

Ontario Needle Exchange Programs: Best Practice Recommendations

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PREFACE FROM ONECC

On behalf of the Ontario Needle Exchange Coordinating Committee (ONECC), itself representative of the Ontario Needle Exchange Network (ONEN), we would like to present this hard-earned, exciting and in our opinion historical document.

The idea for a document establishing best practices standards for needle exchange programs has been discussed within Ontario's network of harm reduction programs for several years now. To my recollection, it was Don Young, Program Manager of the Superior Points Harm Reduction Program in Thunder Bay, who first articulated this project. Don has been a driving force behind this initiative and continues to remind us of the importance of providing innovative and dedicated outreach programs.

While needle exchange programs have been active in Ontario now for 17 years, there were previously no minimum standards or guidelines for program operations. Needle exchange programs have evolved more into syringe distribution and recovery programs, and now commonly serve as a springboard for the evolution of further health services, such as methadone maintenance treatment. Apart from the Mandatory Guidelines legislation originally developed in 1997, there is no policy document, or established standards, for harm reduction programs to utilize in making operational or program planning decisions.

Many harm reduction and needle exchange programs continue to struggle for adequate funding and for recognition as key players in public health and within the larger landscapes of disease prevention, health promotion and health education. Despite continued compelling data making evident the effectiveness, efficacy and efficiencies of needle exchange programs; many of our programs currently survive on minimal and inadequate funding.

Further, programs have lacked access to a synthesis of the literature that would provide an evidence-basis for program developments. Here, for the first time, we have that basis in evidence for the continued progressive evolution of harm reduction practice. It is a document we are extremely proud of; it will serve our field well.

We feel strongly that this document is, in many ways, world-historical. It brings to us, in a concise, synthesized and organized manner, the international literature pertaining to many of the controversial or novel policy and practice challenges we face. What basis is there in evidence to provide inhalation equipment to crack and crystal methamphetamine users? What, if any, other health programs should needle-syringe programs develop? For new programs, what are the best ways known to provide syringe supply? This document provides an evidence basis for responses to these, and myriad other questions.

Harm reduction has come a long way in Ontario over the past 17 years. We feel it has much farther to go. We dedicate this document to the countless clients and friends we have collectively had the honour of knowing and serving over the past years. We remember the dead, and fight for the living.

ONECC would like to thank the team of authors behind this document, and in particular Drs. Carol Strike, Lynne Leonard and Peggy Millson for the continued intelligent support and guidance they have provided our programs.

Sincerely,
Ron Shore
Coordinator, Street Health Centre, Kingston

ABOUT THE AUTHORS

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LYNNE LEONARD is a social scientist and social worker by training and obtained her Ph.D. in epidemiology and social policy from McGill University. At the University of Ottawa, Lynne is an Assistant Professor and Research Scientist in the Department of Epidemiology and Community Medicine where she is the Director of the HIV Prevention Research Team. She has directed several collaborative community-based studies in HIV and HCV prevention research at the national, provincial and regional level. Currently, Lynne is running an evaluation study assessing the impact of the controversial distribution of crack pipes in Ottawa and, with Dr Carol Strike, is working on a study assessing the need for a safer injection facility in the city.

MARGARET (PEGGY) MILLSON is a community medicine specialist and an Associate Professor in the Dept of Public Health Sciences and the HIV Social, Behavioural and Epidemiological Studies Unit, Faculty of Medicine, University of Toronto, as well as a Senior Scientist with the Ontario HIV Treatment Network. Her primary research interests are prevention of bloodborne and sexually transmitted infections in drug users and other marginalized populations, and she has been a principal investigator on a number of studies addressing risk of HIV and HCV among injection drug users, and evaluating harm reduction programmes.

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ABOUT THE ONTARIO NEEDLE EXCHANGE NETWORK

The Ontario Needle Exchange Network (ONEN) was developed in 1998 to provide a forum for the sharing of information and discussion of issues, policies and initiatives that have an impact on needle exchange programs affiliated with public health units in Ontario. The membership of the ONEN includes regional representatives of needle exchange programs funded through the Public Health branch of the Ministry of Health and Long Term Care. The role of ONEN is as follows:

- ▶ To share information on trends, issues and epidemiology related to substance use, HIV/AIDS, Hepatitis B and C and other bloodborne infections
- ▶ To identify priorities regarding professional development and where appropriate, provide this for program staff, managers and others
- ▶ To ensure that the educational information provided to substance users is current, of high quality and consistent across the province
- ▶ To develop strategies to promote needle and syringe exchange programs and other harm reduction strategies in the broader community
- ▶ To facilitate an opportunity for staff to meet periodically to share information and to discuss program direction
- ▶ To provide a provincial perspective supportive of program and client needs
- ▶ To establish working groups to address identified issues
- ▶ To provide input into research needs

The members of the ONEN who oversaw this project were:

- ▶ Eastern Region: Ron Shore, Kingston
- ▶ Eastern Region: Paul Lavigne, Ottawa
- ▶ Northwest Region: Don Young, Thunder Bay
- ▶ Central West Region: Suzanne Newmark, Hamilton
- ▶ Northeast Region: Elizabeth Larocque, Sault Ste. Marie
- ▶ Southwest Region: Jack Smit and Janine Luce, London
- ▶ Central East Region: Cathy White, York
- ▶ Toronto Region: Shaun Hopkins, Toronto

Ex officio: Ministry of Health & Long-Term Care, Public Health Branch: Nancy Peroff-Johnston, and Susan Lindsey

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Our efforts to produce a set of high quality best practices were greatly assisted by reviews conducted by experts who received only our heartfelt gratitude and thanks for their hard work, eye strain, comments and suggestions. This document was greatly improved following the external in-depth reviews completed by: Diane Bailey, Mainline Needle Exchange, Halifax, Nova Scotia; Dave Burrows, AIDS Projects Management Group, Sydney, Australia; Don DesJarlais, Beth Israel Medical Center, NY, NY, and Marliss Taylor, Streetworks Needle Exchange, Edmonton, Alberta. We thank and acknowledge the expertise and assistance provided by the Ontario Needle Exchange Regional Managers: Suzanne Newmark, The Van and Street Health Program, Hamilton; Jack Smit, Counterpoint Needle Exchange, London; and Susan Lindsey, Nancy Peroff-Johnston, Lorraine Scheidel and other reviewers from the Ontario Ministry of Health and Long Term Care.

As well, this project involved completion of many essential, tedious and not-very-glamorous tasks such as locating, retrieving and indexing mountains of literature and entering every corrected typographical error into a revised document. For their assistance, we extend our thanks to Maria Jones, Emily Hansson and Natasha Khan at the Centre for Addiction and Mental Health (CAMH) and Tarek Varani and Emily Meadows in the Department of Epidemiology and Community Medicine at the University of Ottawa. Finally, our proof-reading efforts were greatly assisted by the eagle-eyed editing of Claire Rufo at CAMH.

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OVERVIEW OF THE DOCUMENT

In this document, we present best practice recommendations for needle exchange programs (NEPs) located in Ontario communities. These recommendations are based on the best available scientific evidence. The document is divided into five parts:

- ▶ Introduction - includes background information about the project and NEPs
- ▶ Review of NEP effectiveness literature
- ▶ Start-up tasks for NEPs
- ▶ Best practice recommendations - in brief - includes a 'quick-read' version of all the recommendations
- ▶ Best practice recommendations - in detail - re-iterates the recommendations but provides a more detailed exploration of the issues and cites specific evidence to support the recommendations

Project principles

To develop this document, we adopted a participatory approach in which the authors worked in collaboration with members of the Ontario Needle Exchange Coordinating Committee to develop the structure and content. As well, Ontario Regional NEP Managers provided the project team with feedback regarding the structure and content of the document.

We endeavoured to conduct a thorough review of the best available evidence within the resources and timeline available for this project. Priority was placed on solid scientific evidence. However, to ensure the document is relevant to the Ontario context, a hierarchical approach was adopted whereby evidence from Ontario was reviewed first followed by evidence from elsewhere in Canada and other industrialized nations (e.g., United States, Europe and Australia). For example, there is Ontario evidence demonstrating that injection drug users (IDUs) share injection equipment. As a result, we did not review reports from all other jurisdictions demonstrating that IDUs share equipment. We also made use of practical guides and information sheets developed by NEPs, governmental and non-governmental agencies. For readers, we have noted in the document where evidence is lacking, mixed or unclear.

Best practices versus practical advice

During the development of the project, the team had numerous discussions about whether or not to offer practical advice in addition to evidence-based best practice recommendations for situations when best practices may not be achievable. We spoke about the many differences in NEPs in Ontario in terms of

size, budget and expertise and questioned whether some of the best practices were realistic for small or new NEPs. For example, we questioned whether or not to recommend that clients always be given other injection-related equipment with every needle they obtain from NEPs. The evidence would suggest that this is necessary and desirable but programs may lack the resources to do so. We also debated, for example, whether or not to include a section about needle and syringe cleaning since in some instances sterile needles will not be available when drugs are being injected. As you will read in the pages that follow, we have not recommended needle and syringe cleaning as a 'fall-back' because the evidence shows that this practice does not have empirical support.

Our external reviewers also raised the issue of best practices and practical advice. Several rightly pointed out that small programs would have difficulty implementing all of the best practices. As well, we received comments indicating that over time NEP workers have accumulated extensive practical knowledge and tips that might benefit others.

After much consideration, the team came to the conclusion that the purpose of the document is to provide Best Practice Recommendations and not Practical Advice or Best and Second Best Practices. We agree with remarks that practical advice is needed by NEPs but believe that practical advice belongs in another document, and perhaps, written by those who possess practice-based experience.

When you read this document, you will notice that each section begins with a set of definitive best practice statements. Our goal is to help programs use evidence to move towards best practices (i.e., if these are not already in place) and to push their programs to achieve more for their communities. It is also our goal to help programs advocate for better resources and services and as such, so-called Second Best Practices may not be useful or may slow down program development.

INTRODUCTION

Needle exchange programs¹ (NEPs) make good public health sense because:

- ▶ NEPs reduce transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV) and other bloodborne pathogens among injection drug users (IDUs)
- ▶ NEPs reduce unsafe drug use and sexual behaviours associated with the transmission of HIV, HBV, HCV and other bloodborne pathogens
- ▶ NEPs reduce the number of used needles discarded in the community
- ▶ NEPs do not encourage initiation of injection drug use, do not increase the duration or frequency of injection drug use or decrease motivation to reduce drug use
- ▶ Neither a cure nor a vaccine is available for HIV
- ▶ The lifetime costs of providing treatment for IDUs living with HIV greatly exceeds the costs of providing NEP services
- ▶ At any given time, most IDUs are not receiving drug treatment
- ▶ NEPs are often the only contact IDUs have with health or social service providers

The World Health Organization (WHO, 2004) recommends provision of sterile injection equipment to IDUs as an essential component of HIV prevention programs. The WHO (2004), the United States Preventive Services Task Force (1996) and the American Medical Association (1996) all recognize needle exchanges as essential prevention programs to reduce HIV transmission among IDUs.

The evidence is strong - doing nothing to prevent transmission of HIV, HBV, HCV and other bloodborne pathogens has serious adverse public health consequences.

NEP, SEP or NSP?

In this document we use the term NEP to refer to programs that provide IDUs with access to sterile injection equipment, health education, referrals, counselling and other services. However, in other parts of the world, the term syringe exchange program (SEP) is used as the label for these types of programs. The term needle and syringe programs (NSP) is growing in popularity and in response to the move of many programs away from 'exchange' of equipment to 'distribution' of equipment with or without a return of used equipment. In Ontario, these programs have been known as NEPs since their inception and the Mandatory Programs and Services Guidelines for Ontario uses this label for the program. Consequently, we use the term NEP throughout the document.

¹'Exchange' refers to needle/syringe exchange, distribution and disposal.

NEPs in Ontario

In Ontario, NEPs are designated as a mandatory public health program in areas where injection drug use is recognized as a problem in the community (Ontario Ministry of Health and Long Term Care, 1997). In Ontario, the first NEPs opened in 1989 and 28 NEPs were operational in 2004. As well, there were over 80 satellite sites operated by other community agencies in partnership with an NEP where needles, condoms and other harm reduction materials and services could be accessed (Ontario Ministry of Health and Long Term Care, unpublished data).

Each NEP provides basic exchange services, including:

- ▶ Needle distribution and disposal
- ▶ Condom distribution
- ▶ Education and information
- ▶ Referrals and counselling

Many NEPs have augmented their programs and provide a wide range of services such as: testing for HIV, sexually transmitted infections (STIs), HBV and HCV, and pregnancy, as well as immunizations, food and clothing banks, job referrals, methadone maintenance clinics and medical care, etc. (Ontario Ministry of Health and Long Term Care, 2003).

What 'best practices' are and how to use them

Best practices are a series of recommendations for service design and delivery based on the best available evidence. The recommendations represent a tool to transfer the knowledge developed through research to the delivery of service and development of policy. Please note that this document is not intended to be a prescriptive set of practices for NEPs. All programs develop over time and the best practices can be used to guide development from modest to multi-faceted programs. All NEPs face financial and other constraints. As such, some programs may have resources or partnerships to implement particular components but not others. While the ideal NEP program would include all components, an inability to provide all components should not be used to discourage development and implementation of an NEP. While some components are essential for all NEPs (i.e., needle exchange, disposal, education and referrals and counselling), other components can be added over time.

These best practice recommendations are based on current scientific evidence and expertise from long-standing and well-established NEPs. They will need to be updated over time as evidence for particular practices becomes stronger or points in new directions.

What is harm reduction?

Harm reduction is a set of principles that can be used to guide policy and program development and delivery, as well as advocacy and individual behaviour. Typically, harm reduction is characterized by:

- ▶ A primary goal of reducing drug-related harm rather than a primary goal of reducing drug-use

- ▶ Pragmatic strategies and interventions for people who continue to use drugs
- ▶ A net reduction in drug-related harm
- ▶ Ensuring drug users are treated with dignity and as full members of society. This includes a non-judgmental and non-punitive stance towards the consumption of alcohol and drugs
- ▶ A focus on realistic and achievable goals (Erickson et al., 1997; Lenton and Single, 1998).

Using these principles and policies, programs are developed to reduce or eliminate the adverse health, social, and economic consequences of drug use without requiring abstinence.

How many injection drug users are there in Ontario?

In Ontario, there were an estimated 41,100 IDUs in 2002 (Millson et al., 2005). The estimated number of IDUs by health region is presented in a review of the epidemiology of HIV and HCV among IDUs in Ontario by Millson, Leonard, Remis, Strike and Challacombe (2005).

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NEP Effectiveness

NEP EFFECTIVENESS

The WHO (2004b), the United States Preventive Services Task Force (1996) and the American Medical Association (1996) all recognize NEPs as essential prevention programs to reduce HIV transmission among IDUs. NEPs reduce the risk of HIV transmission by increasing access to sterile needles, removing used needles from circulation and educating clients about the risks of re-using injection equipment (Kaplan 1995; Ksobiech 2003, 2004). The following is a brief review of the NEP effectiveness literature. For more extensive reviews see WHO (2004a, 2004b), Gibson, Flynn and Perales (2001) and Bastos and Strathdee (2000).

NEPs and needle sharing behaviour

NEP use is associated with decreased levels of needle sharing. Among 776 IDUs in Vancouver, Wood et al. (2002) found that acquiring needles exclusively from an NEP was associated with less needle sharing (odds ratio (OR)=0.4) and negatively associated with high risk sharing (i.e., sharing with someone other than an intimate partner in the previous 6 months; (OR=0.46; 95% confidence interval (CI) 0.27-0.76). A cohort study of 212 IDUs in San Jose, California, found that NEP use was associated with a more than two-fold protective effect on HIV risk behaviour including needle sharing (OR=0.45; 95%CI: 0.21-0.92). The protective effect was greatest for IDUs without access to other legal sources of sterile needles (OR=0.16, 95%CI: 0.03-0.96; Gibson et al., 2002). Among a cohort of 340 high risk IDUs in Oakland, California, who reported sharing needles within 30 days prior to the initial interview, NEP use was associated with discontinued needle sharing. Those who began using the NEP at follow-up (n=55; OR=2.53, 95%CI: 1.29-4.95) and those who used the NEP at both initial and follow-up interviews (n=63; OR=1.87, 95%CI: 1.02-3.43) were more likely to discontinue needle sharing than those who had never used the NEP (Bluthenthal et al., 2000).

In a study of 2,306 IDUs in six U.S. states, Monterroso et al. (2000) found that high risk IDUs (defined as high or increased drug injection, needle sharing or injection paraphernalia sharing) were more likely to use an NEP. However, among a subset of IDUs (n=1,080) in sites where HIV seroconversions had occurred, they found a significant association between not injecting with previously used needles and using an NEP (adjusted OR=2.08; 95%CI: 1.15-3.85). And among 1,582 IDUs enrolled in the RAVEN study (Seattle, Washington), exchange users were less likely to report needle sharing (47%) than non-exchange users (58%) at follow-up ($p < 0.01$; Hagan and Thiede, 2000).

Paone et al. (1997) compared IDUs who used a New York NEP and continued risky injection behaviours (n=158; i.e., injection with a previously used needle) with those who had stopped risky injection behaviours (n=391) in the past 30 days. Although both groups received the majority of their needles from an NEP, those who had stopped risky behaviours received more of their needles (mean=95%) from the NEP than those who continued risky injection behaviours (mean=89%, $p < 0.005$). The authors conclude that there is a need to encourage more frequent NEP attendance, and to increase the amount of equipment provided per visit.

According to the WHO (2004b), factors such as group norms and rituals, inaccessibility of sterile injecting

equipment and an inability to carry injecting equipment because of familial, social or legal environments can result in needle sharing even when sterile equipment is available.

NEPs and HIV, HBV and HCV seroprevalence

Drawing on an extensive literature review, the WHO (2004a, 2004b) concludes that there is overwhelming evidence that NEPs are effective to substantially reduce HIV transmission. In New York City (NYC), Des Jarlais et al. (2005) found evidence of a linear relationship between increases in the number of needles exchanged between 1990 and 2002 and a reduction in HIV transmission in the local IDU population (3,651 IDUs). In a meta-analysis of data from three studies, Des Jarlais and Marmor (1996) found that among IDUs in New York City, using an NEP was associated with a three-fold protective effect for HIV incident infection (hazard ratio=3.35, 95%CI: 1.29, 8.65). In the period 1990-92 (prior to legalization and expansion of NEPs in NYC) HIV incidence was 3.55 per 100 person years at risk. By 1999-2002 the rate of HIV incident infection had reduced to 0.77 per 100 person years at risk ($p<0.0001$). Following the opening of an NEP in New Haven, CT, in late 1990, Heimer et al. (1993) found a significant decline in HIV DNA found in used needles. Needles were tested for HIV DNA between 1990 and 1993. The 63.9% prevalence rate of HIV DNA found in returned needles during the first few weeks of NEP operation, declined to 41.1% by 1993 (Heimer et al., 1993; Kaplan and Heimer 1994; Kaplan and Heimer, 1995).

Evidence of NEP effectiveness is further supported by data showing an association between early implementation of NEPs, and harm reduction strategies and low HIV prevalence levels (<5%) in cities such as Toronto, Tacoma Washington, Sydney Australia, Glasgow Scotland and Lund Sweden (Des Jarlais, 2005). Globally, implementation of NEPs has been linked to declines in HIV prevalence. An analysis of HIV prevalence data from studies in 103 international cities reported that cities that introduced NEPs had average annual declines in HIV seroprevalence of 18.6% (Commonwealth Department of Health and Ageing, 2002). Cities without NEPs had average annual increases in HIV seroprevalence of 8.1%.

With regard to HCV, an analysis of data from studies in 101 international cities found a non-significant protective effect for HCV incidence associated with NEPs (Commonwealth Department of Health and Ageing, 2002). Among men IDUs in the Point Project in Ottawa, using an NEP for seven months or more had a significant independent protective effect on baseline HCV infection (Millson et al., 2005). In a case-control study of IDUs in Tacoma, Washington, Hagan et al. (1999) compared IDUs with acute HCV ($n=20$) and HBV ($n=28$) with an IDU control group ($n=26$ and 38 respectively). IDUs who did not use the needle exchange had a seven-fold greater risk of HCV infection than exchange users (AOR=7.29; 95%CI: 1.62-32.75) and more than five-fold risk of HBV infection (AOR=5.53; 95%CI: 1.49-20.44). However, a later study of IDUs enrolled in the RAVEN cohort study (Seattle, Washington) found no protective effect against HCV or HBV associated with NEP use (Hagan et al., 1999). NEP users had elevated (non-significant) risks of HCV and HBV compared with IDUs who had never used the NEP. Similarly, in Chicago, Thorpe et al. (2002) studied a cohort of 510 young adult IDUs (18-30 years) who were HCV seronegative at baseline. Among the group who completed the follow-up ($n=353$) there were 29 incidents of HCV infections. Thorpe et al. found no protective association between use of an NEP and risk of HCV infection.

Negative findings have been largely explained by limitations in study design such as inadequate measures, selection bias, dilution effects and an inadequate definition of NEP processes (WHO, 2004a; Gibson, Flynn

and Perales, 2001; Bastos and Strathdee, 2000; Bluthenthal et al., 2000; Leonard et al., 1999; Vlahov and Junge, 1998). Inadequate measures of NEP participation such as “attends/does not attend” may obscure risks associated with other patterns such as infrequent and/or sporadic attendance (Bastos and Strathdee 2000). Selection bias affects results if IDUs with high-risk behaviours (e.g., frequent injection, frequent sharing) are more likely to use NEPs than IDUs with lower risk behaviours (Des Jarlais, 2000; Schechter et al., 1999; Archibald, 1998). A dilution effect occurs when exchange users are compared with non-exchange users who acquire sterile needles from other sources, as in the Montreal, Vancouver and Seattle studies (Gibson, Flynn and Perales, 2002; Vlahov and Junge, 1998; Bluthenthal et al., 2000). In programs where large numbers of needles are distributed, non-NEP users may receive sterile needles by way of NEP users. In this instance, comparisons of NEP users versus non-users are not valid, as non-users may also benefit from NEP sterile needle distribution; comparisons of infection transmission and risk behaviour rates over time are preferable (Des Jarlais, 2006, personal communication).

In addition, many evaluation studies have paid little attention to defining the NEP process. Instead, an NEP is treated as an entity without variation. Failure to identify program limitations and flaws limits our ability to make comparisons across programs. In this regard, the WHO (2004a) cites a United States National Academy of Sciences Institute of Medicine report that concludes that to reject NEPs on the basis of single studies with design limitations is “poor scientific judgment and bad public health policy” (p.6).

CONSIDERATIONS

Distributing enough needles to facilitate the use of a sterile needle for each injection is an essential strategy to prevent HIV, HBV and HCV transmission. However, 100% coverage may not be feasible, or always necessary (Heimer, 1998) and is difficult to calculate. While this is one way to understand coverage, there are other issues to consider, such as how many IDUs acquire sterile needles regularly and how often they present at NEPs. We also need to know how many needles are distributed, how often, how easy (or difficult) it is to acquire sterile needles, and what other sources of sterile needles IDUs use.

NEPs need to know what it takes to distribute enough sterile needles to eliminate needle re-use. It is important that enough needles are distributed to meet demand from NEP users, including indirect distribution to non-users by NEP users (Des Jarlais, 2006, personal communication). Currently, NEPs distribute a small proportion of the sterile needles required. It is estimated that approximately 1,000 needles are required per IDU per year (Lurie et al., 1998; Holtgrave et al., 1998). In Ontario, it is estimated that 53 needles are distributed per injector per year (Millson et al., 2005). In Montreal (Remis, Bruneau and Hankins, 1998) and in Ottawa (Leonard et al., 2004) it is estimated that NEPs distribute approximately 5% of the needles required by IDUs (see **Needle and syringe exchange** section).

Other concerns about client coverage have been raised in the literature. For example, in Australia, Maher et al. (2001) found that a lack of culturally appropriate services meant that young (15-24 years) Indo-Chinese IDUs did not make use of NEPs and continued to share needles. Other studies indicate that NEPs may have difficulty attracting younger IDUs (Bailey et al., 2003; Vlahov and Junge, 1998; Vlahov et al., 1997). This is concerning because younger IDUs are more likely to share needles (Hahn et al., 2001), putting them at risk of HIV, HBV and HCV transmission. For instance, in Chicago, Bailey et al. (2003) found that local NEPs were

not reaching young IDUs (18-30 years). Among those who did use the NEP, most attended infrequently. Only 13% of IDUs visited NEPs on average more than once a month during the 6 months prior to the baseline interview. However, some NEPs have successfully attracted young IDUs. For instance, in San Francisco some NEPs have specifically targeted young IDUs with strategies such as alternative and underground exchange sites. In a study of 308 young IDUs (under 30 years) in San Francisco, Hahn et al. (2001) found that in the prior month 88% had used at least one NEP site. The evidence reviewed above demonstrates the need to develop partnerships with agencies serving specific ethno-cultural and youth populations.

NEPs alone may be insufficient to prevent HIV, HBV and HCV transmission (Hankins 2002; Patrick et al., 2001; Strathdee et al., 1997) and even low rates of equipment sharing pose risks of virus transmission. This is concerning because HCV and HBV rates among IDUs in Canada are typically high and needle sharing carries a relatively high probability of transmitting these infections (Hahn et al., 2001). Needle sharing during periods of elevated population incidence of HIV, such as during an epidemic or outbreak like the one in Vancouver in the 1990s, is particularly problematic as transmission risk can be increased by sharing with recently infected persons with high viral loads (Taylor et al., 2000; Paone et al., 1997; Strathdee et al., 1997; Strathdee et al., 1998).

NEP COST-EFFECTIVENESS

NEPs are cost-effective strategies for reducing HIV transmission. Calculating cost-effectiveness and interpreting international data are inherently challenging. Nevertheless, accumulated evidence from Canada, the United States and Australia shows that NEPs are cost-effective when compared with the lifetime cost of treating HIV infections (Commonwealth Department of Health and Aging, 2002; Laufer, 2001; Reid, 2000; Jacobs et al., 1999; Holtgrave et al., 1998, Lurie et al., 1998, Gold et al., 1997; Kaplan, 1995). For instance Anderson (2000), citing a 1999 British Columbia (BC) report, notes that “for every HIV infection averted in injection drug users in BC, a total lifetime medical cost of \$145,344 is avoided” (p.1695). In Hamilton, Ontario, the cost of operating an NEP over 5 years was compared with the lifetime cost of treating HIV/AIDS infections (Gold et al., 1997). The authors predicted that the program would prevent 24 cases of HIV infection over five years, giving a cost saving of \$1.3 million over five years. Similarly, an unpublished economic evaluation of Mainline Needle Exchange in Halifax, Nova Scotia, determined that the cost of operating the NEP between 1993 and 1997 was significantly less than the lifetime cost of treating one HIV-positive person (Dow, MacLaren and Skinner 1998).

In the U.S., Lurie et al. (1998) estimated the cost per sterile needle provided, using different distribution models: NEP; pharmacy-based NEP; sale of syringes in pharmacies; sale of pharmacy kits and free distribution of pharmacy kits. (Pharmacy kits contain five needles, sterile water, condoms, alcohol swabs, and cotton swabs packaged in a 1x3x5” resealable plastic container). Although the NEP model was the more expensive on a per needle basis, the authors determined that all models were cost effective when community HIV seroprevalence exceeded 2.1%. Drawing on their analysis of the cost-effectiveness of increasing access to sterile needles, Holtgrave et al. (1998) conclude that: “funding programs to achieve large-scale sterile syringe access and syringe disposal for IDUs is probably a wise and cost-saving use of public funds” (p.S138). For an extensive review of NEP cost-effectiveness see Kahn (1998).

CHARACTERISTICS OF EFFECTIVE PROGRAMS

The research reviewed here shows that NEPs have effective HIV prevention outcomes. However, the question that remains is how can individual NEPs provide effective HIV prevention programming? Drawing on an extensive review of the evidence the WHO (2005) identified characteristics that make HIV prevention programs, such as NEPs, effective. According to the WHO, effective programs are those that:

- ▶ Are implemented as soon as possible
- ▶ Provide a comprehensive range of well-coordinated and flexible services
- ▶ Involve the community in planning and implementation
- ▶ Continually assess and understand local community needs
- ▶ Make services available in multiple locations with varied hours of operation
- ▶ Provide community-based outreach to drug users where they live and use or buy drugs
- ▶ Communicate respect for IDUs and their families to ensure all are treated with dignity and with sensitivity to cultural, racial, ethnic and gender-based characteristics
- ▶ Provide easily accessible sterile injection equipment to reduce the re-use of injection equipment
- ▶ Educate IDUs regarding risk and services for risk reduction
- ▶ Are sustainable
- ▶ Provide a supportive political environment
- ▶ Target IDUs who are living with HIV as well as their sexual partners

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NEP Start-up Tasks

NEP START-UP TASKS

Before opening an NEP, program developers need to undertake a series of activities to ensure the NEP will meet the needs of IDUs and the community. How programs are developed, who is involved, who is hired, as well as the ability to identify, engage and retain clients and build support in the community all contribute to effective programs. The approach taken to develop an NEP will depend on a number of factors such as the skills and experience of the organizing group, availability of community resources and support for the program. Each community will need to tailor development activities to meet their needs.

Below we suggest a number of activities to undertake before opening an NEP, including:

- ▶ Develop an advisory committee
- ▶ Identify mentors at other NEPs
- ▶ Conduct advocacy and community development with IDUs
- ▶ Conduct advocacy for the NEP in the community
- ▶ Collect information about the IDU community
- ▶ Select a program model(s), site(s) and hours of operation
- ▶ Develop a program plan, policies and procedures
- ▶ Hire and train staff

Develop an advisory committee

According to the WHO (2005), developing community support from diverse stakeholders is essential for effective HIV prevention programs. Members of the advisory group typically represent diverse community interests and include representation from: IDUs, other community residents, drug treatment, advocacy groups, organizations serving IDUs, public health department, AIDS service organizations, public schools, physicians, mental health services and law enforcement. Inclusion of law enforcement at the early stages of planning has been found to be essential to ensure that the NEP can open without opposition and/or harassment from law enforcement officials (See **Relationships with law enforcement** section).

Input from stakeholders during the planning phase can help build support, reduce or eliminate opposition, provide access to information and data about the community, begin to build a sense of ownership for, and importance of, the NEP and provide advice about program design. As well, members of the advisory committee can serve as important resources to identify and develop productive referral networks. Advisory groups can help to define and complete development activities.

Identify mentors at other NEPs

As well as including local stakeholders, many NEPs in Ontario have benefited from the expertise of workers and managers at other NEPs. Older Ontario programs received assistance from programs in other parts of the world and also assisted each other over time. Newer programs have received assistance from older well-established programs in Ontario. As well, there are numerous programs throughout Canada that serve diverse groups of IDUs (e.g., women, rural, Aboriginal, large urban, small urban) who can offer specialty

advice and assistance. Mentorship from existing NEPs can help program developers identify steps to take, mistakes to avoid and provide an important source of support and guidance for many of the difficult issues that arise during the development and operation of an NEP.

Conduct advocacy and community development with IDUs

Including local IDUs on advisory groups is crucial to develop a vibrant NEP. IDUs need to be treated as equal members of advisory groups and have their expertise recognized and respected. IDUs bring a wealth of knowledge about the drug scene such as: locations, types of drugs used and prevalence of risk/protective behaviours etc. As well, IDUs have social networks through which to transmit knowledge and credibility of the NEP. As Friedman et al. (2004) and many others note, IDUs are important partners in programming.

IDUs can participate in all aspects of program development and implementation. Specifically, IDUs can make meaningful contributions to NEPs and their community by involving them as part of decision making groups, experts, implementers of interventions and speakers (Jürgens, 2005). **'Nothing about us without us: Greater, meaningful involvement of people who use drugs: A public health, ethical, and human rights imperative'** by Ralf Jürgens (2005) provides a detailed examination of issues related to the inclusion of IDUs in program and policy development and implementation. This report provides guidance on how best to consult with IDUs. For example, it is recommended that when seeking consultation, invite several IDUs, ask groups that represent IDUs to nominate their own representatives, hold meetings in low-key settings, provide cash honorariums and guarantee confidentiality (Jürgens, 2005).

When developing a program, NEPs must establish contact and rapport within the IDU community. While this may take several years to solidify, principles that guide effective work with vulnerable populations include:

- ▶ Consistency
- ▶ Use of simple language
- ▶ Patience and reliability
- ▶ No exploitation of IDUs
- ▶ Sharing of power
- ▶ Identifying and breaking down barriers to participation
- ▶ Reporting back to communities (WHO 2005).

Conduct advocacy for the NEP in the community

As noted above, in Ontario, NEPs are a mandated public health program in regions where injection drug use is a problem (Ontario Ministry of Health and Long Term Care, 1997). While these programs are mandated for community residents, organizations, businesses, police and others may not always accept them. In Ontario, some programs have experienced opposition (Strike, 2004). As a result, NEPs need to conduct advocacy on behalf of their program before the program opens and throughout the lifespan of the program. Advocacy involves a series of activities aimed at generating support (or at least lack of opposition) to an NEP and its clients. Meetings, community forums, presentations, letters to politicians, policy makers and newspapers, education sessions and other activities can be used to create and maintain an hospitable environment

for the program. While advocacy can be planned in advance with identified goals, targets, activities and messages, advocacy can also be less formal and initiated when and where opportunities arise. Nevertheless, overall goals for advocacy must be established to ensure that all who advocate on behalf of the program and its clients work with and not against each other.

As well as focusing advocacy efforts within a community, advocacy can also be thought of in a wider context with the focus on the provincial or federal level or towards all IDUs and drugs users not just NEP clients. Consequently, combining efforts with other NEPs and organizations may be desirable and necessary to achieve the goal(s) that has been set.

Advisory group members can help to identify targets for advocacy, plan the activities and craft the 'message' to be used to advocate for the program and its clients. The WHO (2004) has an advocacy guide focused directly on HIV prevention among IDUs that provides detailed guidance on how to develop and implement an advocacy strategy. This guide recommends the following principles to guide advocacy efforts:

- ▶ Advocacy activities should avoid increasing harm
- ▶ Advocacy activities should aim to protect the rights of IDUs and people living with HIV/AIDS
- ▶ Advocacy activities should balance short-term pragmatic goals with long-term developmental goals
- ▶ The objectives of advocacy must be related to the approaches and activities shown by research to be effective in addressing HIV/AIDS among IDUs
- ▶ Advocacy activities should concentrate on both HIV/AIDS prevention among IDUs and on treatment, care and support
- ▶ Specific and targeted advocacy activities should fit the social, cultural, political and legal context of the society
- ▶ Advocacy activities should target different sectors of society and key individuals, using multiple advocacy techniques at the same time, if possible
- ▶ Advocacy should aim at quickly establishing supportive policies and large enough programs within the social, political and funding context of the country
- ▶ Advocacy should both lead to establishing new policies and programs and react to how institutions, the mass media and others deal with HIV/AIDS among IDUs
- ▶ Advocacy activities should involve, to the extent possible, IDUs and people living with HIV/AIDS in planning, implementing and evaluating programs
- ▶ Advocacy activities should consider differences between groups of IDUs according to gender and ethnic background and to vulnerability to HIV/AIDS and promote equity in treatment, care and support (WHO, 2004)

Collect information about the IDU community

Another crucial task to undertake before opening an NEP involves collecting information about the target community. To be effective, NEPs need to understand their client group, including:

- ▶ How many IDUs live in the community and/or catchment area
- ▶ Where clients live, buy and use drugs, and hang out

- ▶ Social, economic and health status of IDUs
- ▶ What kinds of drugs are used and how they are consumed
- ▶ Current level of knowledge regarding risk and protective behaviours
- ▶ Current patterns of risk and protective behaviours
- ▶ What resources are available for IDUs and if these are used
- ▶ Types of services they would like to access

Methods such as analyses of existing data sets, surveys, focus groups, face-to-face interviews and field observations can all be used to collect relevant data. The **Rapid assessment and response guide on injecting drug use (IDU-RAR)** available from the WHO provides guidance on how to develop a strategy to gather and interpret information, and how to develop an action plan based on the information.

However, other approaches can also be used. For example, planners of the Lifepoint NEP in Milwaukee used an extensive ethnographic approach to collect data used to inform program design and implementation activities (Somlai et al., 1999). Outreach workers from a local AIDS service organization were asked to collect extensive field information about IDU locations, drug use and HIV risk behaviours, and other health and social issues. Many of the outreach workers had previously been IDUs, sex trade workers and/or gang members and were familiar with the 'scene'. Data were collected using face-to-face interviews or focus groups with IDUs in the community, IDUs in drug treatment and drug house owners. Outreach workers visited the sites identified and solicited further behavioural and social information. This information was then used to estimate the number of IDUs in the city, injections per day and needles discarded per day. Data about drug-using locations were used to determine the routes and stops for the mobile NEP service. As well, community consultations were held to answer questions and concerns about the proposed NEP. Somlai et al. (1999) report that extensive data collection, consultation with the community and inclusion of representatives of community organizations and services on the planning task force resulted in less opposition to the program than expected or experienced in other jurisdictions.

Select a program model

Using the data collected about the IDU community, program planners can select the best program model or models to offer NEP services. For example, IDU communities that are located within a small geographic location might be well served by a fixed site and street outreach whereas IDU communities that are dispersed across jurisdictions might be better served by a combination of fixed sites, mobile outreach and satellite sites. Selecting a program model also depends on the resources that are available. Programs that will have the resources to hire numerous staff members with varied skills may be able to combine fixed, mobile and street outreach whereas programs with funding for one or two workers may only be able to offer street and home outreach (see **Needle exchange program delivery models** section).

Regardless of the initial resources, all NEPs grow over time and program models can be added as necessary and/or as access to resources improves and/or when assistance can be solicited from other organizations.

Select sites for the program

Determining locations for program sites is another important step in the development of an effective NEP. Finding a place for NEP services, fixed or mobile, is challenging and has sometimes been a contentious issue in Ontario (Strike et al., 2004) and other jurisdictions (Henman et al., 1998). While advisory groups often assist with the location selection and can help reduce opposition, many NEPs have experienced open hostility from community members and also restrictions on where they can locate their programs. In the past some NEPs agreed to locate their NEP programs away from schools (e.g., 1000 ft away), daycare centres and other public places (Henman et al., 1998; Strike et al., 2004). Some NEP workers in Ontario note that NEPs need to be located in non-residential areas to avoid opposition from neighbours. However, NEPs should be located where clients are, and programs need to be aware of how to mitigate community issues affecting the integrity of the program.

Rockwell et al. (1999) and Welton et al. (2004) argue that the distance IDUs are willing to travel to obtain NEP services is the most important factor to consider when determining NEP sites. Rockwell et al. (1999) found that IDUs who lived within a 10-minute walk of a New York City NEP were almost 3 times more likely to use an NEP. As well, they found that the adjusted odds of injecting with a used syringe were greatly reduced for those living within a 10-minute walk of an NEP (adjusted odds ratio (AOR) = 0.45, 95%CI 0.24 to 0.86, $p=0.015$).

Welton et al. (2004) used complex statistical techniques to determine optimal locations for NEPs in Manhattan, New York, and note several crucial factors that influence NEP site selection, including:

- ▶ Spatial distribution of IDUs (i.e., where do potential clients live?)
- ▶ Distance IDUs are willing to walk or travel to obtain NEP services
- ▶ Willingness to use an NEP if it was available
- ▶ Ease of transportation and proximity to public transportation
- ▶ Availability of supplies from other sources (e.g., pharmacies)
- ▶ Proximity to police stations
- ▶ Proximity to places hostile to IDUs.

Determine hours of operation

NEP accessibility is determined not only by location but also by the hours of operation. NEPs offering services over longer hours are believed to better serve diverse IDU needs. For example, using data collected from 11,855 IDUs who attended at least one of the NEPs in Chicago, Brahmhatt et al. (2000) reported that sites (i.e., 22 sites - storefront, mobile, pager/cell phone) with only daytime hours were more likely than other NEPs to attract older and African American IDUs. Sites open during the evening were more likely to attract Caucasian, Puerto Rican and younger IDUs. Women were more likely than men to attend sites open both day and evening.

Develop a program plan, policies and procedures

NEPs consist of many different services and supports. Each service and support that will be offered needs

to be identified and planned in order to ensure that all components are operational and available to clients. Start-up activities often include development of a program plan that provides a timetable for activities, job descriptions, identification and calculation of the quantity of supplies needed, training needs and guidelines for reporting and evaluation activities (WHO, 2005).

Below we provide an extensive set of Best Practices, however, each program must develop how they will take these recommendations and implement them in their communities and in relation to their host agency. Public health units operate some NEPs but others are operated by AIDS service or other community organizations. This host environment will influence how policies and procedures are defined.

Policies and procedures are developed to ensure that managers, staff and clients all know **who does what, when, how and why**. Policies and procedures define how the work will be done and what rules will govern this work, including for example:

- ▶ How, when and where to offer services
- ▶ How much equipment to offer
- ▶ How to respond to needle stick injuries, client overdoses or other acute health problems on-site
- ▶ Staffing - how to hire and the qualifications necessary
- ▶ Behaviour expectations of staff and clients (e.g., no discrimination, no violence, no dealing or using on-site or in the vehicles) and consequences for violating behavioural expectations
- ▶ How to respond to police requests for information
- ▶ Expectations and limits (if any) for volunteers
- ▶ Collection of program service statistics

Depending on the host agency, some policies and procedures may already be in place. As suggested above, mentors can help with a wide variety of issues, including helping with program plans and providing copies of their own policies and procedures to use as a starting point for new programs.

Program plans, policies and procedures for Ontario NEPs need to be developed in relation to the required program components stipulated by the Mandatory Health Programs and Services Guidelines (Ontario Ministry of Health and Long Term Care, 1997), including:

- ▶ Needle exchange and disposal
- ▶ Condom distribution
- ▶ Education and information
- ▶ Referrals and counselling.

Hire and train staff

Staffing greatly influences the effectiveness of NEPs (WHO, 2005). Staff who are approachable, knowledgeable, experienced with street-life, friendly, non-judgemental, non-directive and helpful are likely to be able to develop and sustain rapport with clients and the community. As well as the personal qualities and skills of the staff, supervision and training are also important for well-run NEPs (WHO, 2005).

Training is important to ensure consistency across staff members, even if new staff have prior experience working in NEPs, with IDUs, other marginalized populations or have other important skills.

In particular, the following have been recommended as important components of staff training for HIV prevention programs:

- ▶ Purpose of the program
- ▶ Target populations
- ▶ Risk behaviours for transmission of HIV (and other bloodborne pathogens)
- ▶ Safer sex, injection and drug use practices
- ▶ Job responsibilities
- ▶ Interpersonal boundaries
- ▶ First aid (WHO, 2005; Strike, 2004)

On-going training of staff is essential to ensure that staff have the opportunity to learn about innovations, different approaches, new information about bloodborne pathogens and treatments, as well as changes in types and patterns of drug consumption. As a result, program plans need to incorporate on-going training plans.

For more information, please see:

The WHO (www.who.int) offers an excellent set of downloadable, free resources to assist with program development, including:

- ▶ Rapid assessment and response guide on injecting drug use (IDU-RAR) (www.who.int)
- ▶ Policy and programming guide for HIV/AIDS prevention and care among injecting drug users (www.who.int)
- ▶ Training guide for HIV prevention outreach to injecting drug users (www.who.int)
- ▶ Advocacy guide: HIV/AIDS prevention among injecting drug users (www.who.int)

As well, the following publications are very helpful:

- ▶ Burrows D. Starting and managing needle and syringe programs: A guide for Central and Eastern Europe and the newly independent states of the former Soviet Union. New York: Open Society Institute. International Harm Reduction Development. 2000. (<http://www.aidsprojects.com/html/Dave/>)
- ▶ Jürgens R. 'Nothing about us without us: Greater, meaningful involvement of people who use drugs: A public health, ethical, and human rights imperative'. Canadian HIV/AIDS Legal Network. 2005. (www.aidslaw.ca)

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Best Practice Recommendations in brief

Needle and syringe exchange²

Best practice recommendations – in brief

To prevent the transmission of HIV, HBV, HCV, and other bloodborne pathogens from injection with non-sterile needles and syringes:

- ▶ Provide sterile needles in the quantities requested by clients
 - ▶ without requiring clients to return used needles
 - ▶ with no limit on the number of needles provided
 - ▶ with encouragement to return used needles
- ▶ Educate clients about the risks of using non-sterile needles

Injection with a previously used needle puts IDUs at high risk for infection with bloodborne pathogens. Studies show that needle/syringe (hereafter referred to as “needle”) sharing is prevalent among IDUs in Ontario but has declined overall since the early 1990s.

Used needles and syringes can serve as a means of transmitting bloodborne pathogens. Under laboratory conditions (i.e., strictly controlled temperature and environment) HIV can survive in used needles for up to 6 weeks, but survival times vary with the amount of blood residue and the storage and handling of the needle. Evidence of HCV has also been detected in used needles, however HCV is more resilient than HIV and is 4-5 times more easily transmitted through a contaminated needle. HBV is also a resilient and virulent virus. Viable virus can survive in dried blood at room temperature for at least a week. HBV is easily transmitted through needle sharing, however transmission is a concern only for IDUs who have not developed immunity through immunization or previous exposure to the virus.

Sharing drugs also carries a risk of transmitting bloodborne pathogens. When drugs are shared by backloading or frontloading, one syringe is used to prepare the drug. A measured amount is then transferred to another syringe. The transfer is done either by removing the needle (frontloading) or removing the plunger (backloading) of the recipient’s syringe. If the needle used for the preparation and transfer of drugs has been previously used, blood or other residues can be transferred along with the shared drugs. HIV and HCV can also be transmitted through equipment sharing. For instance, a needle placed in a common water container or cooker, rinsed with previously used water and/or used with a previously used filter may become contaminated with HIV and/or HCV (see **Distribution of sterile water ampoules, cookers and filters sections**).

Any injection with a used needle puts an IDU at risk for infection, as well as skin and vein problems. This includes re-using one’s own needle. Injecting with a needle contaminated with bacteria and debris can lead to infections such as septicemia and endocarditis. Injecting with a dull needle can cause trauma to the skin, veins and soft tissues and can lead to abscesses, cellulitis and vein collapse.

² “Exchange” refers to needle/syringe exchange, distribution and disposal.

Distributing enough needles to facilitate the use of a sterile needle for each injection is the best method to eliminate the risk of transmitting bloodborne pathogens from re-used or non-sterile needles, and prevent vein damage from blunt or broken needles. However, estimates show that NEPs in Canada distribute a small proportion of the needles required to ensure a sterile needle for each injection. In the past, some NEPs have adhered to a one-for-one exchange policy. This outdated practice restricts access to sterile needles. For instance, IDUs who have no needles to exchange are negatively affected by this policy. Homeless IDUs and others may be unable to store needles until they can attend the NEP. IDUs who have disposed of needles elsewhere are also negatively affected.

To improve coverage, NEPs need to provide needles in the quantities, sizes, gauges and brands that clients request, without requiring exchange for used needles or limits on the number of needles distributed. Providing the number and type of needles requested may help NEPs attract and retain a wide range of clients, meet the recommendation for a new sterile needle for each injection and reduce transmission of bloodborne pathogens.

Calculating the quantity of needles required for 100% coverage is challenging because it is affected by a number of variables including estimates of the number of IDUs in the community (non-NEP users as well as NEP users), the type of drug used and frequency of injection. Approximately 1,000 needles per IDU, per year has been recommended as an easy way to determine the quantity required, however there are more refined estimation methods (see **Program evaluation** section). In Ontario, 100% coverage has yet to be achieved and a wide variation in distribution levels exists. For instance, in 2002 NEPs reported that they distributed between 1 and 474 needles per IDU per year.

IDUs have different needle acquisition patterns that influence NEP attendance. Some IDUs stockpile large numbers, others make sure they have enough for a week or two and still others acquire needles on a daily basis. Of these, day-to-day access is the most problematic because this group is more likely to re-use, share or borrow needles. NEPs can facilitate access to sterile needles with varied modes of program delivery including fixed site with extended hours of operation, mobile needle exchange, peer distribution and home delivery (see **Needle exchange program delivery models** section).

NEPs are well placed to educate IDUs about:

- ▶ The importance of using a new sterile needle for each injection;
- ▶ The risks of needle-sharing, including frontloading and backloading;
- ▶ How to recognize and handle sterile needles (see **Safer injection education** section);
- ▶ How to inject safely (see **Safer injection education** section).

Safer handling and disposal of used injection equipment^{3,4}

Best practice recommendations – in brief

To prevent transmission of HIV, HBV, HCV and other bloodborne pathogens as well as bacterial infections from improperly discarded injection equipment:

- ▶ Educate staff and clients to safely handle and dispose of used injection equipment
- ▶ Provide multiple options and locations for safe disposal of used injection equipment
- ▶ Do not penalize clients who fail to return used needles
- ▶ Estimate the number of needles returned by clients. Neither clients nor staff should count used needles by hand
- ▶ Dispose of used injection equipment, sharps and sharps containers in accordance with local regulations for biomedical waste
- ▶ Encourage HBV vaccination for NEP workers and clients

Safe disposal of used injection equipment and sharps is an important strategy to reduce the amount of used injection equipment discarded in the community and the transmission of bloodborne pathogens among IDUs, NEP workers and the community. **Table 1** provides examples of safer handling and disposal recommendations.

Table 1: Examples of safer handling and disposal recommendations

Disposing of used injection equipment, sharps and sharps containers

- ▶ Sharps must be disposed of in a rigid container with a non-removable lid and labelled “Biomedical Waste/Dchets Biomdicaux”. The container must be capable of withstanding the weight of the biomedical waste without tearing, cracking or breaking
- ▶ When clients exchange needles, provide sharps containers
- ▶ Encourage clients to purchase and/or ask for sharps containers at pharmacies
 - ▶ Some pharmacies may provide free sharps containers to customers who usually purchase their needles there. Some pharmacies may accept sealed containers for disposal
- ▶ When sharps containers are not available, encourage clients to place used equipment in a rigid, plastic container with a tight fitting lid, such as a bleach bottle, fabric softener bottle, or plastic soda pop bottle
- ▶ Encourage clients to write “SHARPS. DO NOT RECYCLE” on containers without such markings
- ▶ Encourage clients to return all sharps containers when 2/3 full to the NEP
- ▶ When possible, pick-up sharps containers from clients homes or locations where they inject and store used equipment

³ ‘Injection equipment’ refers to all injection-related items. ‘Sharps’ refers to needles, syringes, glass stems and other items that may cause cuts or puncture wounds

⁴ also known as biohazard containers

Handling used injection equipment: Recommendations for NEP clients

- ▶ Locate the sharps containers close to the area of use
- ▶ Dispose of used injection equipment immediately
- ▶ Never recap a needle. This may lead to a needlestick injury and (re)infection with HIV, HBV, HCV or other bloodborne pathogens
- ▶ When exchanging needles for other people, ask them to deposit them in a sharps container first
- ▶ Do not bend or break a needle

Handling sharps: Recommendations for NEP workers

- ▶ Be aware that clients exchanging needles may be carrying needles on their person (e.g., in pockets or sleeves) or loose in non-secure containers such as plastic or paper bags
- ▶ Do not touch returned needles
 - ▶ Clients must dispose of their own needles;
 - ▶ If an estimate of the number of needles returned is required this can be done by eyeballing and/or by asking clients how many needles they are returning
- ▶ When performing immunization or testing:
 - ▶ Locate the sharps containers close to the area of use
 - ▶ Dispose of the needle immediately

Collecting used injection equipment discarded in the community

- ▶ Wear puncture resistant gloves
- ▶ Carry a sharps container for immediate disposal

The primary objective of safer handling procedures is to prevent injury and exposure to infected blood. In the event of a needlestick injury, it is important that the injured person receives timely, appropriate care. Post-exposure guidelines outline the procedures to follow in the event of an injury. Ideally, the guidelines will be in place, and workers trained to follow them before an injury occurs. Briefly, post-exposure guidelines include:

- ▶ **First Aid.** Allow the wound to bleed freely, cleanse the wound thoroughly with soap and water. If injury or blood contact is with mucous membranes (i.e., eyes, nose, mouth) flush well with water. Apply a sterile, waterproof bandage.
- ▶ **Medical Attention and Post Exposure Prophylaxis (PEP).** Seek **immediate** medical attention (within hours) from an emergency department, clinic or doctor's office. Testing and post-exposure prophylaxis may be recommended. Delay or failure to seek medical attention may compromise the effectiveness of treatment.
- ▶ **Follow-up Counselling and Evaluation.** Periodic testing for indications of infection as well as counselling for emotional stress may be appropriate. Counselling for prevention of infection transmission is also recommended.
- ▶ **Documentation & Surveillance.** All needlestick injuries should be reported to the NEP manager, and documented. This information can be used to help develop further strategies to prevent injuries.

Distribution of cookers

Best practice recommendations – in brief

To prevent transmission of HIV, HCV and other bloodborne pathogens from the re-use of cookers or spoons:

- ▶ Distribute cookers in the quantities requested by clients with no limit on the number of cookers provided
- ▶ Offer a cooker with each needle provided
- ▶ Educate clients about the risks associated with sharing cookers
- ▶ Educate clients about the correct single-person use of cookers
- ▶ Educate clients about the correct disposal of used cookers

Prior to injection, drugs in powder form, solid form, and tablet form need to be mixed with water to make a solution that can be injected. A cooker is used as the container for this mixing process. It is called a cooker as the solution may be heated to further dissolve the drug so that the solution is of the right consistency for injection. Spoons are often used for this purpose, and less frequently bottle caps. It has been anecdotally reported that some NEPs distribute spoons instead of cookers, however we believe spoons are easier to re-use. As a best practice, we recommend the use of single-use cookers.

Data from international studies document the high frequency of re-use or sharing of cookers among IDUs. IDUs tend to:

- ▶ Retain and re-use cookers longer than either filters or rinse water
- ▶ Share cookers more frequently than other items of drug preparation equipment
- ▶ Share cookers even when a sterile needle is used for injection

Therefore, there may be greater opportunity for contaminating cookers with HCV and HIV than other items of injection equipment.

Virologic studies have documented the presence of HIV and HCV on spoons and cookers removed from injection settings demonstrating the potential HIV and HCV risk associated with the re-use of cookers. In addition to these virologic studies, epidemiologic studies have demonstrated that sharing cookers is an independent predictor of HCV seroconversion and have also documented an association between cooker sharing and HIV prevalence.

The distribution of cookers to clients is the best way for NEPs to reduce the risks associated with the re-use or sharing of cookers among IDUs.

Distribution of filters⁵

Best practice recommendations – in brief

To prevent the transmission of HIV, HCV and other bloodborne pathogens, and to prevent deep vein thrombosis (DVT) from the re-use of filters:

- ▶ Distribute filters with a pore width of 0.22 µm in the quantities requested by clients with no limit on the number of filters provided
- ▶ Offer a 0.22 µm filter with every needle provided
- ▶ Educate clients about the HIV-and HCV-related risks associated with sharing filters and making washes⁵ from filters
- ▶ Educate clients about the risks of bacterial contamination if a new filter is not used, or if a cigarette filter is used
- ▶ Educate clients about the risks of DVT if a new small-pore filter is not used for each injection
- ▶ Educate clients about the correct single-person use of filters
- ▶ Educate clients about the correct disposal of used filters

Prior to injection, drugs in powder, solid or tablet form are mixed with water to make a solution that can be injected. A needle is placed in the mixing container and the solution is then drawn up into the syringe. Filters are used on the tips of the needles to prevent any undissolved particles of the drug and other debris from entering the veins through the syringe.

Cotton or cotton wool is often used as a filter. In addition, there are anecdotal reports of IDUs using tampons, rolling paper and cotton buds. Cigarette filters are also commonly used. Although these filters may prevent large particles getting into the syringe, they may not be clean and will not prevent the entry of small organisms like bacteria.

Data from international studies documents that IDUs frequently re-use filters, however, less is known about how often IDUs inject washes from filters previously used by another IDU.

The distribution of efficient and effective small-pore filters to clients is the best way for NEPs to:

- ▶ Reduce the risks associated with the sharing of filters among IDUs
- ▶ Help clients reduce the use of inefficient large-pore filters such as cigarette filters documented to be associated with the growth of the bacteria responsible for the formation of abscesses
- ▶ Help clients prevent foreign particles from entering the body which can lead to DVT through the use of inefficient filters such as cigarette filters
- ▶ Prevent the sharing of washes made from filters

⁵A drug solution formed by adding water to the drug residue in a used filter, used cooker or used needle.

Distribution of acidifiers

Best practice recommendations – in brief

To reduce the transmission of HIV and HCV, and to reduce the risk of bacterial and fungal infection associated with the use of lemon juice and vinegar as acidifiers:

- ▶ Distribute single-use, airtight and waterproof 100 mg sachets of citric acid or single-use, airtight and waterproof 300 mg sachets of ascorbic acid in the quantities requested by clients with no limit on the number of sachets provided
- ▶ Offer a single-use sachet with every needle provided
- ▶ Educate clients about the potential HIV- and HCV-related risks associated with sharing acidifiers
- ▶ Educate clients about the risks of fungal infections associated with using spore-contaminated lemon juice, vinegar and other acids such as acetic acid
- ▶ Educate clients about the correct single-person use of acidifiers
- ▶ Educate clients about the correct disposal of used acidifiers

To inject insoluble drugs such as brown heroin or crack cocaine, IDUs must first convert the drug into a water-soluble form by adding an acid to create a salt. Common acidifiers include ascorbic, citric, and acetic acids. Data from international studies document the high frequency of acidifier use among IDUs as well as the frequent sharing of acidifiers which is associated with HIV and HCV transmission risk.

Relatively safe acidifiers, such as pure ascorbic, citric or acetic acid, are not always available and an IDU may use more common and accessible acids such as lemon juice, vinegar, and kettle de-scaler. However, lemon juice, vinegar and liquid acids in general have the properties of a growth medium for certain bacteria and fungi. These organisms can infect the heart in the form of endocarditis, and the eyes in the form of candidal endophthalmitis, which can lead to blindness.

The distribution of single-use sachets of citric or ascorbic acid are the best way for needle exchange programs to reduce the HCV- and HIV-related risks associated with sharing acidifiers and to prevent the bacterial and fungal infections associated with using spore-contaminated lemon juice or vinegar as acidifiers.

Distribution of sterile water ampoules

Best practice recommendations – in brief

To prevent transmission of HIV and HCV and other bloodborne pathogens through the shared use of mixing and rinse water, and to prevent the acquisition of bacterial infections from the use of non-sterile water and other fluids:

- ▶ Distribute single-use 2 mL sterile water ampoules in the quantities requested by clients with no limit on the number of sterile water ampoules provided
- ▶ Offer a single-use 2 mL sterile water ampoule with each needle provided
- ▶ Educate clients about the HIV- and HCV-related risks associated with sharing mixing and rinse waters
- ▶ Educate clients about the risks of using non-sterile water such as tap, bottled, rain, puddle and urinal water; and other fluids such as saliva and urine
- ▶ Educate clients about the correct single-person use of mixing and rinse water
- ▶ Educate clients about the correct disposal of used water

Studies have shown that the water used to rinse injection equipment (i.e., needles, cookers and filters) and to dissolve drugs into a solution for injection can pose health risks for injectors, including HIV, HCV and bacterial infections. However, the risks associated with re-using or sharing water are an often-overlooked public health risk.

The risks associated with re-using or sharing water are related to multiperson use of a common water container and/or use of untreated water (e.g., rain water) for the preparation of injection equipment (e.g., needles, syringes, spoons/cookers and filters) and/or drugs into an injectable solution. When a water container is shared or used by more than one person, there is a chance that small amounts of blood from another injector will be deposited into the water and create a risk for HIV, HCV or bacterial transmission. As well, non-sterile or shared water can be contaminated with bacteria and lead to other health problems such as skin abscesses and infections such as endocarditis. These bacterial infections can have serious health implications, including death, for injectors.

Provision of single-use, sterile water ampoules is a best method to eliminate the risk of HIV/HCV through sharing mixing and rinse water and to prevent bacterial infections through the use of non-sterile water. Sterile water ampoules contain enough water to mix drugs into an injectable form. Once opened, the ampoules cannot be recapped eliminating the opportunity for contamination and re-use. The sterile water ampoules are only effective if provided in sufficient quantity to ensure that each injection is prepared with an ampoule of sterile water.

There have been no investigations of the role that water ampoule size may have in sharing water. However, frontline workers report that clients may share from 10 mL ampoules of water. Distributing smaller ampoules of water such as a 2 mL ampoule is therefore recommended.

Distribution of sterile alcohol swabs

Best practice recommendations – in brief

To prevent the transmission of HIV, HCV and other bloodborne pathogens, and to prevent the acquisition of bacterial infections from the re-use or non-use of alcohol swabs:

- ▶ Distribute sterile alcohol swabs in the quantities requested by clients with no limit on the number of swabs provided
- ▶ Offer a sterile alcohol swab with every needle provided
- ▶ Educate clients about the HIV- and HCV-related risks associated with sharing swabs
- ▶ Educate clients about the correct single-person use of sterile alcohol swabs
- ▶ Educate clients about correct disposal of used swabs

Alcohol swabs are used by IDUs to clean the injection site before injection and to remove any blood resulting from the injection from their fingers and other surfaces. Additionally, among IDUs who inject other users, a swab is used to clean their thumb before and after injection, curtailing any bleeding after removing the syringe from the injection site of the IDU receiving the injection. In the absence of sterile alcohol swabs, IDUs may use rubbing alcohol, aftershave lotion and soap and water (see **Safer injection education** section).

The distribution of sterile alcohol swabs to clients is the best way for NEPs to reduce the HCV-related (and potential HIV-related) risks associated with either the re-use or sharing of alcohol swabs among IDUs. In addition, it is very clear from the evidence reviewed that skin cleaning with alcohol prior to injection has a significant protective effect against the formation of abscesses and other bacterial infections such as endocarditis.

NEPs are well placed to distribute sterile alcohol swabs. IDUs will access sterile alcohol swabs when distributed by NEPs, however less frequent NEP-attendees are less likely to always clean their skin before injecting.

Distribution of tourniquets

Best practice recommendations – in brief

To reduce the transmission of HIV, HCV and other bloodborne pathogens associated with tourniquet sharing, and also to reduce the potential for contamination of tourniquets with the bacteria that cause abscesses, trauma to veins and blood circulation impairment which could lead to loss of limbs:

- ▶ Distribute thin, pliable, easy-to-release tourniquets with non-porous surfaces with no limit on the number of tourniquets provided
- ▶ Offer a clean, quick-release tourniquet with every needle provided
- ▶ Educate clients about the risks of bacterial contamination and the risks of acquiring HIV and HCV through the use of previously-used ties or tourniquets
- ▶ Educate clients about the risks of tissue and vein damage and risk of blood circulation impairment if a clean, quick-release tourniquet is not used
- ▶ Educate clients about the correct single-person use of tourniquets
- ▶ Educate clients about the correct disposal of used tourniquets

Tourniquets or “ties” are used by IDUs to “tie off” the vein - to provide pressure to increase the blood flow into the preferred vein and facilitate injection.

In the absence of a thin, pliable, stretchy tourniquet with a non-porous surface which is easy to release, IDUs sometimes use: a piece of rope; a condom; a leather or terry cloth belt; or frequently a bandana. The disadvantage of these items is that they are not elastic enough for quick and easy release and may therefore cause trauma to the skin, to the vein, and may cause infiltration of blood and fluids into surrounding tissues. In addition, these items are hard to clean if they are splattered with blood.

Distributing thin, pliable, easy-to-release tourniquets with non-porous surfaces to clients in the quantities that they request is the best way for NEPs to reduce:

- ▶ HIV- and HCV-related risks associated with tourniquet sharing
- ▶ The potential for contamination of tourniquets by the bacteria that cause abscesses
- ▶ Trauma to veins which facilitates the transmission of bloodborne pathogens
- ▶ The risk of blood circulation impairment which could lead to loss of limbs.

Distribution of glass stems

Best practice recommendations – in brief

To prevent the transmission of HIV, HCV and other bloodborne pathogens through the sharing of equipment used to smoke crack or other drugs:

- ▶ Distribute individual glass stems in the quantities requested by clients with no limit on the number of stems provided
- ▶ Distribute individual mouth pieces based on the number of stems requested or in the quantities requested by clients with no limit on the number provided
- ▶ Distribute individual brass screens based on the number of stems requested or in the quantities requested by clients with no limit on the number provided
- ▶ Educate clients about the HIV- and HCV-related risks associated with sharing glass stems and other devices for inhaling and smoking drugs
- ▶ Educate clients about the health consequences of using other products as screens
- ▶ Educate clients about the correct single-person use of stems
- ▶ Educate clients about the correct disposal of used glass stems, mouth pieces and screens

Crack is a crystal-rock form of cocaine that can be heated to release a vapour which is then inhaled into the lungs. A pipe or glass stem is used to heat a solid drug (or rock) and direct the vapours towards the user's mouth. A screen is placed at one end of the pipe or stem to hold the rock in place. Since glass is a conductor of heat, a protective mouth piece to protect the lips from burns is placed on one end of the stem. The rock is then heated by a flame to melt it and allow for inhalation at the opposite end of the pipe or stem.

Devices to smoke crack or other drugs are often crudely constructed from metal such as pop cans, and from glass materials, which can lead to cuts from sharp edges and lip burns. Plastic bottles and inhalers are also used. When a brass screen is unavailable, users will often use brass wool cleaning pads. However this metal tends to break apart and particles can then be inhaled causing lung damage.

It is hypothesized that contaminated blood can be transmitted between users given that they may have open wounds on their hands and mouths and are documented to be in an environment which reinforces the sharing of drug equipment. This would suggest that HIV and HCV may be transmitted between crack smokers by the shared use of devices to smoke crack or other drugs.

The distribution of glass stems with mouth pieces to clients is the best way for NEPs to reduce the HIV- and HCV-related risks associated with the sharing of devices to smoke crack or other drugs. The distribution of brass screens is the best way for NEPs to reduce the health problems associated with the use of other metals as screens.

Needle exchange program delivery models

Best practice recommendations – in brief

To reduce transmission of HIV, HBV, HCV and other bloodborne pathogens and to prevent other drug-related harm:

- ▶ Provide NEP services using a model or models of delivery that maximizes accessibility
- ▶ Tailor NEP services to meet the specific needs of sub-populations of IDUs (e.g. youth, women and ethno-cultural groups)
- ▶ Involve IDUs in the design and delivery of services
- ▶ Conduct outreach in the community and at other agencies serving IDUs
- ▶ Collaborate with local agencies that serve IDUs to provide additional locations for IDUs to receive NEP services
- ▶ Collaborate with local pharmacies to ensure that IDUs can purchase sterile needles

The effectiveness of NEPs is influenced by their ability to attract and retain clients, and to encourage/facilitate behaviour change. Varied service models have been developed to increase accessibility for clients. In particular, NEP services can be offered from fixed sites, vans and other vehicles, directly in homes, by other agencies that serve IDUs for other purposes, pharmacies, peer groups and vending machines.

Many factors influence how well models of service delivery meet client needs. IDUs vary in terms of their age, gender, cultural/racial backgrounds, type of drugs used, places where they live and resources they have on hand etc. Varied daily routines of the clients, personal preferences, difficult daily lives and distance to and from an NEP on specific days and/or at limited times may exceed the economic resources of clients and also the perceived benefits. For example, IDUs with few financial resources are less able to travel long distances to obtain NEP services. Cultural and racial backgrounds may also encourage or discourage attendance at particular NEP sites. Some IDUs use drugs once a day or less, while others may use five or more times a day. Consequently, NEPs need to tailor services accordingly.

Offering needle exchange services in more than one location, at different times of the day and night and from different models of delivery is likely to increase the number of IDUs who will use program services and maximize the effectiveness in terms of preventing transmission of HIV, HBV, HCV and other bloodborne pathogens. While a mixed model approach is likely to maximize effectiveness, not all jurisdictions have the resources or expertise to offer services using different models. Many programs start with one or two models of service delivery and add additional models over time. The pros and cons of each model of service delivery are reviewed in **Table 2**.

Table 2: Comparison of the strengths and limitations of different NEP models

Model type	Strengths	Limitations
Fixed site NEP	<ul style="list-style-type: none"> ▶ Services are free for IDUs ▶ User friendly Education and other services on-site ▶ Disposal of used equipment 	<ul style="list-style-type: none"> ▶ Hours of operation ▶ Location limited and/or identifying ▶ Crowded when program is busy ▶ Clients reluctant to use sites perceived to be too governmental, clinical, gay-oriented or HIV related
Mobile NEP¹	<ul style="list-style-type: none"> ▶ Services are free for IDUs ▶ User friendly ▶ Increases accessibility (i.e., go where the clients are) ▶ Reaches hard-to-reach IDUs 	<ul style="list-style-type: none"> ▶ May have insufficient space for counselling sessions, arranging referrals, HIV and other disease testing, helping clients fill out forms and contacting other agencies ▶ Cost and maintenance of vehicle
Home visits²	<ul style="list-style-type: none"> ▶ Services are free for IDUs ▶ Reaches hard-to-reach IDUs ▶ Builds credibility in the IDU community 	<ul style="list-style-type: none"> ▶ Safety for staff ▶ Potentially intrusive for clients
Satellite NEP³	<ul style="list-style-type: none"> ▶ Services are free for IDUs ▶ May attract different groups of IDUs ▶ Increase accessibility in terms of location, time, culture and age group ▶ May offset operational and human resource costs from the parent NEP to the satellite site ▶ Increase service complement for satellite agency without incurring NEP equipment/disposal expenses 	<ul style="list-style-type: none"> ▶ Difficult to enforce parent NEP policies on satellite sites ▶ Staff turnover at satellite site may require frequent training of staff by parent NEP
Pharmacy	<ul style="list-style-type: none"> ▶ Hours of operation ▶ Multiple locations ▶ Less stigmatizing/more anonymous 	<ul style="list-style-type: none"> ▶ Costs for IDUs to purchase needles ▶ No disposal of used equipment ▶ No harm reduction services offered ▶ Reluctance to sell to IDUs ▶ Reluctance to sell small quantities of needles ▶ Hours/days

Model type	Strengths	Limitations
Peer-based NEP	<ul style="list-style-type: none"> ▶ Peer knowledge of drugs, drug use and the drug scene ▶ Peer knowledge and empathy about living conditions and context ▶ Increases reach of the NEP to IDUs who will not/cannot use the NEP ▶ May provide employment skills, and income for peer exchangers ▶ Improve self esteem and self worth ▶ No cost to the NEP if peers are unpaid ▶ More convenient/accessible for clients ▶ Peers have credibility and can be important role models for risk reduction 	<ul style="list-style-type: none"> ▶ Training/supervision of peers can be costly ▶ Conflicting identities as peer worker and IDU community member ▶ Peer worker identity may be used to continue/further street economy activities ▶ May violate worker/client boundaries
Vending machines	<ul style="list-style-type: none"> ▶ Location and 24 hour availability ▶ Convenience ▶ Ease of use ▶ Limited staffing required 	<ul style="list-style-type: none"> ▶ No face to face harm reduction services offered ▶ Difficult to maintain anonymity when in a public space

¹ Excluding home visits

² Home visits by mobile NEP

³ Also known as community coalitions or partner agencies, satellite NEP sites are agencies that provide other services to IDUs and, through a collaborative relationship, provide NEP services at their site on behalf of the parent NEP.

Safer injection education

Best practice recommendations – in brief

To reduce injection related harm among IDUs:

- ▶ Educate clients regarding safer injection practices, including:
 - ▶ How to properly use and dispose of injection equipment
 - ▶ How to recognize the signs and symptoms of skin and soft tissue infections
- ▶ Encourage clients to seek testing for HIV and HCV, obtain immunization for Hepatitis A and B and seek medical assistance for skin and soft tissue infections before complications develop (see Vaccination and Testing services sections)
- ▶ Collaborate with local pharmacies to ensure that IDUs can purchase sterile needles
- ▶ Advocate on behalf of IDUs to reduce harsh or judgmental treatment of IDUs in healthcare settings

IDUs experience a number of preventable injection-related problems such as infection with HIV, HBV, HCV and other bloodborne pathogens, skin and soft tissue damage and complications, including death. Many factors contribute to unsafe injection practices, including: the cost of sterile equipment, NEP hours of operation or locations, peer norms and practices, drug use with intimate partners and lack of knowledge.

Education, skills building and provision of equipment by NEPs can reduce the negative health effects of injection drug use, such as transmission of HIV, HBV, HCV and other bloodborne pathogens, toxic effects of the drugs injected, effects of impurities or contaminants in the drugs, overdose, thrombophlebitis and cellulitis, abscesses that sometimes lead to gangrene and amputation, acute or chronic endocarditis and acute fever.

Safer injection education focuses on the process of injection from preparation to clean-up, including information on how to:

- ▶ Find a safe environment to inject
- ▶ Prevent skin or vein damage, and bacterial infections
- ▶ Prepare drugs for injection
- ▶ Prepare equipment for injection
- ▶ Prepare skin and veins before injection
- ▶ Inject properly and to avoid damage to skin and veins
- ▶ Clean-up after injection
- ▶ Recognize and treat skin and vein problems

Encouraging and ensuring that clients have access to a reliable source of sterile injection equipment is crucial to reduce the injection-related risks. Providing written material to clients can help to reinforce instructions however not all clients are able to read. Verbal explanations and technique demonstration, as well as distribution of written materials, ensures that all clients benefit from education efforts.

Most injection-related problems (e.g., abscesses) are easily treated. However, IDUs may delay treatment

seeking to avoid hassles by medical professionals. Advocating on behalf of clients at hospitals and walk-in clinics may reduce prejudice against clients and improve the likelihood that clients will seek help when needed.

Injection techniques are typically learned from, and reinforced by, peer groups. As a result, attempts by NEPs to change injection techniques among IDUs will likely require interventions at both the individual and community level. As well, peer exchangers can assist NEPs to ensure that social network members have access to sterile equipment. In Canada and elsewhere in the world, drug user organizations such as VANDU have played a crucial role in expanding the reach of prevention and harm reduction services through their own networks, and often to IDUs at risk. Involving these organizations can improve interventions. Peer exchangers may have an important role to play to change unsafe injection behaviours to safer injection behaviours.

When NEPs first opened in Canada, most programs offered bleach kits for their clients to disinfect injection equipment. However, the effectiveness of bleach kits as a disinfection tool has been called into question. NEPs in Ontario no longer provide bleach kits. Neither the World Health Organization (2004) nor the Public Health Agency of Canada (2005) recommends that bleach kits be used to reduce the risk of HIV or HCV transmission.

Safer sex promotion and provision of safer sex materials

Best practice recommendations – in brief

To reduce sexual transmission of HIV, HCV, and other STIs:

- ▶ Educate clients about the risk of sexual transmission of HIV, HCV, and other STIs through oral, vaginal and anal penetration, as well as cunnilingus and anilingus.
- ▶ Provide education about prevention of sexual transmission of HIV, HCV and other STIs
- ▶ Educate women having sex with women (WSW) about their potential for becoming infected with STIs including HIV
- ▶ Distribute materials needed to practice safer sex in the quantities requested by clients with no limit on the number provided, including:
 - ▶ Male lubricated and non-lubricated condoms
 - ▶ Female condoms
 - ▶ Packets of lubricant
 - ▶ Dental dams
 - ▶ Latex gloves and fingers cots
- ▶ Refer clients with concerns about contraception or STIs to sexual healthcare providers and ensure that clients who cannot afford to pay for prescriptions or devices have assistance to obtain them
- ▶ Condoms are the first choice for prevention of disease transmission; the use of cervical barriers may be a valuable additional measure

IDUs are at risk of HIV infection through unprotected sex with an infected person. A high proportion of women IDUs have sexual partners who are also IDUs, increasing their risk of having an infected sexual partner. At the same time, men IDUs often have sexual partners who are non-IDUs and who also could be placed at risk of becoming infected. Users of non-injection drugs have also been shown to be at increased risk for sexual transmission of HIV as well as other STIs such as syphilis. Therefore, prevention of sexual transmission of HIV and other STIs is an important component of harm reduction services for drug users.

NEP clients may be less aware of the risks of sexual transmission than of needle sharing risks, and may require education about these risks. Women who have sex with women (WSW) may particularly lack awareness of the possibility of transmission of HIV and other STIs through their sexual contacts and the benefits of using protective barriers. This is particularly relevant since epidemiology suggests that a relatively high proportion (roughly 20 or 30% in many studies) of women IDUs self-identify as lesbian or bisexual.

More extensive discussion of the specifics of the various safer sex materials available is provided in the 'in detail' version of these recommendations.

Overdose prevention education

Best practice recommendations – in brief

To reduce fatal and non-fatal overdose among IDUs:

- ▶ Educate clients about the risks and signs of overdose
- ▶ Educate clients about overdose prevention techniques
- ▶ Provide first aid and cardio-pulmonary resuscitation (CPR) training to clients
- ▶ Encourage clients to seek medical assistance in the event of an overdose or distress
- ▶ Educate clients about the information to provide when 911 is called

Among IDUs, overdose is the leading cause of death. Several factors contribute to an increased risk of overdose among IDUs, including prior nonfatal overdose, injecting drugs from a new or unknown source, unknown strength of the drugs, injecting alone, having someone else inject the drugs into the user (e.g., hit doctor) and a delay in seeking medical assistance.

Education and training of IDUs about how to prevent, recognize and respond to overdose situations are necessary to reduce overdose related deaths. Lack of knowledge about the signs and symptoms of overdose and about the lag time between consumption and onset of overdose symptoms may prevent IDUs from intervening or seeking help. Furthermore, IDUs commonly have inaccurate knowledge about techniques likely to be helpful to someone experiencing an overdose, which could lead to harmful consequences.

Overdose prevention education often includes information and skills building components about how to recognize the signs of an overdose. The symptoms of overdose vary depending on the drug consumed. For example, opiates may lead to symptoms such as deep snoring, slow or erratic heartbeat and passing out. A stimulant overdose (e.g., cocaine, methamphetamine) may lead to symptoms such as rapid breathing, high fever, seizure, convulsions, delirium, confusion, sweating and rapid increase in blood pressure. First aid training is also included in overdose education programs for IDUs, their family and others who may be present during an overdose. Teaching clients the recovery position, mouth-to-mouth resuscitation and CPR and basic life support techniques can be beneficial. Qualified staff should deliver training. Compensating clients for attending training sessions has been shown to increase participation.

Many IDUs fear the consequences of police involvement, leading them to delay seeking assistance in overdose situations. However, evidence shows that early intervention by emergency personnel greatly increases overdose survival. Some IDUs may require guidance as to what to say when they call 911, including what to tell the dispatcher and what paramedics should be told once they arrive at the overdose scene. Partnerships between NEPs, the police, and emergency personnel can be used to develop and implement procedures that would make IDUs less reluctant to seek medical assistance when necessary.

Providing NEP clients with access to naloxone (Narcan ®) may have the potential to reduce opioid related deaths. Naloxone reduces fatal respiratory arrest caused by opioid overdose. In the past it has only been administered by professionals with medical training. However, studies of the effectiveness, side effects and

other harmful events when administered by persons other than medical professionals (e.g., NEP clients) are being conducted. When these results are available, implementation of this type of intervention may or may not be indicated for NEPs.

Several factors found to increase the likelihood of death from overdose among IDUs can be used to identify clients at increased risk and to tailor education programs accordingly. As well as those listed above, factors found to increase the risk of death from overdose include: a long history of injecting, high levels of drug use or intoxication, low tolerance, homelessness, diagnosis of depression, recent release from prison and a history of using combinations of drugs.

Examples of recommended overdose prevention practices are summarized in **Table 3**.

Table 3: Examples of overdose prevention practices

Recommendations	Rationale
Avoid mixing drugs with similar effects	Drugs with similar effects when combined can increase the risk of overdose
When tolerance is low (e.g., after drug treatment or release from jail): <ul style="list-style-type: none"> ▶ Use a smaller amount of drugs than before ▶ Smoke or snort drugs to reduce the speed of absorption into the body ▶ Use with someone else present or let someone know to check 	Lowered tolerance can increase the risk of overdose
Take care when using drugs from a new and/or unknown source: <ul style="list-style-type: none"> ▶ Inject a test shot to test potency ▶ Ask others about the potency 	Using drugs of unknown potency can increase the risk of overdose
Buy drugs from a regular and trusted source	
Know how to recognize symptoms of overdose in self and others	Early intervention during an overdose can reduce the chances of death
Know what to do, and what not to do, if you or someone else shows symptoms of overdose	
Call for assistance if you or someone else is overdosing	
Do not leave someone who is overdosing alone	Early intervention during an overdose can reduce the chances of death and the chances of victimization

Referrals and counselling

Best practice recommendations – in brief

To increase access to community services and other assistance for IDUs:

- ▶ Provide referrals for drug treatment, HIV and HCV counselling and testing, social and mental health services, legal aid, and primary healthcare
- ▶ Establish and manage referral relationships with agencies providing these services
- ▶ Engage in direct advocacy to ensure clients have access to appropriate services
- ▶ Provide clients with information regarding drug treatment, medical care, HIV and HCV counselling and testing, and other health and social services

Many IDUs do not regularly access health and other social service systems, and NEPs are often their only source of assistance with health and social problems. Consequently, NEPs are an important source of referrals for drug treatment and services for the medical, social, emotional and financial needs of IDUs. Some IDUs may not have their service needs met due to lack of knowledge about the community resources available and how to access such services. NEP staff can play a role to help clients identify their needs and access services.

Participation in drug treatment has been shown to decrease needle sharing and injection frequency. Referring clients to drug treatment programs has the potential to reduce or eliminate client drug use and reduce the risk of acquiring HIV, HBV, HCV and other infections. As well, referrals for HIV and HCV counselling, testing and treatment are important because research shows that once IDUs become aware of their positive status, HIV and HCV transmission-related behaviours tend to decline.

Since substance use can increase a person's risk of experiencing financial problems or becoming homeless, it is important that IDUs are informed about the community services available to address their needs. As well, NEPs can help improve clients' awareness of mental health services since the IDU population has been shown to experience high rates of depression and some IDUs participating in NEPs report needing mental health services.

To provide referrals, NEPs need to gather information about the types of services required by their clients and establish productive relationships with other service providers. However, advocacy on behalf of IDUs may be necessary in other service settings. Service providers in these locations may benefit from training provided by NEPs concerning issues such as the health and life circumstances of IDUs, how to interact with this population and the goals of NEPs.

Providing referrals to healthcare and other services is an important role for NEPs, but depending on their funding and stage of development, NEPs might be able to offer a variety of services onsite.

Many NEPs provide referrals to voluntary HIV and HCV counselling and testing, as well as referrals to drug treatment programs. If adequate resources are available, it may be appropriate for NEPs to provide

required services onsite. Wherever possible, NEPs should involve clients in the design and implementation of services and programs. This can assist NEPs in providing services that effectively meet client needs.

Methadone maintenance treatment

Best practice recommendations – in brief

To reduce HIV transmission and other drug related harm:

- ▶ Provide access to harm reduction oriented methadone maintenance treatment at an NEP where resources allow, or through appropriate referral, for opiate dependent drug users who are not seeking high threshold methadone maintenance
- ▶ Advocate for provision of harm reduction oriented methadone maintenance treatment as part of the range of drug treatment options available in the community

Treatment of problematic drug use has the potential to reduce transmission of HIV, and reduce other drug-related harm through eliciting abstinence or by reducing needle use practices found to transmit bloodborne pathogens. There is a large body of evidence supporting the benefits of methadone maintenance treatment (MMT) in preventing HIV infection among IDUs who remain in treatment. However, these results are based on high threshold methadone maintenance treatment which requires abstinence from drugs other than methadone, and which typically has a fairly high drop-out rate. Positive outcomes have generally only been reported based on those individuals who remained in treatment. There is emerging evidence that for those individuals who are unwilling to enter high threshold programs, harm reduction-oriented MMT, which does not require abstinence from other drugs, can still lower HIV risks. Research suggests that receiving an adequate dose of methadone is a key element in effective maintenance.

NEPs may consider providing such programs themselves if necessary resources, including a methadone prescribing physician willing to work with a harm reduction philosophy, are available. Alternatively, they may rely on referral to community MMT physicians and programs, seeking out and advocating for low threshold programs for their clients who are unwilling to stop using all illicit drugs. If clients are referred for MMT, particularly high threshold methadone treatment, NEPs need to be aware of the possibility of drop-out from treatment, and encourage clients to return for NEP services if they need them in the future.

It is in keeping with harm reduction principles that a range of methadone maintenance options be available to clients to meet their particular goals and needs. This may range from high threshold methadone maintenance programs oriented toward clients whose goal is to become abstinent from illicit drugs, to low threshold programs whose goal is to help clients reduce their risks for health harms without requiring them to necessarily reduce their use of other illicit drugs. It is important that MMT programs incorporate counselling and support services to assist clients with their other needs (e.g., mental and physical health concerns, housing needs, employment, etc.) as required.

Primary care

Best practice recommendations – in brief

To improve access to primary care for IDUs:

- ▶ Identify sources of primary care in the community willing to work with IDUs
- ▶ Provide services at NEPs in keeping with the needs of clients and alternative resources available in the community, including:
 - ▶ First aid limited to provision of first aid materials and non-professional assistance unless NEP has access to professional healthcare providers
 - ▶ Vaccination provided by professional staff and offered at NEPs to encourage uptake by clients
 - ▶ Testing offer at NEPs to encourage uptake and allow ongoing followup education and counselling to those who test positive
- ▶ NEPs with relationships to public health units or community health centres should assist their clients in accessing the full range of services available
 - ▶ Where possible negotiate provision of primary care services in the same premises as the NEP to facilitate access for NEP clients
- ▶ Conduct education, outreach and advocacy with health service providers to improve their knowledge about IDUs and their willingness to provide services
 - ▶ Where possible provide for accompaniment and advocacy for clients initial visits to off-site health services until a successful relationship can be established with the service providers and develop ongoing communication to resolve problems

IDUs who are homeless or marginalized typically have multiple health problems and are in need of accessible primary care from providers open to working with them. Many IDUs who attend NEPs will lack such services. The best practice for harm reduction services is either to incorporate such services (the “one-stop-care” ideal) or to assist clients to access these services elsewhere in the community. Many NEPs are able to provide some aspects of preventive care particularly needed by IDUs at their own site through co-operative arrangements with public health staff or other healthcare providers in their community. The services most often provided are testing for HIV/HCV/HBV and sometimes STIs, especially syphilis; testing for tuberculosis; vaccination for HAV and HBV, influenza, and sometimes other diseases; and first aid. (See best practice recommendations for each of these).

A few NEPs in Ontario have also undertaken to provide MMT to their clients as part of their services. (See **Methadone maintenance treatment** section).

In addition to provision of preventive services onsite, NEPs need to establish contact with primary care providers to whom they can refer clients for ongoing clinical care. NEPs can improve access to such care for their clients by providing education to healthcare providers about IDUs and how to work with them and about harm reduction and the evidence for its value. NEPs can assist their clients to access adequate care and to establish relationships with care providers by accompanying clients for initial or urgent care visits in order to advocate for them and facilitate communication between clients and healthcare staff.

First aid for abscesses and skin problems

Best practice recommendations – in brief

To prevent abscesses and skin infections:

- ▶ Educate clients about safer injection practices and provide sterile injection equipment and hygiene materials (e.g., alcohol swabs, filters, sterile water, needles, syringes, cookers and tourniquets)
- ▶ Provide first aid services for abscesses and skin problems as part of NEPs wherever feasible, including help with foot care for problems such as blisters
- ▶ First aid as described here is limited to services which can be provided by a non-professional with first aid training; more complex problems require treatment by a physician or nurse practitioner

IDUs are at risk for abscesses and skin infections which can affect their health and wellbeing. NEPs can address prevention of abscesses and skin infections by teaching proper injection technique and associated hygiene measures, together with provision of ample sterile injection equipment and education about the importance of sterile technique in drug preparation (see **Safer injection education** section).

If prevention fails, NEPs can assist with the management of minor skin infections, and problems such as blistered feet, particularly for homeless IDUs, through provision of opportunities to clean wounds and infected skin and of topical antibiotics and bandages. For more severe infections including abscesses requiring lancing, professional assistance is required and unless the NEP has nurses and/or physicians on site, this requires referral to a family doctor or urgent care facility (see **Primary care** section).

Vaccination

Best practice recommendations – in brief

To reduce acquisition of HAV and HBV, influenza and pneumococcal disease:

- ▶ Educate clients about HAV, HBV and HCV and their prevention, including the availability of vaccination for HAV and HBV
 - ▶ Provide testing for HAV, HBV and HCV as indicated (see **Testing services** section)
 - ▶ Encourage HBV vaccination for all NEP workers and clients
- ▶ Provide vaccination for HAV and HBV for those who are not already immune or carriers in the case of HBV, including a system to ensure as much as possible that clients receive 2 doses of HAV vaccine and 3 doses for HBV (as required for the particular vaccine used in Ontario).
- ▶ Provide influenza vaccination or referral for vaccination to all clients who do not have a primary care provider
- ▶ Provide pneumococcal vaccination or referral for vaccination to all clients who are, or might be, HIV positive or who have chronic lung disease and who do not have a primary care provider
- ▶ Determine tetanus immunization status of clients and offer tetanus immunization to those who are eligible, or refer to a primary care provider
- ▶ NEPs providing vaccination should have medical directives and clearly written policies

IDUs are at risk for HBV and HCV if they share needles or any other injection-related equipment (see **Needle and syringe exchange** and **Distribution of other injection-related equipment** sections). Users of both oral and injected drugs are also at higher risk for HAV than the general population in Canada. IDUs who have not already been infected with HBV should be offered vaccination. For detailed information on immunization use the “Canadian Immunization Guide”.

In Ontario, vaccination consists of three injections because of the particular product used, with attention to ensuring that the intervals between doses are at least as long as those recommended by the manufacturer. If longer intervals occur, it is not necessary to restart or to add extra injections. Persons with weakened immune systems may require higher doses or additional injections and expert advice should be sought in these situations.

HAV and HBV vaccines are provided free of charge through public health units to high-risk adults in Ontario, including IDUs. HBV has also been universally provided to Grade 7 students in Ontario since 1994, so persons between about 13 and 23 years of age who have grown up in Ontario will generally have received vaccination already. However it should be noted that people whose schooling was interrupted, or who attended school irregularly, may not have been immunized. HAV vaccination should be offered to all IDUs who are not already immune to the virus; it consists of two injections at least 6 months apart.

Since both HAV and HBV require administration of more than one injection over several months, NEPs should keep records of client vaccinations and establish a mechanism to remind clients who are due for additional injections, while maintaining confidentiality of all records.

There is evidence that IDUs have elevated rates of bacterial pneumonia, possibly linked to HIV infection. IDUs who are known to have chronic lung disease or weakened immunity because of HIV or other reasons should be offered pneumococcal vaccine and influenza vaccine. In Ontario, influenza vaccine is available free of charge to all adults and so should be offered to all clients if available at the NEP. However, only 1 dose is indicated annually, so it should not be given to clients who are also receiving it from a primary care provider or in an institutional setting.

The Canadian Immunization Guide recommends that adults who have received a three dose primary immunization for tetanus be given a booster dose of tetanus vaccine every 10 years. IDUs who have no record of ever receiving tetanus immunization would require a full three dose series of tetanus vaccine.

Testing services

Best practice recommendations – in brief

To increase clients knowledge of their HIV, HBV, HCV and tuberculosis statuses:

- ▶ Provide voluntary counselling and testing for HIV, HBV, HCV, and tuberculosis as part of NEP services and/or ensure access to testing at other available health services
- ▶ Inform clients about HIV testing options (anonymous, or nominal) so they can make informed decisions about testing
- ▶ Ensure confidentiality of all test results
- ▶ Ensure that IDUs who test positive for HIV, chronic HBV, HCV, or tuberculosis have access to necessary services for counselling, care and treatment
- ▶ Consider testing for syphilis or referring for testing as part of sexual healthcare

IDUs are at risk for HIV, HBV and/or HCV, which may result in a chronically infected carrier state, and also tuberculosis. Latent tuberculosis and early stages of HIV and chronic HBV or HCV can all be completely asymptomatic, and only detectable with appropriate screening tests. Many IDUs lack a regular source of medical care, or may not reveal their risk status to their healthcare provider. NEPs thus have an opportunity to provide necessary testing to their clients who will not receive it elsewhere, or to assist their clients to access screening tests with other providers.

Voluntary counselling and testing for HIV

Knowledge of HIV status may help to encourage safer behaviour among both HIV positive and HIV negative IDUs. For those who are HIV positive, this will entail efforts to avoid infecting others. Knowing that they are HIV-infected may also motivate IDUs to improve self-care and to seek monitoring of their health and HIV treatment when indicated. For those testing HIV negative, pre- and post-test counselling can provide an opportunity to review risk behaviours and counsel about risk reduction. This requires **high quality pre- and post-test counselling for all IDUs** and **support for persons who test positive**. Staff must receive excellent training in counselling, and have access to necessary referrals for care and support. In Ontario, specifically designated sites are able to offer anonymous testing. With anonymous testing, issues such as partner notification and treatment referral can only be dealt with as part of pre- and post-test counselling, unless follow up is sought out by the client. Outside such anonymous test sites, positive test results are reported to public health authorities who will contact the test provider regarding issues of partner notification and client needs for service referral.

HBV & HCV testing

IDUs are at elevated risk of becoming chronic carriers of HBV or HCV. About 10% of persons who become infected with HBV have chronic persistent infection which makes them infectious to others and also may progress to cirrhosis of the liver or liver cancer. Testing can allow persons who are carriers to know this so that they can avoid behaviours which may infect others, receive medical monitoring and consider possible

treatment. IDUs who are tested and found to have no evidence of previous exposure to HBV can be offered immunization to prevent future infection. The majority of persons who have become infected with HCV will remain as chronic carriers with the potential to progress to cirrhosis of the liver and more rarely to liver cancer. Testing positive can allow such persons to know their status and avoid behaviours which may infect others, seek medical monitoring such as tests of their liver function, reduce exposures to alcohol or other substances which are toxic to the liver, and consider the possibility of treatment. Treatment for HCV is lengthy (several months), difficult (it requires injections and side effects include flu-like symptoms and depression), and success of even complete treatment varies from 45-80% depending on the particular HCV genotype, but if successful, it is possible to completely eliminate HCV, as long as re-infection does not occur.

As for HIV, appropriate counselling and information about HBV or HCV should be provided to IDUs considering testing. This requires initial staff training as well as opportunities to keep up with new information. HBV, HCV and HIV status are reported to public health authorities. Only HIV has an anonymous testing option. This may create anxiety for IDUs considering testing, but effective collaboration between NEPs and public health authorities can seek to mitigate these concerns and ensure that public health issues are appropriately addressed. Once identified as being infected, access to medical monitoring and treatment may be difficult to provide in many locations. There is a shortage of specialty services available to manage hepatitis patients, and providers may be unwilling to provide these limited resources to persons whom they perceive as unlikely to comply with treatment.

Tuberculosis screening

Tuberculosis is an infection generally confined to the lungs except in persons with reduced immunity such as those with HIV infection. Many persons who are infected with tuberculosis have it present in latent form so that it does not cause symptoms, and is not infectious to others. However, there is an ongoing risk that such latent infections may become activated so that the infected person will have active lung infection which can also spread to others. IDUs have increased rates of both latent and active tuberculosis, particularly if they are of Aboriginal origin or immigrants from countries with high rates of tuberculosis.

Latent infection with tuberculosis can be detected in most cases through the use of skin tests. These tests require professional training to administer, and to interpret the results at a return visit 48-72 hours later. This testing may be challenging to deliver in mobile NEP services when lighting and other aspects may be more difficult; a particularly important consideration is whether it is possible to ensure finding clients again for followup within the required timeframe. If a screening test of this type is positive, it is necessary to refer for a chest X-ray before treatment is begun, since treatment for latent tuberculosis is different from that required for active tuberculosis. Ensuring necessary followup may require accompanying clients to these services. Tuberculosis is a reportable disease, and persons with active tuberculosis can be required to undergo treatment in order to prevent them from infecting others. There is evidence that providing incentives to return for reading of skin results and other types of supports, including directly observed therapy, increases success in screening and treatment. It is particularly important to ensure that HIV positive persons are tested for tuberculosis since they are at high risk for developing active tuberculosis if untreated. NEPs should educate clients and staff about this risk.

Syphilis testing

There is evidence that IDUs and also users of non-injection drugs (e.g., crack smokers) may have elevated rates of syphilis, especially if they exchange sex for drugs. Screening blood tests for syphilis can be provided at NEPs along with other blood tests. Interpretation of tests for syphilis and treatment require medical expertise. IDUs with positive screening tests should be referred to a sexually transmitted diseases clinic or other source of expert care.

Relationships with law enforcement

Best practice recommendations – in brief

To develop and establish a collaborative relationship with law enforcement:

- ▶ Establish a relationship with local law enforcement agents early in the development of an NEP
- ▶ Provide in-service training to law enforcement agents focussing on:
 - ▶ The purpose and goals of NEPs
 - ▶ Evidence about NEP effectiveness
 - ▶ Evidence concerning the impact of NEPs on injection drug use
 - ▶ The health and social concerns of IDUs
 - ▶ Needlestick injury prevention
- ▶ Negotiate agreements with law enforcement agents to ensure that:
 - ▶ Clients are not harassed while entering or leaving NEP sites and vehicles
 - ▶ NEP equipment is not destroyed or confiscated from clients
 - ▶ NEP fixed, mobile, and other sites are not used for surveillance purposes
 - ▶ NEP staff will not interfere with law enforcement activities
- ▶ Establish protocol for the NEP and law enforcement agents to resolve conflicts

NEP efforts to reduce the transmission of HIV, HBV, HCV and other bloodborne pathogens can be negatively impacted by actions of law enforcement agents. The literature indicates that law enforcement practices sometimes conflict with NEP activities and relationships between NEPs and law enforcement agencies can become problematic particularly when there are misconceptions about NEP purposes, goals and procedures. In Canada, possession of sterile, unused needles is not illegal.

Law enforcement agents who are not familiar with the rationale and evidence base concerning NEPs may be less than supportive of the efforts of program staff and clients to reduce transmission of bloodborne pathogens. Consequently, law enforcement agents sometimes use NEPs for surveillance purposes and may harass clients leaving NEPs, and confiscate sterile equipment. Police crackdowns and increased arrests in areas where drugs are commonly bought and used can reduce drug use over the short-term but also discourage clients from using NEP services. Recent evidence shows that increasing the number of police officers in a community and the amount of money spent on incarceration does not reduce the number of injectors. However, increased policing, arrests and incarcerations are associated with elevated HIV prevalence among injectors.

Fear of being arrested while in possession of drugs and/or injection equipment can lead IDUs to rush injections, skip safer injection techniques (e.g., hand and skin cleaning) and to feel so anxious that they cannot inject with accuracy. All of these consequences can increase the risk of injection-related problems such as infections and skin and soft-tissue damage (see **Safer injection education** section).

Insight from NEP workers suggests that cooperation, negotiation and education may help to reduce the perception and instances where NEPs and law enforcement agencies work at cross-purposes. Establishing

a relationship with local law enforcement agencies before an NEP opens is an important step in program development. Insight from workers also suggests that the following activities can reduce or eliminate tension between NEPs and law enforcement agencies. Encourage the local Medical Officer of Health and/or the Executive Director of a community organization to speak directly with the local Chief of Police about the NEP, its goals and procedures and how the NEP and law enforcement agents will interact (or not). Establish a relationship with the community relations officer in the local law enforcement agency. The goal of the relationship is to ensure that the activities of the NEP and local law enforcement agencies do not lead to tension and difficulties. It is important to establish policies and procedures for the NEP and law enforcement agency relationship, including:

- ▶ A procedure for each party to discuss and resolve disputes
- ▶ Agreement that the NEP sites and vehicles will not be used for surveillance purposes
- ▶ Agreement that police will not enter the NEP sites or vehicles unless there is an official purpose and/or they are invited to do so
- ▶ Agreement that NEP staff will not interfere with police activities

Conducting workshops with law enforcement agents may also be useful, with a focus on:

- ▶ The NEP, its goals and procedures
- ▶ Misconceptions regarding the purpose and goals of NEPs
- ▶ Evidence concerning NEP effectiveness
- ▶ Factors underlying and contributing to illicit drug use (e.g., poverty and unemployment) and related health consequences
- ▶ Evidence demonstrating that NEPs neither increase rates of crime nor encourage initiation/continuation of injection drug use
- ▶ NEPs' aim to ensure that IDUs have access to clean injection equipment so they will be less inclined to share needles and other drug equipment, thus potentially reducing the transmission of bloodborne pathogens
- ▶ The consequences of confiscating and/or destroying harm reduction materials

Workshops can also be used to provide in-service training for needlestick injury prevention. Needlestick injury is a concern for police, and teaching them about needlestick injury prevention techniques may be a good advocacy tool to create/improve collaborative relationships between NEPs and police.

Working collaboratively with police may improve strategies to reduce negative health consequences of injection drug use while at the same time allowing police officers to enforce the law.

Program evaluation

Best practice recommendations – in brief

To ensure the effectiveness of NEPs:

- ▶ Conduct on-going evaluation to determine how well the program meets the needs of the clients
- ▶ Provide training for staff to ensure that the purpose of, and activities related to, evaluation are understood and accepted
- ▶ Involve IDUs in the design and implementation of evaluations
- ▶ Develop a program plan to review evaluation results and modify the program as needed

Ongoing evaluation is an important activity for NEPs to undertake and can help managers and staff determine how well their program meets the needs of clients and where further improvements are warranted. Evaluation results can also be used to demonstrate the effectiveness of the program to community members. According to the WHO (2005), program evaluation is a crucial program activity and 'needs to be taken into account, planned, agreed to and budgeted for from the very beginning of the program' (p.73).

Evaluation activities can vary from simple to complex and the evaluation can be tailored to meet the needs and resources of each program. Questionnaires, interviews, client attendance records, focus groups and other methods can be used to gather evaluation information. As noted in the **NEP start-up tasks** section, program planners need to understand the community they will serve before designing the program. However, IDU populations and surrounding communities change over time and periodic collection of information (e.g., every 12 or 24 months) is necessary to ensure that the program as currently delivered meets the needs of clients and the community. The list below suggests some topics to be included in periodic data collection:

- ▶ How many IDUs live in the community and/or catchment area
- ▶ Where clients live, buy and use drugs, and hang out
- ▶ Social, economic and health status of IDUs
- ▶ What kinds of drugs are used and how they are consumed
- ▶ Current level of knowledge regarding risk and protective behaviours
- ▶ Current patterns of risk and protective behaviours
- ▶ What resources are available for IDUs and if these are used

Process evaluations involve structured collection of information about how the program operates and can be used to determine if the program is operating as planned. In particular, programs can collect information about the number/frequency of services provided to clients and use this information to determine how many clients the program serves and what types of services are used (e.g., equipment, counseling and referrals). Using these program statistics, the programs can then determine:

- ▶ Resource requirements (e.g., equipment)
- ▶ Need for implementation of new models of service delivery
- ▶ Staffing requirements including both number and skill type

Evaluation of client satisfaction can take many forms from ongoing surveys to focus groups to client forums. When evaluating client satisfaction, it is important to gather information from all types of clients (e.g., frequent and non-frequent attenders; young and old; men and women, etc.). As such, a separate survey to investigate these issues with non-attenders is also necessary. Understanding what motivates clients to attend frequently or not at all may provide important insight into how the program is delivered, what works well and what needs improvement. Understanding why some IDUs do not use the NEP is also very important for program development and effectiveness.

Evaluating program impact is very important and requires particular types of evaluation and research methods. Indicators of success that might be evaluated include HIV and HCV seroconversion and behavioural change. I-Track (the Enhanced Surveillance of Risk Behaviours among Injecting Drug Users in Canada) is a repeated cross-sectional survey funded by the Public Health Agency of Canada (2004). Demographic, drug use and risk behaviour information is collected and anonymous HIV and HCV testing are conducted using finger-prick blood samples or saliva samples. This on-going surveillance activity is conducted at selected NEPs across Canada, however, use of similar methods and data collection procedures by other NEPs would provide important information that is comparable to other programs in Canada.

For NEP workers, providing services and conducting ongoing and/or periodic evaluations is time consuming. When evaluation data are not used, staff may question the benefits of conducting these activities and not devote sufficient time or effort to their evaluation duties. As well, clients may fear the consequences of participating in evaluation (e.g., loss of service) and voicing their satisfaction or lack thereof with the program. Involvement of both staff and clients is important to ensure that evaluation activities are relevant to the work staff members conduct and the services clients receive. As well, it is important to share the results of evaluations with staff and clients to demonstrate that their points of view are taken seriously, and to provide further opportunities for input in to program development.

Exchange, Handling and Disposal of
needles and syringes

Needle and syringe exchange⁶

Best practice recommendations – in detail

To prevent the transmission of HIV, HBV, HCV and other bloodborne pathogens from injection with non-sterile needles and syringes:

- ▶ Provide sterile needles in the quantities requested by clients:
 - ▶ without requiring clients to return used needles
 - ▶ without requiring clients to return used needles
 - ▶ with no limit on the number of needles provided with encouragement to return needles
- ▶ Educate clients about the risks of using non-sterile needles

INTRODUCTION

Injection with a previously used needle puts IDUs at high risk for infection with bloodborne pathogens. Canadian studies show that needle/syringe (hereafter referred to as “needle”) sharing is common among IDUs. In Ontario, needle sharing has declined overall since the early 1990s, although the number of IDUs reporting that they have shared needles and equipment differs across communities.

Used needles and syringes can serve as a reservoir and vector for transmission of HIV, HCV, HBV and other bloodborne pathogens. Under laboratory conditions (i.e., strictly controlled temperature and environment) HIV can survive in used needles for up to 6 weeks, but survival times vary with the amount of blood residue and storage/handling of the needle. Evidence of HCV has also been detected in used needles, and sharing needles is a major risk factor for HCV transmission in Canada. HCV is more resilient than HIV and more infectious through blood contact. HBV is also a resilient and virulent virus. Viable virus can survive in dried blood at room temperature for at least a week. HBV is easily transmitted through needle sharing, however transmission is a concern only for IDUs who have not been immunized or who have not developed immunity through previous exposure to the virus.

Sharing drugs also carries a risk of transmitting infection. When drugs are shared by backloading or frontloading, one syringe is used to prepare the drug. A measured amount is then transferred to another syringe. The transfer is done either by removing the needle (frontloading) or removing the plunger (backloading) of the recipient’s syringe. If the syringe used for the preparation and transfer has been previously used, blood or other residues can be transferred along with the shared drugs. HIV and HCV can also be transmitted through equipment sharing. For instance, a needle placed in a common water container or cooker, rinsed with previously used water and/or used with a previously used filter may become contaminated with HIV and/or HCV (see **Distribution of sterile water ampoules, cookers and filters** sections).

HIV, HBV and HCV transmission are not the only concerns. Any injection with a used needle, including one’s own needle, puts an IDU at risk for infections, and skin and vein damage. Injecting with a needle contaminated with bacteria and debris can lead to infections such as septicemia and endocarditis. Injecting

⁶ “Exchange” refers to needle/syringe exchange, distribution and disposal.

with a dull needle can cause trauma to the skin, veins and soft tissues and can lead to abscesses, cellulitis and vein collapse.

A new, sterile needle should be used for every injection. However, in Canada and the U.S., estimates show that NEPs distribute a small proportion of the needles required to ensure a sterile needle for each injection. Distribution of enough needles to facilitate the use of a sterile needle for each injection is a best method to eliminate the risk of transmitting bloodborne pathogens and bacterial infections from re-used or non-sterile needles, and to prevent vein damage from blunt or broken needles. NEPs need to provide sterile needles in the quantities, sizes, gauges and brands that clients request without requiring exchange for used needles and without limits on the number of needles distributed. In addition, NEP clients should be educated to understand:

- ▶ The importance of using a new sterile needle for each injection
- ▶ The risks of needle-sharing, including frontloading and backloading
- ▶ How to recognize and handle sterile needles
- ▶ How to inject safely (see **Safer injection education** section).

CONSIDERATIONS

Distributing sufficient needles

In the past, some NEPs adhered to one-for-one exchange policies. Specifically, some programs have given clients one new, sterile needle for each used needle returned. This outdated practice restricted access to sterile needles among IDUs. Among those who are particularly affected are homeless IDUs who may not have needles to exchange, IDUs who have disposed of needles elsewhere, and IDUs who are unable to store needles until they can attend the NEP. Providing clients with the number of needles they request is more likely to achieve the goal of reducing transmission of bloodborne pathogens and meet the recommendation for a new sterile needle for each injection. This may involve bulk distribution, as some clients may prefer to stockpile needles to ensure they have sufficient sterile needles on hand (Strike et al., 2005). “Stockpilers” may also use needles for peer exchange - an important secondary distribution strategy to reach IDUs who may not use NEPs.

Meeting client preferences for needle type

IDUs have individual preferences for needle/syringe size, gauge and brand and may not use exchange services if they cannot obtain their preferred types. For instance, common requests from clients in Ontario include: 1/2 cc, 1cc, 3 cc, 10 cc; 12-21 gauges for piercing; 21-25 gauges (1-1/2” needle) for steroid users; and 25-29 gauges for intravenous drug use. NEPs that provide a variety of options may be able to attract and retain a wide range of clients and reduce transmission of bloodborne pathogens.

Being available when and where people need needles

Evidence from a Toronto study (Strike et al., 2005) shows that clients engage in different needle acquisition

patterns. Some stockpile large numbers, others make sure they have enough for a week or two while others acquire needles on a daily basis. Of these, day-to-day access is the most problematic because this group is more likely to re-use, share or borrow needles. NEPs can facilitate access to sterile needles with varied modes of program delivery including fixed sites with extended open hours, mobile needle distribution, peer distributors and home delivery (see **Needle exchange program delivery models** section).

Calculating quantities of needles required

Calculating the quantity of needles required for 100% coverage is challenging as it is affected by a number of variables including estimates of the number of IDUs in the community (non-NEP users as well as NEP users), type of drug used and frequency of injection. However, Lurie et al. (1998) suggest that approximately 1,000 needles are required per IDU, per year.

Difficult to re-use syringes (DTRs)

DTRs (also known as single-use syringes) are designed so that once the plunger has been depressed it cannot be retracted; in some designs (e.g., Safety Syringes) the needle retracts into the barrel of the syringe when the injection is complete. The benefits of DTRs are that they can prevent inadvertent re-use and needlestick injury and help prevent transmission of bloodborne pathogens. However, research on the use of DTRs among IDUs has raised several concerns. In a study to test the acceptability of DTRs among 50 City of Ottawa NEP clients (participants did not inject with the DTRs), 54% raised concerns about difficult handling (Flett Consulting Group Inc./Social Data Research Ltd., 2002). Clients commented that the plunger was “too stiff”, the retractable feature was hard to manipulate, and the absence of a lip made it seem difficult to use with one hand. Similarly, Des Jarlais (1998, 2000) reviewed the sparse literature on DTR use among IDUs, and raised the following concerns:

- ▶ Any needle, regardless of design, can be re-used
- ▶ DTRs are difficult to disinfect
- ▶ A faulty mechanism may misfire, resulting in the loss of drugs
- ▶ The mechanism prevents users from aspirating or “registering”, i.e., drawing blood into the syringe to check whether they have found a usable vein and then continuing with injection
- ▶ DTRs prevent users from “booting” or “flagging” - a process of injecting part of the drug solution, then retracting the plunger to draw blood into the drug mixture and injecting again. It has been anecdotally reported that booting, flagging and registering may be associated with risk for embolism. DTRs would help reduce this risk. However, booting and flagging serve to extend the pleasurable effects of drug injection, and IDUs may want to repeat this process several times
- ▶ A user cannot recover the drug if something goes wrong with an injection, e.g., if a vein collapses.

Several organizations have published cautions regarding DTR needle use among IDUs. For example see www.exchangesupplies.org/publications.html.

Using Client Codes and ID Numbers

ID cards are used by some NEPs to certify clients' participation in the program. ID numbers are also used to track the provision of services, for instance, as part of program evaluations. There are advantages and disadvantages to using client ID numbers at NEPs, and a summary is provided below in **Table 4**.

Table 4: Advantages and disadvantages of using client ID numbers

Advantages	Disadvantages
▶ NEPs can collect data for program evaluations, e.g., how many IDUs are served per year	▶ Clients may forget their ID #s, making accurate tracking problematic
▶ NEP utilization can be tracked by client, and data used for targeted interventions. For example, high volume exchangers may be identified as potential peer exchangers	▶ Tracking ID numbers can be time-consuming to administer. Procedures need to be in place to collect data in a timely and accurate way
▶ NEPs can collect data on what, when, where and to whom services are provided that will help tailor the program to the needs of the community	▶ Tracking ID numbers can be challenging in a busy environment, for instance in the NEP van
▶ NEPs can track needle return rates by client. However, this is not recommended as individual (i.e. per client) return rates are of limited value in understanding safe disposal rates (see Safer handling and disposal of used injection equipment section)	▶ Lack of anonymity - whether real or perceived - may discourage clients from using an NEP

Use of bleach to disinfect injection equipment

In 2004, the WHO reviewed the scientific evidence concerning the effectiveness of bleach to disinfect used injection equipment and stated that bleach and other methods of disinfection are not supported with good evidence for reducing HIV transmission. In 2005, the Public Health Agency of Canada reviewed the evidence regarding the use of bleach to prevent the transmission of HCV and concluded that using bleach to disinfect injection equipment offers little benefit

EVIDENCE

Canadian studies show that among IDUs needle sharing rates vary and have declined in some jurisdictions. Health Canada (2004) reports that almost one quarter of 794 participants in the I-Track study injected with a used needle in the preceding 6 months, ranging from 16.5% in Regina to 30.7% in Victoria. In Ontario, trend data show that needle sharing has declined since the early 1990s. In Toronto, the percentage of IDUs who reported sharing needles declined from 42% in 1991 to 24% in 2003 (Millson et al., 2005). Recent data from Sudbury (n=169; 2002/2003) show a similar level of sharing: 26.6% had injected with a used needle in

the preceding 6 months (Health Canada, 2004). Ottawa data (n=968) from the SurVIDU study (1996-2000) show that among participants who completed more than one interview, approximately one-third injected with a borrowed needle in the previous 6 months (Hankins, 2002). Among IDUs (85 women and 418 men) who were interviewed for the Ottawa POINT Project between October 2002 and January 2003, 62% of women and 57% of men had injected with a used needle at some point in their injecting history. Of these, 43% of women and 34% of men had injected with a used needle in the six months preceding the baseline interview. And of these, 68% of women and 67% of men reported injecting with a used needle at the time of the baseline interview (Leonard et al., 2005).

Laboratory testing shows evidence of HIV in used needles. Among needles collected from shooting galleries in Florida, 20% to 94% of visibly contaminated needles showed evidence of HIV (i.e., HIV-1 antibodies, proteins, RNA, DNA; Chitwood et al., 1990; Shah et al., 1996; Shapshak et al., 2000). In New Haven, Connecticut, random samples of needles were tested and showed varying levels of HIV proviral DNA depending on the source: "street" needles (n=160) - 67.5%, "illegal exchange" needles (n=180) - 62.8%, "shooting gallery" needles (n=48) - 91.7% (Heimer et al., 1993). Among NEP needles, the level of HIV was 63.9% at opening (November 1990; Heimer et al., 1993) and declined to 41.1% by May 1992 (Kaplan and Heimer, 1994; Kaplan and Heimer, 1995). The presence of HIV antibodies suggests that a previous user was HIV-positive. It should be noted that the presence of HIV RNA, DNA and proviral DNA indicate that virus particles are present in the needles but the virus may or may not be viable (infectious). Nevertheless, the findings indicate that the contaminated needles could potentially transmit HIV.

Abdala and colleagues found that under laboratory conditions HIV can survive in blood in needles for up to 30 days or longer. Their studies show that recovery of viable HIV is affected by factors including: volume of blood, storage temperature and duration of storage (Heimer and Abdala, 2000; Abdala et al., 2000; Abdala et al., 1999). At temperatures between 4°C and 22°C, HIV was recovered following storage for up to 42 days (Abdala et al., 2000; Heimer and Abdala 2000).

Needle sharing, as well as syringe-mediated sharing (i.e., backloading and frontloading), is associated with HIV transmission. Toronto data from the WHO study (1991-1994) show that sharing injection equipment in the previous 6 months was associated with higher HIV prevalence (OR=2.0 p<0.01; Millson et al., 2005). In Ottawa, data from two studies show that injecting with a used needle was a predictor of HIV infection at baseline. In the Ottawa POINT Project, participants with a history of injecting with a used needle had a three-fold elevated risk for HIV infection (AOR=2.8; 95%CI: 1.3-6.1). The SurVIDU Study (1996-2003) found a three-fold elevated risk among women (AOR=3.0; 95%CI: 1.3-7.1) and a slightly lower risk for men (AOR=2.5; 95%CI: 1.6-3.7; Millson et al., 2005). HIV seroprevalence was also associated with backloading in a study with 660 IDUs in New York City (OR=2.2; 95%CI: 1.5-3.1; Jose et al., 1993).

HCV shares the same injection transmission route as HIV, however, it is four to five times more easily transmitted through a contaminated needle than HIV (Leonard et al., 2004). HCV has also been detected in used needles. In an Australian study, Crofts et al. (2000) detected the presence of HCV RNA in rinses from 70% (14 of 20) of needles collected from 10 injecting sites. Epidemiologic data also provide evidence of HCV transmission risk associated with needle sharing. In Canada, injection drug use is associated with at least half of HCV infections and at least half of active IDUs are infected with HCV (Millson et al., 2005; Gully and Tepper, 1997)

Data from a cross-sectional study with 437 “street youth” (14-25 years; 200 IDUs) in Montreal (1995-1996) show that injecting drugs was an independent risk factor for HCV infection (Adjusted OR=28.4; 95%CI: 6.6-121.4; Roy et al., 2001). In Seattle, needle sharing among a cohort of 317 IDUs was associated with a three-fold increased risk of HCV seroconversion at one-year follow-up (RR 2.94; 95%CI: 1.6-5.3; Hagan et al., 2001). Similarly, a cross-sectional study of 308 young IDUs in San Francisco found that risk factors for anti-HCV (HCV antibodies) included ever borrowing a needle (OR=2.56; 95%CI: 1.18-5.53) and daily injecting (OR=3.85; 95%CI: 2.07-7.17; Hahn et al., 2001). However, evidence of an association between needle sharing and HCV transmission has been less well studied than for HIV.

Increased risk of HIV and HCV transmission are also associated with backloading (Hagan et al., 2001), longer injecting careers (Hahn et al., 2001), crack or cocaine use (Millson et al., 2005; Roy et al., 2001; Monterosso et al., 2000) and frequent or binge injecting (Millson et al., 2005; Thorpe et al., 2002; Hahn et al., 2001). For instance, among participants in the Seattle study (Hagan et al., 2001) who reported injecting with a used needle during the one-year follow-up period, backloading was associated with a two-fold non-significant risk of HCV seroconversion (RR 2.1, 95%CI: 0.9-4.5). Furthermore, among a cohort of 353 young injectors in Chicago who tested HCV negative at baseline, receptive needle sharing and backloading were associated with elevated non-significant risks of seroconversion (Thorpe et al., 2002).

HBV can survive in dried blood at room temperature for at least a week and is easily transmitted through needle sharing (Thompson, Boughton and Dore, 2003). In a cross-sectional study with 437 “street youth” in Montreal (1995-1996), participants who had a history of injection drug use (n=200) had 3.5 times the rate of HBV infection of those who reported no drug use (AOR=3.5, 95%CI: 1.5-8.3; Roy et al., 1999). However HBV transmission is a concern only for IDUs who have not been immunized or are not immune from previous exposure to the virus. Since 1994/5 Ontario school children in grade 7 have been routinely immunized against HBV. Most people who attended grade 7 in Ontario since 1994 will have been immunized, however it should be noted that people whose schooling was interrupted, or who attended school irregularly, may not have been immunized (Health Canada, 2002; see **Vaccination** section).

HIV, HBV and HCV transmission are not the only concerns. Injecting with a used needle, including one’s own needle, puts IDUs at risk for infections, and skin and vein damage. Injecting with a needle contaminated with bacteria and debris can lead to infections such as septicemia and endocarditis. Injecting with a dull needle causes injury and infection. Each time a needle is used the point becomes barbed (dull). (For photographs of needle tips after more than one use, see “What does your needle look like?” metrokc.gov/health/apu/ and click on “Harm Reduction and Drug Use”.) Damage to the skin, veins and soft tissues from injecting with a dull needle can lead to abscesses, cellulitis and vein collapse.

Policies that limit the number of needles distributed also limit the effectiveness of NEPs to prevent HIV and HCV transmission (Heimer et al., 2002). Ideally, NEPs should distribute sufficient needles to provide a new sterile needle for each injection (i.e., 100% coverage; Brahmhatt, Bigg & Strathdee 2000). While 100% coverage may not be feasible, or always necessary (Heimer, 1998), NEPs currently distribute a small proportion of the sterile needles required. Calculating the number of needles required per client is challenging, however U.S. researchers estimate that approximately 1,000 needles are required per IDU, per year (Lurie et al., 1998; Holtgrave et al., 1998). In Ontario, NEPs report a wide variation in levels of needle distribution. For instance in 2002, coverage ranged between 1 and 474 needles per IDU per year (Millson et

al., 2005). On average in Ontario, it is estimated that 53 needles are distributed per injector per year (Millson et al., 2005). In Montreal, Remis, Bruneau and Hankins (1998) estimate that NEPs distribute approximately 5% of the sterile needles required by IDUs. Similarly, in Ottawa, Leonard et al. (2004) calculate that NEPs distribute 5% of the sterile needles required by IDUs in that community. Contextual differences between Canada and the United States (e.g., drug of choice, availability of needles from other sources and legislative differences) make needle coverage comparisons problematic. Nevertheless, U.S. NEPs also distribute a small proportion of the sterile needles required. A total of approximately 154 NEPs were in existence in the U.S. in 2000 (Des Jarlais et al., in Riehm et al., 2004). In a survey of 84 NEPs, Paone et al. (1999) found that only 10 exchanged 500,000 or more needles per year, and the most needles exchanged was approximately 1.5 million per year. A new sterile needle for each injection would require between 1.25 and 1.6 billion needles per year (Drucker et al., in Brahmabhatt, Bigg and Strathdee 2000; Heimer 1998).

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Injection Equipment

Safer handling and disposal of used injection equipment

Best practice recommendations – in detail

To prevent transmission of HIV, HBV, HCV and other blood-borne pathogens as well as bacterial infections from improperly discarded injection equipment:

- ▶ Educate staff and clients to safely handle and dispose of used injection equipment
- ▶ Provide multiple options and locations for safe disposal of used injection equipment
- ▶ Do not penalize clients who fail to return used needles
- ▶ Estimate the number of needles returned by clients. Neither clients nor staff should count used needles by hand
- ▶ Dispose of used injection equipment, sharps⁷ and sharps containers⁸ in accordance with local regulations for biomedical waste
- ▶ Encourage HBV vaccination for NEP workers and clients

INTRODUCTION

Safe disposal of used injection equipment (sharps) is an important strategy to reduce the amount of discarded equipment in the community and the transmission of bloodborne pathogens among IDUs, NEP workers and the community. Removing used equipment from circulation helps reduce the risk of accidental needlestick injury and the likelihood that injection equipment will be re-used.

A needlestick injury is a wound caused when a needle accidentally punctures the skin. Needlestick injuries are a concern for NEP workers and clients who come into contact with used needles. The principal concerns are transmission of HIV, HBV, HCV and other bloodborne pathogens, as well as tetanus.

Among healthcare workers, needlestick injuries are more common during procedures such as recapping a needle and disposing of equipment. However, whenever a needle or sharp is left exposed, a needlestick injury can occur.

Used equipment discarded in the community poses a risk of injury to the general public. The risk of infection with bloodborne pathogens from a needle discarded in the community is low, however any needlestick injury may cause the injured person emotional stress and create potential opposition to the NEP. Opposition to NEPs often focuses on concerns about discarded needles in the community, although research evidence shows that the opening of NEPs decreases improper disposal and is not associated with increases in discarded needles.

Challenges to safer disposal of used injection equipment include 'hidden' drug use, having nowhere to store used equipment, and fear of police. Lack of convenient exchange hours and strict exchange policies can also discourage IDUs from returning used equipment to the NEP.

⁷ 'Injection equipment' refers to all injection-related items. 'Sharps' refers to needles, syringes, glass stems and other items that may cause cuts or puncture wounds

⁸ Also known as biohazard containers

Sharps handling and disposal techniques

Clients should be encouraged to return used equipment to the NEP and should be made aware of the risks to others in the community, and the NEP, of improperly discarded needles. For example, disposing of loose needles in household or community garbage cans, toilets or sewers poses a risk of needlestick injury to sanitation workers. Needles disposed of in sewage systems that empty into rivers or lakes may wash up on beaches. **Table 5** (located at the end of this section) provides examples of safer handling and disposal recommendations.

Recapping a needle used by someone else poses a risk of needlestick injury and transmission of bloodborne pathogens. Encouraging clients and workers to immediately dispose of used injection equipment in sharps containers can reduce this risk. When clients use in groups, or exchange needles for other IDUs, placing a sharps container in close proximity is recommended to ensure that all present can dispose of their own equipment.

Needles should not be bent or broken. Sometimes needles are broken off from the barrel to prevent re-use; however, broken needles can carry bloodborne pathogens. They are also hard to see, can easily get lost, and pose a risk of needlestick injury. If a needle is broken, encourage clients to dispose of all the parts including the barrel, plunger, points and any broken pieces. IDUs should not dispose of someone else's broken needle.

Providing clients with sharps containers can increase returns of used equipment and decrease the chances of needlestick injuries or re-use. Offering clients multiple locations and times to return used equipment can also increase the overall return rate for NEPs. In addition, clients can be encouraged to dispose of needles immediately after use into sharps containers that are placed as close to the location of use as possible.

When clients return used injection equipment to the NEP, proper disposal techniques can reduce the chance of accidental needlestick injury. In particular, neither clients nor NEP staff should recap used needles or hand-count the number of needles returned. Hand counting greatly increases the risk of needlestick injury. Estimating the number of returned needles is sufficient for program accounting and evaluation purposes.

The Ontario Ministry of the Environment Guidelines (2004) state that sharps should be placed in puncture-resistant leak-proof containers with lids that cannot be removed once permanently closed. Sharps containers should be yellow (when not intended for incineration), display the universal biohazard symbol and be labelled "Biomedical Waste/Déchets Biomédicaux". Containers should be able to withstand the weight of the waste without tearing, cracking or breaking.

When sharps are transported (e.g., in the NEP van, between clients' homes, shooting galleries and the fixed site) the Ontario Ministry of the Environment guidelines state that all containers must be sealed, locked or closed prior to transportation so that waste will not be released or discharged in transit. When more than 5 kilograms of waste is transported, more stringent guidelines may apply (see Ministry Guidelines Sections 4.3 and 4.4).

Some NEPs contract out waste collection, transportation, and disposal to a certified medical waste

management company. The medical waste management company can supply sharps containers, pick up full containers and dispose of the waste. Some companies can accommodate small (as well as large) volumes of medical waste. Alternatively, NEPs can negotiate with municipalities to accept used needles (in appropriate containers) at a hazardous waste site.

Providing options for safe disposal of used injection equipment

By providing multiple options for return and disposal of used injection equipment, NEPs may be able to increase return rates and reduce infection transmission. For example, NEPs can collect sharps at fixed, mobile, outreach, and satellite sites. Clients, partners and community members can be provided with sharps containers and encouraged to return them to the NEP for safe disposal. Outreach workers can respond to calls from clients or community members who report sharps or sharps containers that require pickup. NEPs can negotiate with other agencies to accept returned needles, and clients can be encouraged to dispose of injection equipment at other safe disposal sites such as hospitals, public health departments and other NEPs. NEPs can provide clients with a list of alternative locations (e.g., hospitals, pharmacies, satellite programs, mobile sites) that will accept used injection equipment.

Disposal of injection equipment discarded in the community

Evidence from the field shows that NEPs respond to equipment discarded in the community in different ways. In some communities, NEP workers are sent to pick up and dispose of discarded needles. In other places, municipal workers and/or waste management companies respond to calls from community members to pick up and dispose of discarded needles (e.g., City of London). Some NEPs have adopted pro-active initiatives, such as community clean-ups, and organized volunteers or others to collect and dispose of improperly discarded needles on a regular basis (J Smit, AIDS Committee of London, personal communication, 2005).

When discarded needles are collected in the community, puncture resistant gloves should be worn. Recommendations regarding the use of tongs are mixed. Concern about the ability to control and hold the needle when using tongs has led some agencies to discourage their use and encourage the use of puncture resistant gloves (e.g., AIDS Vancouver Island). However, others recommend the use of tongs to prevent needlestick injury (e.g., Ottawa Public Health).

Collaboration with other agencies

Hospital emergency departments are well placed to accept used injection equipment. They are open 24 hours a day, 7 days a week, and have disposal facilities on site. Pharmacies are also places where needles and syringes may be disposed of, although some pharmacies will not accept used equipment for disposal. NEPs need to encourage hospital emergency departments and pharmacies to provide equipment disposal services for IDUs. Public health departments are also places where IDUs may be able to drop off used injection equipment. And NEPs may be able to work with public health departments to share responsibilities for equipment disposal and tracking.

Education and Training

Training NEP staff, volunteers, and clients to dispose of used injection equipment safely can reduce the likelihood of injury and transmission of bloodborne pathogens. Clients can also be encouraged to educate their peers about safe disposal of used injection equipment.

In the event of a needlestick or sharps injury, it is important that staff and volunteers know the procedure to follow so that the injured person receives timely care. Some NEPs have policies and procedures that outline the steps to be taken in the event of an injury. Ideally, these will be in place, and workers trained, before an injury occurs. Public health units have protocols in place and can provide guidance to NEPs on how to create their own policies and procedures. A summary of guidelines found in post-exposure protocols can be found in **Table 6** (located at the end of this section).

CONSIDERATIONS

NEP Exchange Policies

Strict exchange policies (e.g., 1-for-1) penalize clients for failing to exchange used equipment and may discourage IDUs from using and benefiting from NEP services. Homeless clients or clients living in shelters may not be able to store used equipment to return to the NEP. Imposing penalties such as refusing to give clients sterile needles reduces the opportunity for clients to benefit from program services. Clients who cannot dispose of sharps at the NEP can be taught alternative methods to properly dispose of needles.

Calculating return rates

While return rates may provide an incomplete picture of NEP effectiveness and disposal practices, they may be useful for program evaluation purposes. As mentioned previously, estimating the number of needles returned is sufficient for this purpose. Needles and equipment should not be bundled or counted by hand due to the potential for injury.

Guidelines for disposal of equipment other than needles and syringes

HIV, HBV, HCV and other bloodborne pathogens may be transmitted by the re-use of equipment such as cookers, filters, and glass stems (see **Distribution of other injection-related equipment** section), however guidelines for safe disposal of this equipment are not available. NEPs can encourage clients to dispose of all items, including cookers, filters, glass stems, swabs and water, by placing them in a sharps container immediately after use.

Lack of research on community acquired needlestick injury

This review revealed very little literature on community acquired needlestick injury, and none regarding occupational needlestick injury among NEP workers or accidental needlestick injury among IDUs. The

recommendations cited in this document are drawn primarily from the healthcare literature. However, it is reasonable to assume that these recommendations can be applied to occupational and non-occupational exposures related to needle exchange activities.

Initiatives to extend safer disposal services for IDUs

NEPs may wish to encourage community partners and members (e.g., NEP satellite sites, shelters, drop-in centres, landlords of rooming houses) to provide safe disposal of used equipment on their premises. If NEPs opt to extend disposal services in this way, resources will be needed to provide sharps containers (including drop off and pickup), training for community members on safe handling and disposal of used equipment, as well as post-exposure procedures in the event of an injury.

EVIDENCE

NEPs provide an important exit route for used injection equipment (Kaplan and Heimer, 1994). Removing used equipment from circulation helps reduce the risk of transmission of HIV, HBV, HCV and other bloodborne pathogens associated with accidental needlestick injury and/or equipment re-use (Ksobiech 2004; Heimer and Abdala, 2000).

Under laboratory conditions some viruses can survive for several weeks (Abdala et al., 1999). However, they are less stable when exposed to the environment (Leeds, Grenville and Lanark District Health Unit, 2002). HIV is the most fragile of the three viruses and survives for a few hours after infected blood has dried on a surface. HCV is more easily transmitted through a contaminated needle than HIV. However, the ability of the virus to survive on environmental surfaces is relatively poor.

Exposure to HBV carries a high risk of infection for people who have had no prior exposure to and/or who have not received the HBV vaccine (May and Brewer, 2001). The virus is relatively stable outside the body and is found in high virus titers (concentrations) in the blood of untreated individuals (Thompson, Boughton and Dore, 2003). Vaccination is 90% to 95% effective and it is recommended that NEP workers and clients be vaccinated against HBV if they are not already immune (Health Canada, 2002a). Since 1994/95, Ontario school children in grade 7 have been routinely vaccinated against HBV. Most people who attended grade 7 in Ontario since 1994 will have been immunized, however it should be noted that people whose schooling was interrupted, or who attended school irregularly, may not have been immunized. (See Vaccination section).

Recent Canadian estimates of infection risk following a needlestick injury are: HBV 1-40% (among susceptible healthcare workers); HCV 1-7% and HIV 0.3% (Canadian Centre for Occupational Health and Safety, 2005; Public Health Agency of Canada, 1997). These estimates are based on needlestick injuries among healthcare workers exposed to an infected patient.

The likelihood that a needlestick injury will result in infection depends on several factors such as the prevalence of bloodborne pathogens in the IDU community, the type of bloodborne pathogen and how recently the needle has been used (Thompson, Boughton and Dore, 2003). Among healthcare workers the

following factors are associated with increased risk of HIV infection from a needlestick injury: the depth of the injury, the amount of virus in the source person's blood, the volume of blood and the size of the needle, and the use of post-exposure prophylaxis (CDC, 2003; NIOSH, 1999; Macalino et al., 1998). Risk is also increased by certain procedures. Injury is more common when recapping a needle, disposing of equipment and when needles and equipment are left in an inappropriate place or discarded in a container that is not puncture resistant (WHO, 2003; Health Canada, 2002).

Injection equipment improperly discarded in the community poses a risk of needlestick injury for the general public and has the potential to create opposition to the NEP. Among those at risk of community-acquired needlestick injury are people who use parks or other public spaces, people who may pick up a discarded needle, and sanitation workers who may be injured by needles discarded in garbage, sewers or flushed down toilets (Macalino et al., 1998).

The risk of infection from a discarded needle in the community is lower than from a needlestick injury in a healthcare setting (Macalino et al., 1998). Occupational exposure to blood from a patient known to be infected can occur within seconds or minutes after the needle is withdrawn and the volume of blood transferred can be substantial. In a community acquired injury the infection status of the needle's owner may be unknown, however, the needle/equipment may have been exposed to the environment for some time, reducing the viability of bloodborne pathogens (Canadian Paediatric Society, 1999). In both healthcare and community settings, the risk of infection from a needlestick injury is much lower than that associated with needle sharing. Nevertheless, any needlestick injury regardless of the probability of infection is likely to cause the injured person substantial emotional stress over a prolonged period (Macalino et al., 1998).

Challenges for equipment return and safe disposal

There are a number of challenges to safe disposal. IDUs may be unaware of correct disposal practices. For instance, during qualitative interviews with NEP clients in Halifax, Nova Scotia, participants reported breaking the tip off a needle to prevent it being re-used (Jackson et al., 2002). Storing used equipment until it can be disposed of and carrying it to a disposal site may also present barriers to safe disposal. Homeless and insecurely housed IDUs may be unable to store equipment until it can be returned to the NEP. 'Hidden' IDUs may not want to store equipment for fear that their drug use will be discovered. And IDUs may not be willing to store or carry used equipment for fear of having it confiscated by the police and used as evidence of illegal activity (Riley and Oscapella, 1996). Intoxication also presents an obstacle to safe disposal. Intoxication may lead IDUs to misplace needles or forget about used equipment.

NEP policies can also present challenges to safe disposal. Strict exchange policies, such as one-for-one, are not necessary, or desirable, to achieve high return rates (Grund et al., 1992). NEP operating hours may be inaccessible for some IDUs, and clients may not be able to return their needles to the NEP at a given time. ID codes are used by some NEPs to track service utilization and clients' needle exchange rates. The lack of anonymity associated with ID codes - whether real or perceived - may discourage clients from using an NEP and safely disposing of used equipment (Loue, Lurie and Lloyd, 1995; see **Needle and syringe exchange** section). In addition, individual client exchange rates may be of limited value in understanding safe disposal rates (Ksobiech, 2004). Estimating returns is sufficient for calculating return rates.

NEPs and discarded needles

Research suggests that NEPs do not increase the number of discarded needles in the community. A University of California report (undated) concludes that the NEPs evaluated (in 10 U.S. cities and one in Toronto) were not associated with an increase in the total number of discarded syringes. Conversely, the authors note that the establishment of NEPs can be expected to result in fewer discarded syringes.

Khoshnood et al. (2000) found that IDUs who used a New Haven NEP as their sole source of needles had the lowest frequency of needle discard when compared with IDUs who used pharmacies. Among 373 IDUs, 98% of those who used pharmacies only, and 84% of IDUs who used both the NEP and pharmacies reported that they discarded needles “always or sometimes” in the past 6 months, compared with 65% of those whose usual source of needles was the NEP. And in Baltimore (Doherty et al., 2000; 1997) the opening of an NEP was associated with a decrease in discarded needles.

Return rates (also known as exchange rates) also provide information about disposal practices. Among NEPs in Ontario in 2002 the overall return rate was 83.6%, ranging from 44% to 140% (Ontario Ministry of Health and Long-Term Care, 2003). In a meta-analysis of data from 26 international studies Ksobiech (2004) reported an overall return rate of 90%, ranging from 15% (Sicily) to 112% (UK). Four studies reported return rates of 100% or more.

Needles may be safely disposed of even when they are not returned to the source program. Ksobiech (2004) notes that in the studies she reviewed, the needles returned were not necessarily the same needles that were distributed. Similarly, an evaluation of the Prevention Point NEP (San Francisco) found that 13% of needles were returned to other sites (Guydish et al., 1990 in Grund et al., 1992). Nevertheless, given the large volume of needles that are distributed by NEPs, if only a small fraction of these are inappropriately discarded this translates into a significant number of discarded needles (Thompson, Boughton and Dore, 2003).

Strategies to increase return rates and encourage safe disposal

“People use needle exchanges like they (and everybody) uses any other shop” (Grund et al., 1992:46). Strike et al. (2005) and Grund et al. (1992) describe different needs, preferences and motivations among IDUs that influence where, when and how they use NEP services. For some, exchange use is driven by immediate needs; while for others, NEP use is a planned activity (e.g., ‘stockpilers’, ‘collective exchangers’).

NEPs that provide multiple options for return and disposal of used injection equipment may be able to increase return rates and reduce transmission of bloodborne pathogens. Options include providing disposal services at the NEP fixed, mobile, satellite and outreach sites, providing a designated “mailbox” or drop box, and/or directing clients to a pharmacy that accepts used injection equipment (see **Needle and syringe exchange** and **Needle exchange program delivery models** sections). Hankins (1998) reported that, in Quebec, outreach workers carried sharps containers in their backpacks to provide exchange and disposal services for IDUs on the street. And in Australia for example, FitPaks™ (pocket-sized packs of 3, 5 or 10 sterile needles) also function as sharps containers for disposing of used needles. Fitpaks™ full of used needles can be exchanged for new ones at pharmacies, NEPs and health departments (Macalino et al., 1998).

In some European cities, used needles can be disposed of at vending machines that dispense sterile needles in return. In a study of vending machines in Marseille, France (Obadia et al., 1999) one of the main reasons reported for using the machines was 24-hour availability. Primary users of the machines were also younger and less likely to live in a house they owned or rented than IDUs who primarily used other programs, suggesting that vending machines may be a useful disposal strategy for some IDU groups.

NEPs can encourage clients to return their used injection equipment without penalizing them for failing to do so. Clients can be encouraged to return used equipment at another visit, to another site or to another NEP. Clients may also wish to return equipment via a peer, or return equipment on behalf of others (Grund et al., 1992). NEPs need to allow clients to do this, but discourage them from handling needles used by other people and educate them about how to handle needles safely. NEPs can provide clients with sharps containers to be filled and returned/collected for disposal.

Protecting the anonymity of clients may also encourage returns from some IDUs (Macalino et al., 1998). For clients who are unable or unwilling to deliver used equipment to an NEP site, workers can respond to calls to collect used equipment from clients' homes, shooting galleries, or other agreed upon locations (Hankins, 1998).

Table 5. Examples of safer handling and disposal recommendations

Disposing of used injection equipment, sharps and sharps containers
<ul style="list-style-type: none"> ▶ Sharps must be disposed of in a rigid container with a non-removable lid and labelled “Biomedical Waste/Déchets Biomédicaux”. The container must be capable of withstanding the weight of the biomedical waste without tearing, cracking or breaking. ▶ When clients exchange needles, provide sharps containers ▶ Encourage clients to purchase and/or ask for sharps containers at pharmacies <ul style="list-style-type: none"> ▶ Some pharmacies may provide free sharps containers to customers who usually purchase their needles there. Some pharmacies may accept sealed containers for disposal ▶ When sharps containers are not available, encourage clients to place used equipment in a rigid, plastic container with a tight fitting lid, such as a bleach bottle, fabric softener bottle, or plastic soda pop bottle ▶ Encourage clients to write “SHARPS. DO NOT RECYCLE” on containers without such markings ▶ Encourage clients to return all sharps containers when 2/3 full to the NEP ▶ When possible, pick up sharps containers from clients’ homes or locations where they inject and store used equipment
Handling used injection equipment: recommendations for NEP clients
<ul style="list-style-type: none"> ▶ Locate the sharps containers close to the area of uses ▶ Dispose of used injection equipment immediately ▶ Never recap a needle. This may lead to a needlestick injury and (re)infection with HIV, HBV, HCV or other bloodborne pathogens ▶ When exchanging needles for other people, ask them to deposit them in a sharps container first ▶ Do not bend or break a needle
Handling sharps: recommendations for NEP workers
<ul style="list-style-type: none"> ▶ Be aware that clients exchanging needles may be carrying needles on their person (e.g., in pockets or sleeves) or loose in non-secure containers such as plastic or paper bags ▶ Do not touch returned needles <ul style="list-style-type: none"> ▶ Clients must dispose of their own needles ▶ If an estimate of the number of needles returned is required this can be done by “eyeballing” and/or by asking clients how many needles they are returning ▶ When performing immunization or testing: <ul style="list-style-type: none"> ▶ Locate the sharps containers close to the area of use ▶ Dispose of the needle immediately
Collecting used injection equipment discarded in the community
<ul style="list-style-type: none"> ▶ Wear puncture resistant gloves ▶ Carry a sharps container for immediate disposal
<p>Sources: Wilburn and Eijkemans (2004); Ottawa Public Health (2004); WHO (2003); American Nurses Association (2002); International Council of Nurses (2000); NIOSH (1999), Harm Reduction Coalition (1998); AIDS Vancouver Island; Public Health Agency of Canada (1997); Arnott (1986)</p>

Table 6. Examples of needlestick injury post-exposure guidelines

<p>First Aid</p> <ul style="list-style-type: none"> ▶ Allow the wound to bleed freely ▶ Cleanse the wound thoroughly with soap and water ▶ If injury or blood contact is with mucous membranes (i.e., eyes, nose, mouth) flush well with water
<p>Medical Attention and Post-Exposure Prophylaxis</p> <p>Seek immediate medical attention (within hours) from an emergency department, clinic or doctor's office. The needlestick injury will be assessed there. Confidential HIV, HBV and HCV testing may be recommended. Post-exposure prophylaxis (e.g., immunoglobulin or antiviral therapy for HBV and HIV) may be recommended. Many hospitals have policies and procedures in place for NSI exposures, however there are regional variations. Local public health units have protocols in place and can provide guidance and information on what to do and, in some cases, how to assess risk of exposure. Delay or failure to seek medical attention may compromise the effectiveness of post-exposure treatment</p>
<p>Follow-up Counselling and Evaluation</p> <p>Periodic testing for HCV antibodies, liver enzyme levels and HIV antibodies is recommended. Counselling for emotional stress related to the injury and possibility of infection may be appropriate. Counselling for prevention of transmission, such as through sexual contact, blood or organ donation is also recommended</p>
<p>Documentation & Surveillance</p> <p>Report any needlestick injury to the NEP manager. Document all injuries in a sharps injury log. A sharps injury log includes information such as the date of the injury; the equipment involved; a description of the injury; and an explanation of how the incident occurred. This information can be used to help NEPs develop further strategies to prevent needlestick injuries</p>
<p>Sources: CDC (2005);The Works (2005); ONA (2004); Wilburn and Eijkemans (2004); Manitoba Public Health, Communicable Disease Control Unit (2003); Public Health Agency of Canada (1997).</p>

An extensive post-exposure protocol, published by Manitoba Public Health's Communicable Disease Control Unit, can be found at: www.gov.mb.ca/health/publichealth/cdc/fs/ipep.pdf.

An outline of the components of a post-exposure program can be found at: www.aidslaw.ca/mainscontent/issues/testing/e-compulsorytesting/improvedprevention.htm

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THE DISTRIBUTION OF OTHER INJECTION-RELATED EQUIPMENT

While injection with a needle that has previously been used by an IDU living with HIV or HCV infection is the most effective injection practice for acquiring these viruses, studies show that the equipment used to prepare drugs for injection also poses a risk of transmission. The items used to prepare drugs for injection include:

- ▶ **Cookers or spoons** in which drugs are mixed with water and melted into an injectable liquid prior to injection
- ▶ **Filters or cotton** used to remove undissolved drug particles and other debris when drawing up the drug solution from the cooker
- ▶ **Acidifiers** used to convert insoluble drugs such as brown heroin or crack cocaine into a water-soluble form by adding an acid to create a salt
- ▶ **Water** used to dissolve drugs into a solution, to flush syringes before use and to rinse syringes between uses

The practice of several people using these items at the same time, or the use of these items by an individual IDU who does not know whether they have been previously used by another injector, is often referred to in scientific studies as “indirect sharing” to differentiate this practice from the “direct” use of shared needles (Koester and Hoffer, 1994). While the risk of transmission of HIV or HCV from used equipment other than needles is lower than that for needles, studies show that IDUs share other equipment more frequently than needles.

Many of the studies conducted to date do not separate out the different items of equipment when asking study participants about risk behaviours. For example, many studies ask if the participant has ever shared a cooker, filter or water. As a result, it is difficult to determine from these studies if particular items of equipment are more likely than others to be shared and pose a potential risk of HIV or HCV transmission. In this introduction section, we review studies that do not separate out the behaviours and risk associated with each piece of equipment.

EVIDENCE

Re-use of other injection-related equipment

In Canada, pilot data from the I-Track study, examining risk behaviours among Canadian IDUs, document that 43% of the 794 study participants had injected with previously-used drug injection equipment such as cotton, filters, cookers and water. This proportion ranged from 32 to 54% in the various recruitment sites across Canada (Health Canada, 2004).

In terms of Ontario-based studies, among 551 active IDUs recruited from nine NEPs in Ontario, Millson and colleagues documented that the majority of study participants (62%) had shared cookers, cotton or water in the six months prior to their interview, with the proportions of IDUs engaging in this behaviour ranging by region from 55 to 80% ($p < 0.001$; Millson et al., 2003). Leonard and colleagues documented similarly high

rates among 418 men and 85 women IDUs in Ottawa participating in the POINT Project between October 2002 and January 2003. The majority of both men (59%) and women IDUs (68%) had injected with previously-used equipment at some point in their drug injecting history, and of these, 41% of the men and 50% of the women had done so in the six months before their baseline interview (Leonard et al., 2005).

Re-use of drug injection equipment appears to be a very common practice elsewhere in the world (Power et al., 1994; Siushansian et al., 1998; Wang et al., 1998; Thorpe et al., 2001). For example, Hunter and colleagues studied the injection-related risk behaviours of 2,062 IDUs in Greater London, UK, from 1990 to 1993. In 1992 and 1993, over 50% of the respondents reported sharing filters and/or spoons in the six months prior to their interview (Hunter et al., 1995). In an ethnographic study conducted in 1993 by Needle and colleagues which examined drug acquisition and the sharing of injection drug equipment in 54 “networks” of IDUs selected from six American cities and Puerto Rico, the authors found that multiperson use of drug equipment occurred 94% of the time (Needle et al., 1998).

Factors associated with re-using other injection-related equipment

Studies comparing the injection practices of women IDUs with those of men IDUs have found that women are significantly more likely than men to use injection equipment that has already been used by someone else (Bennett et al., 2000; Evans et al., 2003; Archibald et al., 2001). For example, in terms of Ontario-based studies, in the POINT Project conducted by Leonard and colleagues in Ottawa and described above, women IDUs were more likely than men IDUs to have shared someone else’s cooker or spoon and significantly more likely than men IDUs to have shared someone else’s filter or cotton ($p < 0.001$) and someone else’s washes⁹ ($p < 0.001$). These findings suggest that women may be at greater risk of acquiring HIV and HCV through this injection practice. This documented greater risk for women IDUs needs to be incorporated into prevention programs and risk reduction messages.

Younger age has also been found to be significantly associated with sharing injection preparation equipment. Studies have found that younger IDUs with shorter injecting careers were more likely to report recent sharing of injection equipment than older and more experienced injectors (Hunter et al., 1995). This documented greater risk for younger IDUs needs to be incorporated into prevention programs and risk reduction messages.

Similarly, IDUs who receive injections from other people (injection recipients) and IDUs who inject other people (“hit doctors”, “street docs”) have been shown to be more likely to report injections with previously-used cookers, rinse water and filters. Among 1,166 active IDUs in the San Francisco Bay area of California, Kral and colleagues reported that injection recipients were about three times as likely as IDUs who were neither injection recipients or street docs, and about 1.5 times as likely as street docs to report sharing syringes, cookers, rinse water and filters. Street docs were about twice as likely as IDUs who were neither injection recipients nor street docs to report sharing syringes, cookers, rinse water and filters and backloading with dirty syringes (Kral et al., 1999). Additionally, in a recent study of more than 1,500 Vancouver IDUs, results indicated that IDUs needing help injecting were at increased risk of HIV seroconversion in comparison to those not needing assistance (O’Connell et al., 2005). Prevention programs and risk reduction messages need to emphasize the HIV- and HCV-related risks associated with being an injection recipient or a street doc. Current risk reduction messages tend to assume self-administered injections.

IDUs with a history of mental health problems also appear to be more likely to inject using previously-used equipment or to share injection equipment. Archibald and colleagues found in a study among 255 Regina IDUs that IDUs with a history of suicide attempts were more likely to borrow equipment (52% vs. 37%) than those without suicidal ideation (Archibald et al., 2001). Among a cohort of 2,198 IDUs aged 18 to 30 from five U.S. cities, Morse and colleagues found that IDUs with a history of mental health hospitalization were more likely to report sharing syringes (OR=1.6; 95%CI: 1.3-1.9), cookers (OR=1.5; 95%CI: 1.2-1.8), cotton (OR=1.4; 95%CI: 1.1-1.7) and rinse water (OR=1.5; 95%CI: 1.2-1.8). Similarly, IDUs with suicidal ideation were more likely to report sharing syringes (OR=1.8; 95%CI: 1.5-2.2), cookers (OR=1.6; 95%CI: 1.3, 1.9), cotton (OR=1.6; 95%CI: 1.4-2.0) and rinse water (OR=1.7; 95%CI: 1.4-2.1; Morse et al., 2001).

More severely dependent IDUs have also been found to share previously-used drug injection equipment more frequently, likely due to the urgency of their need for drugs while suffering from withdrawal. Gossop and colleagues conducted a study examining heroin dependence and sharing injecting equipment among a group of 408 London, UK heroin users. Equipment sharers were significantly more likely to be polydrug injectors ($p<0.01$), older users (30 vs. 26 years, $p<0.001$) and to have been injecting heroin for longer (12 vs. 8 years, $p<0.001$) compared to non-sharers (Gossop et al., 1993).

Finally, an association has also been found between IDU risk perception and the sharing of cookers. Robles and colleagues found that high perceived risk of developing HIV/AIDS was related to risky injection behaviours as seen in their study among 1,740 Puerto Rican IDUs from 1989-1991. By comparing behaviour at baseline and at follow-up six months later, a high perceived vulnerability to HIV/AIDS infection at baseline indicated a higher likelihood of reporting the sharing of cookers at follow-up. Robles hypothesized that this may be due to the IDUs believing that there is little they can do to reverse the consequences of their risky actions (Robles et al., 1995).

Re-use of other injection-related equipment versus needles

Studies show that IDUs share injection equipment more often than they share needles (Bennett et al., 2000; Gossop et al., 1997; Vlahov et al., 1997; Power et al., 1994; Wang et al., 1998; Thorpe et al., 2001; Green et al., 2001; Huo et al., 2005; Koester, Booth and Zhang, 1996; Archibald et al., 2001; Hunter et al., 1995). Furthermore, several studies have documented that while IDUs may inject with their own sterile needle - i.e., they have not shared needles - many have shared other injection equipment such as spoons, water containers and filters (McCoy et al., 1998; Gossop et al., 1997; Hagan et al., 2001; Power et al., 1994). For example, in the study by Hunter and colleagues described previously, more than 33% of IDUs who reported that they had not shared needles in the six months prior to the interview had shared filters and spoons during that time period (Hunter et al., 1995). These findings suggest that the risk of acquiring HIV and HCV through sharing needles is well understood, while further work is required to profile the HIV- and HCV-related risk associated with sharing other injection equipment.

In a study conducted by McCoy and colleagues among 12,323 active IDUs recruited from 19 sites in the United States, injection with previously-used cookers/cotton/water was almost twice as frequent as injection with a previously-used needle/syringe (McCoy et al., 1998). The more frequent re-use of these items suggests that the potential HIV- and HCV-related risks associated with sharing injection equipment may be of equal concern (Bennett et al., 2000).

Re-use of injection-related equipment and HIV and HCV transmission

Preparing injections with previously-used equipment other than needles has been found to be statistically significantly associated with existing levels of infection with HIV and HCV, and as a predictor of HCV seroconversion among women and men who inject drugs. For example, among 834 active IDUs in East Harlem, New York City, Beardsley and colleagues reported that injectors who tested HIV-positive in their study were significantly more likely to have injected with previously-used cookers, cotton and/or rinse water than injectors who tested HIV-negative ($p < 0.002$; Beardsley et al., 1999).

Hagan and colleagues measured HCV seroconversion among a cohort of 317 active Seattle IDUs who tested negative for HCV antibody at recruitment into their study. Among those IDUs who did not share syringes, sharing drug cookers and filtration cotton elevated the risk of HCV seroconversion six-fold (adjusted relative risk (ARR)=5.9; 95%CI: 1.1-31.7) and 54% of HCV infections among this group were attributable to cooker/cotton sharing (Hagan et al., 2001). Hahn and colleagues conducted a cohort study in which 195 HCV-negative IDUs were recruited and their risk factors for HCV seroconversion examined. In the 21-month time period, it was found that the risk of HCV infection increased significantly for those who shared non-sterile drug equipment (hazard ratio (HR)=2.5; 95%CI: 1.3-5.1; Hahn et al., 2002). Similarly, Thorpe and colleagues measured the incidence of HCV infection among a cohort of 18 to 30 year-old Chicago IDUs between 1997 and 1999. The adjusted relative hazard (ARH) of HCV seroconversion was highest for those IDUs who shared cookers (ARH=3.5; 95%CI: 1.4- 8.5), followed by those who shared rinse water (ARH=2.2; 95%CI: 1.1-4.6), unbleached syringes (ARH=2.0; 95%CI: 1.0-4.0), and cottons (ARH=1.96; 95%CI: 1.0-3.8; Thorpe et al., 2000).

Prevention of injection-related equipment related transmission

Evidence exists that NEPs are well positioned to scale-up their activities to reduce the harm associated with sharing injection equipment other than needles. In a recent 2004 study, Ouellet and colleagues compared IDUs who reported the Chicago NEP as the source for at least half of the needles they injected within the six months prior to their baseline interview (regular NEP users) with IDUs who reported that in the six months prior to their baseline interview they had not used an NEP and neither had someone else gone to the NEP for them (NEP non-users). All HIV and HCV risk-related injection practices were significantly less likely among regular NEP users compared with NEP non-users. Specifically, regular NEP users compared with NEP non-users had a 61% reduced odds of sharing cookers (adjusted odds ratio (AOR)=0.4; 95%CI: 0.3-0.6), a 52% reduced odds of sharing cotton (AOR=0.5; 95%CI: 0.3-0.7), and a 59% reduced odds of sharing water (AOR=0.4; 95%CI: 0.1-0.3; (Ouellet, DeZheng and Bailey et al., 2004).

These findings confirm that NEPs are well positioned to implement or to scale up their harm reduction interventions to reduce the harms associated with injection with previously-used injection equipment. However, despite this evidence, there are significant obstacles to initiate and/or maintain this key service. These obstacles relate to the cost of supplies and financial constraints. The actual costs of these additional harm reduction supplies are minimal. At the time of writing in June 2005, a box of 100 cookers costs \$7.00, a box of 2,550 filters \$7.65, a box of 1,000 acidifiers \$12.00, a box of 100 water ampoules \$20.00, a box of 200 swabs \$1.40, and 1,000 tourniquets \$141.24. Despite these very minimal costs, many NEPs and AIDS Service Organizations (ASOs) are unable to purchase these items. For example, in 2004 the Canadian AIDS Society carried out a Harm Reduction Kit Survey among its member groups (Canadian AIDS Society, 2004). Many

organizations responded that they were not in a position to purchase and distribute the items that they knew were so essential to reduce the harm associated with injection drug use.

Other injection-related equipment sections

In this introduction section, we reviewed evidence from studies that did not separate out the behaviours and risks associated with each piece of equipment. In the sections that follow, we provide best practice recommendations for injection related equipment and review evidence from studies that examine behaviours and risks related to specific pieces of equipment, including:

- ▶ Cookers
- ▶ Filters
- ▶ Acidifiers
- ▶ Sterile water ampoules
- ▶ Sterile alcohol swabs
- ▶ Tourniquets

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Distribution of cookers

Best practice recommendations – in detail

To prevent transmission of HIV, HCV and other bloodborne pathogens from the re-use of cookers or spoons:

- ▶ Distribute cookers in the quantities requested by clients with no limit on the number of cookers provided
- ▶ Offer a cooker with each needle provided
- ▶ Educate clients about the risks associated with sharing cookers
- ▶ Educate clients about the correct single-person use of cookers
- ▶ Educate clients about the correct disposal of used cookers

INTRODUCTION

Prior to injection, drugs in powder form (cocaine, white heroin); solid form (crack/rock cocaine, black tar heroin); and tablet form (dilaudid, PCP, oxycontin) need to be mixed with water to make a solution that can be injected. A cooker is used as the container for this mixing process. It is called a cooker as the solution may be heated to further dissolve the drug so that the solution is of the right consistency for injection. Spoons and less frequently bottle caps are used for this purpose. It has been anecdotally reported that some NEPs distribute spoons instead of cookers, however we believe spoons are easier to re-use. As a best practice, we recommend the use of single-use cookers.

An individual user will use their syringe to draw up water—often from a shared water container—and squirt this water into the cooker for mixing with the powdered drug. Several needles may be placed into the cooker to draw up individual hits of the drug solution. This practice is particularly common when drugs are collectively purchased and subsequently shared among a group of users. A previously-used needle is estimated to contain approximately 0.01 mL or more of residual fluid which may be deposited into the shared communal cooker through this process of drug preparation and distribution (Loimer, Werner and Presslich, 1991).

Data from international studies document the high frequency of re-use or sharing of cookers among IDUs. IDUs tend to retain and re-use cookers longer than either filters or rinse water; share cookers more frequently than other items of drug preparation equipment; and share cookers even when a sterile needle is used for injection. Therefore, there may be greater opportunity for contaminating cookers with HCV and HIV than other items of injection equipment.

Virologic studies have documented the presence of HIV and HCV on spoons and cookers removed from injection settings, demonstrating the potential HIV and HCV risk associated with the re-use of cookers. In addition to these virologic studies, epidemiologic studies have demonstrated that sharing cookers is an independent predictor of HCV seroconversion and have also documented an association between cooker sharing and HIV prevalence.

The distribution of cookers to clients is the best way for needle exchange programs to reduce the risks associated with the re-use or sharing of cookers among IDUs.

EVIDENCE

Sharing a cooker is common among IDUs. In Ottawa, Leonard and colleagues examined cooker sharing among 418 men and 85 women IDUs participating in the POINT Project between October 2002 and January 2003. The majority of both men (59%) and women (68%) had injected with previously-used equipment at some point in their injection drug use history. The majority of both men (82%) and women (76%) who had injected with previously-used equipment in the six months prior to their baseline interview had shared another person's cooker or spoon (Leonard et al., 2005).

Needle and colleagues examined drug acquisition and sharing of injection drug equipment in 54 "networks" of IDUs selected from six American cities and Puerto Rico. The authors found that cookers were shared 84% of the time (Needle et al., 1998).

Similarly, in a study examining the multiperson use of injection-drug equipment among 794 street-recruited Chicago IDUs, Huo and colleagues found that 65% of participants shared cookers with other IDUs at the time of their baseline interview. At follow-up, IDU participation in an NEP was associated with the reduction of needle sharing but not associated with the reduction of sharing cookers. This suggests that despite awareness efforts, the risks of indirect sharing among IDUs remains under-recognized or difficult to avoid (Huo et al., 2005).

Several studies have found that IDUs share cookers more frequently than other items of drug preparation equipment (Gossop et al., 1997; Beardsley et al., 1999; Koester, Booth and Zhang, 1996; Thorpe et al., 2002; Koester, Booth and Wiebel, 1990; Archibald et al., 2001; Scottish Drugs Forum and Glasgow Involvement Group, 2004). Clatts and colleagues reported from their direct observations of injecting episodes that IDUs tend to retain and re-use cookers longer than either filters or rinse water. Seventy-eight percent of cookers examined showed evidence of previous use, and 90% of the cookers were retained for future use (Clatts, Heimer and Abdala, 1999). **It appears therefore that there may be greater opportunity for contaminating cookers with HCV and HIV than other items of injection equipment.**

IDUs who use their own sterile needles for injection may share cookers during drug preparation. For example, Hunter and colleagues studied the injection-related risk behaviours of 2,062 IDUs in Greater London, UK, from 1990 to 1993. In 1992 and 1993, over 50% of the respondents reported sharing cookers and/or filters in the six months prior to the interview. More than 33% of those who reported that they had not shared needles during the previous six months had shared cookers and filters during that time period (Hunter et al., 1995).

An association has also been found between IDU risk perception and the sharing of cookers. Robles and colleagues found that high perceived risk of developing HIV/AIDS was related to risky injection behaviours as seen among a group of 1,740 Puerto Rican IDUs from 1989 to 1991. By comparing behaviour at baseline and at follow-up six months later, it was found that having a high perceived vulnerability to HIV/AIDS at

baseline indicated a higher likelihood of reporting the sharing of cookers at follow-up. Robles hypothesized that this may be due to the IDUs believing that there is little they can do to reverse the consequences of their risky actions (Robles et al., 1995).

IDUs with a history of mental health problems also appear to be more likely to inject using previously-used cookers. Morse and colleagues found that among a cohort of 2,198 IDUs aged 18 to 30 from five U.S. cities, IDUs with a history of mental health hospitalization (OR=1.5; 95%CI: 1.2-1.8) or with suicidal ideation (OR=1.6; 95%CI: 1.3-1.9) were more likely to report sharing cookers (Morse et al., 2001).

HIV transmission and cooker sharing

HIV may be transmitted between IDUs by the shared use of cookers. In a 1996 study, Shah and colleagues examined previously-used injecting equipment from shooting galleries in Miami, Florida for the presence of HIV-1. Antibodies to HIV-1 were detected in three (14%) of 21 rinses from cookers. Gag and envelope gene DNA were detected in six (46%) and seven (54%) of the 13 cookers examined (Shah et al., 1996).

In addition to this virologic study, epidemiologic studies also document increased HIV risk through injecting with previously-used cookers. Among 355 IDUs completing both a baseline and a two week follow-up interview as participants in the evaluation of Baltimore's NEP between August 1994 and August 1995, significant differences in cooker-sharing behaviour related to HIV-positive status were observed. IDUs testing HIV-positive at their baseline interview were more likely to report sharing cookers (71%) than IDUs testing HIV-negative at their baseline interview (56%; Vlahov et al., 1997).

HCV transmission and cooker sharing

HCV may be transmitted between IDUs by the shared use of cookers. In a study carried out in 2000, Crofts and colleagues examined previously-used injecting equipment from 10 Australian injecting settings for the presence of HCV RNA. HCV RNA was detected on 25% (1/4) of the spoons tested (Crofts et al., 2000).

In addition to this virologic study, epidemiologic studies also document increased HCV risk through using cookers at the same time as other IDUs or after other people have used them. In a cohort study of 353 HCV-negative young adult IDUs aged 18 to 30 years recruited from the greater Chicago, Illinois area, Thorpe and colleagues found the sharing of cookers to be a statistically significant predictor of HCV seroconversion. Sharing a cooker in the six months prior to the follow-up interview elevated the risk of HCV seroconversion among this group of younger IDUs four-fold (adjusted relative hazard (ARH)=4.1; 95%CI: 1.4-11.8). After adjustment for syringe-sharing, sharing cookers remained the strongest predictor of HCV seroconversion, elevating the risk of seroconversion three-fold (ARH=3.5; 95%CI 1.3-9.9; Thorpe et al., 2002).

Similarly, Hagan and colleagues measured HCV seroconversion among a cohort of 317 active Seattle IDUs who tested negative for HCV antibody at recruitment into their study. Among the 123 IDUs who did not share syringes, sharing cookers and cotton (combined) elevated the risk of HCV seroconversion six-fold (adjusted relative risk (ARR)=5.9; 95%CI: 1.1-31.7; Hagan et al., 2001).

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Distribution of filters

Best practice recommendations – in detail

To prevent the transmission of HIV, HCV and other bloodborne pathogens, and to prevent deep vein thrombosis (DVT) from the re-use of filters:

- ▶ Distribute filters with a pore width of 0.22 µm in the quantities requested by clients with no limit on the number of filters provided
- ▶ Offer a 0.22 µm filter with every needle provided
- ▶ Educate clients about the HIV-and HCV-related risks associated with sharing filters and making washes¹⁰ from filters
- ▶ Educate clients about the risks of bacterial contamination if a new filter is not used, or if a cigarette filter is used
- ▶ Educate clients about the risks of DVT if a new small-pore filter is not used for each injection
- ▶ Educate clients about the correct single-person use of filters
- ▶ Educate clients about the correct disposal of used filters

INTRODUCTION

Prior to injection, drugs in powder, solid or tablet form are mixed with water to make a solution that can be injected. A needle is placed in the mixing container and the solution is then drawn up into the syringe. Filters are used on the tips of the needles to prevent any undissolved particles of the drug, other debris and/or bacteria from being drawn into the syringe or injected into a vein.

Cotton or cotton wool is often used as a filter. In addition there are anecdotal reports of IDUs using tampons, cigarette rolling paper and cotton buds. Cigarette filters are also commonly used as filters. Although these filters may prevent large particles from getting into the syringe, they may not be clean and will not prevent the entry of small organisms like bacteria.

Data from international studies document the high frequency among IDUs of re-use or sharing of filters and the frequency of the practice of the injection of washes obtained from previously-used filters from different users whose HIV and HCV status may be unknown.

The distribution of efficient and effective small-pore filters to clients is the best way for NEPs to:

- ▶ Reduce the risks associated with the sharing of filters among IDUs
- ▶ Help clients reduce the use of inefficient large-pore filters such as cigarette filters documented to be associated with the growth of the bacteria responsible for the formation of abscesses
- ▶ Help clients prevent foreign particles from entering the body which can lead to DVT through the use of inefficient filters such as cigarette filters
- ▶ Prevent the sharing of washes made from filters

¹⁰A drug solution formed by adding water to the drug residue in a used filter, used cooker or used needle.

CONSIDERATIONS

IDUs may frequently experience a condition called “cotton fever”. The cause of cotton fever is currently unknown, however it is documented to be associated with injection drug use and the use of cotton filters (Harrison and Walls, 1990). As a known pyrogen, cotton has been known to provoke an inflammatory and pyrogenic response creating symptoms such as headache, chills and rigors, dyspnea, palpitations, nausea, emesis, abdominal pain and other fever symptoms that can even mimic sepsis (Harrison and Walls, 1990). Animal studies also confirm the inflammatory and pyrogenic effects of cotton wool (Bogdan, Cristea and Coman, 1981).

Shragg studied two heroin addicts with febrile symptoms after they had boiled a previously-used cotton filter in order to retrieve and inject residual narcotic. No cause of fever could be determined other than that believed to be caused by the filter itself (Shragg, 1978). Ferguson and colleagues reported a case of cotton fever in an IDU who had used cotton to filter heroin and concluded that the bacterial organism, *Enterobacter agglomerans* was with most probability the causal agent of cotton fever (Ferguson, Feeny and Chirurugi, 1993). The concern is that IDUs experiencing these symptoms may be suffering from a more serious illness such as pneumonia, endocarditis or hepatitis and therefore it is recommended that all febrile IDUs are hospitalized as a measure of precaution, which presents a significant burden on the healthcare system (Harrison and Walls, 1990).

EVIDENCE

Filter sharing among IDUs

Filters are frequently shared among IDUs. For example, in an ethnographic study conducted in 1993 by Needle and colleagues that examined drug acquisition and the sharing of injection drug equipment in 54 “networks” of IDUs selected from six American cities and Puerto Rico, the authors found that cotton filters were shared 77% of the time. Moreover, when drugs were purchased by a high-risk group, cotton filters were always shared (Needle et al., 1998). Similarly, Hunter and colleagues studied the injection-related risk behaviours of 2,062 IDUs in Greater London, UK, from 1990 to 1993. In 1992 and 1993, over 50% of respondents reported sharing filters and/or spoons in the six months prior to the interview. More than 33% of those who reported that they had not shared needles during the previous six months had shared filters and spoons during that time period (Hunter et al., 1995).

Evidence of filter sharing is common among Canadian IDUs. Among Ottawa IDUs, Leonard and colleagues examined filter or cotton sharing among 418 men and 85 women participating in the POINT Project between October 2002 and January 2003. The majority of both men (59%) and women (68%) had injected with previously-used equipment at some point in their injection drug use history. Among this group, the majority of both men (68%) and women (72%) who had injected with previously-used equipment in the six months prior to their baseline interview had shared another person’s filter or cotton (Leonard et al., 2005). Archibald and colleagues investigated injection equipment sharing behaviour among 1,430 Regina IDUs. The borrowing of cotton occurred 65% of the time, exceeded only by cookers (86%) and needles/syringes (69%; Archibald et al., 2001).

IDUs with a history of mental health problems appear to be more likely to inject using previously-used cotton filters. For example, Morse and colleagues found that among a cohort of 2,198 IDUs aged 18 to 30 from five U.S. cities, IDUs with a history of mental health hospitalization (OR=1.38; 95%CI:1.12-1.68) or with suicidal ideation (OR=1.62; 95%CI:1.36-1.94) were more likely to report sharing cotton (Morse et al., 2001).

Filters, particularly cigarette filters, can absorb some of the drug solution. These solution-soaked filters are often given to other users who may have obtained several such filters from different users. These filters are mixed with water and the resultant “wash” is injected. This practice was observed by Bourgois and Pearson in an observational study of HIV injection-related risk behaviours among a network of 46 heroin users in San Francisco. In this group, lower members in the network hierarchy would ask for “cotton shots” referring to the use of a cotton remnant from a previous injection episode (containing blood and residual heroin) to prepare a solution for injection (Bourgois and Pearson, 1998). There is potential for the transmission of HCV and HIV through the injection of washes obtained from previously-used filters from different users whose HIV and HCV status may be unknown.

Prevention of bacterial infection

Microbiological studies of the injection equipment of heroin users have found bacteria in their needles, most notably variations of the Streptococcus and Staphylococcus bacterium. These are the two bacteria responsible for the formation of abscesses (Cafilisch, Wang and Zbinden, 1999).

In a study carried out in 1997, Cafilisch and colleagues measured the bacterial growth in sterile syringes after they had been used for injection with three different types of filters. Bacterial contamination was found in 23 of 24 syringes used with a cigarette filter; in 20 of 24 syringes used with a filter with a pore width of 20 μ m; and in only 6 of 24 syringes when a filter with a pore width of 0.22 μ m was used. The authors concluded that a filter with a pore width of 0.22 μ m was significantly more effective in preventing bacterial contamination of syringes than both cigarette filters (relative risk (RR)=18.0) and the 20- μ m filter (RR=4.5; Cafilisch, Wang and Zbinden, 1999).

Prevention of particles entering the body

Foreign particles entering the body through injection drug use can lead to DVT. In a 2001 Scottish study examining the cause of venous thromboembolism among 322 women aged 16 to 70 years accessing hospital care in Glasgow for vein thrombosis, McColl and colleagues observed that injection drug use was a common risk factor for DVT. Injection drug use was associated with 21% of all cases of DVT observed among this group. Among women under 40 years of age the DVT-related risk attributed to injection drug use was even more pronounced. Among this younger group of women, injection drug use was associated with 52% of cases of DVT, leading the study authors to conclude that injection drug use may be the most common risk factor for DVT in their region (McColl et al., 2001).

HIV transmission and filter sharing

HIV may be transmitted between IDUs by the shared use of filters. In a 1996 study, Shah and colleagues examined used injection equipment from shooting galleries in Miami, Florida for the presence of HIV-1.

Antibodies to HIV-1 were detected in three (18%) of 17 rinses made from filters (cottons). Gag and envelope gene DNA were detected in three (27%) and four (36%) of the 11 filters examined respectively (Shah et al., 1996).

In addition to this virologic study, epidemiologic studies also document increased HIV risk through injecting with previously-used filters. Among 355 IDUs completing both a baseline and a two week follow-up interview for the evaluation of Baltimore's Needle Exchange Program (August 1994 to August 1995), significant differences in cotton-sharing behaviour related to HIV-positive status were observed. IDUs testing HIV-positive at their baseline interview were more likely to report sharing cotton (52%) than IDUs testing HIV-negative at their baseline interview (43%; Vlahov et al., 1997).

HCV transmission and filter sharing

HCV may be transmitted between IDUs by the shared use of filters. In a study carried out in 2000, Crofts and colleagues examined used injection equipment from 10 Australian injection settings for the presence of HCV RNA. HCV RNA was detected on 40% (2/5) of the filters tested (Crofts et al., 2000).

In addition to this virologic study, epidemiologic studies also document increased HCV risk through the sharing of filters. Lucidarme and colleagues, in a study carried out between March 1999 and July 2000, examined the factors associated with HCV seroconversion among 165 HCV-negative IDUs attending care centres in Northern and Eastern France. In this study, injection with a used filter (cotton) was a significant independent predictor of HCV seroconversion. Injection with a used filter (cotton) increased the risk of acquiring HCV infection more than 16-fold (adjusted relative risk (ARR)=16.4; 95%CI: 1.4-190.6; Lucidarme et al., 2004).

Sharing cotton filters was also a significant independent predictor of HCV seroconversion in an earlier American study carried out by Thorpe and colleagues from 1997 to 1999 among 353 HCV-negative active young adult IDUs aged 18 to 30 years recruited from the greater Chicago, Illinois area. Sharing a cotton filter in the six months prior to the follow-up interview doubled the risk of HCV seroconversion among this group of younger IDUs (adjusted relative hazard (ARH)=2.4; 95%CI: 1.1-5.0; Thorpe et al., 2002). Similarly, Hagan and colleagues measured HCV seroconversion among a cohort of 317 active Seattle IDUs who tested negative for the HCV antibody at recruitment into their study. Among the 123 IDUs who did not share syringes, sharing cookers and cotton elevated the risk of HCV seroconversion six-fold (ARR=5.9; 95%CI: 1.1-31.7; Hagan et al., 2001).

HIV transmission from sharing washes made from filters

After use, filters retain a residue of the drug solution. Using several filters and water, a wash is made which is subsequently injected. Power and colleagues observed that it was common practice for IDUs to leave used filters as payment in kind for being permitted to inject in another user's home (Power et al., 1994)

The use of a filter with a pore width of 0.22 μm is able to soak up only about one drop of liquid (\pm 50 μL). As a result, the use of this filter may reduce the sharing of filters and washes (Cafilisch, Wang and Zbinden, 1999).

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Distribution of acidifiers

Best practice recommendations – in detail

To reduce the transmission of HIV and HCV, and to reduce the risk of bacterial and fungal infection associated with the use of lemon juice and vinegar as acidifiers:

- ▶ Distribute single-use, airtight and waterproof 100 mg sachets of citric acid or single-use, airtight and waterproof 300 mg sachets of ascorbic acid in the quantities requested by clients with no limit on the number of sachets provided
- ▶ Offer a single-use sachet with every needle provided
- ▶ Educate clients about the potential HIV- and HCV-related risks associated with sharing acidifiers
- ▶ Educate clients about the risks of fungal infections associated with using spore-contaminated lemon juice, vinegar and other acids such as acetic acid
- ▶ Educate clients about the correct single-person use of acidifiers
- ▶ Educate clients about the correct disposal of used acidifiers

INTRODUCTION

To inject insoluble drugs such as brown heroin or crack cocaine, IDUs must first convert the drug into a water-soluble form by adding an acid to create a salt. Common acidifiers include ascorbic, citric, and acetic acids. Data from international studies document the high frequency of acidifier use among IDUs as well as the frequent sharing of acidifiers which is associated with HIV and HCV transmission risk.

Relatively safe acidifiers, such as pure ascorbic or citric acid are not always available and an IDU may use more common and accessible acids such as lemon juice, vinegar, and kettle de-scaler. However, lemon juice, vinegar and liquid acids in general have the properties of a growth medium for certain bacteria and fungi. These organisms can infect the heart in the form of endocarditis, and the eyes in the form of candidal endophthalmitis, which can lead to blindness.

The distribution of single-use sachets of citric or ascorbic acid are the best way for NEPs to reduce the HCV- and HIV-related risks associated with sharing acidifiers and to prevent the bacterial and fungal infections associated with using spore-contaminated lemon juice, vinegar or liquid acids as acidifiers.

CONSIDERATIONS

Ascorbic acid (also known as vitamin C) is often recommended to IDUs by harm reduction professionals as it is less caustic than citric acid and therefore less irritating to the veins and has a large margin of safety. This margin allows more room for “error” as a small amount of extra ascorbic acid will be unlikely to cause vessel damage. A concern for ascorbic acid users is evident from hospital data which document that large infusions of vitamin C have been linked to the formation of kidney stones. However this is not usually a

concern for IDUs since the amount of acid used per injection is relatively small (Anonymous, 2005; Garden et al., 2004). Anecdotal reports of using commercial preparations of vitamin C in tablet-form suggest that there are increased risks of injecting flavouring, bulking and colouring agents (Anonymous, 2005).

Citric acid is often the acidifier of choice among IDUs despite the smaller margin of safety as it dissolves drugs easily. Citric acid is distributed in a pure form that is readily-available (i.e., not in tablet form) and of consistent strength, therefore making it relatively easy to use (Garden et al., 2004; Anonymous, 2005). IDUs are usually not concerned about inadvertent citric acid over-use (and therefore often choose citric acid instead of ascorbic acid) since they learn from experience how much citric acid to use in order to dissolve the drug but still avoid a burning sensation. It is important that IDUs are aware that vitamin C sachets are three times the size of citric acid sachets since vitamin C is a weaker acid. Thus, if IDUs were to switch from using vitamin C to using citric acid, they need to be made aware of the difference in strength and reduce the amount of acid used for injection in order to avoid pain and vein damage.

EVIDENCE

Preparing a drug with an acidifier is a common practice among IDUs. For example, Garden and colleagues evaluated the provision of single-use citric acid sachets among a group of 360 IDUs (280 men and 80 women between the ages of 17 and 52 years old) in Glasgow, Scotland and found that 94% of study participants reported using an acidifier to dissolve their drug prior to injection and all had at one point used single-use citric acid sachets. Two thirds of the sample had tried using lemon juice as an acidifier and 44% had tried vinegar. Men IDUs were significantly more likely to use lemon juice and vinegar compared to women IDUs ($p=0.05$), and IDUs who injected more frequently ($p=0.05$) and those with longer injecting careers ($p=0.001$) were also significantly more likely to inject using vinegar and other acidifiers (Garden et al., 2004).

Sharing acidifiers also appears to be a common practice. For example, in 2004 the Scottish Drugs Forum (SDF) and the Glasgow Involvement Group (GIG) surveyed 76 Glasgow IDUs to gain feedback on existing needle exchange provisions. Ninety-one percent of respondents shared spoons and acidifiers (combined) most frequently, indicating a potential risk of infection with HIV or HCV through indirect sharing. The authors also found that 41% of respondents included acidifiers as one of their top five provision requests (Scottish Drugs Forum and Glasgow Involvement Group, 2004).

Any acid injected into the bloodstream is likely to cause vessel irritation and possible local vein damage. It is important therefore to use the smallest quantity of acid possible in order to dissolve a drug and avoid vascular harm (Anonymous, 2005; Scott et al., 2000). For this reason and other hygienic reasons discussed below, citric and ascorbic acids are sometimes packaged into single-use, airtight and water-resistant sachets of 100 mg and 300 mg respectively, and made available to IDUs through NEPs and pharmacies (Anonymous, 2005).

Bacterial and fungal infection

Lemon juice, vinegar and liquid acids in general have the properties of a growth medium for certain bacteria and fungi (Anonymous, 2005; Gallo et al., 1985). These organisms can infect the heart in the form

of endocarditis, and the eyes in the form of candidal endophthalmitis, which can lead to blindness (Gallo et al., 1985; Garden et al., 2004; Anonymous, 2005). Botulism is another concern associated with the use of contaminated acids during injection episodes (Anonymous, 2005)

Shankland and Richardson examined the epidemiology of an outbreak of candidal endophthalmitis among heroin users in the United Kingdom. Isolates of the organism *Candida albicans* were found in the lemon juice used by the affected IDUs. Similarly, Garden and colleagues in the study described previously found that 38% of IDUs who reported using an acidifier had experienced some sort of eye problem, and those who injected more frequently were significantly more likely to experience eye problems than those who injected less frequently ($p < 0.001$; Garden et al., 2004).

McGuigan and colleagues examined the presence of *Clostridium novyi* type A and other spore-forming organisms among a group of 60 Scottish IDUs during an outbreak between April and August 2000. *Clostridium novyi* is a bacterial strain that can lead to necrotizing fasciitis, a potentially fatal condition (Anonymous, 2005). In this study, 31 cases involved women, the majority of whom had injected heroin and citric acid extravascularly. The predominant symptoms included soft-tissue infection, necrotizing fasciitis, and multiple organ failure leading to death. Twenty-three IDUs died, likely as a result of a toxin-producing organism. The authors hypothesized that this was an opportunistic infection involving the extravascular injection of heroin and citric acid contaminated with *C. novyi* type A spores. The acidic solution damaged the soft tissue and the associated toxin led to severe local inflammation (McGuigan, 2002).

Sharing acidifiers and HIV and HCV transmission

HCV and HIV can be transmitted between IDUs through the sharing of contaminated injection drug equipment (Thorpe et al., 2002; Thorpe et al., 2000; Hagan et al., 2001; Shah et al., 1996; Vlahov et al., 1997). Thus, if several IDUs were to use the same acidifier source for their injections, acidifiers can be considered possible reservoirs for infectious organisms. If an IDU living with HCV or HIV loaded their previously-used syringe from a communal acidifier source, the other non-infected members of the injection group would thus be exposed to the bloodborne pathogen upon drawing up the contaminated acid. As mentioned earlier, the SDF and GIG found that 91% of their study participants shared spoons and acidifiers (Scottish Drugs Forum and Glasgow Involvement Group, 2004).

The 100 mg and 300 mg sachets provided by some pharmacies and NEPs are designed to provide an IDU with enough acid for only one injection, thus reducing the possibility of infection with HCV and HIV by discouraging the multiperson use of acidifiers (Anonymous, 2005). Single-use sachets are also useful in encouraging frequent visits to pharmacies and NEPs, allowing for frequent contact between IDUs and outreach staff.

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Distribution of sterile water ampoules

Best practice recommendations – in detail

To prevent transmission of HIV and HCV and other bloodborne pathogens through the shared use of mixing and rinse water, and to prevent the acquisition of bacterial infections from the use of non-sterile water and other fluids:

- ▶ Distribute single-use 2 mL sterile water ampoules in the quantities requested by clients with no limit on the number of sterile water ampoules provided
- ▶ Offer a single-use 2 mL sterile water ampoule with each needle provided
- ▶ Educate clients about the HIV- and HCV-related risks associated with sharing mixing and rinse waters
- ▶ Educate clients about the risks of using non-sterile water such as tap, bottled, rain, puddle and urinal water; and other fluids such as saliva and urine
- ▶ Educate clients about the correct single-person use of mixing and rinsing water
- ▶ Educate clients about the correct disposal of used water

INTRODUCTION

Prior to injection, drugs in powder, solid or tablet form need to be mixed with water to make a solution that can be injected into the bloodstream. A needle is placed into a water container and water is drawn up into the syringe. The water is then squirted into a container—usually a spoon or cooker—for mixing with and dissolving the drug.

Between injections, IDUs may rinse their needles which involves flushing the needle with water in order to remove any blood from the previous injection which can form blood clots and cause problems within the vascular system. Other injection equipment such as cookers are also rinsed between uses. Needles from different users may therefore be placed into the same water container for either mixing or rinsing.

Studies have shown that the water used to rinse injection equipment (i.e., needles, cookers and filters) and to dissolve drugs into a solution for injection can pose health risks for injectors, including HIV, HCV and bacterial infections. However, the risks associated with re-using or sharing water are an often-overlooked public health risk.

The risks associated with re-using or sharing water are related to multiperson use of a common water container and/or use of untreated water (e.g., rain water) for the preparation of injection equipment (e.g., needles, syringes, spoons/cookers and filters) and/or drugs into an injectable solution. When a water container is shared or used by more than one person, there is a chance that small amounts of blood from another injector will be deposited into the water and create a risk for HIV, HCV or bacterial transmission. As well, non-sterile or shared water can be contaminated with bacteria and lead to other health problems such as skin abscesses and infections such as endocarditis. These bacterial infections can have serious health implications, including death for injectors.

Provision of single-use, sterile water ampoules is the best method to eliminate the risk of HIV/HCV transmission through sharing mixing and rinse water and to prevent bacterial infections through the use of non-sterile water. Sterile water ampoules contain enough water to mix drugs into an injectable form. The sterile water ampoules are only effective if provided in sufficient quantity to ensure that each injection is prepared with an ampoule of sterile water.

CONSIDERATIONS

There have been no investigations of the role that water ampoule size may have in sharing water. However, frontline workers report that clients may share from 10 mL ampoules of water. Distributing smaller ampoules of water such as a 2 mL ampoule is therefore recommended. Ampoules of water have advantages over bottles of water as once opened the ampoules cannot be recapped eliminating the opportunity for contamination and re-use.

The Canadian manufacture of a 2 mL ampoule for distribution to Canadian NEPs is expected to commence in January 2006 and to be complete by June 2006. This new product will meet all regulatory requirements and quality assurance standards of Health Canada, including having its own Drug Identification Number (DIN) (Paul Lavigne, personal communication, December 2005).

To avoid the risks associated with the re-use of water from other IDUs, IDUs may purchase their own sterile water from a local pharmacy or prepare it at home by boiling tap water for at least 10 minutes and storing it in a sterile sealed container (Sorge and Kershner, 1998). However, as some IDUs will not have the financial resources to buy sterile water or have access to a stove to prepare it themselves, IDUs may turn to non-sterile water sources such as tap, bottled, rain, puddle or urinal water. Non-sterile water can be contaminated with bacteria and lead to health problems such as skin abscesses and infections such as endocarditis.

EVIDENCE

Sharing of mixing and rinse water

The sharing of mixing and rinse water is a frequent practice among Ontario IDUs. The POINT Project conducted by Leonard and colleagues between October 2002 and January 2003 examined injection-related risk behaviours among 418 men and 85 women active IDUs in Ottawa. Seventeen percent of study participants reported using water from a container into which another user had put a used syringe in the six months prior to their baseline interview, and women IDUs were significantly more likely than men IDUs to have shared someone else's rinse water ($p < 0.001$). The sharing of water persists even among those IDUs who do not share needles. Among the 402 participants who had not injected with a used needle in the six months prior to their baseline interview, 15% reported using water from a container into which someone else had put a used syringe in the six months prior to their baseline interview, and 9% had done so in the month prior to their baseline interview (Leonard et al., 2005).

Other studies report nearly half of study participants shared rinse water (Thorpe et al., 2001; Huo et al., 2005; Hunter et al., 2005). Koester and colleagues conducted a study examining the risk of HIV transmission from shared drug equipment among 280 active IDUs in three racially distinct neighbourhoods in Denver, Colorado. Seventy-five percent of participants had shared rinse water, and among this group, 47% reported sharing rinse water more than half the time (Koester, Booth and Wiebel, 1990). Similarly, Wang and colleagues analyzed the results from two 1997 studies among opiate-users in Zurich, Switzerland. Fifty percent of IDUs had shared water from a communal container, and IDUs measured the water using their own syringes which had been used more than once 83% of the time (Wang et al., 1998). In an ethnographic study conducted in 1993 by Needle and colleagues examining drug acquisition and the sharing of injection drug equipment in 54 "networks" of IDUs selected from six American cities and Puerto Rico, the authors found that rinse water was shared 77% of the time. Moreover, sharing rinse water was found to be a more frequent practice among the lower-risk groups. A lower risk network was defined as a linkage that involved at least one member of the group who injected with previously-used injection drug equipment, but drug solutions or needles were not shared within the network. When drugs were purchased by a low-risk group, rinse water was shared five times out of six episodes (Needle et al., 1998).

IDUs with a history of mental health problems appear to be more likely to share rinse water. For example, in examining the relationship between a history of mental health problems and HIV- and HCV-related risk behaviours among a cohort of 2,198 IDUs aged 18 to 30 from five U.S. cities, Morse and colleagues found that IDUs with a history of mental health hospitalization (OR=1.48; 95%CI: 1.21-1.81) or suicidal ideation (OR=1.72; 95%CI: 1.44-2.05) were more likely to report sharing rinse water (Morse et al., 2001).

These practices are a concern as the communal water can become contaminated if an individual living with HCV or HIV were to place a previously-used needle into the water, potentially exposing other members of the group to infection.

Use of sterile water

IDUs have demonstrated interest in using sterile water provided by their local NEP. Among participants in the Ottawa POINT Project described earlier, 338 IDUs (67%) had used the Ottawa NEP in the six months prior to their baseline interview and 79% of these NEP attendees reported picking up sterile water in the same time period (Leonard et al., 2005). The Scottish Drugs Forum and the Glasgow Involvement Group surveyed 76 IDUs within Glasgow in 2004 in order to gain feedback on existing needle exchange provisions. The authors report that 26% of respondents included water as one of their top five provision requests (Scottish Drugs Forum and Glasgow Involvement Group, 2004).

Use of non-sterile fluids and bacterial infection

The use of non-sterile fluids such as urine or saliva, or tap, bottled, rain, puddle or urinal water may expose an IDU to bacteria and other organisms causing infection or illness. *Pseudomonas aeruginosa* is an organism found in non-sterile water sources such as toilets, and it was the organism responsible for 10% of 180 cases of sternoclavicular septic arthritis reviewed by Ross and Shamsuddin. The authors found that injection drug use was the most common risk factor for this condition (Ross and Shamsuddin, 2004).

Other studies have found a relatively high prevalence of oral flora in drug-related soft-tissue abscesses as a result of using saliva to prepare a drug solution (Calder and Severyn, 2003; Henriksen et al., 1994; Gonzalez et al., 1993; Murphy et al., 2001). For example, Gonzalez and colleagues conducted a four-year retrospective review of 59 IDUs with drug-related abscesses and reported that most of the organisms cultured were oral or skin flora (Gonzalez et al., 1993).

HCV transmission

Even small amounts of blood in rinse water can be enough to infect another user with HCV (Anonymous, 2005). In a study carried out in 2000, Crofts and colleagues examined previously-used injection equipment from 10 Australian injection settings for the presence of HCV RNA. Hepatitis C virus RNA was detected in 33% (1/3) of the water samples tested (Crofts, Aitken and Kaldor, 1999).

In addition to this virologic study, epidemiologic studies also document increased HCV risk through injecting with previously-used water. Evidence from cohort studies documents an elevated risk of HCV seroconversion attributed to sharing rinse water. Hagan and colleagues measured HCV seroconversion among a cohort of 317 active Seattle IDUs who tested negative for HCV antibody at recruitment. The risk of HCV seroconversion was elevated for IDUs who shared rinse water, although it was not statistically significant (Hagan et al., 2001). Similarly, Thorpe and colleagues measured HCV incidence among a cohort of 700 18 to 30 year-old Chicago IDUs between 1997 and 1999. Sharing rinse water doubled the risk of HCV seroconversion among study participants. The adjusted relative hazard (ARH) of HCV seroconversion was highest for sharing cookers (ARH=3.48; 95%CI: 1.43-8.48), immediately followed by sharing rinse water (ARH=2.21; 95%CI:1.06-4.63; Thorpe et al., 2000).

HIV transmission

Water for mixing and rinse water can also become contaminated with HIV if an IDU living with HIV places a previously-used needle into the communal water source. This risk was evaluated in a 1996 study by Shah and colleagues. The authors examined previously-used injection equipment from shooting galleries in Miami, Florida for the presence of HIV-1. Antibodies to HIV-1 were detected in one (6%) of 17 rinse waters. Gag and envelope gene DNA were detected in 38% (5/13) and 67% (10/15) respectively of the rinse waters examined (Shah et al., 1996).

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Distribution of sterile alcohol swabs

Best practice recommendations – in detail

To prevent the transmission of HIV, HCV and other bloodborne pathogens, and to prevent the acquisition of bacterial infections from the re-use or non-use of alcohol swabs:

- ▶ Distribute sterile alcohol swabs in the quantities requested by clients with no limit on the number of swabs provided
- ▶ Offer a sterile alcohol swab with every needle provided
- ▶ Educate clients about the HIV- and HCV-related risks associated with sharing swabs
- ▶ Educate clients about the risks of bacterial infection if the injection site is not cleaned with a sterile alcohol swab prior to injection
- ▶ Educate clients about the correct single-person use of sterile alcohol swabs
- ▶ Educate clients about correct disposal of used swabs

INTRODUCTION

Alcohol swabs are used by IDUs to clean the injection site before injection and to remove any blood resulting from the injection from their fingers and other surfaces. Additionally, among IDUs who inject others, a swab is used to clean their thumb before and after injection, curtailing any bleeding after removing the syringe from the injection site of the IDU receiving the injection. In the absence of sterile alcohol swabs IDUs may use rubbing alcohol, aftershave lotion or soap and water.

The distribution of sterile alcohol swabs to clients is the best way for NEPs to reduce the HCV-related (and potential HIV-related) risks associated with either the re-use or sharing of alcohol swabs among IDUs. In addition, it is very clear from the evidence reviewed that skin cleaning with alcohol prior to injection has a significant protective effect against the formation of abscesses and other bacterial infections such as endocarditis.

NEPs are well placed to distribute sterile alcohol swabs. IDUs will access sterile alcohol swabs when distributed by NEPs, however less frequent NEP-attendees are less likely to always clean their skin before injecting.

CONSIDERATIONS

The importance of the distribution of sterile alcohol swabs at NEPs is evidenced in a study by Longshore and colleagues investigating frequency of attendance at a Rhode Island NEP and its association with injection-related risk practices among 248 IDUs. IDUs who visited the NEP less frequently were less likely to always clean their skin before injecting (AOR=0.33; 95%CI: 0.1-1.1, p=0.07). Although, as the authors note, the significance level falls just short of the conventional cut-off for statistical significance, likely due to small sample numbers (Longshore, Bluthenthal and Stein, 2001).

EVIDENCE

Sharing of alcohol swabs

Alcohol swabs are frequently shared among IDUs. For example, in 2004 the Scottish Drugs Forum and the Glasgow Involvement Group surveyed 76 Glasgow IDUs to gain feedback on existing needle exchange provisions. Twenty-three percent of study participants had shared alcohol swabs, indicating the potential risk of infection with HCV and HIV through indirect sharing (Scottish Drugs Forum and Glasgow Involvement Group, 2004).

Many IDUs are aware of the importance of cleaning their skin with their own individual sterile alcohol swab as evidenced by the demand for sterile alcohol swabs at NEPs. In a 1999 Canadian study by Schechter and colleagues examining the association between NEP attendance and the spread of HIV among 694 Vancouver IDUs, 50% reported receiving alcohol swabs from the NEP (Schechter et al., 1999). In the Scottish study described earlier, 21% of the study participants included alcohol swabs as one of their top five provision requests from the NEP (Scottish Drugs Forum and Glasgow Involvement Group, 2004).

Prevention of bacterial infections

Using a sterile alcohol swab to clean the skin prior to injection has been shown to reduce the occurrence of bacterial infections associated with injection drug use. Vlahov and colleagues surveyed 1,057 active IDUs in Baltimore, Maryland, and found that the occurrence of subcutaneous abscesses and endocarditis was less common among those IDUs who reported skin cleaning all the time (Vlahov et al., 1992).

Moreover, Murphy and colleagues examined the risk factors for skin and soft-tissue abscesses among 418 San Francisco IDUs and reported that skin cleaning with alcohol was the only independent variable found to have a significantly protective effect against abscess formation (OR=0.48; 95%CI: 0.3-0.74, $p<0.05$; Murphy et al., 2001).

Prevention of infection with HCV

Swabs can be contaminated with microbial pathogens, and as such, HCV may be transmitted between IDUs when alcohol swabs are shared. In a study carried out in 1999, Crofts and colleagues examined previously-used injection equipment from 10 Australian injection settings for the presence of HCV RNA. HCV RNA was detected on 67% (6/9) of the alcohol swabs tested (Crofts, Aitken and Kaldor, 1999).

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Distribution of tourniquets

Best practice recommendations – in detail

To reduce the transmission of HIV, HCV and other bloodborne pathogens associated with tourniquet sharing, and also to reduce the potential for contamination of tourniquets with the bacteria that cause abscesses, trauma to veins and blood circulation impairment which could lead to loss of limbs:

- ▶ Distribute thin, pliable, easy-to-release tourniquets with non-porous surfaces with no limit on the number of tourniquets provided
- ▶ Offer a clean, quick-release tourniquet with every needle provided
- ▶ Educate clients about the risks of bacterial contamination and the risks of acquiring HIV and HCV through the use of previously-used ties or tourniquets
- ▶ Educate clients about the risks of tissue and vein damage and risk of blood circulation impairment if a clean, quick-release tourniquet is not used
- ▶ Educate clients about the correct single-person use of tourniquets
- ▶ Educate clients about the correct disposal of used tourniquets

INTRODUCTION

Tourniquets or “ties” are used by IDUs to “tie off” the vein – to provide pressure to increase the blood flow into the preferred vein and facilitate injection.

In the absence of a thin, pliable, stretchy tourniquet with a non-porous surface which is easy to release, IDUs sometimes use: a piece of rope; a condom; a leather or terry cloth belt; or frequently a bandana. The disadvantage of these items is that they are not elastic enough for quick and easy release and may therefore cause trauma to the skin, to the vein, and may cause infiltration of blood and fluids into surrounding tissues. In addition, these items are hard to clean if they are splattered with blood.

Distributing thin, pliable, easy-to-release tourniquets with non-porous surfaces to clients in the quantities that they request is the best way for NEPs to reduce:

- ▶ HIV- and HCV-related risks associated with tourniquet sharing
- ▶ The potential for contamination of tourniquets by the bacteria that cause abscesses
- ▶ Trauma to veins which facilitates the transmission of bloodborne pathogens
- ▶ The risk of blood circulation impairment which could lead to loss of limbs

CONSIDERATIONS

As some NEP clients may be allergic to the latex of the tourniquets, non-latex tourniquets will also need to be available for distribution.

EVIDENCE

Sharing tourniquets

Participant observation studies of IDUs in Australia (Crofts, Aitken and Kaldor, 1999) and Scotland (Taylor et al., 2004) have shown that tourniquets may be a potential source of exposure to bloodborne pathogens. For example, an IDU may use the tourniquet to stem the flow of blood after an injection. This IDU may then apply the tourniquet to an injecting partner's arm, depositing a smear of blood on the skin which is subsequently punctured by a needle. It is the act of each IDU passing the tourniquet over their injection site which creates the opportunity for the blood of an IDU living with HCV or HIV to make contact with the blood of another person.

Other studies have shown that IDUs frequently share tourniquets. The Scottish Drugs Forum and the Glasgow Involvement Group surveyed 76 Glasgow IDUs in 2004 in order to gain feedback on existing needle exchange provisions. Sixty percent of respondents had shared tourniquets, indicating the potential risk of infection with HIV or HCV by means of indirect sharing (Scottish Drugs Forum and Glasgow Involvement Group, 2004).

These earlier findings prompted the Australian National Council on AIDS, Hepatitis C and Related Diseases to advise the Australian Federal Government in April 2000 that tourniquets, as well as other injecting equipment, clothing and surfaces used while injecting, may potentially spread HCV among IDUs:

It is very important for people who inject drugs to be aware of blood when injecting as it is very easy for blood to be transferred to tourniquets, tables, clothing and hands during the injecting process. Many people who inject drugs share equipment such as tourniquets as they are not aware of the potential risk of spreading or transmitting the virus. Even though a drug user may only get a small trace of blood on the tourniquet as they pass it over their injection site when removing it, we believe that this may be a sufficient amount of blood to transmit the hep C virus if the same tourniquet is then used by another drug user (Australian National Council on AIDS, Hepatitis C and Related Diseases, 2000).

In September 2001, the Australian Government Department of Health and Ageing, Population Health Division, published the National Hepatitis C Resource Manual, a comprehensive resource developed in consultation with academic researchers, healthcare providers, and health councils across Australia with the primary goal of "providing standardised, accurate and current information about HCV and associated issues to a wide range of healthcare providers." The manual states that anyone who has shared any injection drug equipment with others, including tourniquets, has been at risk for acquiring HCV. According to the manual's safer injecting procedures, an IDU must:

Use a new, sterile needle and syringe and clean or sterile injecting equipment, clean water (tap water is suitable), sterile swabs (one to swab the spoon and one to swab the injecting site), **a tourniquet not used by others**, a new filter, and an appropriate disposal bin. (Emphasis added; La Trobe University, 2004)

Tourniquets and bacterial infections

A microbiological study carried out by Rourke and colleagues examining bacterial contamination of 200 tourniquets obtained over a two-week period in June 2000 from a cross section of healthcare professionals working in a 1,200-bed teaching hospital in Sheffield, UK, revealed that 10 (5%) of the tourniquets sampled were contaminated with *Staphylococcus* bacterium, the organism responsible for the formation of abscesses (Rourke, Bates and Reade, 2001).

Similarly, Golder and colleagues examined 77 tourniquets from a London, UK teaching hospital in order to determine if previously-used tourniquets could pose a cross-infection risk to patients. Fifty tourniquets were examined for blood stains and culture-growth on blood-agar plates. Twenty-five had visible bloodstains, all 50 grew heavy skin flora, and of these, 17 tourniquets cultured bacterial organisms. It was determined that tourniquets are a potential reservoir of pathogenic bacteria and are thus a cross-infection risk to patients (Golder et al., 2000).

Conroy supported this argument in a letter to the British Medical Journal, indicating that methicillin-resistant *Staphylococcus aureus* (MRSA) is likely transmitted from patient to patient by means of tourniquet re-use. Disposable tourniquets are advised in order to eliminate this risk of cross-infection (Conroy, 2004).

Tourniquets and HIV and HCV infection

HCV and HIV may be transmitted between IDUs by the shared use of tourniquets. In the microbiological study carried out by Rourke and colleagues described above, 75 (36%) of the 200 tourniquets sampled had visible blood stains (Rourke, Bates and Reade, 2001).

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Distribution of glass stems

Best practice recommendations – in detail

To prevent the transmission of HIV, HCV and other bloodborne pathogens through the sharing of equipment used to smoke crack or other drugs:

- ▶ Distribute individual glass stems in the quantities requested by clients with no limit on the number of stems provided
- ▶ Distribute individual mouth pieces based on the number of stems requested or in the quantities requested by clients with no limit on the number provided
- ▶ Distribute individual brass screens based on the number of stems requested or in the quantities requested by clients with no limit on the number provided
- ▶ Educate clients about the HIV- and HCV-related risks associated with sharing glass stems and other devices for inhaling and smoking drugs
- ▶ Educate clients about the health consequences of using other products as screens
- ▶ Educate clients about the correct single-person use of stems
- ▶ Educate clients about the correct disposal of used glass stems, mouth pieces and screens

INTRODUCTION

Crack is a crystal-rock form of cocaine that can be heated to release vapours which are then inhaled into the lungs. A pipe or glass stem is used to heat the drug and direct the vapours towards the user's mouth. A screen is placed at one end of the pipe or stem to hold the rock in place. Since glass is a conductor of heat, a protective mouth piece to protect the lips from burns is placed on one end of the stem. The rock is then heated by a flame to melt it and allow for inhalation at the opposite end of the pipe or stem.

Pipes are often crudely constructed from metal such as pop cans, and from glass materials which can lead to cuts from sharp edges and lip burns (Haydon and Fischer, 2005). Plastic bottles and inhalers are also used (Queen's West CHC Harm Reduction Team, 2005).

When a brass screen is unavailable, users will often use brass wool cleaning pads. However this metal tends to break apart and particles can then be inhaled and cause lung damage.

It is hypothesized that contaminated blood can be transmitted between users, given that they may have open wounds on their hands and mouths and are documented to be in an environment which reinforces the sharing of drug equipment. This would suggest that HIV and HCV may be transmitted between smokers by the shared use of devices to smoke crack or other drugs.

The distribution of glass stems with mouth pieces to clients is the best way for NEPs to reduce the HIV- and HCV-related risks associated with the sharing of devices to smoke crack or other drugs. The distribution of brass screens is the best way for NEPs to reduce the health problems associated with the use of other metals as screens.

EVIDENCE

Negative health effects of crack smoking

Smoking crack cocaine has been found to hinder the immune system (The Safer Crack Use Coalition of Toronto, 2003), thus respiratory problems are common among users, and injuries from smoking devices often heal slowly (Porter, Bonilla and Drucker, 1997). When a proper screen is unavailable, users will often use brass wool cleaning pads. However this metal tends to break apart and particles can then be inhaled causing lung damage and additional bleeding (The Safer Crack Use Coalition of Toronto, 2003; Porter, Bonilla and Drucker, 1997).

Several studies among crack smokers document the presence of burns and ulcerations on the tongue, lips and oral cavity (Faruque et al., 1996; Porter and Bonilla, 1993; Porter, Bonilla and Drucker, 1997). Additionally, Porter and colleagues (1997) reported the detection of blood from hand and mouth injuries on used smoking devices. These findings suggest that crack smokers often have open wounds on and around their mouth and hands, and can thus contaminate drug equipment with blood.

Sharing smoking equipment

Haydon and Fischer emphasized that the social dynamics of crack use encourage the sharing of drugs and drug equipment among users (Haydon and Fischer, 2005). These social norms in the crack-using community may influence crack smokers to use previously-used (and possibly contaminated) drug equipment which can in turn expose them to bloodborne pathogens. Similarly, Porter and colleagues found that two-thirds of the 250 participants in their study reported sharing smoking devices and about half of these almost always shared (Porter, Bonilla and Drucker, 1997).

Crack smokers appear to be more likely to engage in HIV- and HCV-related sexual behaviour. Porter and colleagues found that only 33% of heavy crack smokers used condoms when giving oral sex and those with frequent lip injuries were less likely to use condoms for oral sex. This is a concern since crack smokers often have oral sores and lip wounds which could facilitate the transmission of HIV through oral sex (Porter, Bonilla and Drucker, 1997).

Potential HIV transmission and stem sharing

HIV may be transmitted between crack smokers by the shared use of devices to smoke crack. Porter and colleagues found that 10% of crack smokers had seen someone share a stem with blood on it. One user said, "A person's hand was bleeding and the other person did not care. He knew it and took the [bloody] stem anyway" (Porter, Bonilla and Drucker, 1997). The authors also reported that participants who identified themselves as HIV-positive were more likely to be crack smokers (67% of self-reported HIV-positive individuals vs. 48% of other participants), were more likely to share stems (80% vs. 66%), were significantly more likely to injure their lips when smoking (80% vs. 53% $p=0.04$) and more likely to give frequent oral sex (39% vs. 17%) than participants who did not self-identify as HIV-positive (Porter, Bonilla and Drucker, 1997).

Faruque and colleagues studied the presence of oral sores among crack-smokers in crack-smoking neighbourhoods in New York, Miami and San Francisco. They found that crack smokers (10%) were more likely than non-crack smokers (5%) to report having oral sores in the month prior to their interview. They also found that among 2,323 participants, oral sores were more prevalent among HIV-positive crack users (14%) than among HIV-negative crack users (8.0%) (Faruque et al., 1996).

Theall and colleagues also documented an association between positive HIV serostatus and presence of oral sores. African American heterosexual women crack smokers were interviewed between June 1998 and June 2000. After controlling for the amount of oral sex, crack users with a history of oral sores (such as cuts or burns on the lips due to crack smoking) had an increased likelihood of having HIV antibodies (Theall et al., 2003).

Potential HCV transmission and stem sharing

HCV may be transmitted between crack smokers by the shared use of devices to smoke crack. It is primarily transmitted through blood-to-blood contact with an HCV-infected individual (McMahon and Tortu, 2003). Tortu and colleagues reported that HCV prevalence rates among non-IDUs ranged from 5 to 29% indicating a potential route of HCV transmission by a non-injecting means (Tortu et al., 2001). Ward and colleagues also suggest an association between HCV infection and crack smoking, since in a survey of 193 crack-smoking women, five users were found to be infected with HCV (Ward et al., 2000). In a study among 884 homeless women and/or partners or friends, Nyamathi and colleagues found that recent daily crack smokers were more likely than less-frequent users to be infected with HCV (Nyamathi et al., 2002). Other studies show epidemiological and virological evidence supporting oral HCV transmission (McMahon and Tortu, 2003; Tortu et al., 2004; Nyamathi et al., 2002). These findings suggest the possibility that oral lesions from crack use may facilitate HCV transmission between users.

In a later study by Tortu and colleagues, an association between sharing non-injection drug equipment and HCV infection was found more commonly among HIV-positive individuals emphasizing the close association between HIV and HCV (Tortu et al., 2004). Haydon and colleagues reiterate that since HIV and HCV transmission may be similar, a link between oral sores and HCV transmission may exist among crack smokers (Haydon et al., 2001).

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Program Delivery Models

Needle exchange program delivery models

Best practice recommendations – in detail

To reduce the transmission of HIV, HBV, HCV, other bloodborne pathogens and to prevent other drug-related harm:

- ▶ Provide NEP services using a delivery model(s) that maximizes accessibility for IDUs
- ▶ Tailor NEP services to meet the needs of sub-populations of IDUs (e.g., youth, women and ethno-cultural groups)
- ▶ Involve IDUs in the design and delivery of services
- ▶ Conduct outreach in the community and at other agencies serving IDUs
- ▶ Collaborate with local agencies that serve IDUs to provide additional locations for IDUs to receive NEP services
- ▶ Collaborate with local pharmacies to ensure that IDUs can purchase sterile needles

INTRODUCTION

To reduce transmission of bloodborne pathogens, NEPs increase access to sterile needles among IDUs, remove used needles from circulation, educate clients about safer injection practices and provide education, referrals and other services. In Ontario, NEPs are mandatory public health programs in communities where drug use is recognized as a problem (Ontario Ministry of Health and Long Term Care, 1997).

As described in the **NEP effectiveness** section, the effectiveness of NEPs to prevent HIV transmission among IDUs is influenced by the number of needles distributed. However, NEP effectiveness is also influenced by the ability of NEPs to attract and retain clients, and to encourage/facilitate behavioural change. Service providers and researchers have noted the importance of the mode of service delivery, location and hours of operation as factors that directly impact on accessibility and effectiveness of NEPs. NEPs that are designed to maximize accessibility in terms of location and time are more likely to prevent the transmission of HIV, HCV, HBV and other bloodborne pathogens from non-sterile needles and syringes.

Studies show wide diversity among IDUs in terms of gender, age, years of injecting and type of drug injected, culture, language, race, mental health status and other factors. As a result, IDUs have varied service needs, and studies show that different models attract different types of IDUs. Personal preferences and chaotic daily lives also influence program attendance. As a result, NEPs need to tailor service delivery to accommodate the diverse needs of the IDU population.

Over the past two decades, varied service models for NEPs have been developed and implemented to increase accessibility for clients. To maximize the advantages and offset disadvantages of different types of model, many programs in Canada, and elsewhere, offer services using more than one model. As Henman et al. (1998) note, when different service models are combined, NEPs are likely to achieve maximum effectiveness.

While a mixed model approach is likely to maximize effectiveness, not all jurisdictions have the resources or expertise to offer services using different models. Historically, many NEPs in Ontario started with one

or two models of service delivery and added additional models in relation to their funding, increased knowledge of the IDU community, requests from clients, partnerships with other agencies and an increase in staff expertise. As well, many NEPs in Ontario and elsewhere experimented with and refined their models of service delivery in response to client need.

In this section of the Best Practices, we review evidence about the most commonly used models of service delivery: fixed site, four types of outreach (mobile service, satellite sites, peer/secondary exchangers, home delivery), pharmacy, mixed model and multi-service. These models have received the most attention and evaluation.

Unfortunately, many studies do not report the service model of the NEP under study. As a result, the evidence about the effectiveness of particular NEP models is less well developed. The evidence available to evaluate the relative effectiveness of one type of model versus another is often lacking. Most studies compare the types of clients attracted to a particular model versus another type of model. There have been no randomized controlled trials evaluating relative effectiveness. However, the literature reviewed here does show that different models attract different types of IDUs, which suggests that there is no ONE best model of service delivery.

For easy comparison of the strengths and limitations of each model of service delivery, please see **Table 7.**

Table 7: Comparison of the strengths and limitations of different NEP models

Model type	Strengths	Limitations
Fixed site NEP	<ul style="list-style-type: none"> ▶ Services are free for IDUs ▶ User friendly ▶ Education and other services available on-site ▶ Disposal of used equipment 	<ul style="list-style-type: none"> ▶ Limited hours of operation ▶ Location - limited and/or identifying ▶ Crowded when program is busy ▶ Clients reluctant to use sites perceived to be too governmental, clinical, gay-oriented or HIV related
Mobile NEP¹	<ul style="list-style-type: none"> ▶ Services are free for IDUs ▶ User friendly ▶ Increases accessibility (i.e., go where the clients are) ▶ Reaches hard-to-reach IDUs 	<ul style="list-style-type: none"> ▶ May be insufficient space for counselling sessions, arranging referrals, HIV and other disease testing, helping clients fill out forms and contacting other agencies ▶ Cost and maintenance of vehicle
Outreach to Homes²	<ul style="list-style-type: none"> ▶ Services are free for IDUs ▶ Reaches hard-to-reach IDUs ▶ Builds credibility in the IDU community 	<ul style="list-style-type: none"> ▶ Safety for staff ▶ Potentially intrusive for clients

Model type	Strengths	Limitations
Satellite Outreach sites³	<ul style="list-style-type: none"> ▶ Services are free for IDUs ▶ May attract different groups of IDUs ▶ Increase accessibility in terms of location, time, culture and age group ▶ May offset operational and human resource costs from the parent NEP to the satellite site ▶ Increases service complement at satellite agency without incurring NEP equipment/disposal expenses 	<ul style="list-style-type: none"> ▶ Difficult to enforce parent NEP policies on satellite sites ▶ Staff turnover at satellite site may require frequent training of staff by parent NEP
Pharmacy	<ul style="list-style-type: none"> ▶ Extended hours of operation ▶ Multiple locations ▶ Less stigmatizing/more anonymous 	<ul style="list-style-type: none"> ▶ Costs for IDUs to purchase needles ▶ No disposal of used equipment ▶ No harm reduction services offered ▶ Reluctance to sell to IDUs ▶ Reluctance to sell small quantities of needles ▶ Limited hours/days of operation
Peer-based outreach	<ul style="list-style-type: none"> ▶ Peer knowledge of drugs, drug use and the drug scene ▶ Peer knowledge and empathy about living conditions and context ▶ Increases reach of the NEP to IDUs who will not/cannot use the NEP ▶ May provide employment skills, and income for peer exchangers ▶ Improve self esteem and self worth ▶ No cost to the NEP if peers are unpaid ▶ More convenient/accessible for clients ▶ Peers have credibility and can be important role models for risk reduction 	<ul style="list-style-type: none"> ▶ Training/supervision of peers can be costly ▶ Conflicting identities as peer worker and IDU community member ▶ Peer worker identity may be used to continue/further street economy activities ▶ May violate worker/client boundaries
Vending machines	<ul style="list-style-type: none"> ▶ Location and 24 hour availability ▶ Convenience ▶ Ease of use ▶ Limited staffing required 	<ul style="list-style-type: none"> ▶ No face to face harm reduction services offered ▶ Difficult to maintain anonymity when in a public space

¹ Excluding home visits

² Home visits by mobile NEPs

³ Also known as community coalitions or partner agencies, satellite NEP sites are agencies that serve IDUs for other purposes and through a collaborative agreement also provide NEP services at their site on behalf of the parent NEP.

FIXED SITES

NEPs based at fixed sites range from single offices to office suites that provide space for exchange services, counselling, phone referrals, supply storage, etc. In Ontario, fixed site NEPs are located within public health units, AIDS service organizations, other health or social service agencies and/or stand-alone rented spaces. Workers have found that fixed sites with the following features best meet program and client needs:

Accessibility

- ▶ Barrier free entrance where clients can come and go freely
- ▶ Friendly and welcoming atmosphere when clients enter
- ▶ Equipment and information that are easily located

Size

- ▶ Sufficient space for multiple clients to enter, leave and interact with staff and other clients
- ▶ Sufficient space for enclosed offices and space to store supplies

Comfort

- ▶ Space for clients and staff to sit, relax and speak with each other

Privacy

- ▶ Have enclosed offices and space for counselling, medical testing and other private matters
- ▶ Have enclosed offices for clients to speak with workers about personal concerns and/or receive results from HIV, HCV or other medical tests
- ▶ Have enclosed offices for staff and clients to make telephone calls for referrals, appointments or other private matters

Determining optimal locations for fixed sites is crucial for NEP effectiveness. As indicated above, where fixed sites are located determines, to a large extent, the likelihood that IDUs will use the services. Several studies in the United States have shown that NEPs located within walking distance are more likely to be used than NEPs located further away. As well, these studies show the importance of multiple NEP locations to ensure that IDUs located throughout a community have access to program services (WHO, 2004). Once operational, many programs modify and/or increase their locations over time in relation to a greater understanding of client need, changes in the IDU community, new opportunities to partner with other agencies, opposition from the surrounding community, increased funding and other factors. Issues regarding site selection are also reviewed in the NEP start-up tasks section.

Considerations for fixed sites

Meeting the diverse needs of IDUs can be challenging for NEPs who often operate on shoestring-like budgets. For example, maximizing hours of operation may be difficult for programs with small staff complements. As well, NEPs whose fixed site hours of operation are constrained by those of the parent organization (e.g., 9 to 5 at the public health unit) may have difficulty meeting the needs of clients. NEPs may also face challenges

drawing clients into a fixed site when drug use is geographically dispersed and/or the catchment area for the NEP is large. On the other hand, fixed sites that are well attended can become overcrowded and uncomfortable for clients and staff.

As well as spatial and time constraints, acceptance of an NEP by staff of a larger agency (e.g., public health unit) can create challenges for both NEP staff and clients. In particular, fear about NEP clients and reluctance to collaborate with the NEP may lead to a hostile environment and negatively impact program attendance. Fixed sites can also be focal points for opposition by community residents. Some NEPs have moved to reduce opposition and to ensure access for clients.

Clients may be reluctant to use fixed sites if they fear police surveillance of the location. While infrequently reported in Ontario, fixed NEP sites have been used by law enforcement agencies for surveillance purposes. In the past, NEPs experiencing surveillance by the police have negotiated (or re-negotiated) a non-surveillance agreement (see the **Relationships with law enforcement** section).

Evidence for NEP fixed sites

Using qualitative data collected in Ontario, Strike et al. (2002a) reported that location, adequate space and hours of operation are perceived by workers to be factors that influence client development and retention at fixed sites. NEP workers report that clients are sometimes reluctant to attend fixed sites at public health units or AIDS service organizations because these locations are perceived to be too clinical, governmental, gay-oriented or HIV-related. Fear of clients (e.g., thefts and assaults) by non-NEP workers in the same building as the NEP can create an inhospitable environment for NEP clients and negatively impact program attendance (Strike et al., 2002a). In light of the importance of location, some Ontario NEPs reported moving closer to the core drug-using areas and/or redesigning their space to reduce contact between clients and other agency staff (Strike et al., 2002a).

A study of 1,020 IDUs in Vancouver showed that 75% used the fixed site NEP as their primary source of needles (Miller et al., 2002). An analysis comparing IDUs who primarily used the fixed site versus those who primarily used the van NEP or pharmacies showed that van users tended to have the highest risk profiles. A study in New Haven Connecticut by Khoshnood et al. (2000) among 268 IDUs showed that, when available, IDUs (n=268) will use both fixed site NEPs and pharmacies to obtain equipment. However, preferences in 'usual source of needles' were noted: 41% used pharmacies only, 34% used NEPs and pharmacies, 15% used NEPs only and 10% used neither NEPs nor pharmacies.

Evaluation of retention rates of a fixed site model in Connecticut, found that 34% (n=466) of IDUs only visited the program once (Khoshnood et al., 1995). However, among those who returned more than once (n=922) during the study period, 29% made visits in four consecutive quarters of a year and the median number of participation days in a year was 333. IDUs who had injected for 10 or more years and were non-white males had the highest retention rates, while young IDUs had the lowest.

Bailey et al. (2003) found that among 700 young IDUs (ages 18 to 30) only 35% attended one of more than 20 NEP sites in Chicago in the past 6 months. Frequent NEP attenders (i.e., those attending more than

7 times in a six-month period) were less likely than non-attenders to share needles (OR = 0.32), other injection equipment (OR = 0.51), or to re-use their own needles (OR = 0.25). Bailey et al. (2003) suggest that given the known benefits for older IDUs, NEPs need to develop models that serve the needs of young IDUs as well.

OUTREACH

Outreach is a form of NEP service delivery used to provide services to clients who typically avoid health and social service providers. Fear of being reported to the police, arrested and/or treated with a lack of respect discourages some IDUs from attending NEPs. Using outreach, workers provide many NEP services, including education, information, referrals and distribution of equipment at community locations such as streets/alleys, parks, bars/clubs, shooting galleries/crack houses, other health and social service agencies, private residences, prison/jail/detention centres and other locations where IDUs may live, use drugs or gather.

Recently, the WHO (2004) conducted a review of outreach-based programs for IDUs and stated:

'The evidence supports the view that outreach and face-to-face contact between outreach workers and the target group is associated with reduced risk behaviour and reduced exposure to HIV.' (WHO, 2004)

In particular, the WHO (2004) noted that outreach is associated with decreased drug use, injection drug use and sharing of injection equipment; and also associated with increased condom use and entry into drug treatment.

Drug scenes change over time in terms of person, place, time and behaviour. Changes in the drug sellers, types of drugs available and/or sought, housing, police surveillance and arrest activities and other events can impact the drug scene. As well, drug scenes are varied and there is rarely only one scene in a given city. As a result, NEPs need to be adaptable to change and variation. One of the many advantages of outreach based services is the ability to re-direct efforts as needed.

Outreach is only effective to the extent that workers know where and how to reach IDUs and establish trust and credibility. Among outreach workers, the following personal skills were noted to influence the effectiveness of outreach work:

- ▶ Empathy
- ▶ Respect for others
- ▶ Being genuine and communicating in concrete terms
- ▶ Addressing issues of self-disclosure
- ▶ Dealing with the immediacy of the feeling of IDUs
- ▶ Competence
- ▶ Trustworthiness
- ▶ Adhering to the guidelines of the program
- ▶ Commitment and conviction to work with IDUs (WHO, 2004)

In the following sections, we review four types of NEP outreach: **mobile, satellite, home** and **peer**. Please see the WHO publication 'Evidence for action: Effectiveness of community-based outreach in preventing HIV/AIDS among injecting drug users' (2004) for an extensive review of the outreach literature.

MOBILE OUTREACH

According to the WHO (2004), outreach is important for IDUs who avoid formal service settings but who would greatly benefit from NEP outreach if these were delivered where IDUs live and use drugs (e.g., streets, bars, shooting galleries/crack houses, markets etc). Mobile NEP services can be provided at accessible locations and times for clients who prefer to exchange during evening hours, do not have a vehicle or money for transportation, and/or may be too impaired to drive to the fixed site. Mobile NEP outreach can assist clients with a variety of health services, including access to sterile equipment, education and referrals. HIV testing and counselling offered by mobile NEP outreach has been shown to greatly increase the uptake of testing among IDUs. Mobile outreach ranges from cars to vans to renovated mobile homes or buses with the vehicle size determining the types of services that can be offered. Workers have found that vehicles with the following features best meet program and client needs:

Accessibility

- ▶ Barrier free window or door for clients to receive and dispose of equipment
- ▶ Friendly and welcoming staff
- ▶ Equipment and information that are easily dispensed
- ▶ Regular and frequent mobile service

Size

- ▶ Sufficient for a client(s) to enter, leave and interact with staff.
- ▶ Capacity to store and exchange supplies from inside the vehicle or through an open window

Comfort

- ▶ Space for clients and staff to sit, relax and speak with each other

Privacy

- ▶ Markings on the vehicle that make it visible to clients but less noticeable to other members of the community

Considerations for mobile NEP outreach

While mobile outreach can meet the needs of clients in terms of basic NEP services, it can be insufficient for lengthy counselling sessions, arranging referrals, HIV and other testing, helping clients fill out forms and contacting other agencies. Workers from programs that only provide mobile outreach have stated that a combined mobile/fixed site approach would better serve their clients. When unable to purchase a program vehicle, some NEPs offer services from workers' personal vehicles. Workers are reimbursed for mileage and other expenses; however, workers have noted that reimbursements do not always equal their

expenses. As well, discomfort or safety may be an issue for family members who drive these vehicles at other times.

Clients may be reluctant to use mobile NEP outreach if they fear police surveillance. While infrequently reported in Ontario, mobile outreach has been used by law enforcement agencies for surveillance purposes. As well, police harassment of NEP staff and clients using mobile services has been reported in Ontario. In the past, NEPs experiencing surveillance have negotiated (or re-negotiated) a non-surveillance agreement (see the **Relationships with law enforcement** section).

Evidence for mobile outreach

Using qualitative data collected in Ontario, Strike et al. (2002a; 2004) reported that mobile outreach increases accessibility for clients who are unable or unwilling to attend fixed NEP sites. Mobile outreach provides workers with the opportunity to meet at locations convenient for clients. As well, workers report that mobile outreach provides an increased opportunity to find and engage new clients. However, workers noted that they prefer to have both mobile and fixed sites because it is difficult to counsel clients and offer HIV, HCV and other testing in a vehicle, particularly when there are many clients seeking equipment and other services at the same time.

Depending on the markings on the vehicle, mobile outreach can be less visible to other community members. Vehicles with highly visible markings and/or routes that pass schools and parks can become targets of community opposition and police surveillance (Strike 2004).

A study of 1020 IDUs in Vancouver showed that 19% used the Van NEP as their primary source of needles (Miller et al., 2002). An analysis comparing IDUs who primarily used the van versus those who primarily used the fixed site NEP or pharmacies showed that van users tended to have the highest risk profiles. Independent predictors of van use, included: fewer years injecting, difficulty finding needles, Aboriginal ethnicity, incarceration in the previous 6 months and daily cocaine injection.

A study conducted in Baltimore (Riley et al., 2000) compared first-time clients of a van-based exchange (n=124) with clients of a pharmacy-based exchange (n=162) and found that the van site was less likely to attract African Americans (OR = 0.21) but more likely to attract those injecting cocaine (OR=2.82) or injecting 4 or more times per day in the past 2 weeks (OR=2.0). Another study conducted in Baltimore (Latkin and Forman, 2001) found that most IDUs (90% of n=741) obtained needles from street sellers. When asked about the most frequent source of needles, 45% reported street sellers and 27% reported one of the eight NEP vans. The NEP van attracted IDUs who injected daily, were HIV positive before the NEP opened and attended shooting galleries. Only 4% of the participants used the NEP (i.e., eight vans and two pharmacies) exclusively to obtain needles. The limited hours of the NEP are believed to have reduced access for Baltimore IDUs. Analysis of data from 12 HIV Outreach Demonstration Projects in the United States (Tinsman et al., 2001) showed that clients who were offered mobile on-site HIV testing and counselling were 86 times (95%CI: 6.4-1156) more likely to obtain an HIV test than those at other outreach projects.

SATELLITE OUTREACH SITES

Sometimes known as community coalitions or partner agencies, satellite outreach sites are community agencies that provide other types of services in the community (e.g., social, shelter, youth, etc.) but also provide NEP services at their site on behalf of the parent NEP. As indicated above, varied service models and service sites can help NEPs to increase accessibility of their services to a larger number of IDUs (WHO, 2004). Satellite outreach sites serve this purpose. Agencies that serve a different type of clientele (e.g., age, ethnicity, or gender), are open at different times and/or are situated in another locale can provide benefits for parent NEPs and their clients such as offsetting human resource and space costs, and increasing accessibility through varied locations and times. Typically, parent NEPs provide supplies and train the satellite NEP staff.

According to the WHO (2004), outreach by NEPs to IDUs is important for IDUs who avoid formal service settings but who would greatly benefit from NEP services if these were delivered where IDUs can be found. Satellite outreach sites services can assist clients with a variety of health services, including access to sterile equipment, education and referrals.

Considerations for satellite outreach sites

Satellite sites can be troublesome for NEPs when satellite staff do not follow NEP service guidelines. Concerns about the consequences for the parent NEP as a result of satellite NEP worker behaviour have been raised. However, NEP managers may be hesitant to impose guidelines if doing so damages inter-agency relationships and, potentially, service availability.

Evidence for satellite outreach sites

Evidence concerning the effectiveness and operation of satellite outreach sites is sparse in the literature. Nevertheless, NEPs report the importance of these partnerships for their clients. In 2002, 14 of the 25 NEPs in Ontario partnered with other programs or agencies to provide NEP services at 59 satellite sites across the province (Public Health Branch, Ministry of Health and Long Term Care, 2003). The types of agencies acting as satellite sites included, for example: drop-in centres, youth centres, Elizabeth Fry, pharmacies, AIDS service organizations, STI clinics, community health centres, shelters, Aboriginal health services and drug treatment centres.

Using data from a qualitative study of NEPs in Ontario, Strike et al. (2002a) reported that NEPs try to improve accessibility for clients by negotiating satellite outreach services at other agencies. The goal of satellite sites is to offer services over a larger physical area, during more hours of the day, to a diversity of clients, and to meet clients' choice in terms of location. According to NEP workers, for NEPs without mobile outreach, satellite outreach sites may provide exchange services to clients across a larger geographic area or may provide services in a better location. Typically, parent NEPs provide supplies and training to staff of the satellite sites. However, some parent NEPs use their own staff at satellite sites. Not all agencies identified as potential satellite sites embrace this idea. A small number of NEP coordinators note that some

agencies are unwilling to act as satellite sites despite a mandate to serve marginalized members of the community (e.g., drop-ins, soup kitchens and temporary shelters).

In practice, many Ontario NEPs have semi to formal written agreements between the parent NEP and the agency that provides satellite NEP services. For example, in Ottawa, a formal written agreement is used to guide the relationship between the parent NEP (The SITE, City of Ottawa Public Health) and agencies serving as satellite NEP sites (Mr. Paul Lavigne, personal communication). The agreement covers all aspects of the NEP services, including for example: exchange policies, equipment supply and disposal, HBV immunization for satellite site staff and liability insurance. As well, Ottawa and other Ontario NEPs require satellite NEP sites to maintain service records; e.g., needles in/out; other equipment in/out; age and sex of clients, etc.

OUTREACH TO HOMES

In this model of outreach, workers are dispatched to homes in response to telephone or pager requests by clients. As well, home outreach is used to provide peer exchangers (see Peer-based outreach in **Needle exchange program delivery models** section) with large quantities of supplies on a regular basis (e.g., once per week). Delivery of NEP services to client homes is a contentious issue and has not been as widely diffused in Canada as other service models. Overall, there have been sparse accounts and studies of NEP outreach based on a home delivery model.

Home visits are a form of outreach recognized by the WHO (2004) as an important component of HIV prevention programs for IDUs who avoid formal service settings but who would greatly benefit from NEP services if these were delivered where IDUs live and use drugs. Home outreach by NEP staff can assist clients with a variety of health services, including access to sterile equipment, education and referrals.

Proponents of home outreach suggest this mode of delivery increases access for IDUs who cannot or choose not to attend a fixed or other NEP site. Home visits are said to demonstrate the comfort and acceptance of clients by NEP workers. As well, home outreach is said to provide an opportunity to reach other IDUs who are present during the home delivery but who have not previously used an NEP. Finally, home outreach is said to offset the space constraints inside mobile NEP services.

Considerations for outreach to homes

Despite the testimonials of advocates, NEP home outreach is also believed to be potentially dangerous, particularly by workers who are not overly familiar with the drug scene or culture. Workers conducting home outreach may have little control over who is in the home and events that transpire (e.g., arrests or violence) while the delivery is being conducted. As well, concerns have been raised about the consequences of placing workers who are former users in such close proximity with open drug use. Some NEPs continue to provide outreach to homes but workers deliver equipment and other services at the door and do not enter homes.

Evidence for NEP home visit model

In Ontario, one NEP was initially designed around a home delivery model following recognition that few local IDUs were willing to attend the fixed site (Hankins, 1998). Security concerns were noted to be unwarranted. However, some workers relapsed into drug use (Hankins, 1998).

Strike et al. (2002a) reported that one-third of Ontario NEPs provided services to clients' homes. Workers conducting home outreach believed this mode of service delivery increased the accessibility and credibility of the NEP. However, workers who were former drug-users (i.e., roughly one-quarter of the front-line staff) were more comfortable with home visits than others. Delivering service in clients' homes was a contentious issue among NEP workers and managers who were interviewed because of varied opinions regarding the safety and perceived intrusiveness of home delivery.

However, workers who conducted home outreach contend that the risk of harm is low because home visits are conducted with trusted, regular clients. Five violent incidents during home outreach were reported across 15 sites and almost 10 years of operation for some of the programs (Strike et al., 2002a).

PEER-BASED OUTREACH

Peer-based NEP outreach programs have many labels, including secondary exchange, peer exchangers, natural helpers or satellite exchange etc. but should not be confused with satellite outreach sites based in agencies as described above. Peer-based outreach builds on existing social networks and community norms of reciprocity. Peer-based outreach operates much like other forms of NEP service delivery; however, clients provide direct service to their peers. Some peer outreach programs are self-run, integrated within a larger NEP, conducted from homes and/or on the street. Other peer-based programs operate out of peers' homes or through street outreach.

With or without this formal label or designation, many IDUs assist other IDUs in the community with needle exchange and other needs. Peer-based outreach appears to be beneficial in reaching diverse groups of IDUs, including those most at risk of HIV. For example, peer-based outreach for youth is associated with reduced needle re-use and sharing. In Canada, there are only a few peer-operated NEPs (e.g., CounterFIT in Toronto; and VANDU in Vancouver) however many NEPs have formal or informal peer outreach components. Peer-operated NEPs play an important role in HIV prevention efforts in the Netherlands, Australia and United States.

The WHO (2004) recommends outreach as an important component of HIV prevention programs to reach IDUs who avoid formal service settings but who would greatly benefit from NEP services if these were delivered where IDUs live and use drugs (e.g., streets, bars, shooting galleries/crack houses, markets etc). Peer outreach services can assist clients with a variety of health services, including access to sterile equipment, education and referrals.

In a recent review of the literature, the WHO (2004) notes that peer-based outreach and outreach provided by professional NEP staff are both associated with reductions in HIV risk behaviours. However, the WHO

(2004) also notes that there is evidence showing that peer-based outreach may be associated with greater reductions in risk behaviours than outreach provided by others. Research shows that peers may be able to recruit more diverse groups of IDUs and encourage more widespread changes in behaviour. Interventions with IDU social networks demonstrate that training one member of the network to provide risk reduction education can reduce risk behaviour across the entire network.

Peer exchangers often reach otherwise hard-to-reach IDUs who may be suspicious of the NEP and/or reluctant to abandon their relative invisibility as IDUs in favour of acquiring NEP services. Peer-exchangers have been shown to be important conduits for changing norms within social networks. Specifically, peer exchangers, in conjunction with education from NEPs, may help to change unsafe injection norms to safer injection norms and behaviours within their social networks. As well, peer exchangers, as a group, have developed educational materials and acted as advocates on behalf of the community of IDUs.

Peer exchangers who are directly recruited by the NEP are often IDUs who are well known and respected in the IDU community, and may be already providing informal exchange. These peer exchangers are trained by the NEP to provide harm reduction education to other IDUs. Typically, peer exchangers distribute and/or exchange sterile equipment to their friends, acquaintances or others for free, while a minority may sell or trade the equipment for money, goods or other things. It has been noted that those who sell/trade needles obtained from NEPs derive meagre profits.

Peer-based exchange is built on the premise that NEP clients can be encouraged to give NEP supplies and harm reduction messages to their peers. However, clients can only provide supplies to others if they have enough to meet their own needs as well as those of others. As such, programs that discourage bulk exchange and/or distribution of equipment may be unknowingly (or knowingly) limiting the distribution of sterile equipment to their immediate clients (see Needle and syringe exchange section).

Considerations for peer-based outreach

In the past, peer based outreach has been discouraged in some parts of Ontario and elsewhere in Canada. Reports suggest that some NEPs have preferred individual based exchange provided by paid staff to ensure that IDUs receive educational and other messages as well as sterile needles. Despite discouraging clients from providing needles to their friends and acquaintances, this practice does occur. Concerns about providing services directly to IDUs and not through other IDUs may have merit. There have been reports in the United States that IDUs, in particular women, who exchange needles for others are more likely to engage in risky injection behaviours and to become HIV infected. However, other studies report contrary findings. Nevertheless, these studies do point to the need to train and work with IDUs who attend NEPs on behalf of others to reinforce the need for safer injection and sexual behaviour.

Despite the potential advantages of peer-based outreach, evidence suggests that this model of service delivery can become problematic. For example, pre-existing or new conflicts between peer workers and NEP clients can impede delivery and receipt of services. IDUs are often incarcerated and NEP clients dependent on particular peer outreach workers for equipment may face difficulties if this person is apprehended

and jailed. As well, peer exchangers require on-going training to ensure that the types of education they provide to other IDUs are correct and consistent with the NEP education. Peer exchangers may also need emotional and other support that can be time consuming for NEPs with small staff complements.

Street-based needle sellers have been found to be an important source of needles for IDUs in several American cities. In the literature there are reports of selling previously used needs that have been cleaned (or not) and presented to buyers as 'new' (see for example Stopka et al., 2003; Latkin and Forman, 2001). The frequency of this behaviour appears to be variable across locations, but is worrisome. The extent to which needles (sterile or not) are sold on the street in Canada is unknown, and may be less common given the number of NEPs and the ability to purchase needles at pharmacies. Nevertheless, IDUs in several Canadian studies have endorsed questions asking if they have 'given, lent, or sold' used equipment in the past. Ensuring that IDUs have access to large quantities of sterile needles and other equipment through NEPs (i.e., saturate the market with free equipment) may reduce street-level sales of used equipment (see for example Coffin, 2000).

Evidence for peer-based outreach

Using data from a large qualitative study (n=120) in Toronto, Strike et al. (2005) examined needle acquisition patterns and noted that some IDUs stockpile large supplies of needles for their own use. Stockpilers said that they intentionally acquired large quantities of needles because they intended to give them out to other IDUs. This peer distribution network was noted to be an important source of needles for IDUs who acquire needles on a daily basis and/or are sex trade workers, on parole or probation, homeless or in tenuous/short-term housing circumstances or closeted IDUs. IDUs who are the most marginalized and disorganized in terms of drug-using behaviour were the most likely to have difficulties securing a sterile supply of equipment. Strike et al. (2005) note that the willingness of stockpilers to give away sterile syringes reduced the number of incidents where IDUs were without a syringe, could be exploited and/or have to share syringes.

In Toronto, one satellite NEP is peer-operated and all clients are considered to be potential service providers (Strike et al., 2005). The goals of this approach are to assist clients to develop employment skills, to increase self-esteem and control over their lives, to provide a user-friendly environment for clients, and to foster community development within the community of drug injectors. In 2001, this program distributed and exchanged the fourth largest number of needles among Ontario programs offering needle exchange. This program has also incorporated a small number of non-violent drug dealers into their program. According to staff, this point-of-sale approach reaches otherwise hidden drug-using networks. Whether or not the drug dealers sell the needles they receive from the satellite NEP is unclear. However, the free and readily accessible supply at the satellite NEP, its large network of peer exchangers, other local NEP sites and over the counter (OTC) sales, are believed to reduce opportunities for dealers to make a large, if any, profit from the NEP supply of needles. As well, participants noted that they receive free needles from their dealers suggesting that dealers are not selling the needles received from the satellite NEP.

A comparison of peer based exchange between Vancouver and Montreal by Tyndall et al. (2002) showed that 46% of participants from Vancouver and 50% from Montreal reported supplying a sterile needle to

another person through trading, selling, lending or giving. Factors associated with providing needles to others in the past six months included: borrowing used equipment (Adj OR=2.4; 95%CI: 1.85-3.71), acquiring 20 or more needles per visit at the NEP (Adj OR=2.0; 95%CI: 1.34-2.54), and greater than weekly attendance at the NEP (Adj OR=1.54; 95%CI: 1.17-2.13). Tyndall et al. (2002) conclude that secondary distribution was an important means through which to reach high risk IDUs.

In Edmonton, a group of IDUs who were identified as 'Natural Helpers' - IDUs who helped other IDUs in the community, including providing sterile equipment to others - engaged in a community development project with Edmonton's NEP, Streetworks (Taylor and Jasperson, 2001). As part of this project, Natural Helpers developed educational materials for the community (e.g., Vein Care Handbook; Street First Aid). Members of Natural Helpers have engaged in community advocacy through presentations and hosting a poster presentation session at a provincial conference. As a result of participation, Taylor and Jasperson (2001) note that members who provide mutual support, have refined their outreach and first aid skills, and some members have tried to reduce/eliminate drug use, attend educational programs and re-enter the workforce.

A review of U.S. studies of outreach services to IDUs provided by indigenous community members concluded that outreach-based HIV prevention is effective for IDUs (Coyle et al., 1998). Using results from 36 studies of pre and post-test behaviours, Coyle et al. (1998) found that a significant proportion of IDUs exposed to outreach change their behaviours in the desired direction. Specifically, exposure to outreach workers was consistently associated with stopping injection drug use, reduced frequency of injecting and reduced re-use of needles and other injection equipment. As well, results from these studies showed more frequent needle disinfection, entry into drug treatment and increases in condom use. Finally, Coyle et al. (1998) report that there is some evidence from these studies to demonstrate a dose effect - longer exposures to outreach interventions are associated with greater reductions in injection frequency.

Results from an intervention focused on using peer leaders to disseminate information about HIV risk reduction and role model safer injection behaviour in Baltimore showed that, with training, peer leaders can effectively promote HIV prevention within their own network and among other drug users (Latkin 1998). For this intervention, 36 peer IDU leaders were trained (i.e., 10 sessions) to provide HIV risk reduction information and behavioural modelling to members of their networks. Pre- and post-intervention behavioural data were collected from leaders and 78 members of their networks and controls. At follow-up, peer leaders who were trained were more likely than controls to report increased needle cleaning and condom use and decreased needle sharing. Network members with a trained peer leader reported less HIV risk behaviour than controls and that they had received HIV risk behaviour information from the peer (Latkin 1998).

Using data collected from a large NEP study (n=5,369), Valente et al. (1998) reported that 9.4% of the Baltimore NEP clients were classified as peer (satellite) exchangers and these clients accounted for 64% of all needles distributed by the NEP. The authors note that the peer exchangers needed training in counselling and educational techniques but increased the availability of NEP supplies to 24 hours a day, 7 days a week. Sears et al. (2001) found that a youth, peer-based secondary exchange program combined with youth-specific media and community development activities was associated with reduced needle re-use and sharing, and more consistent condom use with casual partners. IDUs who did not attend the peer secondary exchange were at greater risk of sharing needles (AOR 3.74) and re-using needles (AOR 2.77).

Stopka et al. (2003), using data from an ethnographic study in Hartford, Connecticut, reported that syringe sellers (e.g., IDUs with excess quantities of syringes; IDUs wishing to make extra money; other members of the street-based community; and diabetics) play an important role in needle access when other formal venues are closed and/or for IDUs who wish to avoid formal venues.

Friedman et al., (2004) used data from 120 IDUs in Brooklyn, New York to examine the extent to which IDUs help each other. Results from this study show that some IDUs participate in volunteer and other community activism and also encourage others to reduce their risk of acquiring an injection and/or sexual-related infection. The investigators note that future behavioural interventions need to evaluate not only the impact on the focal behaviour but also the extent to which behavioural change messages are disseminated by intervention participants to others in the community.

In the literature, there have been varied findings about the relationship between peer exchange, gender, risk behaviour and HIV transmission. Using data from a study conducted in Baltimore (1994 to 1997) among IDUs, Valente et al. (2001) reported that women who returned syringes originally acquired by someone else were more likely to become HIV infected than women who returned their own syringes. At the time of this study, the Baltimore NEP had a one-for-one exchange policy. IDUs who used the NEP more frequently were more likely to return their own needles and to return them more quickly than other IDUs. Riehm et al. (2004) reported a comparison of women's versus men's (n=531) needle access, use and distribution behaviours using data from 23 NEPs in California. Results from this study suggest that while women are more likely than men to exchange needles on behalf of others, women who did so are more likely to give used needles to others (OR=4.1; 95%CI: 1.28-13.35) but less likely to accept used needles (OR=0.31; 95%CI: 0.97-1.02). Among men, those who exchanged for others were less likely to re-use their own needles (OR=0.31; 95%CI: 0.18-0.54) than others. The authors conclude that while women who exchange for others are less likely to engage in behaviours that put themselves at risk, they may put their networks at risk by giving used needles to others.

Using data from an ethnographic study of secondary exchangers (i.e., IDUs who give NEP supplies to other IDUs; n=26) and recipients of secondary exchange (n=21), Snead et al. (2003) reported that most secondary exchangers provided needles to friends, family and partners but were less likely to do so for strangers. The NEP was reported to facilitate and encourage this type of exchange. Most recipients used only one secondary exchanger but a few had a 'back-up' secondary exchanger. While most secondary exchangers reported that they provided needles to others for reasons of affection or altruism, both exchangers and recipients noted that there was an expectation of reciprocity in the exchange relationship (e.g., money, drugs or something else) and 50% accepted money or drugs for needles. Secondary exchangers tended to provide needles from their homes but some also delivered to other IDUs. As well, some secondary exchangers said that they required one-for-one exchange whereas recipients said that this was not usually necessary. Recipients had also used NEPs but tended to use secondary exchangers because of geographic proximity and lack of a place to store supplies. While risk reduction was discussed with recipients, many exchangers indicated an interest in peer education training.

Using data from 1.5 years of participant observation in San Francisco and New York City, Broadhead et al. (1995) reported on current and former IDUs who were hired to conduct street-based outreach to other IDUs. Several problems emerged in the programs including: using the outreach position to continue street

hustles; lack of supervision that allowed some to shirk responsibilities; and workers who were former users were sometimes reluctant to go back to these communities or to be non-judgmental with IDUs. Dual identities as outreach worker and community member were also noted to be potentially problematic for peer workers who were sometimes expected to or wished to behave as a community member rather than an outreach worker. Nevertheless, many peer workers were committed to their jobs and tried to work as professionals. Broadhead et al. (1995) conclude that despite many problems, the peer-based outreach programs served as a catalyst for sustained changes in risk behaviours in their communities.

Using data from field observations, Henman et al. (1998) note that IDUs who conduct peer exchange for other users usually do so as part of relationships based on reciprocity and mutual favours. While some sell these needles, the profits derived tend to be meagre.

PHARMACY-BASED NEEDLE PURCHASE AND EXCHANGE

In Ontario, over-the-counter (OTC) purchase of needles is an important source of needles for IDUs. Needles can be purchased legally at pharmacies without a prescription and pharmacists are encouraged to sell needles to IDUs (Ontario College of Pharmacists 1992); however, sales of needles are at the discretion of individual pharmacists (Ontario College of Pharmacists 2001). Nevertheless, in Ontario, Quebec and Great Britain some pharmacists work directly with local health authorities to provide NEP services, including disposal.

Research data shows that pharmacies are an important source of needles for IDUs because some IDUs prefer to purchase their needles at pharmacies rather than attend an NEP. In particular, several studies in the United States have shown that women prefer to obtain their needles from pharmacies rather than from NEPs. Pharmacies are said to be more anonymous and/or more accessible in terms of location or time of day. OTC sale of needles is at the discretion of individual pharmacists and those who believe in the benefits of needle sales for IDUs are more likely to sell needles to IDUs.

Location is an important factor that determines the likelihood that an IDU will go to a pharmacy to purchase needles. Pharmacies that are closest to drug using areas are more likely to be used by IDUs but only if these purchases can be completed with few difficulties and/or lack of perceived harassment.

The Faculty of Pharmacy and Pharmaceutical Sciences at the University of Alberta offers a web-based continuing education course that any pharmacist can complete. The course is entitled: 7021 Harm Reduction: Opportunities for Pharmacists to Prevent the Spread of Bloodborne Pathogens <http://www.pharmalearn.ualberta.ca/conted>. As well, the Royal Pharmaceutical Society of Great Britain has developed practice guidelines for pharmacists providing NEP services (e.g., service delivery, safety precautions, evaluation, disposal of used equipment and training; available on-line www.rpsgb.org.uk/members/practice/framePractGuid.htm).

Considerations for pharmacy-based needle purchase/exchange

Some IDUs may prefer the anonymity of OTC purchases but lack funds to buy needles in small or large quantities. As well, OTC purchases can be difficult and stigmatizing experiences. Pharmacists may be reluctant to sell needles to clients because they do not embrace the idea of needle exchange and/or are concerned about thefts, or safety of staff, risks from discarded needles and discomfort of other patrons. As well, sale of small quantities of needles may not be perceived as cost effective and lead to refusal of requests for less than 10 needles.

Evidence for pharmacy-based needle purchase/exchange

A review of the evidence by the WHO (2004) concerning the effectiveness of OTC sales of needles showed that this mode of delivery was associated with reduced HIV risk behaviour and reduced HIV seroprevalence.

Use of pharmacies to acquire needles

In many places in the world, pharmacies are important sources of sterile needles for IDUs. A Toronto study showed that some IDUs prefer to purchase needles at pharmacies rather than attend an NEP (Strike et al., 2005). A study of 1020 IDUs in Vancouver showed that 6% used pharmacies as their primary source of needles (Miller et al., 2002). Comparison of IDUs who primarily used pharmacies versus those who primarily used the fixed site NEP or Van NEP showed that pharmacy users tended to have lower risk profiles. In Ottawa, Leonard and colleagues report higher rates than those observed among Vancouver IDUs. In Ottawa, among 418 men and 85 women IDUs participating in the POINT Project between October 2002 and January 2003, 20% of men IDUs and 14% of women IDUs reported a pharmacy as their main source of new unused needles in the six months prior to their baseline interview. The most frequently reported reasons for accessing a pharmacy for sterile needles related to the convenience of the pharmacy (68% of men and 58% of women) and constraints in the NEP services including the NEP being closed when needles were required (14% of men and 32% of women) and the NEP van not being able to get to them in time (12% of men and 26% of women). Significantly more women IDUs (37%) than men IDUs (16%) reported that they accessed pharmacies as their main source of new needles as they were uncomfortable using the NEP ($p < 0.05$).

Using data from the United States National Household Survey on Drug Abuse, Anderson et al. (1998) reported that pharmacies were the most frequent source of needles for 38% of the 379 IDUs recruited to the study in 1995 and 1996. A study conducted in Baltimore (Riley et al., 2000) compared first-time clients of a van-based exchange ($n=124$) with clients of a pharmacy-based exchange ($n=162$) and found that the pharmacy site was more likely to attract African Americans but less likely to attract those injecting cocaine or injecting 4 or more times per day in the past 2 weeks. In France, pharmacies are the main source of new needles for IDUs (Moatti et al., 2001).

Factors found to influence preference for OTC purchases of needles include: longer hours of operation, convenient locations and less stigmatizing/identifying locations (Khoshnood et al., 2000; Strike et al., 2002a). Junge et al. (1999) asked Baltimore IDUs where they would prefer to obtain needles if current laws were changed to legalize OTC sales to IDUs. Equal proportions stated a preference for NEPs and pharmacies

(i.e., 49% for both). However, Junge et al. (1999) reported that women preferred pharmacy purchases to NEPs.

When asked about how much they would be willing to pay for needles purchased OTC - the mean was \$0.80 USD with a range of \$0.10 to \$4.00 USD (Junge et al., 1999). IDUs also indicated that OTC purchases would be more appealing if pharmacies offered a greater variety of needles (i.e., brands, gauges and barrels).

Community pharmacists, OTC sales and needle exchange

While some pharmacists play a key role in providing access to needles, others are reluctant because of concerns about encouraging drug use, discarded needles, shoplifting, and/or risk of alienating other customers (Myers et al., 1998; Gleghorn et al., 1998; Weinstein et al., 1998; Reich et al., 2002, Lewis et al., 2002). One report suggested that IDUs who look middle class have a better chance of purchasing needles than other IDUs (Pierce, 1999).

In 1992/93, Myers et al. (1998) conducted a national mail survey of Canadian community pharmacists (n=1976) attitudes and practices with respect to interventions for IDUs. Overall, 73% supported needle exchange for IDUs, however, only 20% said that they would sell needles in response to all requests for needles. Only 12% of the pharmacists indicated that they had biohazard disposal bins on-site. Using a scale of 1 (not willing) to 3 (very willing), the mean willingness of community pharmacists to sell needles to IDUs was 2.02. Factors noted to influence willingness to sell needles to non-diabetics included: attitudes towards IDUs, personal support of needle exchange, perceived threat of robbery and concern about public health. Pharmacists who obtained their license after 1980, had previously served a person living with HIV and/or worked for a pharmacy chain were more willing to sell needles to non-diabetics.

New York City pharmacists (n=130) who participated in a telephone survey by Coffin et al. (2000) endorsed similar concerns about OTC sales of needles to IDUs. This study was conducted immediately prior to changes in the law making it legal for pharmacists to sell up to 10 needles without a prescription. Only 40% of these pharmacists said they would sell needles to IDUs.

In Great Britain, pharmacy based NEPs are organized by local health authorities. Pharmacists are provided with equipment and are remunerated for providing NEP services at no cost to the clients (Sheridan et al., 2000). A study by Sheridan et al. (2000) showed that 83% of pharmacists offered clients pre-packaged needle kits, 49% limited the number of needles they would provide at one time (range of 6 needles to 125) and pharmacies in this study had an overall return rate of 30%. However, pharmacists who encouraged the return of used equipment tended to have higher return rates and IDUs participating in another study by this team reported that they returned needles obtained from the pharmacy NEP to the local NEP. Pharmacies located in city centres completed more transactions with IDUs than NEPs located elsewhere. The most commonly reported problems with the pharmacy-based NEP were shoplifting and intoxicated clients both of which were said to 'sometimes' occur. Incidents of violence in the pharmacy with NEP clients were rare; over 80% of pharmacists reported no incidents of violence. Finally, 64% of pharmacists believed that other pharmacy clients were not aware of the NEP services on site. Many pharmacists reported that their NEP clients frequently asked for other equipment such as filters, sterile water, citric acid, and ascorbic acid.

To improve access through pharmacies in Connecticut, Weinstein et al. (1998) piloted two initiatives: an IDU packet (two needles/two condoms) paid for by the health department but to be distributed by pharmacies and peer education provided to pharmacists by a team comprised of a university-based pharmacist and local health department AIDS coordinators. Of 44 pharmacies visited by the team, 35 agreed to participate in the pilot program. Follow-up was poor but demonstrated that pharmacists could be encouraged to participate in HIV prevention programming.

A 1994 survey of 329 Connecticut pharmacists showed that pharmacists who believed that sales of needles would benefit the health of IDUs and overall community wellbeing, and pharmacists who believed their peers were also selling needles were more supportive of OTC needle sales (Wright-De Agüero et al., 1998). Another study conducted in Baltimore (Gleghorn et al., 1998), showed that although sale of needles is legal, many pharmacists continued to require a prescription or verification of diabetic status.

MULTI-MODEL AND MULTI-SERVICE PROGRAMS

Most reviews of NEP program models note the desirability of combining multiple models (e.g., fixed, mobile outreach and satellite sites) to improve access to services for clients (Brahmbhatt et al., 2000; Khoshnood et al., 2000; Strike et al., 2002a; Tyndall et al., 2002). Unfortunately, studies of multi-model NEPs versus single model are lacking. Where possible Ontario NEPs have tried to provide varied service models to meet diverse needs and offset the disadvantages of individual models (Strike et al., 2002a). Other studies have shown that different types of venues attract different types of injectors (Schechter et al., 1999; McKegney et al., 1989; Barnard, 1993). Consequently, mixed service model approaches may address concerns about temporal and geographical accessibility and also concerns that only one service location may lead to new injecting networks and increased rates of HIV transmission (Hankins, 1998).

Given the complexity of the health and social issues experienced by IDUs, a multi-service model is often recommended by service providers and researchers alike. These types of models are often referred to as one-stop-shopping where clients can receive services from a variety of disciplines (e.g., public health, family medicine, social work, mental health etc.) in one location. As such, needle exchange is one of many services all designed to meet the needs of IDUs and/or other street-involved individuals.

Multi-service models are believed to be necessary given the reluctance of IDUs to utilize existing health, social and other services. This reluctance stems from the stigmatized status of IDUs and poor treatment of IDUs by some health and service providers. For example, Morrison et al. (1997) found that IDUs will avoid treatment seeking until faced with a crisis because of prior unpleasant experiences. In the four weeks prior to the survey, 52% of IDUs had no contact with a health service other than an NEP; and 30% had not attended a health service in the past 6 months. However, injection-related problems were common among IDUs (n= 147): 21% had abscess (i.e., injection site infections); 49% had thrombosis (i.e., vein clots); 84% had bruising at an injection site(s); 87% had other injection problems such as fasciitis (i.e., deeper injection site infection), arterial damage and/or limited venous access. Only 27% had recently sought assistance for these problems.

Many governmental and non-governmental organizations advocate for comprehensive approaches to

reduce the transmission of bloodborne pathogens. The components recommended are summarized in the table below.

Table 8: Components of comprehensive programs to prevent transmission of bloodborne pathogens among IDUs

1	Outreach
2	Information, education & communication
3	Risk reduction counselling
4	HIV testing and counselling
5	Needle and syringe programs
6	Disposal of used injection equipment
7	Drug treatment services
8	Agonist pharmacotherapy program (drug substitution treatment)
9	HIV/AIDS treatment and care
10	Primary healthcare
11	Peer education
12	Interventions in criminal justice systems (e.g., education counselling and testing)
13	Primary drug prevention
14	Modify laws restricting sale or possession of needles
15	Collaboration with pharmacists and police
Sources: WHO 2005; Academy for Educational Development (2000); Association of State and Territorial Health Officials in the United States	

As well as recommending components, the Academy for Educational Development (2004) also recommended four principles to guide a comprehensive approach, including:

- Coordination and collaboration across all sectors and programs
- Ensuring coverage, access and quality
- Reduction of stigma for IDUs
- Tailoring services to meet the needs of diverse populations of IDUs

OTHER DELIVERY MODELS

To date needle vending machines have not been used in Canada for needle exchange. However, in Europe and Australia, needle vending machines are used to deliver sterile needles to, and obtain used needles from, IDUs. Typically, these needle vending machines operate much like coin-operated soft drink machines: a free, sterile needle is dispensed for every used needle deposited into the machine. Exchange is limited to the number of used needles clients have and/or the maximum in the machine. In Australia, the vending machines also dispense cotton, swabs and a spoon.

Data suggest that syringe vending machines may attract a different IDU clientele than other models of needle exchange. In particular, vending machines have been found to attract a younger clientele who are less likely to have their own place to live and more likely to engage in HIV risk behaviour than clientele of pharmacies or NEPs.

A series of studies conducted in France investigated the impact of different modes of sterile needle delivery on IDUs. In particular, Moatti et al. (2001) compared IDUs who used syringe vending machines to those using pharmacies and/or NEPs. A total of 343 IDUs were recruited from these locations and results showed that vending machine users tended to be under 30 years old, using heroin and buprenorphine, and were less likely to be HIV positive. In contrast, NEP users were older, heroin users and often HIV infected. As well, IDUs who primarily used the vending machines were less likely to have their own place to live and to be in contact with drug treatment (Obadia et al., 1999). Results from the study suggest that syringe vending machines are a complementary mode of delivery to NEPs and pharmacy sales.

A physician office-based NEP (Reilly, 1990) has been offered in Australia but has not been evaluated.

PRISON-BASED NEPS

The HIV prevalence in Canadian prisons is estimated to be nearly ten times that of the general population (Correctional Service of Canada, 2003). Although a committee established in 1999 by the Correctional Service of Canada (CSC) examined the feasibility of NEPs in Canadian prisons and recommended that pilot NEPs be implemented, as of 2004 no Canadian prison system had initiated a prison NEP (Canadian HIV/AIDS Legal Network, 2004a). While critics contend that making sterile needles available to prisoners would condone drug use, international evidence has illustrated the benefits of prison NEPs.

Jacob and Stover (2000) evaluated the usefulness and effectiveness of a two-year pilot NEP initiated in 1996 in Vechta and Lingen, two prisons located in northern Germany. Needle dispensing machines were installed at the Vechta prison, while the Lingen prison had counselling and healthcare staff distribute sterile needles to prisoners. Findings showed that the number of used needles returned was high in both prisons. The dispensing machine offered anonymous access to sterile needles. However, inmates sometimes tampered with the machine and the machines experienced technical failures, thus reducing the accessibility of sterile needles. Many Lingen prisoners were reluctant to use the machines and identify themselves as drug users to prison staff. Consequently, some prisoners asked others to acquire the needles on their behalf. Prior to the pilot, 54 prisoners across both prisons reported injecting with a used needle, whereas after the machines were installed, no Vechta inmates and only four Lingen inmates reported injecting with a used needle for their last injection. Furthermore, overdoses and abscesses decreased and the number of IDUs using follow-up treatments from health services increased after the initiation of the pilot program.

The Canadian HIV/AIDS Legal Network (2004b) reviewed international literature from six countries (Switzerland, Germany, Spain, Moldova, Kyrgyzstan, and Belarus) and visited prisons in four countries with the goal of evaluating effective prison NEPs and encouraging prison systems with HIV and HCV epidemics to implement NEPs. Several key components of successful NEPs were outlined:

- ▶ To gain support for prison-based NEPs, prison staff need to be consulted and educated about the purpose of and processes involved in delivering NEP services
- ▶ To encourage utilization of prison-based NEP services, maintaining the confidentiality of prisoners is crucial
- ▶ Prison-based NEPs can only be successful if they are accessible. Providing multiple access points within a facility can facilitate accessibility. Discreet exchange provided by staff can also ensure access
- ▶ Prison-based NEPs are most effective when they are situated within a comprehensive harm-reduction program that includes HIV/HCV education and substitution therapy, for example. As mentioned above, prison NEPs have been found to increase health service utilization
- ▶ Evaluation of programs before any expansions is important to ensure that the manner in which the services are offered meets the needs of the prisoners. Additionally, rigorous evaluations contribute to the evidence base needed to develop and disseminate best practices of prison NEPs

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Education

Safer injection education

Best practice recommendations – in brief

To reduce injection related harm among IDUs:

- ▶ Educate clients regarding safer injection practices, including:
 - ▶ How to properly use and dispose of injection equipment
 - ▶ How to recognize the signs and symptoms of skin and soft tissue infections
- ▶ Encourage clients to seek testing for HIV and HCV, obtain immunization for Hepatitis A and B and seek medical assistance for skin and soft tissue infections before complications develop (see **Vaccination** and **Testing** services sections)
- ▶ Advocate on behalf of IDUs to reduce harsh or judgmental treatment of IDUs in healthcare settings

INTRODUCTION

IDUs experience a number of preventable injection-related problems such as infection with HIV, HBV, HCV and other bloodborne pathogens, skin and soft tissue damage and complications such as death. Educating clients about safer injection practices can reduce and/or eliminate the occurrence of many of these injection-related problems. Safer injection education includes information about preventive techniques and practices that clients can adopt to reduce their risk of injection-related problems.

Barriers to safer injection

Many individual and social factors contribute to unsafe injection practices. For example, the cost of sterile equipment can pose a barrier for some IDUs. As well, NEPs that are not open in convenient locations and/or at convenient times may pose a barrier for IDUs to inject more safely. Peer norms and practices can reinforce unsafe practices. However, peer norms can also reinforce safer practices. Drug use with intimate partners can also lead to unsafe injection practices. As well, inadequate knowledge can pose a barrier to safer injection. The types of practices that can lead to injection-related problems are summarized below.

Re-use of needles and other injection equipment

Re-use of needles and other injection equipment among IDUs can lead to transmission of HIV, HCV and other bloodborne pathogens and also to skin and soft tissue infections (i.e., abscesses; see **Needle and syringe exchange** and **Distribution of other injection-related equipment** sections). As well, re-use of needles can reduce the sharpness and shape of needles and lead to skin and vein damage.

Injection site damage

The places where IDUs inject into their bodies can increase or decrease the chances of damage, injury and infection. Commonly used sites for injection include: arms, legs, neck, groin, fingers, toes and abdomen. However, some sites are safer and less likely than others to lead to injury and/or infection. The Harm Reduction Coalition in New York developed an injection site hierarchy starting with the least risky and

moving to the most risky: arms, hands, legs, feet, groin and neck to help clients select safer injection sites (Sorge and Kershner, 1998). Convenience, ease of access, skill and other factors influence the choice of injection sites. As well, vein damage and infections can reduce the accessibility of some veins and lead IDUs to inject in other sites on the body, including high-risk areas such as the groin and neck.

Most skin and soft tissue infections resolve without formal medical attention. However, serious complications can develop and lead to sepsis, amputation or death. Consequently, encouraging IDUs to seek medical assistance before complications develop can reduce seriousness of the complications and/or death.

Injection practices

Numerous injection practices such as intramuscular injection ('muscling'), subcutaneous injection ('skin popping') and missing a vein when trying to inject intravenously can increase the likelihood of abscesses. Injection with non-sterile equipment and failure to clean the skin before injection also increase the risk of infection. Previous abscesses can lead to colonization of skin with bacteria and promote future abscesses. As well, the adulterants used to 'cut' drugs (i.e., increase the volume) can lead to skin and soft tissue infections.

Needlestick injuries

Needlestick injuries are a concern for NEP workers and clients who come into contact with needles used by someone else. Among healthcare workers, the most common causes of these injuries are needle recapping and unsafe collection and disposal of sharps (WHO, 2003). IDUs who dispose of needles for other IDUs may be at risk of needlestick injuries and would benefit from training regarding how to avoid this type of injury (see Safer handling and disposal of used injection equipment section).

Safer injection education

Through education, skills building and provision of equipment, NEPs help to reduce the negative health effects of injection drug use, such as transmission of HIV, HBV, HCV and other bloodborne pathogens, toxic effects of the drugs injected and effects of impurities or contaminants in the drugs. Safer injection education can also help to reduce overdose, thrombophlebitis and cellulitis, abscesses that sometimes lead to gangrene and amputation, acute or chronic endocarditis and acute fever (i.e., cotton fever; WHO 2004).

Safer injection education commonly focuses on the process of injection from preparation to clean-up and tips are provided on how to recognize and respond to infections, abscesses and other injection-related problems. Issues regarding the context where injection takes place (e.g., home, inside/outside, with friends, and cleanliness) are also often included.

There are numerous examples of safer injection education material available on-line and referenced in this document. Many are presented in plain language (i.e., English) and likely to be accessible to many clients. Providing clients with written material can help to ensure that they can look over the material if they are unsure or do not remember instructions and/or show or give it to other IDUs.

Examples of recommended safer injection practices are summarized in the table below.

Table 9: Examples of safer injection education components

Recommendations	Rationale
Safer injection environment	
Inject in a physical location (e.g., an apartment) that is safe and secure with running water	Reduces the risk of harassment by others and the risks of hurried injections
Clean surfaces with alcohol swabs before putting down injection equipment	HBV and HCV can survive for months on surfaces and pose a potential risk for transmission of either virus
Inject with someone else present (if possible) but do not share needles or any other equipment	In the event of an overdose, having a friend or someone else that can be trusted present may increase the likelihood that emergency medical services will be called to provide assistance (see Overdose prevention education section)
How to prevent vein or skin damage, and bacterial infections	
Regularly exercise arm muscles (e.g., flex, squeeze a ball, clench fist, or lift weight)	Bigger muscles make veins more prominent, easier to locate and may lead to less vein or skin damage
Wash hands and skin with hot soapy water before injecting	Reduces risk of bacterial and other infections
Drink lots of water	Increases size of veins and reduces the chance of missing a vein. 'Digging' around for a vein can cause vein, skin and soft tissue damage
Get tetanus and HBV immunizations (see Vaccination section)	Reduces the risk of acquiring either infection
How to prepare drugs for injection	
Use a new, clean cooker to mix and cook drugs (see Distribution of cookers section)	Re-using cookers can pose a potential risk for the transmission of HIV, HBV, HCV or other bloodborne pathogens
Crush solid drugs into a fine powder	Fine powders are easier to dissolve and less likely to 'clot' the needle
Use sterile water to mix drugs (see Distribution of sterile water ampoules section)	Non-sterile water (e.g., puddle or toilet water, a cup used by multiple injectors) can pose a risk for the transmission of HIV, HBV, HCV or other bloodborne pathogens

Recommendations	Rationale
Use Vitamin C powder/ascorbic acid powder as an acidifier to dissolve drugs that are in a 'base' form. Ensure the correct amount of acid is used in order to avoid pain and vascular damage (see Distribution of acidifiers section)	Dissolving drugs sold in a 'base' form with vinegar or lemon juice can cause vein damage and/or eye infections from lemon juice
Use a clean filter designed for this purpose (see Distribution of filters section)	Using cigarette filters, cotton balls, tampons, Q-tips or other materials to filter drugs can introduce small particles and/or poisons from cigarette filters into the drug solution and into the body and lead to irritations, infections and/or other problems
Dilute drugs with sterile water or a saline solution	Diluted drugs are less likely to irritate veins
Frontloading or backloading drugs should always be done with sterile needles	Frontloading or backloading involves dividing a drug solution between two or more people. If any of the needles or syringes have been previously used there is a potential risk for the transmission of HIV, HBV, HCV or other bloodborne pathogens
How to prepare equipment for injection	
Always use a new, sterile needle to inject (see Needle and syringe exchange section)	Re-use of needles poses a potential risk for the transmission of HIV, HBV, HCV or other bloodborne pathogens
Use small (or thin) gauge needles	Reduces the size of the puncture wound and the likelihood of infection
Inspect needle packaging to ensure that it has not been opened or damaged	Used needles are sometimes repackaged, sold on the street as 'new' and pose a potential risk for the transmission of HIV, HBV, HCV or other bloodborne pathogens
How to prepare skin and veins before injection	
Clean the injection site with a sterile alcohol swab before each injection (see Distribution of sterile alcohol swabs section)	Reduces risk of bacterial and other infections
Use a clean tourniquet to make veins bigger (see Distribution of tourniquets section)	Increases size of veins and reduces the chance of missing a vein. Regular use of a tourniquet helps to maintain the flexibility of veins

How to inject properly and avoid damage to skin and veins	
Know how to inject yourself	Reduces the chance of: losing control of the situation, being taken advantage of by others and/or being placed at risk of disease transmission by someone else
Ensure that the bevel of the needle is pointing up, inject intravenously at a 30-45° angle and in the direction of the blood flow. If injecting into a muscle, inject at a 90° angle. If skin-popping, inject at a 45° angle	This technique increases control of the needle point and may reduce damage to skin and veins
Inject into veins not arteries	Injection into an artery can result in bleeding and life-threatening loss of blood
Inject between the valves in the vein	Easier to inject and reduces vein damage
Avoid injection in the: <ul style="list-style-type: none"> ▶ Hands, feet and legs ▶ Neck ▶ Torso ▶ Groin 	Decreases the risk of: <ul style="list-style-type: none"> ▶ Deep vein thrombosis (i.e., blood clots), leg ulcers and vascular insufficiency ▶ Serious infections of the brain ▶ Damaging lymph vessels or nodes
After inserting the needle, remove the tourniquet	Reduces the chances of bruising
Inject slowly and in a relaxed manner	Reduces the chance of missing a vein. Taking a deep breath helps to keep hands steady
Rotate injection sites	Using the same vein repeatedly can damage vein and increase the likelihood of infections
If injecting into muscles, inject in the upper arm or buttock	Reduces risk of bacterial and other infections
Do not shoot close to or into an abscess	Causes more damage to the vein and surrounding tissue
Do not lick needles before injecting	Reduces risk of bacterial and other infections
After the drugs are injected, slowly remove the needle at the same angle as it went in	This technique increases control of the needle point and may reduce damage to skin and veins
How to clean-up after injection	
After removing the needle, use a clean cotton ball to apply pressure to the injection site	Reduces bleeding after an injection

Dispose of used needles and other equipment in a puncture-proof container (see Safer handling and disposal of used injection equipment section)	Reduces opportunity for re-use of equipment and needle-stick injuries
Use a sterile bandage or cotton pad if there is bleeding after an injection	Use of other materials can increase the risk of bacterial infections. Use of alcohol pads to stem bleeding is not recommended because alcohol reduces clotting
How to recognize and treat skin and vein problems	
Know how to recognize the signs and symptoms of minor (e.g., injection site redness, warmth, swelling and pain) and serious (e.g., chest pain, prolonged malaise, grey pallor, swollen hands or feet, chills, fever, hot flashes, headaches, nausea, vomiting, shortness of breath) injection-related infections	Early medical assistance can cure many (not all) infections and reduce the chances of complications and death (see First aid for abscesses and skin infections section)
Seek assistance for injection-related problems	Early medical assistance can cure many (not all) infections and reduce the chances of complications and death
Do not squeeze or cut into an abscess	Squeezing or cutting into an abscess can push bacteria into the bloodstream
Other	
Avoid injection practices that may increase the risk of overdose	Please see Overdose prevention education section
Sources: Harm Reduction Coalition, 2000; International Council of Nurses, 2001; WHO, 2004; Seattle and King County Public Health, 2004; Sexual health and bloodborne virus program, Department of Health, Government of Australia, 2004; Chicago Recovery Alliance, 2005.	

CONSIDERATIONS

While providing written material to clients can help to reinforce instructions, not all clients are able to read. According to workers, it is as important to explain written material and demonstrate techniques, as it is to distribute written material to clients.

During safer injection education sessions, clients are often encouraged to rotate injection sites to reduce the risk of vein damage caused by over-use of particular sites. However, recent research suggests that IDUs may not rotate their injection sites because they fear losing a 'hit' and/or find it difficult to use their non-dominant hand for injection.

Encouraging and ensuring that clients have access to a reliable source of sterile injection equipment is crucial to reduce injection-related risks. It is also important because of concerns raised in the United States about street needle sellers selling 'used' needles but telling buyers that the needles are new. The frequency of this practice in Canada is unknown but does raise concerns for IDUs who may unknowingly buy non-sterile needles. Teaching clients how to recognize new from used needles (e.g., only buy needles in packaging that is intact) is not recommended because of the difficulties of determining with 100% accuracy if a needle is new or not. Clients who believe they are able to distinguish new from used needles may develop a false sense of security and unknowingly place themselves at risk of injection-related infections and injuries.

Most injection related problems (e.g., abscesses) are easily treated by trained medical professionals. However, IDUs may delay treatment seeking because they want to avoid the judgemental attitudes of, or reporting to the police, by medical professionals. Advocating on behalf of clients at hospitals and walk-in clinics may help to reduce prejudice against clients and improve the likelihood that clients will seek help when needed.

Pamphlets and other information materials available target either IDUs who self-inject or healthcare workers. These materials are not available for IDUs who inject other people. Often labelled 'hit doctors' or 'street-docs' these IDUs help others who are unable to inject drugs because they lack the skills, suffer from severe withdrawal or for other reasons. However, hit doctors are at risk of acquiring bloodborne pathogens from needlestick injuries and other unsafe injection practices. Encouraging clients to learn how to properly inject may reduce opportunities for victimization. However, development of appropriate materials for hit or fix doctors may provide opportunities to reduce unsafe injection practices.

Injection techniques are typically learned from and reinforced by peer groups. As a result, attempts by NEPs to change injection techniques among IDUs will likely require interventions at both the individual and community level. Peer exchangers may have an important role to play in changing unsafe injection behaviours to safer injection behaviours (see Peer-based outreach in **Needle exchange program delivery models** section). As well, peer exchangers can assist NEPs to ensure that social network members have access to sterile equipment.

As part of safer injection education in Australia, attempts have been made to discourage IDUs from injecting alone. Injecting while someone else is present can increase the chances that if an overdose occurs, someone will call for assistance. However, this type of advice must also reinforce the need to avoid

sharing of any injection equipment and to practice safer sex.

When NEPs first opened in Canada, most programs offered bleach kits for their clients to disinfect injection equipment. However, the effectiveness of bleach kits as an effective disinfection tool has been called into question. NEPs in Ontario no longer provide bleach kits. Neither the World Health Organization (2004) nor the Public Health Agency of Canada (2005) recommend that bleach kits be used to reduce the risk of HIV or HCV infection.

Teaching people to inject safely can be controversial when the rationale behind this practice is unclear. Teaching clients how to inject properly may be seen to promote, enable and/or condone injection drug use instead of a practice to reduce the harm caused by improper/unsafe injection practices.

EVIDENCE

Prevalence of injection-related problems

A study by Morrison et al. (1997) showed that injection-related problems were common among Glasgow IDUs (n= 147) recruited from NEPs. Specifically, 21% had abscesses (i.e., injection site infections); 49% had thrombosis (i.e., vein clots); 84% had bruising at an injection site(s); 87% had other injection problems such as fasciitis (i.e., deeper injection site infection), arterial damage and/or limited venous access. In the four weeks prior to the survey, 52% of IDUs had no contact with a health service other than an NEP; and 30% had not attended a health service in the past 6 months. Despite the frequency of injection related problems, only 27% had recently sought assistance for these problems stating that these problems were normal (62%) or they were reluctant to seek assistance because of unpleasant past experiences (28%). When the NEP referred IDUs, 34% did not attend the service to which they were referred. Morrison et al. (1997) conclude that IDUs will avoid treatment seeking until faced with a crisis and that NEPs need to be more proactive and encourage clients to seek medical assistance.

Among Sydney IDUs (n=200), almost all reported ever injecting into the crook of the arm. In the past 6 months, 86% injected into the crook of the arm, 48% into the forearm, 26% into the hand and 12% into the upper arm (Darke, Ross and Kaye, 2001). As well, participants reported using a mean of 3.1 injection sites in the past 6 months. Fully 97% reported a history of injection related problems with a mean of 2.3 injection-related problems in the past 6 months, including scarring/bruising (84%), lumps/swelling (64%), difficulty injecting (49%), and hitting an artery (10%).

Other injection-related problems such as wound botulism (Passaro et al., 1998; Passaro et al., 2000); vascular complications (Woodburn and Murie, 1996); and eyeball infections (Shankland and Richardson, 1998) have been reported.

Isolation of bloodborne pathogens from injection equipment

A wide range of bloodborne pathogens (or viral DNA) has been isolated from injection equipment (see **Needle and syringe exchange** and **Distribution of other injection-related equipment** sections),

including HIV, HBV and HCV (Lewis, 1974).

Use of bleach to disinfect injection equipment

In 2004, the WHO reviewed the scientific evidence concerning the effectiveness of bleach to disinfect used injection equipment. The concentration of bleach, contact time with the needle/syringe and presence of other matter in the needle (e.g., blood clots) influence the efficacy of bleach disinfection. Despite limited evidence, the WHO (2004) concluded that 'the evidence supporting the effectiveness of bleach in decontamination of injection equipment and other forms of disinfection is weak'. Furthermore, the WHO (2004) states that bleach and other methods of disinfection are not supported with good evidence for reducing HIV transmission. In 2005, the Public Health Agency of Canada reviewed the evidence regarding the use of bleach to prevent the transmission of HCV and concluded that using bleach to disinfect injection equipment offers little benefit.

A study of 2,302 IDUs in six urban sites in the United States (Monterroso et al., 2000) found that IDUs who reported ever cleaning a needle with bleach were 3.70 times more likely (95%CI: 1.34-10.0) to become HIV infected than other IDUs. Monterroso et al. (2000) suggest that IDUs who had tried to protect themselves from HIV transmission may not have done so consistently or correctly, or both.

Unsafe injection practices

Using data from 92 IDUs attending a Bristol, UK NEP, Maliphant and Scott (2005) reported on the prevalence of femoral vein injection (i.e., groin injection). Of those interviewed 51% injected into the femoral vein. The mean length of time from first injection to groin injection was 7 years, however a small number started this practice early in their injection career. Ease of access and perceived lack of other usable or convenient sites encouraged groin injection. While NEPs recommend that IDUs rotate injection sites, results from the study showed that fear of losing a 'hit' or difficulty injecting with the non-dominant hand deterred rotation of injection sites. Maliphant and Scott (2005) also advise that clients be encouraged to self-inject so that they do not lose control over their drugs, injection equipment or other circumstances.

A study conducted by Tortu et al. (2003) in East Harlem among 185 IDU women found that intimate relationships were associated with unsafe injection events. In particular, prior injection with a partner and injection with a spouse or primary heterosexual partner were predictive of unsafe injection events. Tortu et al. (2003) stress the need for interventions to target couples.

Use of acidifiers to dissolve drugs

Some drugs (e.g., crack; and black tar heroin) are sold in a chemical 'base' form and can only be dissolved using an acidifier. However, the type of acidifier used has been shown to have negative consequences for IDUs. For example, Shankland and Richardson (1988) suggest a link between lemon juice used to dissolve brown heroin and an outbreak of yeast infections of the eye (candida endophthalmitis) among heroin users in Glasgow (see **Distribution of acidifiers** section).

Behavioural change interventions

Since the 1990's, numerous studies have demonstrated the importance of peer norms on injection-related behaviours (see for example: Birkel, 1993; Zapka et al., 1993; Paone et al., 1997; Booth et al., 1998; Broadhead 1998; Madray and van Hulst 2000; Hawkins 1999; Marsch and Bickel 2004). For example, Paone et al. (1997) have noted that attempts to change individual IDU injection behaviours may be difficult if injection norms within social networks favour unsafe behaviours. As a result, interventions targeted at peer norms, and often employing peers as conduits of information and techniques have been undertaken. Overall, studies suggest that interventions targeted at peer groups and norms may be the most effective means of changing individual behaviours (see for example: Birkel, 1993; Zapka et al., 1993; Paone et al., 1997; Booth et al., 1998; Broadhead 1998; Madray and van Hulst 2000; Hawkins 1999; Marsch and Bickel 2004). Paone et al. (1997) suggest that social network interventions, including the use of peer exchangers (see Peer-based outreach in **Needle exchange program delivery models** section) may play an important role in changing unsafe injection behaviours to safer injection behaviours. Peer exchangers can help to ensure that all members of a social network each have their own sterile equipment. As well, Hawkins et al. (1999) have noted the importance of demonstrating safer techniques to reduce unsafe practices. Nevertheless, a recent study reported that computer delivered education among some IDUs may be effective to reduce unsafe behaviours (March and Bickel 2004).

In Canada and elsewhere in the world, drug user organizations such as VANDU have played a crucial role in expanding the reach of prevention and harm reduction services through their own networks, and often to IDUs at risk (Jürgens 2005). Involving these organizations can improve interventions. Peer exchangers can have an important role to play to change unsafe injection behaviours to safer injection behaviours.

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Safer sex promotion and provision of safer sex materials

Best practice recommendations – in detail

To reduce sexual the transmission of HIV, HCV, and other STIs:

- ▶ Educate clients about the risk of sexual transmission of HIV, HCV, and other STIs through oral, vaginal and anal penetration, as well as cunnilingus and anilingus
- ▶ Provide education about prevention of sexual transmission of HIV, HCV and other STIs
- ▶ Educate women having sex with women (WSW) about their potential for becoming infected with STIs including HIV
- ▶ Distribute materials needed to practice safer sex in the quantities requested by clients with no limit on the number provided, including:
 - ▶ Male lubricated and non-lubricated condoms
 - ▶ Female condoms
 - ▶ Packets of lubricant
 - ▶ Dental dams
 - ▶ Latex gloves and fingers cots
- ▶ Refer clients with concerns about contraception or STIs to sexual healthcare providers; and ensure that clients who cannot afford to pay for prescriptions or devices have assistance to obtain them
- ▶ Condoms are the first choice for prevention of disease transmission; the use of cervical barriers may be a valuable additional measure

INTRODUCTION

IDUs are at risk of HIV infection through unprotected sex with an infected person as well as through the sharing of injection equipment. A high proportion of IDUs have sexual partners who are also IDUs, increasing their risk of having an infected sexual partner. At the same time, IDUs often have sexual partners who are non-IDUs and who could also be placed at risk of becoming infected. Users of non-injection drugs have also been shown to be at increased risk for sexual transmission of HIV as well as other STIs such as syphilis. Therefore, prevention of sexual transmission of HIV and other STIs is an important component of harm reduction services for drug users.

A comprehensive guide to assessing risk for sexual transmission of HIV is available from the Canadian AIDS Society. HIV Transmission: Guidelines for Assessing Risk is available online at: www.cdnaids.ca/web/repguide.nsf/pages/cas-rep-0307.

NEP clients may be less aware of the risks of sexual transmission than of needle sharing risks, and may require education about these risks. Women who have sex with women (WSW) may particularly lack awareness of the possibility of transmission of HIV and other STIs through their sexual contacts and the benefits of using protective barriers. This is particularly relevant since epidemiology suggests that a relatively high proportion (roughly 20 or 30% in many studies) of female IDUs self-identify as lesbian or bisexual. More extensive discussion of the specifics of the various safer sex materials available is provided in the sections to follow.

CONSIDERATIONS

NEPs have generally been established with a primary focus on reduction of injection-related risks for IDUs. Some have extended to provision of materials to reduce transmission of infection through the sharing of smoking equipment by non-injectors. Because of this focus on drug use issues, not all NEP staff may be sufficiently knowledgeable and experienced in addressing sexual risk behaviours with their clients. Similarly, clients who are attending NEPs primarily for injection related issues may be uncomfortable addressing sexual risk behaviours and may need trust, encouragement and appropriately private conditions to be willing to engage in discussion of sexual risks.

EVIDENCE

IDUs are at risk of HIV infection through unprotected sex with an infected person as well as through the sharing of injection equipment. A high proportion of IDUs have sexual partners who are also IDUs, increasing their risk of having an infected sexual partner (Ross and Williams, 2001; Ross et al., 1993; Sasse et al., 1991). Users of non-injection drugs have also been shown to be at increased risk for sexual transmission of HIV as well as other STIs such as syphilis (Marx et al., 1991; Martin and DiCarlo, 1994). Therefore, prevention of sexual transmission of HIV and other STIs is an important component of harm reduction services for drug users.

A meta-analysis by Semaan et al. (2002) examined the effectiveness of 33 U.S.-based HIV intervention studies in reducing the sexual risk behaviours of drug users by reducing unprotected sex or increasing the use of male condoms. Ninety-four percent of the studies examined recruited IDUs and 21% recruited crack users. Interventions compared with no intervention showed a strong and significant effect (OR 0.60, 95%CI: 0.43-0.85). Interventions which were compared to other HIV interventions still showed a modest additional benefit (OR 0.91; 95%CI: 0.81-1.03). They conclude that the potential reductions in sexual risk behaviour justify providing sexual risk behaviour reduction interventions to IDUs and that developing interventions with stronger effects to further reduce sexual risk behaviours among IDUs must remain a high priority.

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Distribution of condoms

Best practice recommendations – in detail

To reduce the sexual transmission of HIV, HCV, and other infections (STIs):

- ▶ Distribute materials needed to practice safer sex in the quantities requested by clients with no limit on the number provided, including:
 - ▶ Male lubricated and non-lubricated condoms
 - ▶ Female condoms
 - ▶ Packets of lubricant
- ▶ Educate clients about the HIV, HCV and STI -related risks associated with the non-use of condoms
- ▶ Educate clients about the correct use of condoms

INTRODUCTION

Different sexual activities have varying degrees of risk for transmission of STIs including HIV and HCV (Canadian AIDS Society, 2004). Sexual activities that involve infected semen, vaginal fluid, menstrual blood or urine on an open wound or mucosal membrane carry a risk of disease transmission from one person to another. Fishman and Anderson stated that the situations that carry the greatest risk of infection include unprotected receptive anal or vaginal intercourse that involves torn mucosal lining or the presence of genital ulcerations (Fishman and Anderson, 2003).

CONSIDERATIONS

Some NEP clients may be allergic to latex condoms. However, as both latex and polyurethane condoms are effective mechanical barriers to the sexual transmission of HIV and other STIs, both types should be available for distribution. Both types of condoms undergo numerous regulatory tests in Canada to ensure their strength and efficacy. Synthetic products such as polyurethane condoms are known to be stronger than latex although also more expensive. Polyurethane does not stretch like latex, however it is more resistant to degradation due to exposure to light or heat thus polyurethane condoms last longer. Natural membrane condoms such as those made of lambskin are not considered effective in preventing disease transmission since HIV can easily pass through the pores of the membrane (Canadian AIDS Society, 2004).

The female condom is a polyurethane sheath that lines the inside of the vagina and is held in place by two flexible rings at either end. Similar to a male condom, the female condom has been proven to be an effective mechanical barrier to STIs and viruses including HIV (Canadian AIDS Society, 2004).

EVIDENCE

Male condom use practices

Correct and consistent use of condoms for all penetrative sexual acts has been proven to help reduce the sexual transmission of STIs including HIV (Saracco et al., 1993; Anonymous, 1993; Anonymous, 2002; Weller and Davis, 2002; Guimaraes, Vlahov and Castilho, 1997; Ding et al., 2005; Anonymous, 2003; Centers for Disease Control and Prevention, 2004; Hanenberg et al., 1994; Paz-Bailey et al., 2005; Carey et al., 1994). However the correct and consistent use of condoms is low. For example, MacDonald and colleagues interviewed 712 Canadian street youth (391 men and 321 women) in 1988 and found that 73% of men and 75% of women inconsistently used condoms (MacDonald et al., 1994).

In terms of condom use among Ontario IDUs, a study of clients at Ontario NEPs in 1997 to 1998 found that 59% of both male and female participants did not always use condoms (Millson et al., 2003). In Ottawa, among 418 men and 85 women IDUs participating in the POINT Project between October 2002 and January 2003, Leonard and colleagues reported differing levels of condom use among IDUs depending on the closeness of the sexual partner. For example among 60 women IDUs reporting sex with a regular male partner, the majority (68%) reported never using condoms with them. In direct contrast, condom use with an occasional male partner or male client was higher. Among the 12 women IDUs who reported sex with an occasional male partner, 67% reported using condoms every time and among the 24 women IDUs who reported sex with a male client, 75% reported using condoms every time. This pattern of lower condom use with regular opposite sex partners observed among women IDUs was similarly observed among men IDUs. Among 205 men IDUs reporting sex with a regular female partner, 32% reported using condoms all the time; among 184 men IDUs who reported sex with an occasional female partner, 58% reported using condoms every time and among the 44 men IDUs who reported sex with a female client, 52% reported using condoms every time (Leonard et al., 2005).

Infrequent condom use is especially common among IDUs and female commercial sex workers (CSWs). For example, in a study by White and colleagues examining the sexual behaviours of 97 men IDUs and 44 women IDUs in London, UK, 66% of those who engaged in sexual activities reported never using condoms (White et al., 1993). In Canada, pilot data from the I-Track study examining risk behaviours among Canadian IDUs document that 69% of 209 women participants reported that condoms were never used during penetrative sex with a regular male sex partner. This proportion ranged from 54 to 82% in the various recruitment sites across Canada (Health Canada, 2004).

Female condom effectiveness and use

Minnis and Padian performed an article review to examine the effectiveness of female controlled barrier methods in preventing the sexual transmission of HIV and other STIs. The authors suggest that the use of female condoms offers as much protection from STIs as male condoms. For example, one article by Fontanet found that female condoms were at least as effective as male condoms at reducing the sexual transmission of STIs (RR=0.8; 95%CI: 0.5-1.2) (Minnis and Padian, 2005).

The female condom can also be used during anal intercourse to provide some protection although it has

not been designed or approved for this purpose (Canadian AIDS Society, 2004). Gross and colleagues examined 2,277 participants in a prospective cohort study and found that 48% of men who have sex with men (MSM) had heard of using the female condom for anal sex and 13% of this group had used it in the six months prior to the interview. However, among users of the female condom, 57% reported problems such as rectal bleeding (Gross et al., 1999).

Prevention of STI transmission (other than HIV)

The use of condoms has been proven to reduce transmission of STIs such as chlamydia, gonorrhea, genital ulcers (e.g., herpes), and pelvic inflammatory disease from penile-vaginal or penile-anal sex (Anonymous, 1993; Anonymous, 2003). For example in a study by Paz-Bailey and colleagues examining the effect of correct and consistent condom use on the transmission of chlamydia and gonorrhea among 509 adolescent girls in Atlanta, Georgia, the authors found that after adjusting for confounders, correct and consistent use of condoms reduced transmission of chlamydia (OR=0.4; 95%CI: 0.2-1.0) and was highly protective for gonorrhea (OR=0.1; 95%CI: 0.0- 0.7; Paz-Bailey et al., 2005).

Condom use has also reduced the sexual transmission of STIs among CSWs. Ding and colleagues (2005) examined HIV and other STIs among 621 female CSWs in China. Inconsistent condom use was independently associated with the transmission of STIs. Sex workers who reported engaging in unprotected sex at least twice per month were found to be more likely to have had an STI (adjusted odds ratio (AOR) =5.2; 95%CI: 2.3-12.0). CSWs who reported having unprotected sex between one and two times per month had a slightly lower risk of having had an STI (AOR=4.6; 95%CI: 2.0-10.4; Ding et al., 2005).

Similarly, Hanenberg and colleagues investigated the impact of a Thai HIV-control program that started in 1989 targeted at the commercial sex industry. Among Thai female CSWs surveyed between 1989 and 1993, condom use increased from 14 to 94% and the number of diagnosed cases of five major STIs was reduced by 79% in men (Hanenberg et al., 1994). These studies among others elucidate that condoms are highly effective tools for preventing the spread of several STIs.

Prevention of HIV transmission

Risk of HIV transmission depends on many issues such as viral load and host immunity. The probable risk for one episode of unprotected penile-vaginal intercourse has been estimated to be between 0.1 and 0.2%. Penile-anal intercourse has a higher estimated risk of 0.8 to 3.2% (Fishman and Anderson, 2003). These risks may be increased by the presence of additional risk factors such as ulcerative STIs (syphilis, herpes, etc.), and being uncircumcised for men (Røttingen, Cameron and Garnett, 2001; Canadian AIDS Society 2004).

Correct and consistent use of condoms has been shown to effectively prevent the transmission of HIV (Anonymous, 2003; Centers for Disease Control and Prevention, 2004). According to the Centers for Disease Control and Prevention, the ability of condoms to prevent HIV transmission has been scientifically established through various observational and laboratory studies. In these studies, condoms have been proven to provide a high degree of protection between serodiscordant couples and provide an impermeable barrier to viruses even smaller than HIV (Centers for Disease Control and Prevention, 2004). One such

laboratory study conducted by Carey and colleagues examined the effectiveness of latex condoms as a barrier to HIV-similar viruses. The authors found that the weakest condom barrier situation still provided at least ten times more protection than not using a condom at all.

Evidence of reduction in HIV transmission risk associated with consistent condom use can also be seen in studies that compare individuals who use condoms all the time and those who use them inconsistently. For example, Guimaraes and colleagues examined post-coital vaginal bleeding and HIV transmission risk among serodiscordant couples in Brazil. Among 418 women, the authors found that reporting "sometimes" (OR=1.4) and "rarely to never" (OR=2.0) use of condoms during vaginal sex was independently associated with HIV infection when compared to those who "always" use condoms (Guimaraes, Vlahov and Castilho, 1997).

In a systematic review of the effectiveness of condoms to reduce the risk of heterosexual transmission of HIV, Weller and Davis calculated an HIV incidence estimate of 5.8 per 100 person years (95%CI: 3.16-9.66) among 10 cohorts in which participants "never" used condoms during heterosexual intercourse. In contrast, an HIV incidence estimate of 1.1 per 100 person years (95%CI: 0.56-2.04) among 13 cohorts in which participants "always" used condoms yielding a proportionate reduction of 80% in HIV seroconversion with consistent use of condoms (Weller and Davis, 2002).

Similarly, Saracco and colleagues investigated male-to-female sexual transmission of HIV in 343 couples. An HIV seroconversion incidence rate of 7.2 per 100 PY was calculated for those who inconsistently or never used condoms, and 1.1 per 100 PY for those who always used condoms during penile-vaginal intercourse (Saracco et al., 1993).

The results of these and many other studies show that condoms are an effective means of preventing the sexual transmission of HIV (Anonymous, 2002).

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Distribution of dental dams and other protective barriers

Best practice recommendations – in brief

To reduce the sexual transmission of HIV, HCV, and other infections (STIs):

- ▶ Distribute dental dams in the quantities requested by clients with no limit on the number provided
- ▶ Educate clients about the risk of sexual transmission of HIV, HCV, and other infections through oral, vaginal and anal penetration, as well as cunnilingus and anilingus
- ▶ Educate women IDU clients who have sex with women about their susceptibility to the sexual transmission of infections including HIV
- ▶ Educate clients about the potential HIV- and other STI-related risks associated with non-use of dental dams
- ▶ Educate clients about the correct use of dental dams and the possibility of using plastic wrap if dental dam are unavailable

INTRODUCTION

HIV and other STIs are found in menstrual blood, and in the vaginal and anal secretions of people living with these infections. It is recommended therefore that a barrier be placed between the mouth and the vagina or anus in order to reduce the risk of HIV and other STI transmission when performing oral sex (Canadian AIDS Society, 2004; Sexual Health Info Center, 2005; Wikipedia, the free encyclopedia, 2005; Barnard College Student Health Services, 2004; Centers for Disease Control and Prevention, 2000).

For infection control purposes, dental dams were first used as dental surgery tools to isolate a tooth. They are thick 6" by 6" square pieces of latex and have recently been recognized as safer sex tools as they provide a barrier preventing HIV and other STI transmission (Canadian AIDS Society, 2004; Sexual Health Info Center, 2005; Wikipedia, the free encyclopedia, 2005; Barnard College Student Health Services, 2004). A makeshift dental dam can be made by cutting a rolled condom and opening it up to a rectangular sheet of latex (Wikipedia, the free encyclopedia, 2005; Barnard College Student Health Services, 2004). The dam is placed over the vagina or anus during oral sex.

Plastic wrap has also been recommended as a safer sex tool by some AIDS educators. It is cheap, accessible, and easy to use, however it is not as elastic as latex (Canadian AIDS Society, 2004). Only Glad® plastic wrap has been studied in the laboratory as an effective physical barrier to STIs. It was found to be an effective barrier to the herpes simplex virus, but has not yet been tested as a barrier for HIV (Canadian AIDS Society, 2004).

CONSIDERATIONS

A common theme identified in studies of lesbian sexual relationships is the idea of "lesbian immunity", a concept identified by Stevens and Hall in their study on safer sex for lesbian and bisexual women in San Francisco. After interviewing 1,189 lesbian and bisexual women, the authors reported that 56% of respondents had unprotected sex with women and 20% had unprotected sex with men which was in part

due to the belief that women who have sex with women cannot contract HIV (Fishman and Anderson, 2003).

Similarly, Morrow and Allsworth found that 84% of lesbian and bisexual women believed that during the year prior to the interview they were not at risk of HIV infection and 61% believed they had no lifetime risk. However, in terms of actual behaviour, 85% of these women reported having unprotected sex with another woman every month (Morrow and Allsworth, 2000; Fishman and Anderson, 2003).

As female-to-female transmission of HIV has been documented (Morrow and Allsworth, 2000), it is imperative that this observed weak HIV risk perception among lesbian and bisexual women is addressed through harm reduction counselling at NEPs.

Although cunnilingus is likely to be lower risk than penile-vaginal sex, it would also seem reasonable to advise male partners of women living with HIV or women at higher risk of acquiring HIV to use dental dams as a protective barrier when giving oral sex.

EVIDENCE

Utilization of dental dams and plastic wrap

Studies have documented that the frequency of use of dental dams and plastic wrap during oral sex is low. Morrow and Allsworth examined sexual risk behaviours among 504 self-identified Canadian and American lesbian and bisexual women and found that among 436 lesbians, only 7% had ever used a latex dam and 1% had ever used plastic wrap. Among 68 bisexual women, 4% reported any latex dam use and 9% reported ever using plastic wrap (Morrow and Allsworth, 2000).

These findings of low engagement in protective sex among lesbians and bisexual women are confirmed in a study by Fishman and Anderson. Among 78 lesbians, 2% always used dental dams, 6% sometimes used them, 91% knew about dental dams but never used them, and 2% had no knowledge of dental dams as a safer sex tool. Similarly 2% of respondents always used plastic wrap, 10% sometimes used it, 78% knew about plastic wrap but never used it, and 11% had no knowledge of plastic wrap as a safer sex tool (Fishman and Anderson, 2003).

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Distribution of latex gloves and finger cots

Best practice recommendations – in brief

To reduce the sexual transmission of HIV, HCV, and other infections (STIs):

- ▶ Distribute latex gloves and finger cots in the quantities requested by clients with no limit on the number provided
- ▶ Educate clients, particularly lesbian and bisexual women, about the HIV-, HCV- and STI-related risks associated with the non-use of latex gloves
- ▶ Educate clients, particularly lesbian and bisexual women, about the correct use of latex gloves

INTRODUCTION

Finger cots are latex covers that envelop individual fingers, whereas a latex glove will protect the entire hand. In the same way that latex condoms prevent the transmission of STIs during sexual intercourse, latex gloves and finger cots will prevent HIV, HCV and other STI transmission to or from hand or finger cuts during manual sexual stimulation (Canadian AIDS Society, 2004). For this reason, both these items are tools for safer sex and should receive more attention in STI/HIV sexual risk-reduction programs, especially targeting lesbians and bisexual women.

CONSIDERATIONS

Vinyl gloves, although not as effective at blocking transmission of HIV and other pathogens as latex gloves, do provide some protection and should be offered to those clients with latex allergies. See further discussion below.

EVIDENCE

Frequency of glove use

Studies have shown that lesbians and bisexual women frequently engage in digital sexual stimulation, however use of latex gloves remains low. Morrow and Allsworth examined sexual risk behaviours among 504 self-identified Canadian and American lesbian and bisexual women. Digital-vaginal stimulation and digital-anal stimulation were common sexual activities among this group: 89% reported giving digital-vaginal stimulation and 94% reported receiving it; and 35% reported giving and 35% reported receiving digital-anal stimulation. Despite the frequency of engagement in these sexual activities, only 6% of 436 lesbians and 12% of 68 bisexual women ever used a latex glove (Morrow and Allsworth, 2000).

Similarly, Fishman and Anderson examined HIV risk perception among 78 lesbians and found that only 4% always used latex gloves, 11% sometimes used them, 83% knew about latex gloves but never used them,

and 1% had no knowledge of latex gloves as a safer sex tool (Fishman and Anderson, 2003).

Prevention of HIV transmission

Latex has been proven to prevent the transmission of pathogens including HIV. Zbitnew and colleagues compared the effectiveness of vinyl and latex gloves as barriers to HIV-1 and herpes simplex virus type 1 transmission. The authors found that intact gloves prevented the transmission of viral particles (Zbitnew et al., 1989).

Similarly, Neal and colleagues conducted a review of the literature examining pathogen penetration of latex gloves. The authors found that glove design, composition, manufacturer and mechanical manipulation all had an influence on glove performance as a barrier to pathogens. They concluded that latex gloves appeared to be better barriers to viral penetration than vinyl gloves (Neal et al., 1998).

The effectiveness of latex gloves as a barrier to HIV transmission can also be determined from studies examining the prevention of needlestick injuries in a healthcare setting. Johnson and colleagues studied the efficacy of several glove combinations as barriers to HIV transmission after the gloves were punctured with a needle containing HIV-1. One, two and three layers of latex glove material were tested, and sometimes the intermediate level was replaced with a cotton or Kevlar layer. The presence of a virucidal compound was also tested. The rate of HIV-1 infection of cell cultures was greater than 90% with a single layer of latex, and 23 to 60% for the double- and triple- layer trials. The authors also found that the rate of infection was 6% for two latex layers and an intermediate layer of Kevlar without spermicide, which was reduced to 0% with the addition of a spermicide. The latter two trials proved Kevlar with and without a virucidal compound to be the most effective barrier to needlestick HIV transmission (Johnson et al., 1991).

For these reasons latex gloves should be used to protect sexual partners from HIV transmission during sexual activities involving vaginal or anal penetration with the fingers or hand.

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Encourage use of cervical barriers

Best practice recommendations – in brief

- ▶ Condoms (male and female) are the first choice to reduce sexual transmission of HIV, HCV, and other STIs. Other barrier methods may be used in addition to condoms
- ▶ Educate clients about diaphragms and cervical caps and their benefits, used along with condoms if possible, in reducing risks of STIs, especially HIV
- ▶ Refer clients who are interested in using diaphragms or cervical caps to a source of sexual health/family planning care for expert fitting and prescription of these devices

INTRODUCTION

Cervical barriers, such as diaphragms and cervical caps, are made of latex or silicone and are used to prevent pregnancy by placing them over a woman's cervix before engaging in penile-vaginal intercourse (Canadian AIDS Society, 2004). Recent studies have shown however that cervical barriers may also play a role to prevent sexual transmission of STIs, including HIV (Canadian AIDS Society, 2004).

CONSIDERATIONS

When diaphragms and cervical caps are used for contraception, they are often used with a spermicide, usually containing nonoxynol 9. Several clinical trials of nonoxynol 9 use in its own right as a prevention for HIV (in the form of a sponge, gel or film) have demonstrated that it does not reduce HIV transmission, and may even increase it due to inflammation and damage to the vaginal and cervical epithelium. Further research is required to determine the effectiveness of cervical barriers used with or without spermicide; it is particularly urgent that spermicides be identified which will be effective contraceptives and also effective in reducing HIV risk. Meanwhile it is probably wise to recommend that clients avoid the use of nonoxynol 9 in situations where there is a risk of HIV transmission.

EVIDENCE

The cervix and HIV transmission

Women are physically more vulnerable to the sexual transmission of HIV and other STIs than men (Canadian AIDS Society, 2004; Anonymous, 1993). This contention of biologic disadvantage in relation to HIV is grounded in the relative efficiency of male-to-female transmission of the virus in one single act of unprotected heterosexual contact compared with female-to-male transmission. A higher concentration of HIV in semen than in vaginal secretions; a greater transmitted volume of seminal fluid compared with vaginal fluid; and a comparatively larger area of mucous membrane in the vagina through which seminal fluid is absorbed together construct for women a greater likelihood than men of being infected in one

single act of penile-vaginal unprotected intercourse (Suffet and Lifshitz, 1991; Newell, 1999; Grubert et al., 1999). However a woman's vulnerability to infection is in part due to the nature of the cervix (Canadian AIDS Society, 2004).

The cervical epithelium is fragile. It consists of a single layer of relatively fragile cells that is more easily damaged compared to the multiple strong layers of cells making up the vaginal epithelium (Canadian AIDS Society, 2004). Moench and colleagues studied the properties of the vagina and cervix in terms of disease prevention, and described the cervix as an easily compromised barrier providing a likely site for STI and HIV infection (Moench, Chipato and Padian, 2001). In addition, the HIV-specific receptors (CD-4 positive cells) are commonly found in the cervical lumen and rarely found in the vaginal lumen. Another receptor, CCR5, acts as the co-receptor for HIV and is also found more frequently in the cervix (Patterson et al., 1998). These properties contribute to the cervical epithelium having a higher risk of HIV infection compared to the vaginal epithelium (Moench, Chipato and Padian, 2001).

These findings have led researchers to study the cervix and its susceptibility to disease. Zhang and colleagues examined the sexual transmission of simian immunodeficiency virus (SIV) in CD-4 positive cells in rhesus macaques (Zhang et al., 1999). Endocervical cells were found to be infected after three days and the vaginal mucosa was found to be infected after 12 days. Thus, it appears the cervix may be an initial site for infection, although there is evidence that the cervix is not necessary for infection to occur (Moench, Chipato and Padian, 2001). A study by Hu and colleagues showed that removal of the cervix in the SIV/ macaque model did not reduce the efficiency of transmission through the vaginal epithelium (Hu, Gardner and Miller, 2000). This should not, however, be interpreted to mean that the cervix is not a site of increased vulnerability to infection (Moench, Chipato and Padian, 2001).

Prevention of STIs transmission (other than HIV)

To date, there are no controlled trial studies that confirm the protective effect of cervical barriers on the transmission of STIs. However, there are numerous studies providing observational and epidemiological evidence often by comparing diaphragm users to non-users (Moench, Chipato and Padian, 2001; Minnis and Padian, 2005).

Magder and colleagues studied factors relating to the transmission of genital chlamydial infection among 2,320 patients who attended the Denver Metro Health Clinic between 1981 and 1983. The authors reported 17% of 1,031 women patients had positive cervical cultures. However no infection was detected among women using a diaphragm (Magder et al., 1988; Moench, Chipato and Padian, 2001).

Similarly, Rosenberg and colleagues led a retrospective study comparing various female barrier methods reported by 5,681 women from an urban health clinic. Women using the contraceptive sponge or diaphragm had between 68% and 76% lower rates of infection with gonorrhoea (OR=0.3; 95%CI: 0.2-0.5) and trichomoniasis (OR=0.2; 95%CI: 0.1-0.5) respectively compared with women using no contraception or with tubal ligations. In this study, the protection from STIs offered by the sponge or diaphragm appeared to be greater than that offered by condoms (Rosenberg et al., 1992; Moench, Chipato and Padian, 2001).

Finally, a case-control study conducted by Austin and colleagues examined the protective effect of

spermicide on the sexual transmission of gonorrhea among 735 women with gonorrhea and 958 infection-free women attending an STI clinic. The relative risk (RR) of gonorrhea for spermicide and diaphragm users was 0.45 (90%CI: 0.2-1.3). Among women not using oral contraceptives, an intrauterine device or with tubal ligation, the RR of gonorrhea for spermicide users compared with non-users was 0.47 (90%CI: 0.3-0.9). Thus the use of diaphragms in conjunction with spermicide can help to appreciably reduce the risk of sexual transmission of gonorrhea (Austin, Louv and Alexander, 1984).

Prevention of HIV transmission

A woman's susceptibility to HIV is related to her STI history. Patterson and colleagues examined chemokine receptor expression in the female genital tract and the associated implications for HIV transmission. The authors reported that the number of CCR5 receptors significantly increased in women with STIs ($p=0.02$; Patterson et al., 1998). Given that the cervix appears to be a primary site of infection (Moench, Chipato and Padian, 2001; Minnis and Padian, 2005), cervical barriers would theoretically prevent the exposure of the cervical epithelium to various infectious agents. With diaphragm use, the exposure of CD-4 positive cells and CCR5 receptors would be reduced thus limiting HIV infection opportunities.

Female-controlled barrier methods can protect the cervix and are effective in reducing the risk of STIs and potentially also HIV transmission and thus should be considered an effective tool in disease prevention. Both diaphragms and cervical caps require fitting by a physician or nurse-practitioner. Both are most effective when used along with, rather than instead of, condoms and are likely to be less effective than female condoms as barriers to HIV transmission, although there is as yet no research assessing this. These barriers may provide some degree of protection where male or female condom use cannot be negotiated. However, more study is needed to determine how effective they are in prevention of HIV in situations where male or female condom use is not possible.

NEPs can provide educational information about the use of diaphragms, cervical caps and condoms, encourage their female clients to consider these options, and refer them to sexual health clinics run by public health departments, other family planning services, or family doctors/gynecologists to be fitted for a diaphragm or cervical cap.

Female-controlled HIV prevention methods are needed to ensure that women can play an active role in reducing their risk of acquiring STIs, including HIV (Minnis and Padian, 2005).

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Overdose prevention education

Best practice recommendations – in brief

To reduce fatal and non-fatal overdose among IDUs:

- ▶ Educate clients about the risks and signs of overdose
- ▶ Educate clients about overdose prevention techniques
- ▶ Provide first aid and CPR training to clients
- ▶ Encourage clients to seek medical assistance in the event of an overdose or distress
- ▶ Educate clients about the information to provide when 911 is called

INTRODUCTION

Death rates among drug users are 3 to 14 times greater than non-drug using same-age peers (Joe et al., 1982) and many of these deaths are attributable to overdose. Among IDUs, overdose is the leading cause of death (Powis, 1999; Commonwealth of Australia, 2001). Several factors contribute to an increased risk of overdose among IDUs, including:

- ▶ Polydrug use (i.e., using different types of drugs and/or alcohol together)
- ▶ Loss of drug tolerance (e.g., after an incarceration or drug treatment)
- ▶ Hurried injection of drugs
- ▶ Injection of drugs from a new or an unknown source
- ▶ Unknown strength of drugs
- ▶ Long history of injection drug use
- ▶ Prior nonfatal overdose
- ▶ Injecting alone or having someone else inject the drugs into the user
- ▶ Delay in seeking medical attention
- ▶ Recent release from prison

However, many overdoses can be prevented with prompt and appropriate medical and other assistance. Overdose deaths seldom occur immediately after injection of drugs and evidence suggests that early intervention by emergency personnel greatly increases survival. Education and training of IDUs about how to prevent, recognize and respond to overdose situations is necessary to reduce overdose-related deaths and other serious health consequences such as pulmonary, cardiac, muscular and neurological complications.

Lack of knowledge about overdose

Not all IDUs are knowledgeable about the signs and symptoms of overdose or about the lag time between consumption and onset of overdose symptoms. As a result, symptoms that do not appear immediately after an injection may not be interpreted as symptoms of overdose and may not lead IDUs to intervene or seek help. It is important that IDUs seek attention not only in overdose situations but also when someone

who has injected drugs appears to be in distress.

IDUs often underestimate their personal risk of overdose but are considerably more accurate in estimating other IDUs' risk of overdosing. Underestimating personal risks can lead some IDUs to continue unsafe practices such as injecting alone or injecting larger than usual quantities of drugs.

As well, IDUs commonly have inaccurate knowledge about the techniques likely to be helpful to someone experiencing an overdose. IDUs often believe that to speed recovery, someone experiencing an overdose should be: placed in a cold bath, injected with more drugs or with salt water, or be inflicted with pain. These commonly held beliefs are inaccurate, could lead to harmful consequences and point to the need for accurate overdose prevention education.

Lack of medical or other assistance

While lack of knowledge about overdose may contribute to overdose-related deaths among IDUs, lack of medical or other assistance during an overdose greatly contributes to deaths. Real or perceived concern about arrest discourages many IDUs from seeking assistance for an overdose. Often, police are dispatched or their presence is requested by ambulance services when overdose is the reason for calling emergency medical assistance. However, evidence shows that early intervention can reduce the risk of death.

Components of overdose prevention education

Overdose prevention education often includes information and skills building components (see **Table 10**). In terms of information, education programs include explanations about how to recognize the signs of an overdose and the risks of lowered tolerance. The symptoms of overdose vary depending on the drug consumed. For example, opiates may lead to symptoms such as deep snoring, slow or erratic heartbeat and passing out. A stimulant overdose (e.g., cocaine, methamphetamine) may lead to symptoms such as rapid breathing, high fever, seizure, convulsions, delirium, confusion, sweating and rapid increase in blood pressure. Overdose education can be provided face-to-face and/or with a comprehensive range of printed overdose prevention material available on-site and/or handed out with other program equipment.

First aid training is also included in overdose education programs for IDUs, their family and others who may be present during an overdose. Teaching clients effective resuscitation and basic life support techniques to revive someone who has overdosed can be beneficial until medical help arrives. Teaching clients about the recovery position to prevent users from choking on their own vomit, mouth-to-mouth resuscitation, and cardio-pulmonary resuscitation (CPR) is also recommended.

Qualified staff should deliver training. Compensating clients for attending training sessions has been shown to increase participation. Organizations that could provide such training include ambulance services, St. John's Ambulance, and the Red Cross. Training conducted by ambulance staff may potentially foster understanding and trust between IDUs and ambulance staff.

Since overdose deaths seldom occur immediately after drugs are injected, and there is usually time to intervene, encouraging clients who witness an overdose to seek medical assistance by calling 911 can

reduce overdose deaths. However, IDUs may need training about what they need to say when calling 911 for assistance. For example, the literature suggests that when calling 911, IDUs need not mention that someone has overdosed but rather inform dispatchers that the person has stopped breathing and provide the address and phone number for the location (Sorge & Kershner, 1998, Harm Reduction Coalition, 2000). However, to provide effective medical assistance when they arrive, paramedics need information about the type of drug consumed and any known medical conditions. As well as encouraging clients to call 911, encouraging them to not leave the person who has overdosed alone is also recommended.

Table 10: Examples of recommended overdose prevention practices

Recommendations	Rationale
Avoid mixing drugs with similar effects	Drugs with similar effects when combined can increase the risk of overdose
When tolerance is low (e.g., after drug treatment or release from jail): <ul style="list-style-type: none"> ▶ Use a smaller amount of drugs than before ▶ Smoke or snort drugs to reduce the speed of absorption into the body ▶ Use with someone else present or let someone know to check 	Lowered tolerance can increase the risk of overdose
Take care when using drugs from a new and/or unknown source: <ul style="list-style-type: none"> ▶ Inject a 'test shot' to test potency ▶ Ask others about the potency 	Using drugs of unknown potency can increase the risk of overdose
Buy drugs from a regular and trusted source	
Know how to recognize symptoms of overdose in self and others	Early intervention during an overdose can reduce the chances of death
Know what to do, and what not to do, if you or someone else shows symptoms of overdose	
Call for assistance if you or someone else is overdosing	
Do not leave someone who is overdosing alone	Early intervention during an overdose can reduce the chances of death and the chances of victimization

Targeted overdose prevention education

Several factors found to increase the likelihood of death from overdose among IDUs can be used to identify clients at increased risk and to tailor education programs accordingly. Factors found to increase the risk of death from overdose include: a long history of injecting, high levels of drug use or intoxication, low tolerance, prior non-fatal overdose, homelessness, diagnosis of depression, recent release from prison and a history of using combinations of drugs.

CONSIDERATIONS

Despite the consequences of overdose for IDUs, many fear the consequences of police involvement and delay seeking assistance in overdose situations. There are several initiatives in Australia that aim to limit police attendance at overdoses and many jurisdictions have developed formal policies outlining police protocols in overdose situations. These initiatives can increase the likelihood that IDUs will call for assistance, and also decrease overdose deaths. Similar initiatives in other jurisdictions may produce similar results. In particular, development of partnerships between NEPs, the police, and emergency personnel can be used to develop and implement procedures that would make IDUs less reluctant to seek medical assistance when necessary. For instance, policies could include ensuring police do not arrest, search, or charge IDUs (or others) who have placed an emergency call.

Although not yet widely available in Canada, buprenorphine is used in other countries as an opiate replacement treatment. In France, buprenorphine is the predominant opiate replacement treatment in use. However, in France, there have been reports of buprenorphine injection and overdoses (Moatti et al., 2001). Should buprenorphine become more widely available in Canada, education will be needed about the potential risk of buprenorphine overdose for clients and those who may purchase diverted buprenorphine.

Providing NEP clients with access to naloxone (Narcan ®) may have the potential to reduce opioid related deaths. Naloxone reduces fatal respiratory arrest caused by opioid overdose. Currently, there are several community-based trials (i.e., Alberta, United States and Australia) testing the effectiveness of teaching IDUs how to properly administer naloxone. Naloxone is expensive and the cost-effectiveness of this intervention has yet to be determined. If proven effective and safe, NEPs may consider adding this type of training to their overdose prevention efforts.

As part of safer injection education in Australia, attempts have been made to discourage IDUs from injecting alone. Injecting while someone else is present can increase the chances that if an overdose occurs, someone will call for assistance. However, this type of advice must also reinforce the need to avoid sharing of any injection equipment and to practice safer sex.

Safer injection facilities such as centres where IDUs can inject their own pre-obtained illicit drugs under the supervision of medically trained staff, have been shown to reduce overdoses in the community. Evaluations of safer injection facilities in Germany and Switzerland have shown reductions in drug-related mortality (Warner-Smith et al., 2001; Degwitz et al., 2003; CCSA, 2004). However, introduction of other interventions and the availability of methadone treatment may also have contributed to the observed decline in mortality. Evaluation of an injection facility in Frankfurt, Germany showed a considerable decline in fatal overdoses during the first five years of its operation (Warner-Smith et al., 2001). However, it was suggested the decline may also be due to the methadone program offered at the site. Warner-Smith et al. (2001) suggest that more evidence is required to determine the effect of safer injection facilities on overdose among IDUs.

EVIDENCE

Prevalence and risk factors for overdose

Studies in Canada suggest that overdose deaths are a pervasive issue among IDUs. In 2001, cocaine was recorded in 27 deaths in Toronto of which 22 were the result of an accidental overdose, four were classified as unknown cause of death, and one was a suicide (Research Group on Drug Use, 2004). Similarly, there were 25 heroin-related deaths in Toronto in 2001 of which 19 were accidental overdoses, five were an unknown cause of death, and one was a suicide. Of the 302 cocaine-related deaths recorded between 1991 and 2001 in Toronto, 250 (82.8%) were the result of accidental overdose. During this same time period, there were 468 heroin-related deaths and 340 (72.6%) were accidental overdoses.

Fischer et al. (2004) studied the experience of and characteristics associated with nonfatal overdoses among illicit opioid users (i.e., injectors and non-injectors) in Vancouver, Edmonton, Montreal, Quebec City, and Toronto. Of this sample, 17.2% reported an overdose episode in the previous six months, and among these, 37.8% reported multiple overdose episodes. Factors significantly associated with overdose included: living on the street (AOR=1.96); drug treatment in the past 12 months (AOR=1.70); and oral, nasal or smoking route of administration (AOR=2.37). Fischer et al. (2004) state that the finding related to a history of drug treatment points to the need for treatment programs to educate clients about the relationship between lower drug tolerance after periods of abstinence or reduced drug use and elevated risk of overdose.

In British Columbia, one drug overdose per day was estimated to have occurred during the 1990's (Wood et al., 2001). Of 361 baseline interviews with active IDUs under 30 years of age in Ottawa, 17.2% reported at least one non-fatal overdose experience (Leonard et al., 2005). Poulin, Stein, and Butt (2000) studied all deaths involving drugs from 1993 to 1995 in Halifax, Nova Scotia and found the average crude mortality rate due to illicit drug overdose was 0.2 deaths per 100,000 population.

Just over one-third of IDUs interviewed by Powis et al. (n=312; 1999) in London, England reported at least one non-fatal overdose. Among those who reported an overdose, the mean was five overdoses but most reported only one non-fatal overdose. Powis et al. (1999) estimated approximately one overdose for every six years of injecting occurred in their sample.

In Australia, the rate of death from opioid-related overdose increased three-fold during the 1990's from 250 deaths in 1991 to 958 deaths in 1999 (Commonwealth of Australia, 2001). As well as deaths, there are an estimated 12,000 to 21,000 non-fatal overdoses among heroin users that occur each year in Australia (Commonwealth of Australia, 2001).

McGregor et al. (1998) reported that of 218 Australian heroin users interviewed, 48% had ever experienced an overdose and 11% had done so in the six months prior to the interview. Most overdoses (81%) occurred in a private home and 88% in the presence of someone else. In the six months prior to the interview, 73% of participants rarely or never worried about a personal overdose.

Lack of medical or other assistance

In the Fischer et al. (2004) study, almost one-quarter of those reporting an overdose (24.1%) stated that they did not receive any formal medical assistance. Furthermore, exposure to drug treatment within the past 12 months was associated with overdose.

A study conducted by Davidson et al. (2002) in San Francisco, California among 973 current injectors under 30 years old found that 73% of current IDUs had witnessed at least one heroin-related overdose in their lifetime and 50% reported witnessing an overdose in the past 12 months. Only one-third of the overdoses involved emergency services. For the remaining two-thirds of cases where emergency services were not called, 67% reported it was not necessary because the victim regained consciousness. However, for the remaining one-third where 911 was not called, 56% of witnesses reported fear of police involvement as a reason for not contacting emergency services.

In the Powis et al. (1999) study, only 56% of IDU participants who reported an overdose had gone to the hospital as a result of an overdose. When asked about their last overdose, 81% were with someone when the overdose occurred, 27% reported that an ambulance was called, 43% went to the hospital and 10% said their last overdose was a suicide attempt. Over half (56%) of the participants had witnessed someone else overdose.

Among participants in the McGregor et al. (1998) study, 70% of participants had witnessed someone else's overdose and 41% had witnessed an overdose in the six months prior to the interview but less than half called an ambulance. As well, 40% who had witnessed an overdose delayed or did not seek medical assistance because they feared police involvement.

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Services

Referrals and counselling

Best practice recommendations – in brief

To increase access to community services and other assistance for IDUs:

- ▶ Provide referrals for drug treatment, HIV testing and counselling, social and mental health services, legal aid, and primary healthcare
- ▶ Establish and manage referral relationships with agencies providing these services
- ▶ Engage in direct advocacy to ensure clients have access to appropriate services
- ▶ Provide clients with information regarding drug treatment, medical care, HIV and HCV counselling and testing, and other health and social services

INTRODUCTION

Since many IDUs do not regularly access health and other social service systems, NEPs are often the only line of contact for this population and thus are an important bridge to drug treatment and other services. Providing referrals to health units and community-based agencies is an effective means of addressing the medical, social, emotional and financial needs of IDUs.

Providing referrals

Participation in drug treatment has been shown to decrease needle sharing and injection frequency. Referring clients to such programs not only has the potential of reducing or eliminating client drug use but also reduces clients' risk of acquiring bloodborne pathogens. Referrals also contribute to the goal of increasing the number of IDUs enrolled in drug treatment programs.

Needle sharing and other harmful injection practices place IDUs at increased risk of acquiring bloodborne pathogens. Research has shown that once IDUs become aware of their HIV positive status, HIV transmission-related behaviours decline. NEPs can provide IDUs with the essential link to HIV testing and counselling services if they are unable to offer these services onsite.

Some IDUs are at higher risk than others of becoming infected with bloodborne pathogens. Studies have found that female sex workers who inject drugs are at greater risk of infection due to engaging in riskier behaviours. This marginalized population could especially benefit from referrals to services that could help them reduce their high-risk behaviours, potentially lowering infection rates.

Establishing relationships with health and community agencies

NEPs need to gather information about the types of services needed by their clients, determine which service needs are unmet, and initiate connections with organizations that provide such services. Establishing and maintaining relationships with healthcare and community organizations is an important step to ensure IDUs have access to comprehensive services that can improve their life circumstances.

Advocacy

IDUs face numerous barriers to care as a result of stigmatization by healthcare and other service providers. When establishing relationships with staff at various organizations, these service providers may benefit from training provided by NEPs concerning issues such as the health and life circumstances of IDUs, how to interact with this population and the goals of NEPs.

Providing information and counselling

Some IDUs may not have their service needs met due to lack of knowledge about the community resources available and how to access such services. For instance, while some clients may declare an interest in seeking drug treatment, others may be unaware of this option, perceive that they are ineligible or not know how to seek treatment. NEP staff has a role to play in helping clients who declare an interest and/or appear to be ready to access drug treatment.

Since substance use can increase someone's risk of experiencing financial problems or becoming homeless, it is important that IDUs are informed about the community services available to address their needs. As well, NEPs can help improve clients' awareness of mental health services since the IDU population has been shown to experience high rates of depression and some IDUs participating in NEPs report needing mental health services.

Offering confidential and voluntary HIV testing and counselling is an effective method of ensuring clients are aware of their HIV status and are linked with appropriate medical and social services. At pre-test counselling, assessing risk behaviours, discussing HIV transmission routes, and educating about risk reduction approaches are recommended. Post-test counselling involves giving clients their test results, educating them about risk reduction approaches, and providing them with information about and referral to other services if necessary.

CONSIDERATIONS

Providing referrals to healthcare and other services is an important role for NEPs, but depending on their funding and stage of development, NEPs might be able to offer a variety of services onsite. The ability to provide services beyond basic needle exchange is also dependent on the training and qualifications of the NEP staff. Specifically, if NEPs hire employees who do not hold formal social work or nursing degrees for instance, staff cannot be expected to perform duties requiring such qualifications. Staff members may feel pressured and overburdened if they do not feel they have the necessary skills. Although counselling provided at NEPs is not given much attention in the literature, it is a daily component of NEP work. Again, staff members should be qualified if they are providing anything beyond informal counselling for the various social and personal issues IDUs may have.

Many NEPs provide referrals to voluntary HIV testing and counselling, as well as referrals to drug treatment programs. If adequate resources are available, it may be appropriate for NEPs to provide required services onsite. Wherever possible, NEPs should involve clients in the design and implementation of services and

programs, which could assist NEPs in providing services that effectively meet client needs. Furthermore, evaluations should be conducted to ensure that providing services onsite is improving service utilization and not deterring IDUs uninterested in services other than needle exchange from accessing NEPs.

A report by the CDC (Lurie & Reingold, 1993) in the United States cautions against over-emphasis on referrals for drug treatment. In particular, the authors of this report suggest that over-emphasis may alienate clients and discourage future attendance.

EVIDENCE

Drug Treatment

In their review of numerous drug treatment approaches (e.g., pharmacotherapy programs and behavioural interventions) utilized in many countries, the WHO (2005) concluded that controlling the spread of HIV is most successful where there are a variety of comprehensive drug treatment services available. Furthermore, developing wide-ranging treatments that include substitution maintenance treatment for IDUs was recommended for all countries with a heroin-using or IDU population. The review found that many countries are incurring significant expenditures on incarcerating drug users despite the fact that this is not an effective solution to the drug problem since it is associated with high relapse rates upon release. Several studies indicated an overall cost benefit for treatment, with considerable savings in social and healthcare costs when drug treatment was implemented (see **Methadone maintenance treatment** section).

In 1993, Monterroso et al. (2000) examined the HIV status, program participation, and risk reduction behaviours of 2,306 IDUs participating in the multicity (Baltimore, New York, Chicago, Los Angeles, and San Jose) Collaborative IDU Study. Results showed that participation in NEPs and drug treatment programs substantially reduced IDUs' risk of acquiring HIV by reducing the likelihood of injecting with previously used needles. Additionally, IDUs' reduction in injection frequency was strongly associated with participating in a drug treatment program.

To examine the role of NEPs in referring clients to drug treatment services, Brooner et al. (1998) studied treatment outcomes of new admissions into an opioid agonist treatment program in Baltimore, Maryland. Participants referred through standard referral methods (i.e., self, family, or other healthcare/social service providers; n=243) were compared to those referred by NEPs (n=82). Results showed that NEP clients were significantly older and had more severe drug use at baseline when compared to standard referral clients. Additionally, 42% of NEP referred clients reported no history of opioid agonist treatment compared to only 26% of standard referral clients, thus demonstrating the vital role NEPs can play in connecting IDUs with drug treatment services.

In a retrospective cohort study, Hallinan et al. (2004) examined the incidence of HCV in IDUs enrolled in opioid replacement therapy (ORT). Fifty-four IDUs who were HCV negative upon entering treatment after January 1996 were retested before July 2003. There was only one seroconversion in the continuous ORT group (n=34) and four seroconversions in patients in the interrupted ORT category (n=20), both of which

represent low HCV incidence in this population. This study demonstrates the positive impact of ORT on HCV prevention in IDUs, particularly continuous ORT.

Kuo et al. (2004) evaluated the effectiveness of referring Baltimore NEP participants to a LAAM maintenance drug treatment program. Of 163 IDUs, 114 (70%) agreed to LAAM referral. Of the 82 participants who enrolled in the program at least three months before the study's end, 69 (84%) were still actively enrolled in treatment at 90-day follow-up. Additionally, one-month follow-up of participants showed significantly reduced addiction severity, with cocaine and heroin use decreasing. Although LAAM is now contraindicated, this study demonstrates the feasibility and positive outcomes of referring NEP participants to drug treatment.

In 1992, Lurie and Reingold (1993) reviewed literature on NEPs, contacted NEPs and visited several sites in order to determine their public health impact. At the Vancouver NEP, the majority of referrals were for HIV testing (63%) and medical services (10%). Of the 18 American and Canadian NEPs visited, only one reported they did not refer clients to drug treatment. Furthermore, only 9% (3 of 33) of US NEPs provided drug treatment onsite, eight supplied onsite medical care, and seven offered onsite HIV testing and counselling. NEP referral rates to drug treatment and other public health services were found to vary considerably by site. Referral relationships seemed better in the more highly funded NEPs and those more incorporated into the public health system. It was suggested that a lack of emphasis on providing referrals to drug treatment was due to recognition that many IDUs do not express interest in entering drug treatment. Furthermore, the authors pointed out that the limited drug treatment and community-based intervention slots available need to be increased in order for drug treatment referrals to be useful.

HIV testing and counselling

Cohn (2002) reviewed research concerning drug-related behaviours and the effects of these behaviours on HIV prevention and care of IDUs. Cohn proposed that in order to reduce HIV transmission among IDUs, service providers need to increase the proportion of IDUs who are aware of their HIV status and connect them with services that will help them reduce transmission behaviours. The main goal of the Serostatus Approach to Fighting the HIV Epidemic (SAFE), an initiative of the Centers for Disease Control and Prevention, is to increase HIV testing rates and connect IDUs to appropriate healthcare and preventive services (Janssen et al., 2001). Some fundamental elements of this program include making HIV testing facilities easily accessible, improving access to HIV/AIDS care through community-based agencies, and increasing the proportion of HIV positive individuals who adopt and maintain risk reduction behaviour by ensuring availability and accessibility of appropriate prevention services. NEPs can play an essential role in linking IDUs with HIV testing facilities, thus potentially reducing HIV transmission behaviours.

In Baltimore, Maryland, between 1988 and 1994, Celentano et al. (2001) examined the characteristics of HIV behavioural risk factors of 2960 IDUs. At study entry, participants were tested for HIV and at 11 points throughout the study period they were assessed for HIV behavioural risk (e.g., needle sharing, and attending shooting galleries). Participants also had risk reduction counselling involving guidance about the readiness to change, drug treatment needs, and assistance with safer decision-making. HIV infected IDUs were more likely to reduce risk behaviours than HIV negative IDUs, as demonstrated by lower rates of needle sharing. In addition, HIV infected participants were more likely to cease using drugs over the course of the study

than HIV negative participants. The findings illustrate that once IDUs are aware of their HIV positive status, reductions in HIV transmission-related behaviours are evident.

Watters, Kral and Bluthenthal (1995) studied HIV seroprevalence rates of 1177 street-recruited IDUs in the San Francisco area. Results showed that there was a strong association between prior HIV testing and counselling and lower HIV seroprevalence.

Otten et al. (1993) studied the impact of counselling preceding and following HIV testing for clients at a large urban STI clinic in Miami, Florida from 1988 to 1989. STI rates moderately declined after post-test counselling in the 331 clients who tested positive for HIV.

In their longitudinal investigation of 328 IDUs in New York City between 1991 and 1996, Marmor et al. (2000) studied the HIV infection rate of IDUs. Throughout the study, risk reduction counselling was provided, which involved discussing drug treatment enrollment, abstaining from drug injection, and promoting sterile needle usage. The authors found that the average drug injection rate declined for consistent-, sporadic-, and non-NEP users across the study period. Additionally, although consistent NEP users were less likely than sporadic or non-NEP users to decrease their injection rate, their HIV infection rates were lower.

High-risk populations

In their study comparing NEP clients who were current female sex workers to female NEP clients who were not sex workers, Paone et al. (1999) explored whether the heightened risk of acquiring HIV continued for sex workers participating in NEPs. From 1992 to 1996, 1371 participants at eight NEPs in five American cities (New York, Rochester, Buffalo, Los Angeles, and Chicago) provided information concerning their sexual and drug use behaviours during the previous 30 days. Findings showed that despite NEP utilization, sex workers still engaged in riskier injection practices than other female NEP clients. Female NEP clients involved in the sex trade generally had a higher HIV risk than female NEP clients who were not sex workers. Sex workers were more likely to inject daily, inject with a needle previously used by someone else, and engage in unprotected sex when compared to their female NEP counterparts. They also reported heavier drug use, using a greater variety of drugs, and injecting considerably more frequently than other women. Furthermore, compared to other female NEP clients, sex workers were more likely to report being homeless in the past six months and less likely to report a reliable source of income. In order to reduce their risky behaviours, it was suggested that NEPs connect this high-risk population to services that meet their social, emotional and economic needs.

In Providence, Rhode Island, the six-month prevalence of major depression in IDUs participating in an NEP (n=251) was compared to that of IDUs enrolled in methadone maintenance treatment (MMT; n=277; Brienza et al., 2000). A higher proportion of IDUs in the NEP cohort met the criteria for major depressive disorder (MDD; 54%) than those in the MMT cohort (42%). Women had a significantly higher rate of MDD than men in both cohorts. Due to the high rates of depression found in IDUs accessing NEP services, the authors emphasized the importance of NEPs in providing referrals to mental health services.

NEP participation and healthcare contact

Between 1994 and 1998, Strathdee et al. (1999) interviewed 1483 IDUs receiving HIV tests six months prior to the opening of a Baltimore NEP and semi-annually thereafter to establish the role of NEP attendance and health services contact in entry to detoxification. Both healthcare utilization and NEP participation were found to be associated with entry into a detoxification program for HIV negative and HIV positive IDUs. Specifically, outpatient medical care and hospital admission were independently associated with entering detoxification for HIV positive IDUs. HIV positive IDUs were also almost twice as likely to enter detoxification if they had recently seen a physician compared to IDUs who had not and were over three times more likely to enter a treatment program in the first year after the NEP's initiation, although this rate decreased considerably with time.

Health and social service needs of IDUs

Examining the progression of NEPs in Canada, Hankins (1998) outlined several challenges facing efforts to prevent HIV infection among IDUs. First, many drug users feel marginalized and fear stigmatization by healthcare and other service providers, thus making them reluctant to seek services. Second, many healthcare workers lack training and experience in working with IDUs, which can adversely affect the way they interact with this population. Furthermore, despite the lack of available resources, NEPs have been allocated much of the responsibility concerning HIV prevention.

Strike et al. (2004) examined various elements of needle exchange outreach work that cause employees to perform duties beyond their official job requirements. In 1999, 59 workers from 15 Ontario-based NEPs were questioned regarding organizational policies and procedures. While workers considered their role to involve educating and supporting NEP clients, many employees went beyond the NEP mandate by regularly carrying out informal tasks to meet their clients' needs. Extra activities included personal and social support (e.g., visits to hospitals or jails) and assistance dealing with bureaucratic and social service organizations (e.g., completing social assistance forms). Although providing extra client services can result in meeting more of the clients' needs, doing too much for clients can also have negative outcomes. Specifically, if clients become over-reliant on workers or become unclear as to what they can expect from the NEP, this may deter them from using the service. In addition, extending the boundaries of their job can cause workers to be overworked and stressed, thus straining already limited resources. Many workers feel obligated to meet a variety of client needs because other service agencies have neglected to do so. Another role workers take on is that of client advocacy, which can involve using their health professional status to negotiate on behalf of clients with other service providers and educating these providers about needle exchanges, harm reduction approaches, and negative perceptions of IDUs held by service providers.

In 1998, in Providence, Rhode Island, Stein and Friedmann (2002) interviewed 251 participants not registered in drug treatment and 312 enrolled in a methadone maintenance program to determine self-reported perceived and unmet needs (categorized as income assistance, housing assistance, medical care, mental healthcare, alcohol treatment, and drug treatment) of HIV negative IDUs. Across both groups, mental health and housing services were the needs most highly endorsed and approximately 69% of participants stated their needs were unmet. While 62% of methadone clients claimed to have at least one unmet need, 94% of NEP clients reported this. Housing services, mental healthcare and alcohol treatment needs were reported

significantly more by NEP clients than methadone clients. The fact that almost half of NEP clients reported needing help with housing and 80% thought they needed drug treatment points to the important role of NEPs in referring clients to community services that are not provided onsite.

HIV treatment

Ware, Wyatt, and Tugenberg (2005) investigated the reasons behind HIV-infected drug users being underrepresented among eligible HIV-infected people receiving antiretroviral treatment and examined the assumption that drug users are less able to adhere to antiretroviral treatment than other HIV-infected individuals. Through repeatedly interviewing 52 HIV-positive drug users in Boston, Massachusetts, results showed that although drug users had quite unstable lifestyles, many were highly committed to fulfilling work, family and other commitments. Despite drug use sometimes impeding their ability to take medications, drug users attempted to reduce or terminate drug use in order to properly follow antiretroviral treatment. The authors concluded that HIV-positive drug users are no less capable of adhering to HIV treatment than other HIV-positive individuals and should be treated in the same way. Also, focusing on drug use as a main barrier to adherence causes healthcare providers to neglect other factors that could be affecting their ability to successfully maintain treatment.

Future directions for NEPs

Brief interventions can be effective at reducing the risk of bloodborne pathogen transmission. Tucker et al. (2004) randomly assigned 145 IDUs in Melbourne, Australia to either an individually tailored brief behavioural intervention (BBI) or to a control group receiving written educational information about HCV to measure the effectiveness of HCV risk reduction interventions. At one-month follow-up, both groups significantly reduced their HCV risk reduction behaviours. Additionally, the BBI group was significantly more likely to report usefulness of and satisfaction with the intervention compared to the control group. This study demonstrates the feasibility of NEPs providing HCV education to reduce bloodborne pathogen transmission in the IDU population. It is also advisable that NEP staff engage in counselling to discuss risk reduction behaviours, thus lowering such behaviours in this population.

In Baltimore, Maryland, Kidorf et al. (2005) examined the drug treatment motivation of 302 IDUs newly registered to an NEP who were referred through either motivational interviewing, job readiness (control group), or standard referral. Motivational interviewing involves empathic counselling and can be delivered in only one session. The study found that White IDUs and those diagnosed with major depression were more likely to enroll in treatment. Results also indicated that although IDUs from all referral categories showed a high degree of interest in receiving drug treatment, only 11% enrolled in treatment during the one-year observation period. Furthermore, participants referred through motivational interviewing did not show more treatment interest or treatment-seeking behaviour than the other two referral groups, thus demonstrating it is not a more effective referral mode.

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Methadone maintenance treatment

Best practice recommendations – in brief

To reduce HIV transmission and other drug-related harm:

- ▶ Provide access to harm reduction oriented methadone maintenance treatment at an NEP where resources allow, or through appropriate referral, for opiate dependent drug users who are not seeking high threshold methadone maintenance
- ▶ Advocate for provision of harm reduction oriented methadone maintenance treatment as part of the range of drug treatment options available in the community

INTRODUCTION

Treatment of problematic drug use has the potential to reduce transmission of HIV, HBV and HCV through eliciting abstinence or by reducing needle use practices found to transmit bloodborne pathogens (WHO, 2005). Methadone maintenance treatment (MMT) was introduced in Canada in the early 1960's (Fischer, 2000). Methadone is a prescription opioid agonist, which can eliminate opioid cravings and withdrawal symptoms (NIH, 1998). It is sometimes used as a short term treatment to ease withdrawal symptoms during detoxification, with the ultimate goal of becoming drug free. It is also used for longer term maintenance of opiate dependent individuals as an alternative to use of illicit opiates; sometimes after a period of months or years such persons withdraw from methadone with a goal of becoming opiate free. Because of the risk of relapse to illicit opiate use when methadone is discontinued, many users require long-term maintenance, probably for life, as well as access to safer injection equipment if they do return to injecting.

In 1996, modifications to the provincial methadone system in Ontario (Brands, 2000) brought it under the supervision of the College of Physicians and Surgeons of Ontario, and gave methadone prescribing physicians greater discretion in terms of dosing, urinalysis and consequences following positive urine tests for illicit drugs, counselling requirements, and the handling of 'take home' doses (Brands, 2000; CPSO, 2001). These policy changes paved the way for dramatic increases in patient registrations (Strike, 2005), and the introduction of low threshold (harm reduction based) MMT programming.

Low-threshold methadone programs which offer full opiate replacement treatment seek to break down barriers to the treatment of opioid dependence by reducing entry and retention criteria, and by accepting individuals who continue to use drugs without threat of expulsion from the program (Finch, 1995; Ryrle, 1997; Hartgers, 1992; van Ameijden, 1999; Klingemann, 1996; Yancovitz, 1991; Torrens, 1996). Unlike higher threshold programs, the primary aim of these programs is not necessarily to eliminate illicit drug use, but to establish and maintain contact with opioid users in order to help stabilize and reduce some of the risks associated with drug use. For some participants, the aim is to develop the trust needed to address other health concerns. These programs are targeted at a population of opioid users most in need of drug treatment and other health and social services. Such programs are client-centered; clients establish their own goals and in consultation with their physicians determine their methadone dose, but typically this is initially a full replacement dose, and is only tapered to lower doses if this is the desire of the client.

In addition, physicians, nurses and counsellors offer medical and social support services to the clients. As part of their participation in these programs, clients are offered counselling, assistance with issues such as housing and social support programs (e.g., welfare), testing for HIV and HCV, and referral to other services such as primary healthcare.

CONSIDERATIONS

Provision of low threshold methadone services at NEPs requires a physician who has received training and acquired an exemption from the College of Physicians and Surgeons of Ontario to prescribe methadone, and who is willing to work within a harm reduction framework. It also requires staff who are skilled in counselling and supporting clients who may be severely marginalized and require assistance with multiple issues such as housing, primary healthcare needs, mental health needs, job training, re-entry issues, etc. NEPs require sufficient resources to undertake these services. At the same time, NEPs seeking to find services of this kind for their clients may encounter difficulties in many communities where there are insufficient methadone treatment slots available or where those available are limited to high threshold treatment. NEPs may need to educate providers and advocate with them to try to increase availability of lower threshold MMT. If clients are referred for high threshold MMT, NEPs need to be aware of the drop-out rate from this treatment, and encourage clients to return for NEP services if they need them in the future.

EVIDENCE

According to a recent United Nations position paper “There is consistent evidence from numerous controlled trials, large longitudinal studies and program evaluations, that substitution maintenance treatment for opioid dependence is associated with generally substantial reductions in illicit opioid use, criminal activity, deaths due to overdose, and behaviours with a high risk of HIV transmission” (WHO/UNODC/UNAIDS, 2005). Numerous studies have documented the positive effect of MMT on HIV risk behaviours. Comprehensive reviews of this research detail positive effects of MMT on illicit opioid use, HIV risk behaviours and HIV seroconversion (Marsch, 1998; Gibson, 1999; Sorensen, 2000; Prendergast, 2001). However, most of the literature is based on high threshold MMT programs that cater to, and benefit, only those drug users who are willing and able to conform to a goal of abstinence from all illicit drugs. Therefore, the findings from these studies are not readily generalizable to low threshold MMT programs.

Evaluations of the impact of low threshold MMT on injection-related HIV risk behaviours have produced mixed results (Finch, 1995; Grella, 1996; Rylie, 1997; van Ameijden, 1992, 1994; Hartgers, 1992). Three studies reported reductions in injection-related HIV risk behaviour through 2 to 12 months of follow-up, depending on the study (Finch, 1995; Grella, 1996; Rylie, 1997). The remaining three studies pertain to harm reduction programs typified by low methadone dose and irregular attendance rather than low threshold MMT programs which provide full methadone maintenance treatment; these studies documented no risk reduction or protective effect on seroconversion (van Ameijden, 1992, 1994; Hartgers, 1992).

Two low threshold MMT programs offered at Ontario NEPs (The Works in Toronto and Streethealth in

Kingston) have been comprehensively evaluated between 2000 and 2004. Evidence from this evaluation indicates high retention rates in methadone maintenance over the first year; improvements in physical and mental health related quality of life; and reductions in use of a number of illicit drugs (heroin, other opiates, and cocaine) while others (alcohol, crack, and cannabis) remained stable but did not increase. Injection-related risk behaviours also declined significantly. Conclusions from this research support the benefit of low threshold MMT programs for clients unwilling to enter higher threshold MMT programs where abstinence from all illicit drugs is the goal of treatment (Millson, 2004; Villeneuve, 2005). Unpublished evaluation research examining the Direction 180 harm reduction methadone maintenance program in Halifax also supports the conclusion that it stabilized clients, including those who had previously failed at other treatment, and that they reduced their HIV and HCV risk behaviours (Marshall, 2003, 2004).

For additional information see:

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Primary Care

Primary Care

Best practice recommendations – in detail

To improve access to primary care for IDUs:

- ▶ Identify sources of primary care in the community willing to work with IDUs
- ▶ Provide services at NEPs in keeping with the needs of clients and alternative resources available in the community, including:
 - ▶ First aid - limited to provision of first aid materials and non-professional assistance unless NEP has access to professional healthcare providers
 - ▶ Vaccination - provided by professional staff and offered at NEPs to encourage uptake by clients
 - ▶ Testing - offer at NEPs to encourage uptake and allow ongoing followup education and counselling to those who test positive
- ▶ NEPs with relationships to public health units or community health centres should assist their clients in accessing the full range of services available
 - ▶ Where possible negotiate provision of primary care services in the same premises as the NEP to facilitate access for NEP clients
- ▶ Conduct education, outreach and advocacy with health service providers to improve their knowledge about IDUs and their willingness to provide services
 - ▶ Where possible provide for accompaniment and advocacy for clients' initial visits to off-site health services until a successful relationship can be established with the service providers and develop ongoing communication to resolve problems

INTRODUCTION

IDUs are at risk for a number of health concerns in addition to those related to bloodborne pathogens. These include abscesses, septicemia (generalized infection spread through the bloodstream after bacteria are introduced into a vein during injection), endocarditis (infection of one or more heart valves when bacteria or fungi spread through the bloodstream to the heart) and a variety of other possible infections. IDUs who are poor, homeless or marginally housed may be at particular risk for poor nutrition and exposure to respiratory diseases in crowded settings such as shelters, etc. All of these issues point to a need for access to primary care providers who are willing and able to work with IDUs to address their many health concerns.

NEPs need to determine how best to support their clients in having these needs met. Services such as first aid, vaccinations, and testing for a variety of infectious diseases are all given at some harm reduction programs. This is generally based on their trusting relationship with clients, which allows clients to access these needed services when they might not otherwise do so. However, provision of most primary care services requires specialized training and professional licensure, and carries with it issues of professional standards of care and professional liability, all of which must be taken into account in deciding to provide these expanded services. NEPs that are located within public health units may have access to services through the preventive clinical services provided by the public health department. In addition to services

such as immunization and testing, specific services such as diagnosis and treatment of STIs and provision of family planning services, are provided by most public health departments as part of their mandate, and such services should be accessible to NEP clients. To improve access for clients, it may be possible to arrange for external service providers to provide their services at the NEP.

Inevitably, NEPs that do not have full primary care services within their organization will encounter a need to refer clients for such services. It may be more appropriate in some situations to expend resources seeking successful referrals for clients to primary care providers who will undertake their ongoing primary care. This may include assisting clients in obtaining identification so that they can acquire OHIP cards if they do not have these. It will also require a good knowledge of available health services and providers in the community, and may involve specific outreach to connect with such service providers and assess their willingness to undertake medical care of IDUs. In situations where such providers are not available, NEP staff may choose to accompany clients for urgently required care, in order to advocate on their behalf.

The sections which follow discuss provision of specific primary care services to IDUs. However, it is important for NEPs to assess their capacity to provide such services and determine the limits of the services that they can provide and the balance to be struck between providing direct services and assisting and advocating for clients in obtaining appropriate services elsewhere in the community.

First aid for abscesses and skin problems

Best practice recommendations – in brief

To prevent abscesses and skin infections:

- ▶ Educate clients about safe injection practices and provide sterile injection equipment and hygiene materials (e.g., alcohol swabs, filters, sterile water, needles, syringes, cookers, and tourniquets)
- ▶ Provide first aid services for abscesses and skin problems as part of NEPs wherever feasible, including help with foot care for problems such as blisters
- ▶ First aid as described here is limited to services which can be provided by a non-professional with first aid training; more complex problems require treatment by a physician or nurse practitioner

INTRODUCTION

It is well known that IDUs are at risk for abscesses and skin infections which can affect their health and wellbeing. In some situations, specific skin infections such as necrotizing fasciitis can quickly become life-threatening, and may require potentially disfiguring removal of skin and muscle in order to halt the spread of infection. Although in general abscesses and other skin infections are not life-threatening, they can be painful and may interfere with quality of life and result in sequelae such as scarring. They may also lead to more severe conditions such as septicemia if infection spreads through the bloodstream. Many marginalized IDUs do not have a regular source of primary care where such problems can be treated, and will either attend emergency departments for these conditions, or will attempt self-treatment. There is very little published evidence available on the provision of first aid through NEPs; the one paper on the subject that was located is reviewed here, along with the principles to be considered with regard to this type of programming.

CONSIDERATIONS

NEPs are well-placed to address prevention of abscesses and skin infections. These conditions are likely to occur because of inadequate cleaning of the injection site, injection with a needle/syringe with bacterial contamination, and/or injection of unsterile drugs into a site where they are not readily absorbed or disseminated. Teaching proper injection technique and associated hygiene measures, together with provision of ample sterile injection equipment and education about the importance of sterile technique in preparation can all contribute to avoidance of abscesses and skin infections, as well as of bloodborne pathogens and of bacterial septicaemia, endocarditis and other infections (see **Safer injection education** section).

If prevention measures fail, or for persons who have not received them, it is important that treatment be provided. First aid may involve draining abscesses that have formed, or providing topical treatment such as ointments for superficial skin infections that have not formed abscesses. In addition, IDUs who are

homeless or marginally housed may need first aid treatment for relatively common conditions such as foot problems and skin conditions such as scabies or other infestations.

Staff of NEPs may vary in their level of professional training and experience with respect to provision of first aid treatment. While provision of non-prescription treatments such as antibiotic ointments, as well as assistance with necessary hygiene measures such as footbaths may be provided by persons with no professional training, drainage of abscesses and prescription of oral antibiotics require medical supervision which may not be available at all NEPs. Furthermore, experience and training are necessary to be able to determine under what conditions first aid is insufficient and clients require referral to an emergency department or other medical facility. In order to adequately address this issue, NEPs need access to primary care providers, such as nurse practitioners and/or physicians, either providing services at the NEP or collaborating with the NEP to provide care for NEP clients at primary care offices or clinics.

EVIDENCE

Only one published research study was identified addressing this issue directly. Grau et al (2002) described a wound and abscess clinic provided concurrently with an NEP in Oakland, California. This clinic treated an average of eight clients in each two hour session, and was staffed by volunteers including physicians, physician assistants, an emergency medical technician, a nurse, and several untrained volunteers. The latter assisted the professional staff (e.g., with wound cleaning and post-treatment bandaging) or did administrative tasks. Forty-three percent of participants had incision and drainage performed, 46% received abscess care, and 12% had treatment for cellulitis (an infection requiring antibiotics but not drainage). Fifty-seven percent received oral antibiotics while 47% were given topical antibiotics (of course, some of these clients received both). Thirty-three percent of clients did not require referral, 12% received one referral, and 56% required two or more referrals. However, only 5% of clients received a referral to a hospital; most referrals appear to have been for follow-up primary care (aftercare and wound checking related to their infection). The majority of clients using the clinic heard about it from peers, friends or relatives; 46% were from the immediate vicinity of the NEP, but 13% came 20 miles or more to attend. It is difficult to determine how generalizable this evidence is, since it relates to the United States where health services are provided differently and no information is given on the degree to which clients were insured or not. Also, the clinic clientele were about half Hispanic, and translation was provided by NEP staff. No commentary is provided about the role that this may have played in bringing clients to this service.

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Vaccination

Best practice recommendations – in detail

To reduce acquisition of HAV and HBV, influenza and pneumococcal disease:

- ▶ Educate clients about HAV, HBV and HCV and their prevention, including the availability of vaccination for HAV and HBV
 - ▶ Provide testing for HAV, HBV and HCV as indicated (see **Testing services** section)
 - ▶ Encourage HBV vaccination for all NEP workers and clients
- ▶ Provide vaccination for HAV and HBV for those who are not already immune or carriers in the case of HBV, including a system to ensure as much as possible that clients receive 2 doses of HAV vaccine and 3 doses for HBV (as required for the particular vaccine used in Ontario).
- ▶ Provide influenza vaccination or referral for vaccination to all clients who do not have a primary care provider
- ▶ Provide pneumococcal vaccination or referral for vaccination to all clients who are or might be HIV positive or who have chronic lung disease and who do not have a primary care provider
- ▶ Determine tetanus immunization status of clients and offer tetanus immunization to those who are eligible, or refer to a primary care provider
- ▶ NEPs providing vaccination should have medical directives and clearly written policies

INTRODUCTION

IDUs have elevated rates of bloodborne viral infections, including HAV and HBV (NACI, 2002) however both HAV and HBV can be prevented by vaccination.

IDUs who are also homeless or marginally housed, or who have predisposing medical problems such as asthma, chronic obstructive lung disease, diabetes, HIV infection, etc, are at elevated risk for severe illness when they acquire respiratory infections. Two of these, influenza and pneumococcal pneumonia, can be prevented through provision of vaccination. Influenza can generally be prevented or at least rendered less severe by a single vaccination annually, ideally provided in the fall prior to the beginning of the influenza season. Pneumococcal vaccination provides longer lasting immunity. A single re-immunization is recommended after five years for high risk clients over 10 years of age who have compromised immune systems or hepatic disease.

Immunizations are usually provided as part of primary care. However, many IDUs do not have a regular source of primary care, and therefore may not receive needed immunizations. NEPs may provide a point of access for this service, since they have contact with marginalized and underserved IDUs. At the same time, immunization is a professional service which requires expertise and access to medical supervision including emergency care in the event of an adverse reaction. NEPs may not have staff with this expertise, and may need to seek such services for their clients through collaborative arrangements. These arrangements may entail service providers attending NEPs for specific immunization clinics, or NEPs referring clients to immunization clinics at public health units or primary care sites. It is essential that good client records be kept of immunizations received and of any adverse effects from these.

Successful referral of clients to clinical services requires that such services be accessible and welcoming to NEP clients. In some instances accompaniment by NEP staff can ensure that clients receive needed care appropriately, but this can be time-consuming and can take staff away from other needed services.

Services such as vaccination should normally be part of ongoing primary care. The decision to provide such services within NEPs should be taken with conscious awareness about the extent to which the NEP is willing and able to provide primary care services, and what other options may be available to clients for receiving primary care.

In addition to these general considerations, delivery of each vaccine may involve somewhat different issues and separate evidence, which are reviewed below. For more extensive discussion of vaccination, the most authoritative source is The Canadian Immunization Guide (NACI, 2002). NEPs that will provide vaccination should have medical directives and clear written policies.

Hepatitis A & B Vaccines: Considerations

One rationale for providing HAV and HBV vaccines as part of NEP services is that they have not been part of routine adult care, but are offered to high risk adults only, with the understanding that IDUs are known to be at elevated risk for both HAV and HBV. It is also important to determine whether clients have already been vaccinated, since once a series of 3 vaccinations is completed, immunity is believed to be long-lasting.

Separate vaccines are available for HAV and HBV. There is also a combined vaccine available which will immunize for both viruses at once. The Canadian Immunization Guide (2002) recommends this combined product for adults who are at increased risk for both diseases, including users of illicit drugs whether by injection or orally. In Ontario, individual vaccines for HAV and HBV are provided free of charge to high risk persons, including IDUs, but the combined vaccine is not. For this reason, the combined vaccine will not be discussed further here (for more information see NACI, 2002). Information is provided separately below for HAV and HBV, although only HBV vaccination at NEPs has been formally studied. HAV and HBV vaccines can be given at the same visit, but must be given in separate injections at different sites.

HBV vaccine is now provided routinely in Ontario to adolescents, so that within a few years, all Ontario-born adults should already have received it, and mainly IDUs born outside Ontario may require this vaccination. It should be noted however that persons who left school early or whose school attendance was irregular may not have received vaccination, so vaccination records should be checked whenever possible. At present, HAV is not included in routine childhood immunization in Ontario, but is provided to persons at increased risk, such as IDUs.

There are many different causes of hepatitis, which simply means inflammation of the liver. Hepatitis is usually accompanied by jaundice, which refers to a yellowing of the skin and white portion of the eyes caused by inability of the liver to clear bilirubin, a pigmented material formed from the normal breakdown of worn out red blood cells. The most common causes of acute hepatitis are infection with viruses designated as hepatitis A, B, and C. HAV and HBV are vaccine preventable, while HCV is not. Any of these infections can also occur without any symptoms, or with only mild flu-like symptoms. As a result, it is not possible to

determine from a history of hepatitis which, if any, virus was responsible, and persons may have had past viral hepatitis without any awareness of it. Therefore, the only way to determine past infection and current immunity with any certainty is through blood testing.

Persons with chronic liver disease (including carriers of HBV or HCV) are at increased risk of severe liver damage if they contract another hepatitis (e.g., A). Therefore it is particularly important that persons who are already carriers of HBV and/or HCV receive HAV vaccine (and also HBV vaccine for those with HCV who have not already had HBV).

Hepatitis A: Considerations

In the United States in 1990-2000, 6% of cases of HAV were attributed to IDUs (CDC, 2005). HAV is mainly transmitted by the oral-fecal route, through direct contact with infected persons or contact with contaminated food or water. It is also present in blood for a brief period and could be transmitted through contact with infected blood, although this is likely to be rare. Acute HAV involves symptoms similar to other forms of hepatitis such as fever, nausea, loss of appetite, abdominal pain, dark urine, and jaundice. Symptoms can last up to two months, or occasionally longer, and about 25% of those infected may need to be hospitalized (NACI, 2002). HAV is rarely fatal, although this is more common in older persons (about 2% in those over 50). There is no specific treatment, it does not go on to chronic disease or carrier states, and once recovered immunity is lifelong.

There are currently four vaccines for HAV licensed in Canada. Vaccination for adults involves two doses, at least six months apart. Side effects are generally limited to soreness at the injection site, although some people experience headache, fever, fatigue, and gastrointestinal symptoms. Very rarely, severe allergic reactions may occur, likely due to some component in the vaccine. Anyone who has had a severe allergic reaction to a previous vaccination should not be given the vaccine without this being carefully evaluated by an expert.

HAV vaccine is available free of charge through public health units in Ontario to persons at increased risk such as IDUs. Since two doses are required, it is important that records be kept to try to ensure that a second dose of vaccine is given six months or more after the first.

Evidence for Hepatitis A immunization in NEPs

There is published research on the provision of HBV vaccine in NEPs, but none regarding HAV. There are recommendations that IDUs are at increased risk and should be immunized for HAV (e.g., NACI, 2002).

Hepatitis B: Considerations

HBV is a serious disease. About 1-2% of adults who become infected will have severe illness (called "fulminant" hepatitis) which has a 63-93% death rate (CDC, 2005). Among those infected with HBV as adults, 6-10% develop chronic infection, remain carriers, and may go on to develop chronic active hepatitis. Some of these persons will then develop cirrhosis of the liver or hepatocellular carcinoma (liver cancer), both of which are usually fatal. Therefore prevention of HBV is an important health measure.

The approximately 10% of persons with previous HBV infection who remain chronic carriers have virus particles in their blood, which can be transmitted to others through sharing of needles or other items contaminated with blood, which could include crack pipes. Carriers can also have the virus present in saliva, semen, and vaginal fluid, with the result that it can also be transmitted sexually and through human bites. Transmission through other saliva contact such as kissing is considered unlikely. Carrier mothers can also pass the infection to their newborns unless the infant is treated with antibodies to HBV (Hepatitis B immune globulin, HBIG) at birth, as well as being immunized. Carriers of HBV will have evidence of HBV surface antigen (HbsAg) on blood tests, indicating the presence of the virus. They will not have formed antibodies to the virus, so these will not be found in their blood tests, and they do not benefit from being immunized.

HBV vaccine is provided as a series of three shots, for the particular product used in Ontario. For the three-dose product, the first two doses are given no less than one month apart, followed by a third dose after four to six months. If adjustments are needed to the schedule, the third dose can be given within eight weeks of the second, but must also be at least 16 weeks after the first. If longer intervals occur, it is not considered necessary to restart the series or add extra doses. Persons whose immune systems are weakened may need higher doses of vaccine or more doses and expert advice should be sought where possible for these situations.

Persons with mild respiratory infections can still receive vaccination; those with more severe illnesses should wait until these resolve. It is recommended that vaccination be given in the muscle of the upper arm (the deltoid) in adults (NACI, 2002). The most common side effect is soreness at the injection site. About 11-17% of adults may experience headache, fatigue or irritability after vaccination; a smaller percentage may have low fever. Serious allergic reactions are quite rare, but are a contraindication to further vaccination for HBV.

Because they may be at increased risk for possible needlestick injury or other blood exposures, all NEP staff should be advised to receive HBV vaccine if they have not already done so.

As with other immunizations at NEPs, provision of HBV vaccine requires staff who have the necessary expertise, or else collaborative arrangements with outside professionals are needed to carry out vaccination clinics at the NEP, or to provide services to NEP clients in another location. Because multiple doses of vaccine over a period of several months are required, accurate record keeping and administrative efforts to determine who requires vaccination, and when, are necessary. Furthermore, it will be necessary to educate clients about the importance of following up at the appropriate intervals. Ensuring the proper vaccination schedule may prove challenging for both clients and staff.

Evidence for Hepatitis B vaccination at NEPs

There is a great deal of epidemiological evidence that IDUs are at increased risk for HBV, that this risk is high early in their injecting careers, and that vaccination could prevent them from becoming infected. The focus here will be on evidence related to NEPs as a site for provision of this service.

Two published studies address the provision of HBV vaccine in NEPs. Des Jarlais et al. (2001) reported on a cohort study of IDUs in Alaska which counselled and tested clients for HBV, along with HIV and HCV, and

referred those eligible for HBV vaccination to two local clinics or their Medicaid provider, where they would receive free vaccination. With provision of free transportation and monetary incentives of up to \$50 for each vaccination, 31% of those eligible ultimately received three shots. The authors compared this to on-site vaccination at an NEP in New York City, where 76% of the 94 persons asked to participate in the study did so, of whom 36 were eligible for HBV vaccine, and 30 (83%) completed three vaccinations given by a physician's assistant or nurse available at the NEP for a few hours on one or two days per week. These participants received \$5 for initial testing visits and \$10 for each visit to receive the second and third dose of vaccine. The authors concluded that both convenient location and small financial incentives greatly facilitate provision of HBV vaccine. They do not directly address the benefit of a location that is not only convenient but familiar and trusted, as is likely to be the case with NEPs, but their study could be seen as confirming the importance of this factor.

McGregor et al. (2003) examined factors influencing HBV vaccine uptake among clients of an NEP in a large urban area in England. Eighty-seven percent had been offered vaccine, 59% accepted at least one dose, and 27% completed three doses. The authors found that IDUs who shared needles and who had HCV, both of which might mark them as higher risk for infection with HBV, were less likely to be offered vaccine. IDUs who were older, who shared needles, and those who had only recently begun to use the NEP or who had been using it for an extended period (more than 2 years) were less likely to accept vaccination. NEP staff identified lack of staff training, chaotic lifestyles of clients, and failure of drug treatment services, family doctors or prisons to start or complete courses of vaccine as barriers to successful vaccination.

Tetanus vaccination

The Canadian Immunization Guide indicates that injection drug use is a risk factor for tetanus, and recommends that all adults who have had a 3 dose primary immunization series for tetanus (usually included as part of childhood immunization) be given a booster dose every 10 years to maintain their immunity. Adults who have never received primary immunization will require a 3 dose series of vaccinations, followed by boosters every 10 years.

Influenza & pneumococcal vaccines: Considerations

Provision of influenza and pneumococcal vaccine at NEPs may be indicated for two reasons. First, both are recommended for persons who are HIV-infected, and NEPs are likely to be providing services to persons with HIV infection, both diagnosed and undiagnosed. Secondly, there is some evidence that HIV negative IDUs are also at increased risk for bacterial pneumonia (Hoge et al., 1994), which may be reduced by providing pneumococcal vaccine. Influenza vaccination is recommended for persons with a number of other chronic conditions including chronic lung disease and diabetes, and in Ontario has been recommended for all adults in order to reduce influenza-related illness and emergency room visits. NEPs may consider providing these vaccines because they are points of care for persons who do not have access to a family doctor or other primary healthcare source.

Provision of vaccines requires professional training and expertise which may not be available at all NEPs. Alternative approaches such as seeking to collaborate with care providers to ensure access for NEP clients to primary care may be feasible alternatives but can require considerable staff resources. Because

immunizations require only specific inputs in time and money, they may be more attractive and feasible services to offer at NEPs compared to more extensive and open-ended primary care, however, there will still be a need to consider how to address a wider range of unmet health needs.

Influenza vaccine is available free of charge through public health as part of the universal influenza immunization program in Ontario. Pneumococcal vaccine is not currently provided by public health but can be obtained by physicians free of charge from public health units for certain high-risk groups. Since influenza immunization requires only one shot annually, while pneumococcal vaccine is given once to develop longterm immunity, they are both likely to require less administrative effort regarding follow-up than multi-dose vaccinations. However adequate record keeping is needed to avoid unnecessary repeat doses.

Evidence for pneumococcal and influenza vaccinations at NEPs

One study has been published about the administration of pneumococcal vaccine and influenza vaccine in an NEP. This study (Stancliff et al., 2000) found that IDUs at an NEP in New York City were much more aware of influenza vaccine than pneumococcal vaccine, and were more likely to accept it when offered. However, 70% of those offered pneumococcal vaccine did accept it, as compared to 86% for influenza vaccine. Many NEP users for whom these vaccines were indicated did not have a regular source of medical care and thus were considered unlikely to have received them without this intervention.

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Testing services

Best practice recommendations – in detail

To increase clients' knowledge of their HIV, HBV and HCV statuses:

- ▶ Provide voluntary counselling and testing for HIV, HBV, HCV, and tuberculosis as part of NEP services and/or ensure access to testing at other available health services
- ▶ Inform clients about HIV testing options (anonymous, nominal) so they can make informed decisions about testing
- ▶ Ensure confidentiality of all test results
- ▶ Consider testing for syphilis or referring for this as part of sexual healthcare

INTRODUCTION

IDUs are at increased risk for HIV, HBV and/or HCV, which may result in a chronically infected carrier state, and also tuberculosis. Latent tuberculosis and early stages of HIV and chronic HBV or HCV can all be completely asymptomatic, and only detectable with appropriate screening tests. Many IDUs lack a regular source of medical care, or may not reveal their risk status to their healthcare provider. NEPs thus have an opportunity to provide necessary testing to their clients who will not receive it elsewhere, or to assist their clients to access screening tests with other providers. Since syphilis can be detected using blood tests, it may also be included in testing provided at NEPs, but tests require expert interpretation and follow-up if positive.

Voluntary counselling and testing for HIV

Knowledge of HIV status may help to encourage safer behaviour among both HIV positive and HIV negative IDUs. For those who are HIV positive, this will entail efforts to avoid infecting others. Knowing that they are HIV-infected may also motivate IDUs to improve self-care and to seek monitoring of their health and HIV treatment when indicated. For those testing HIV negative, pre- and post-test counselling can provide an opportunity to review risk behaviours and counsel about risk reduction.

Considerations for voluntary counselling and testing for HIV

Effective HIV testing requires high quality pre- and post-test counselling and support for persons who test positive. This necessitates that staff receive excellent training in counselling, and have access to necessary referrals for care and support. In Ontario, specifically designated sites are able to offer anonymous testing, which may be an option that some IDUs want to have. Testing at these sites is done using a code known only to the client, so that results cannot be linked to the individual by anyone else. This means that issues such as partner notification and treatment referral can only be dealt with as part of pre- and post-test counselling, unless follow-up is sought out by the client. Outside such anonymous test sites, positive test results are reported to public health authorities who will contact the test provider regarding issues of partner notification and client needs for service referral.

Evidence for HIV counselling and testing at NEPs

Available research evidence supports the likelihood that HIV positive IDUs may utilize this information to reduce their risk of infecting others (Des Jarlais, 2004). It is also important that HIV infected persons receive regular monitoring in order to ensure that they can be offered anti-retroviral therapy in a timely manner, since those who only present for medical treatment with AIDS defining illnesses and severely deteriorated immune systems are at serious risk of death or inadequate recovery. Clear monitoring and appropriate treatment can only occur if such persons are aware of their infection and able to access needed care. Evidence supports the availability of testing through NEPs as a key measure in ensuring such awareness.

HBV and HCV testing

Injection drug use is a risk factor for becoming a chronic carrier of HBV or HCV. About 10% of persons who become infected with HBV have chronic persistent infection which makes them infectious to others and also may progress to cirrhosis of the liver or liver cancer. Testing can allow persons who are carriers to avoid behaviours which may infect others, to receive medical monitoring and to consider possible treatment. IDUs who are tested and found to have neither chronic infection nor immunity (i.e., no evidence of previous exposure to HBV) can be offered immunization to prevent future infection. HAV vaccine is also available free to IDUs (see **Vaccination** section). The majority of persons who have become infected with HCV will remain chronic carriers with the potential to progress to cirrhosis of the liver and more rarely to liver cancer. Testing positive may alert clients to their risk of infecting others, and may motivate them to change their behaviour, to seek medical monitoring such as tests of their liver function, to reduce exposures to alcohol or other substances which are toxic to the liver, and to consider the possibility of treatment. Treatment for HCV is lengthy (several months), difficult (it requires injections and side effects include flu-like symptoms and depression), and even success of complete treatment varies from 45-80% depending on the particular HCV genotype (Wong, 2006), but if successful, it results in sustained clearance of the virus so that the person is no longer infectious to others or at risk of further damage to their liver from HCV. However, if they participate in risk behaviours, they are at risk for becoming re-infected.

Considerations for HBV and HCV testing

As for HIV, appropriate counselling and information about HBV and HCV should be provided to IDUs considering testing. This requires initial staff training as well as opportunities to keep up with new information.

HBV, HCV, and HIV statuses are reported to public health authorities. Only HIV has an anonymous testing option. This may create anxiety for IDUs considering testing, but effective collaboration between NEPs and public health authorities can seek to mitigate these concerns and ensure that public health issues are appropriately addressed.

Once identified as being infected, access to medical monitoring and treatment may be difficult to provide in many locations. Currently, there is a shortage of specialty services available to manage hepatitis patients, and providers may be unwilling to provide these limited resources to persons whom they perceive as unlikely to comply with treatment.

Evidence for Hepatitis testing at NEPs

No published studies were found that directly addressed the issue of hepatitis testing in NEPs; testing and vaccination within NEPs are addressed in the **Vaccination** section.

Tuberculosis screening

Tuberculosis (TB) is an infection generally spread through droplets in the air from an infected person and confined to the lungs except in those with reduced immunity such as with HIV infection. Many persons who are infected with TB have it present in latent form. That is, it is confined to enclosed areas within the lungs, does not cause symptoms, and is not infectious to others. However, there is an ongoing risk that such latent infections may become activated so that the infected person will have an active lung infection which can damage their own lungs and also spread to others. About 10% of those with latent infection will develop active disease, usually within the first 2-5 years after infection, but sometimes later in life. The risk of developing TB may be 100 times greater in persons infected with HIV than in the general population. Thus it is essential that HIV infected persons be tested for latent TB and treated to prevent going on to active TB. Even without HIV infection, IDUs have increased rates of both latent and active TB. This is particularly true for persons of Aboriginal origin and immigrants from countries with high rates of TB (Fitzgerald et al., 1999).

Latent infection with TB can be detected in most cases through the use of skin tests. These tests require professional training to administer, and to interpret the results at a return visit 48-72 hours later. If a screening test of this type is positive, it is necessary to provide a chest X-ray to ensure that the person has latent TB only with no evidence of active TB, before treatment is begun, since treatment for latent TB is different from that required for active TB. Medication for both latent and active TB is available free of charge through public health units. TB is a reportable disease, and persons with active TB can be required to undergo treatment in order to prevent them from infecting others.

Considerations for tuberculosis screening

Screening for TB at NEPs requires staff with the necessary professional training and experience; it also requires the capacity to ensure that clients return within the 48-72 hour timeframe to interpret their test results, or have it read elsewhere and reported. This may be especially challenging in mobile NEP services, and where possible it may be preferred to do such testing at a fixed site. If screening is positive, it then becomes necessary that clients be willing and able to access chest X-rays and appropriate follow-up treatment depending on the outcome of these X-rays. It may be necessary for NEP staff to accompany clients to ensure that they receive the necessary follow-up services.

Evidence for tuberculosis screening at NEPs

A number of studies have examined approaches to providing TB screening for IDUs. Typically the rate of return for follow up among IDUs is relatively low if this is attempted using only education and encouragement to return. Studies that utilize incentives, typically small monetary or non-monetary (e.g., vouchers, transit tokens, tickets, etc.) achieve high rates of return for reading of screening tests. One study used incentives

for attending at follow up chest X-rays and medical assessments and demonstrated improved rates of attendance for these as well. Thus the evidence suggests that achieving adequate rates of follow-up for test reading and especially for further diagnostic testing and treatment may be challenging, and that use of modest (e.g., \$5-15) incentives may greatly improve success.

Once the need for treatment is confirmed and it is determined whether this should be treatment for latent infection or for active infection, approaches such as directly observed therapy have been utilized to ensure that treatment is successfully adhered to. TB treatment involves a minimum of six months of treatment and failure to adhere to therapy will result in treatment failure and possibly also drug resistant TB which is subsequently harder to treat. In order to ensure appropriate follow up and treatment, an alliance between the NEP staff and public health staff involved in tuberculosis control programs is needed. There is evidence that directly observed therapy delivered in the community or at methadone maintenance or other drug treatment services can facilitate successful management of TB treatment.

Syphilis testing

An outbreak of syphilis has been described among sex trade workers and their clients in Calgary, in which about half of those infected were injectors of crack cocaine (Jayaraman, 2003). There is also evidence from the United States that IDUs and also users of non-injection drugs (e.g., crack smokers) may have elevated rates of syphilis, especially if they exchange sex for drugs (Lopez-Zetina J, 2000). Screening blood tests for syphilis can be provided at NEPs along with other blood tests. Interpretation of tests for syphilis and provision of appropriate treatment require expertise and those with positive screening tests should be referred to a sexually transmitted diseases clinic or other source of expert care.

For more information see:

Hepatitis A and B:

National Advisory Committee on Immunization (NACI) for Health Canada. Canadian Immunization Guide, 2002. Accessible online: www.phac-aspc.gc.ca/publicat/cig-gci/pdf/cdn_immuniz_guide-2002-6.pdf

Hepatitis C:

National Institutes of Health. US government consensus statement on testing and treatment, 2002. Accesible online: <http://consensus.nih.gov/2002/2002HepatitisC2002116html.htm>

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Law Enforcement

Relationships with law enforcement

Best practice recommendations – in detail

To develop and establish a collaborative relationship with law enforcement:

- ▶ Establish a relationship with local law enforcement agents early in the development of an NEP
- ▶ Provide in-service training to law enforcement agents focussing on:
 - ▶ The purpose and goals of NEPs
 - ▶ Evidence about NEP effectiveness
 - ▶ Evidence concerning the impact of NEPs on injection drug use
 - ▶ The health and social concerns of IDUs
 - ▶ Needlestick injury prevention
- ▶ Negotiate agreements with law enforcement agents to ensure that:
 - ▶ Clients are not harassed while entering or leaving NEP sites and vehicles
 - ▶ NEP equipment is not destroyed or confiscated from clients
 - ▶ NEP fixed, mobile, and other sites are not used for surveillance purposes
 - ▶ NEP staff will not interfere with law enforcement activities
 - ▶ Needlestick injury prevention
- ▶ Establish protocol for the NEP and law enforcement agents to resolve conflicts

INTRODUCTION

NEP efforts to reduce the transmission of HIV, HBV, HCV and other bloodborne pathogens can be negatively impacted by actions of law enforcement agents. In particular, literature indicates that law enforcement practices sometimes conflict with NEP activities and relationships between NEPs and law enforcement agencies can become problematic particularly when there is a perception that providing needles and other NEP services encourages and endorses an illegal activity. Law enforcement agents who are not familiar with the rationale and evidence base concerning NEPs may not be supportive of the efforts of program staff and clients to reduce transmission of bloodborne pathogens. Consequently, law enforcement agents sometimes use NEPs for surveillance purposes. As well, police sometimes harass NEP clients after leaving NEPs and sterile equipment is confiscated. As a result, IDUs can be reluctant to attend NEPs. In Canada, possession of sterile, unused needles is not illegal.

Police crackdowns and increased arrests in areas where drugs are commonly bought and used have been shown to reduce drug use over the short-term. However, crackdowns also discourage clients from using NEP services. As well, there is evidence that crackdowns may displace drug use to other areas and/or reduce drug use for a short period of time with drug use patterns returning to previous levels after crackdowns. Recent evidence shows that increasing the number of police officers in a community and the amount of money spent on incarceration does not reduce the number of injectors. However, increased policing, arrests and incarcerations are associated with elevated HIV prevalence among injectors.

Fear of being arrested while in possession of drugs and/or injection equipment can lead IDUs to rush injections, skip safer injection techniques (e.g., hand and skin cleaning) and to feel so anxious that they cannot inject with accuracy. All of these consequences can increase the risk of injection-related problems such as infections and skin and soft-tissue damage.

Evidence and insight from NEP workers suggests that cooperation, negotiation and education may help to reduce the perception and instances where NEPs and law enforcement agencies work at cross-purposes. Establishing a relationship with local law enforcement agencies before an NEP opens is an important step in program development and may reduce the chances of the harassment of NEP staff and clients by police.

Insight from NEP workers suggests that the following activities can reduce or eliminate tension between NEPs and law enforcement agencies. Encourage the Medical Officer of Health and/or the Executive Director of a community organization to speak directly with the local Chief of Police about the NEP, its goals and procedures and how the NEP and law enforcement agents will interact (or not). The goal of the relationship is to ensure that the activities of the NEP and local law enforcement agencies do not lead to tension and difficulties. As such, it is important to establish policies and procedures for the relationship between the NEP and law enforcement agencies, including:

- ▶ A procedure for each party to discuss and resolve disputes
- ▶ Agreement that the NEP sites and vehicles will not be used for surveillance purposes
- ▶ Agreement that police will not enter the NEP sites or vehicles unless there is an official purpose and/or they are invited to do so
- ▶ Agreement that NEP staff will not interfere with police activities

Establishing a relationship with the community relations officer in the local law enforcement agency can provide a gateway to ensure that both parties have an understanding of one another's goals and responsibilities. A relationship with the community relations officer can facilitate opportunities for NEPs to conduct workshops with law enforcement agents. Workshops can include information about the following:

- ▶ The NEP, its goals and procedures
- ▶ Misconceptions regarding the purpose and goals of NEPs
- ▶ Evidence concerning NEP effectiveness
- ▶ Factors underlying and contributing to illicit drug use (i.e., poverty and unemployment)
- ▶ The health consequences of illicit drug use
- ▶ Evidence demonstrating that NEPs neither increase rates of crime nor encourage initiation/continuation of injection drug use
- ▶ The consequences of confiscating and/or destroying harm reduction materials

Workshops can also be used to provide in-service training for needlestick injury prevention. Needlestick injury is a concern for police, and teaching them prevention techniques may be a good advocacy tool to create or improve collaborative relationships between NEPs and police.

Working collaboratively with police may improve their understanding of the need for NEP services and the public health benefits of such programs. It also allows for both law enforcement agencies and NEPs to work

together to develop possible solutions that will meet the needs of both organizations by incorporating strategies to reduce negative health consequences of injection drug use while at the same time allowing police officers to enforce the law.

CONSIDERATIONS

Although the literature concerning how to go about ensuring that law enforcement agencies do not interfere with NEP service goals is lacking, perspectives from available sources were examined to formulate the best possible strategies to develop relationships between NEPs and law enforcement agencies.

Some NEPs have distributed identification cards for IDUs that officially state the individual is a client of an NEP. NEPs have negotiated a policy with police to ensure that officers will not confiscate needles and other materials from IDUs with such cards (Loue et al., 1995). However, some NEP staff have raised concerns that IDUs who are stopped by police in a situation unrelated to illicit drug use and are in possession of an NEP identification card may be subjected to closer scrutiny and/or searches than is warranted by the situation for which they were detained.

EVIDENCE

Police crackdowns

In 2003, a large-scale police crackdown to reduce illicit drug use in Vancouver's downtown east side was examined to determine its impact on injection drug use behaviour (Wood et al., 2004). Information concerning drug use, risk-taking behaviour, access to healthcare services, and perceived effectiveness of law enforcement efforts on the supply of drugs was gathered from 244 IDUs three months before the crackdown and from 142 IDUs three months after the beginning of the crackdown. IDUs reported that police presence led to significant changes in the public location of drug use (i.e., changes in the neighbourhood or alley used) and a marginal increase in recent drug usage in a public space (i.e., a park, public washroom, or street). Additionally, IDUs reported less contact with street nurses and were significantly less willing to utilize a safer injection site. Although the number of used needles found on the streets of the downtown east side core decreased significantly, there was a significant increase in unsafe needle disposal outside the core, as well as a significant decrease in the use of public safe needle disposal boxes. There was also a significant reduction in the number of needles returned to Vancouver's largest NEP.

Police crackdowns have been found to have negative effects on IDUs' ability to practice harm reduction. Between August and December 2000, Cooper et al. (2005) interviewed 40 IDUs in the Bronx to determine how a police crackdown was affecting their drug use behaviour. Increased police surveillance of public spaces and the elevated chance of being stopped by police were the two main factors that hindered IDUs' utilization of safer injection methods. Several strategies used to avoid police placed IDUs at increased risk of injection-related health problems. Some IDUs who injected in public spaces reported rushing to inject so they would not be caught by police. Others reported feeling unsafe returning home through police monitored areas after purchasing drugs, thus they chose to inject outside. Several IDUs skipped cleaning

their skin in order to save time, thus increasing their chances of abscesses, cellulitis, and endocarditis. IDUs reported carrying drugs in their mouths so that if approached by police, they were ready to swallow it and avoid arrest. This action not only compromises sanitary injecting, but also puts IDUs at risk of overdosing. Since needles could not be safely hidden on their person, participants hid needles around the neighbourhood's public spaces. Placing needles in public spaces potentially endangered the public health and safety of children who lived in the area, and put IDUs at risk of unknowingly exposing themselves to infection if others borrowed the needles or not having a needle available if someone stole them.

In a similar study, changes in NEP use were examined over a period of nine months before and after the initiation of an intensive long-term police intervention to deter drug activity in Philadelphia (Davis et al., 2005). The crackdown involved uniformed police officers standing on targeted corners, many of which were in close proximity to NEP sites. Although the police intervention effectively reduced the occurrence of drug trafficking on the targeted corners, it was significantly associated with a reduction in the use of the NEP, particularly among Black and male clients. Reductions in the use of the NEP suggest that former NEP clients could have increased their rates of sharing and reusing needles, thus increasing the probability of acquiring a communicable disease. Furthermore, numerous cases of police harassment of NEP clients were reported and at least one client was arrested for possession of needles received at the NEP site.

An intensive police anti-drug initiative in Melbourne, Australia resulted in several negative consequences for IDUs' ability to practice safer injection. Aitken et al. (2002) qualitatively studied how a police crackdown affected the lives of IDUs and drug dealers. IDUs reported that while the crackdown made it more difficult to obtain drugs, the effect on the overall market was minimal and temporary. The crackdown resulted in a displacement of drug dealers from the streets into locations where police activity was less intense such as coffee shops. Some IDUs resorted to injecting alone in alleys, thus decreasing their chances of being found if an overdose were to occur. One participant reported utilizing a friend's old needle due to feeling uncomfortable walking past police who were standing opposite the local NEP.

In their study of Cabramatta, an area of Sydney known as Australia's heroin capital, Maher and Dixon (1999) consulted with 143 current heroin users between 1995 and 1997 to determine the impact of several intensive policing interventions which took place during this time. During police anti-drug initiatives, IDUs reported being more reluctant to carry injection equipment, with some reporting either picking up used needles on the street or borrowing them from friends. A number of participants reported that when police caught them with needles, the police would destroy the needles or would force the IDUs to destroy them. Additionally, some participants reported swallowing heroin stored in the mouth to avoid being caught by police with drugs, which led to several near-fatal overdoses.

Crime and NEPs

Marx et al. (2000) examined arrest trends in Baltimore City six months prior to and six months following the opening of two NEP sites in 1994. Although there was an increase in drug possession arrests in the program areas early after the opening of the NEP, findings indicated that drug-related arrests did not increase more prominently in NEP areas than in other sections of the city after the introduction of the program. The increased drug possession arrests are believed to be associated with police sweeps that occurred soon after program initiation.

Establishing relationships with law enforcement

Using data from a qualitative study of 15 Ontario NEPs, Strike (2001) reported that police and NEPs sometimes interfere with each others' work. For example, NEPs in Ontario have been subject to police surveillance that discouraged clients from attending fixed sites. Police have also followed NEP vehicles around the community. As well, police have detained clients exiting the NEP and confiscated any equipment obtained from the program. Although only a few instances were reported, NEPs have interfered with police matters (e.g., arrests of IDUs on-site). However, at the time of the study (late 1990's), most NEPs reported that their relationship with the local police was good but some reported on-going harassment of the staff and clients. NEPs that reported good relationships also reported that a police officer was a member of the advisory board and/or that the Medical Officer of Health and/or Executive Director of a community organization had established an on-going relationship with the police and a set of procedures and policies for the relationship between the NEP and the police. Participants noted that staff changes in the NEP and/or the police require that relationships between the two need to be regularly revisited.

Somlai et al. (1999) reported that inclusion of law enforcement during the planning stages of the Milwaukee NEP Lifepoint greatly reduced opposition from law enforcement agents. Law enforcement personnel collected their information from enforcement agencies in other locations to develop guidelines and policies for working with the NEP. Local law enforcement adopted a neutral stance towards the NEP and agreed not to actively investigate the NEP or its clients. However, law enforcement indicated that NEP clients would be subject to the same enforcement activities as other citizens.

Evaluation of law enforcement practices

In a recent American study, Freidman et al. (2006) examined the impact of arrests for possession of cocaine or heroin, police employees per capita and corrections expenditures per capita on the population prevalence of injection drug use and the prevalence of HIV. Results did not show a relationship between these three factors and the prevalence of injection drug use. Freidman et al. (2006) suggest that the results indicate that increased expenditures on policing and incarceration do not necessarily result in decreased injection drug use. However, results did show that all three factors were associated with HIV prevalence. Freidman et al. (2006) conclude: 'These findings suggest that legal repressiveness may have little deterrent effect on drug injection and may have a high cost in terms of HIV and perhaps other diseases among injectors, their partners, and the broader community, and that alternative methods of maintaining social order should be investigated' (p. 97).

Sutton and James (1996) reviewed the work of various Australian law enforcement agencies, interviewed personnel in senior policy, management, and operational positions, assessed relevant criminal justice data and formulated methods to help make Australia's drug law enforcement more rational and accountable. Based on their findings, it was recommended that drug law enforcement policy should reflect a commitment to enforcing drug laws while operating from harm minimization principles. This involves developing policy statements and related practices that specify: how these meet the standards of harm minimization principles; outcomes such as expected reductions in illicit drug supply; and strategies to resolve conflicts between supply reduction and harm minimization goals. In order to implement these objectives and enhance drug law enforcement agencies' capacities, it was recommended that drug law enforcement agencies engage in

multi-sectoral collaborations to: achieve an integrated approach to supply reduction and harm reduction, develop a shared understanding of harm reduction across agencies, and develop an integrated training strategy for police and other stakeholder agencies.

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Program Evaluation

Program evaluation

Best practice recommendations – in detail

To ensure the effectiveness of NEPs:

- ▶ Conduct on-going evaluation to determine how well the program meets the needs of the clients
- ▶ Provide training for staff to ensure that the purpose of, and activities related to, evaluation are understood and accepted
- ▶ Involve IDUs in the design and implementation of evaluations
- ▶ Develop a program plan to review evaluation results and modify the program as needed

INTRODUCTION

On-going evaluation is an important activity for NEPs to undertake. Information gathered from on-going evaluation can help managers and staff determine how well their program meets the needs of clients and where further improvements are warranted. Evaluation results can also be used to demonstrate the effectiveness of the program to community members. According to the WHO (2005), program evaluation is a crucial program activity and 'needs to be taken into account, planned, agreed to and budgeted for from the very beginning of the program' (p.73).

Evaluation activities vary from simple to complex and decisions regarding the type of evaluation to undertake need to be tailored to meet the needs and resources of each program. Questionnaires, interviews, client attendance records, focus groups and other methods can be used to gather evaluation information. All NEPs need to implement evaluations of process (e.g., hours of operation and site locations), client satisfaction and service coverage (e.g., percentage of IDUs receiving services). Evaluation of program impact is also important and depending on staff skills may require collaboration with external evaluators/researchers.

As noted in the **NEP start-up tasks** section, program planners need to understand the community they will serve before designing the program. However, IDU populations and surrounding communities change over time and periodic collection of information (e.g., every 12 or 24 months) is necessary to ensure that the program as currently delivered meets the needs of clients and the community. The list below suggests some topics to be included in periodic data collection:

- ▶ How many IDUs live in the community and/or catchment area
- ▶ Where clients live, buy and use drugs, and hang out
- ▶ Social, economic and health status of IDUs
- ▶ What kinds of drugs are used and how they are consumed
- ▶ Current level of knowledge regarding risk and protective behaviours
- ▶ Current patterns of risk and protective behaviours
- ▶ What resources are available for IDUs and if these are used

Methods such as analyses of existing data sets, surveys, focus groups, face-to-face interviews and field observations can all be used to collect relevant data. The Rapid assessment and response guide on injecting drug use (IDU-RAR) available from the WHO provides guidance on how to develop a strategy to gather information, to collect and interpret information and to develop an action plan based on the information.

Process evaluations involve structured collection of information about how the NEP operates and can be used to determine if it is operating as planned. In particular, programs can collect information about the number/frequency of services provided to clients and use this information to determine how many clients the program serves and what types of services are provided (e.g., equipment, counseling and referrals). Using these program statistics, program can then determine:

- ▶ Resource requirements (e.g., equipment)
- ▶ Need for implementation of new models of service delivery
- ▶ Staffing requirements including both number and skill type

Evaluation of client satisfaction can take many forms from on-going surveys to focus groups to client forums. When evaluating client satisfaction, it is important to gather information from all types of clients (e.g., frequent and non-frequent attenders; young versus old; men versus women, etc.). As such, a separate survey to investigate these issues with non-attenders is also necessary. Understanding what motivates clients to attend frequently or not may provide important insight into how the program is delivered, what works well and what needs improvement. Understanding why some IDUs do not use the NEP is also very important for program development and effectiveness.

As discussed in the **Needle and syringe exchange** section, some NEPs use ID numbers to certify clients' participation in the program and also to track service provision over time as part of program evaluations. There are both advantages and disadvantages to using client ID numbers at NEPs, and a summary is provided in **Table 11**.

Table 11: Advantages and disadvantages of using client ID numbers

Advantages	Disadvantages
NEPs can collect data for program evaluations, e.g., how many IDUs are served per year	Clients may forget their ID numbers, making accurate tracking problematic
NEP utilization can be tracked by client, and data used for targeted interventions. For example, high volume exchangers may be identified as potential peer exchangers	Tracking ID numbers can be time-consuming to administer. Procedures need to be in place to collect data in a timely and accurate way
NEPs can collect data on what, where and to whom services are provided that will help tailor the program to the needs of the community	Tracking ID numbers can be challenging in a busy environment, for instance on the NEP van
NEPs can track needle return rates by client. However, this is not recommended as individual (i.e. per client) return rates are of limited value in understanding safe disposal rates (see Safer handling and disposal of used injection equipment)	Lack of anonymity—whether real or perceived—may discourage clients from using an NEP

Evaluating program impact is very important and requires particular types of evaluation and research methods. Indicators of success that might be evaluated include: HIV and HCV seroconversion and behavioural change. I-Track is the Enhanced Surveillance of Risk Behaviours among Injecting Drug Users in Canada, a repeated cross-sectional survey funded by the Public Health Agency of Canada (2004). Demographic, drug use and risk behaviour information is collected and anonymous HIV and HCV testing are conducted using finger-prick blood samples. This on-going surveillance activity is conducted at selected NEPs across Canada, however, use of similar methods and data collection procedures by other NEPs could provide important program information that is comparable to other programs in Canada.

The WHO (www.who.int) offers an excellent set of downloadable and free resources to assist with program development, including:

- ▶ Rapid assessment and response guide on injecting drug use (IDU-RAR)
- ▶ Policy and programming guide for HIV/AIDS prevention and care among IDUs
- ▶ Training guide for HIV prevention outreach to IDUs

CONSIDERATIONS

For NEP workers, providing services and conducting on-going and/or periodic evaluations is time consuming. When evaluation data is not used, staff may question the benefits of conducting these activities and not devote sufficient time or effort to their evaluation duties. As well, clients may fear the consequences of participating in evaluation (e.g., loss of service) and voicing their satisfaction or lack thereof with the program. Involvement of both staff and clients is important to ensure that evaluation activities are relevant

to the work staff members conduct and the services clients receive. As well, it is important to share the results of evaluations with staff and clients to demonstrate that their points of view are taken seriously and to provide a further opportunity for input in to program development.

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WHO. Training guide for HIV prevention outreach to injecting drug users. Accessed May 2005 from: www.who.int/hiv

Other Considerations

OTHER NEP CONSIDERATIONS

Methamphetamine

Recently in the media and in many outreach programs, concerns have been raised about the growing popularity of methamphetamine. For NEPs, methamphetamine may be problematic if popularity results in increased numbers of IDUs in the community. While similar to cocaine, the pharmacology of this drug is different and may create new concerns for NEP clients. These issues are examined in greater detail below.

Methamphetamine is a synthetic drug classified as an amphetamine-type stimulant (ATS) that acts on the body's central nervous system. It stimulates the release of excessive amounts of dopamine, which enhances mood and body movement. Methamphetamine can be smoked, snorted, injected, or taken orally depending on its form and is commonly known as meth, speed, chalk, crystal, and ice (National Institute on Drug Abuse [NIDA], 2002). Methamphetamine is manufactured quite easily in illicit labs using inexpensive over-the-counter ingredients such as pills containing ephedrine or pseudoephedrine (found in diet pills and cold medications) and chemicals such as acetone, rubbing alcohol, and freon (Gunter et al., 2004). Compared to other illicit drugs, the cost of methamphetamine is relatively low and a methamphetamine habit can be maintained on as little as \$5 per day (Consensus Panel Report, 2005).

An intense rush or sensation lasting several minutes is experienced by users immediately after smoking or injecting the drug. When snorted or swallowed, the effect takes longer to present and results in a euphoric high but not a rush. Following the initial euphoric state, users usually feel tired and depressed because the drug suppresses the normal production of dopamine (NIDA, 2002). Compared to amphetamine, methamphetamine is more potent (Degenhardt & Topp, 2003) and although it shares similarities with cocaine, methamphetamine metabolizes in the body at a much slower rate and its effects can last up to 24 hours (Consensus Panel Report, 2005).

There are numerous short- and long-term effects of methamphetamine use. Short-term effects include increased energy, insomnia, irritability, dryness of mouth, decreased appetite, nausea and an increased heart rate, respiration, and body temperature. One particularly problematic side effect is the violent and aggressive behaviour exhibited by methamphetamine users, which has led to increased domestic abuse incidents and hospital emergency room admissions (Cretzmeyer et al., 2003). In their study of 1,016 methamphetamine-dependent outpatients participating in the Methamphetamine Treatment Project, Zweben et al. (2004) found that users reported high levels of psychiatric symptoms such as depression and experienced difficulty controlling violent and aggressive behaviour. This behaviour may be problematic for emergency department staff and other service providers who come into contact with methamphetamine users.

When used regularly, methamphetamine tolerance develops quickly (CAMH, 2001), which could lead to the use of higher and more frequent doses. Many users tend to follow a 'binge and crash' pattern over several days or weeks. Long-term side effects of methamphetamine use can include such conditions as paranoia, confusion, mood disturbances, anxiety, memory loss and periodontal disease (Consensus Panel Report, 2005). Furthermore, irreversible damage to blood vessels in the brain can cause strokes and central nervous system effects such as hyperthermia and convulsions can result in death if not treated immediately (NIDA, 2005).

Those who inject methamphetamine are at increased risk of health-related harms associated with the drug. Damaged blood vessels, skin abscesses at or around the injection site (Brands, Sproule, Marshman, 1998), endocarditis, and septicemia are common among regular users of stimulants such as methamphetamine (Consensus Panel Report, 2005). In the production process, methamphetamine can become contaminated with substances shown to cause lead poisoning in IDUs and blocked blood vessels can occur if the drug contains insoluble particles that lodge in the small blood vessels of the hands, feet, lungs and brain (Brands et al., 1998).

Since injection is a common method of administering methamphetamine (Cretzmeyer et al., 2003), users are also at risk of acquiring HIV, HCV, and other bloodborne pathogens if injection equipment is shared. Due to decreased inhibitions, methamphetamine use sometimes leads users to engage in risky sexual behaviour, placing them at increased risk of infection with bloodborne pathogens (Consensus Panel Report, 2005).

In their study of 194 HIV positive men who have sex with men in San Diego, California, Semple et al. (2004) found that methamphetamine injectors reported more years and a higher intensity of methamphetamine use, as well as more health and social problems including higher HIV and STI prevalence and more sexual risk behaviours compared to non-injecting methamphetamine users.

The Canadian Addiction Survey (Canadian Centre on Substance Abuse, 2004) gathered data about alcohol and other drug use among Canadians 15 and older. Although only amphetamine-type stimulants (listed as 'speed' in the survey) were examined and not methamphetamine use specifically, the results imply a low prevalence rate, with a 6.4% lifetime prevalence rate for speed and less than a 1% prevalence rate in the preceding 12 months. However, this may not be an accurate reflection of methamphetamine use as the survey was conducted by telephone and in high schools, and did not survey hard-to-reach populations such as street youth and people in rural and remote settings. Moreover, there is evidence of increased methamphetamine use in the greater number of methamphetamine-related hospital admissions, police contacts, and clients seeking community treatment (Consensus Panel Report, 2005).

OxyContin™

For NEPs, OxyContin™ has the potential to create new challenges and concerns for clients. Anecdotal reports from some NEP workers suggest that OxyContin™ is used by some of their clients. Illicit use of OxyContin™ has increased profoundly since its introduction in 1995. OxyContin™ is the brand name for oxycodone hydrochloride - a semi-synthetic, opioid (narcotic). Increasing Oxycontin™ use among youth is causing concern. In Atlantic Canada, schools and police have expressed concern about the growing number of young people requiring treatment for OxyContin™ dependence (OxyContin Task Force, 2004). In the U.S., a National Institute on Drug Abuse (NIDA) survey (2004) found that 1.7% of 8th-graders, 3.5% of 10th-graders, and 5.0% of 12th-graders had used OxyContin™ in the previous year. Data on OxyContin™ use among Ontario youth are being collected (CAMH, 2005) and not available at the time of printing.

While similar to other opiates, the pharmacology of this drug is different and may create new concerns for NEP clients (e.g., overdose). These issues are examined in greater detail below.

The first reports of illicit OxyContin™ use were in rural regions of the US (e.g., Appalachia) hence its nickname: hillbilly heroin. Other street names are: Oxy, OC, Oxycotton, Killer, Kicker and Poor Man's Heroin. This prescription pain medication provides long lasting relief of chronic, moderate to severe pain. Oxycodone is also found in Percocet and Percodan, however, these pain relievers are short-acting and contain lower doses of oxycodone (2.5-5 mg per tablet). OxyContin™ contains 10-80 mg of oxycodone and has a time-release mechanism that spreads the release of the drug over a 12-hour period.

Chewing or crushing the tablets circumvents the time-release mechanism to release a rapid, high dose of oxycodone. The crushed tablets may be snorted or injected to produce a heroin-like euphoria. OxyContin™ is highly addictive and its prescription quality provides a consistent dosage and dependable high. In a study of OxyContin™ users seeking treatment in Kentucky, the average daily dose was 184 mg (Hays, 2004).

Side effects of using OxyContin™ include reduced awareness and response to pain, inability to concentrate, sleepiness, slower and shallow breathing and decrease in heart rate and blood pressure. Withdrawal effects, include uncontrolled craving, and are similar to that of morphine withdrawal (e.g., muscle aches, nausea, diarrhea, restlessness and sweating). Withdrawal has been reported to be worse than that of heroin and lasts longer.

The high dose of oxycodone means it is easy to accidentally overdose. In the U.S. several hundred people have died of OxyContin™-related overdoses in recent years (Cone et al., 2003). However, these mortality statistics should be interpreted with caution. In many cases polydrug use prevented a precise determination of the agent that caused death. As with other opiates, OxyContin™ overdose is characterized by deep sleep that may progress to stupor or coma, low blood pressure, slowed heart rate, cyanosis (bluish or purplish skin colour due to lack of oxygen), slowed breathing, reduced body temperature, flaccid (limp) muscles, cold, clammy skin, and death.

Considerations for OxyContin™

Since OxyContin™ is prescription quality there are fewer concerns about the negative health effects from the adulterants common with street drugs. Nevertheless, the tablets are designed to be swallowed and contain fillers that are not suitable for injecting.

Young people who inject OxyContin™ may be difficult to attract to NEPs (see for example Bailey et al., 2003; Normand, Vlahov, Moses, 1995) although they are at risk of infections associated with needle and equipment sharing. In addition, drug treatment services and harm reduction programs may need to adjust services to meet the needs of youth dependent on OxyContin™ - i.e., both IDUs and non-injectors. Adolescent House, an out-patient mental health program in St. John's Newfoundland, recently reported that growing demand from youth dependent on OxyContin™ had strained resources (OxyContin Task Force 2004). In response, the agency sought additional resources through community partnerships and out-of-province referrals to residential treatment programs.

In the U.S. and Canada, OxyContin™ dependence has been linked to increases in the number of thefts and robberies of homes and pharmacies. In Ontario several pharmacies have stopped or restricted the sale of OxyContin™ due to security concerns (See for example www.medi-plus.ca/article/267/asp).

Buprenorphine

Buprenorphine hydrochloride (trade name Subutex) was approved for the treatment of opiate dependence in Canada in February 2005. It is a semi-synthetic opioid that diminishes drug cravings, reduces withdrawal symptoms and blocks the effects of subsequent opiate use (Brands, Sproule, Marshman, 1998). It is also used to treat moderate to severe pain and as an analgesic it is 25-50 times more potent than morphine (Brands, Sproule, and Marshman, 1998).

Buprenorphine is becoming more widely available in the world, and in France buprenorphine is the most commonly prescribed opioid replacement therapy. In comparison with methadone, buprenorphine may have some advantages. It is longer lasting, has a lower risk of overdose, and has fewer withdrawal symptoms (O'Connor, 2000).

Buprenorphine tablets come in 2- and 8-mg tablets. The tablets are dissolved under the tongue (sublingually), as chewing or swallowing reduces the effect. Treatment begins with 2 or 4 mg on day one, increasing to 12 to 16 mg on day two, with most patients reaching a stable dose of between 2 and 32mg per day (The Medical Letter Inc., 2004; Brands Sproule Marshman 1998). At doses of 8 mg sublingually, buprenorphine suppresses heroin use as well as, or better than, 60 mg of oral methadone (Brands Sproule Marshman 1998). In U.S. clinical trials, Schottenfeld et al. (2000) and Marsh et al. (2005) found that alternate-day and three-times-a-week doses were effective opiate replacement therapies. After a sufficient dose has been achieved and stabilized, buprenorphine is often prescribed as a take home medication as the potential for diversion and/or overdose is considered lower than for methadone. Patients in methadone maintenance treatment can be transferred to buprenorphine treatment, however their methadone doses need to be decreased before the transfer occurs (Seattle and King County Public Health, 2004).

With increasing doses, buprenorphine has a ceiling effect (Brands Sproule Marshman, 1998). Consequently, there is less concern about overdose (even when it is taken with other opioids) than with other therapies such as methadone (WHO 2004). The most common reported side effects of buprenorphine are cold or flu-like symptoms, headaches, sweating, sleeping difficulties, nausea and mood swings (Brands Sproule Marshman, 1998).

At high doses and when combined with other opioids, buprenorphine is associated with respiratory depression (difficulty breathing). However, buprenorphine does not produce lethal respiratory depression even at 10 times the analgesic dose, or in combination with other opioids (U.S. Food and Drug Administration/ Centre for Drug Evaluation and Research 2002).

Considerations for buprenorphine

With its recent introduction, many practice issues have yet to be established. For instance, the type of training required by practitioners, including physicians, pharmacists and nurses has not been established (WHO, 2004). In each Canadian province or territory, decisions regarding whether or not physicians will require a special authorization to prescribe buprenorphine have yet to be made (Garmaise, 2005).

Buprenorphine is currently more expensive than methadone (WHO, 2004). U.S. sources estimate the cost of treatment at between \$280 and \$350 (U.S. dollars) per month (Seattle and King County Public Health, 2004; Medical Letter Inc., 2003). It is not known whether buprenorphine will be available under the Ontario Drug Benefit Program or covered by private insurers.

Although buprenorphine was initially believed to have less potential for diversion, illicit use has been documented and the tablets may be crushed and snorted or injected. To deter illicit injection in the U.S., buprenorphine is also combined with naloxone (under the trade name Suboxone) to counteract the opioid effect (U.S. Food and Drug Administration, 2002; Brands, Sproule, and Marshman, 1998).

Heroin (diacetylmorphine) substitution

Studies of heroin substitution programs in Europe (e.g., Switzerland, Netherlands, Germany, United Kingdom) have shown that this form of treatment is associated with reduced HIV risk and increased overall quality of life (Millson et al., 2005). Proponents argue that heroin substitution treatment be made available to treat IDUs who have tried and been unsuccessful with other treatments such as methadone maintenance and abstinence programs (Metrebian et al. in CCBH 2002; Fischer and Rehm, 1997). For instance, Fischer and Rehm (1997) argue that “while methadone can be and is an important element in a ‘harm reduction’-based opiate control strategy, it cannot be considered as a sufficient or the perfect ‘solution’. Rather, further effective ways to reduce opiate-related harms and costs need to be explored and assessed” (p. 369).

Studies in the Netherlands and Switzerland, in particular, have assessed the impact of prescribing heroin to severely dependent individuals. Positive results in terms of treatment retention were observed. However, there have been some questions raised about the study designs and the ability to attribute improvements in health and social well-being to the prescription of heroin (WHO, 2004). Nevertheless, a WHO (1999) report acknowledged that the Swiss study showed that:

- ▶ Injectable heroin as a treatment modality is feasible
- ▶ Clients can be maintained on a stable dose of heroin
- ▶ With some modifications, a heroin treatment program can be delivered at treatment centres providing methadone maintenance
- ▶ A heroin treatment program can achieve reasonable retention levels
- ▶ Improvements in the participants’ physical and mental health, social functioning and reported drug use and criminal behaviour based on self-report were observed

In Canada, plans are underway to study the effectiveness of heroin prescription programs as a treatment for opiate dependence. The North American Opiate Medication Initiative (NAOMI) is a clinical trial that will test whether medically prescribed heroin can successfully attract and retain street-heroin users who have not benefited from previous treatment programs, including methadone. The NAOMI study will enroll 470 participants in two groups - heroin prescription or methadone maintenance. The study will be conducted in two sites (Vancouver and Montreal) and participants in the heroin prescription group will be treated for approximately one year, and then transferred into another treatment program.

Safer injecting facilities

Safer injecting facilities (SIFs) are controlled healthcare settings where IDUs can inject pre-obtained drugs under medical supervision, access needle exchange services, and receive primary healthcare, emergency care for overdoses, health education, and referrals.

SIFs respond to individual and community drug-related harms that cannot be addressed by the simple expansion of existing prevention programs, by reducing the incidence of overdose and disease transmission; reducing crime, improperly discarded needles, and public drug use; increasing appropriate use of health and social services by IDUs; and reducing the health, social, legal, and incarceration costs associated with injection drug use.

Since the late 1980s, close to 60 SIFs have been successfully established in 32 European cities (Dolan et al., 2000; Broadhead et al., 2002), and a trial SIF has been evaluated in Australia (MSIC Evaluation Committee, 2003). Emerging findings from these diverse settings indicate that SIFs provide an effective means of addressing drug-related harms. Specifically, as of 2003 there has never been a report of a fatal overdose in a SIF (Kimber et al., 2003). Non-fatal overdoses were reported as occurring less frequently in SIFs in comparison to open drug scenes, and are 10 times less likely to result in hospitalization (Dolan et al., 2000). Additionally, among clients of the trial SIF in Australia, almost 1,400 referrals to health and social services were made for 577 SIF clients, 43% were for the treatment of drug dependence, 32% were to primary healthcare facilities, and 25% to social welfare services (MSIC Evaluation Committee, 2003).

These findings led Health Canada in January 2003 to affirm its support for the scientific evaluation of trial SIFs in Canada. Given the potential benefits for IDUs and the wider community, an investigation of whether SIFs might be a valuable addition to the existing harm reduction strategy in Canadian cities is indicated.

Evidence exists documenting the characteristics of those IDUs most likely to use SIFs. This information will be important for jurisdictions considering implementing SIFs or evaluating the utility of such an intervention in their area. The majority (75 to 89%) of Montreal IDUs (Green et al., 2002) and Melbourne IDUs (Fry, Fox and Rumbold, 1999; Fry, 2002) reported that they would be willing to inject in a SIF if one were available, compared to only 37% of Vancouver IDUs (Wood et al., 2003). Willingness to inject at a SIF therefore appears to vary by geographic location. Three studies examined socio-demographic and behavioural factors related to willingness to use a prospective SIF: in Vancouver, IDUs who reported requiring help injecting, sex trade involvement, and difficulty accessing clean syringes were significantly more likely to be willing to inject at a SIF (Kerr et al., 2003a; Wood et al., 2003), whereas experiencing an overdose in one's lifetime was an important factor among IDUs in Melbourne (Fry, Fox and Rumbold, 1999). Male gender and frequently injecting heroin were significant factors for willingness to use SIFs in both cities (Fry, Fox and Rumbold, 1999; Wood et al., 2003). Notably, IDUs who inject in public areas have been found to be significantly more likely to be willing to use a SIF than those who inject in mainly private locations (Fry, 2002; Fry, Fox and Rumbold, 1999; van Beek and Gilmour, 2000; Wood et al., 2003). These findings suggest that IDUs at high risk for bloodborne disease transmission and fatal overdose may be successfully targeted by this intervention, as well as draw attention to certain groups whose needs should be specifically addressed (e.g., women IDUs).

IDUs in Melbourne (Fry, Fox and Rumbold, 1999; Fry, 2002) and Toronto (Green et al., 2002) provided several

additional reasons for being willing to use a SIF, including the desire for safety and privacy while injecting drugs; the desire to keep injecting off the street and out of public areas; convenience; freedom from police pressure; a greater capacity to safely dispose of used injecting equipment; presence of trained staff to assist in the event of an overdose; and the chance to inject in a clean and hygienic environment. In contrast, the reported barriers to injecting in a SIF included the degree of privacy and confidentiality offered by the facility; drug-related violence at the SIF; and police presence in the immediate vicinity.

The rules for injecting at a SIF can also have an impact on IDUs' willingness to use the facility. For example, Kerr and colleagues reported reduced willingness among Vancouver IDUs if three specific rules for SIF use issued by Health Canada were implemented, including: the requirement of registration of all clients, the prohibition of the sharing of drugs, and the prohibition of assisted injection (Kerr et al., 2003b). Similar results were reported in an earlier study among Melbourne IDUs (Fry, 2002). Although these guidelines are important for evaluation purposes and for the health and safety of SIF clients, these findings speak to the need for close consultation with potential service users to make the intervention maximally acceptable (Fry, 2003).

In Ontario, a needs assessment is currently underway (August 2005) to investigate the feasibility of a SIF for Ottawa, a city experiencing a public health crisis in relation to levels of HIV and HCV prevalence among IDUs. While international findings highlight some of the ways in which a SIF may theoretically impact the harms of injection drug use in the city, consultation with Ottawa IDUs is needed to assess the acceptability of such a facility. Through personal interviews with 250 street-recruited IDUs the research is exploring such questions as:

- ▶ What are IDUs' prevailing attitudes towards this intervention?
- ▶ Are there perceived barriers for use which are unique to Ottawa?
- ▶ What characteristics specific to the drug scene in Ottawa impact willingness to use and IDUs' preferences for a prospective SIF?

As there are also many important legal and community issues regarding SIFs that are unique to the Ottawa situation and require further study, these will be specifically explored in the proposed research through focus groups involving health professionals, regional and provincial policy makers, and representatives from community service organizations and law enforcement.

This feasibility study will be complete by the end of the year and findings returned to the Ottawa community early in the New Year through a series of community forums. Although the findings will be specific to Ottawa IDUs and their experience of risk conditions, the needs assessment process is generalisable to other Ontario jurisdictions. Ontario communities considering a SIF as an enhancement of their NEP and harm reduction programs are encouraged to contact Dr Lynne Leonard at the University of Ottawa.

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(Endnotes)

¹ 'Exchange' refers to needle/syringe exchange, distribution and disposal.

² "Exchange" refers to needle/syringe exchange, distribution and disposal.

³ 'Injection equipment' refers to all injection-related items. 'Sharps' refers to needles, syringes, glass stems and other items that may cause cuts or puncture wounds

⁴ Also known as biohazard containers

⁵ A drug solution formed by adding water to the drug residue in a used filter, used cooker or used needle.

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Don has been working with high-risk individuals for approximately 16 years, and has seen the program he manages grow into one of the busiest in Ontario. Don has also been instrumental in the development of 16 rural communities creating harm reduction programs (communities ranging in population from 1,000 to 10,000). He helped to develop their policy and procedures manuals as well as provided input into site selection and training of staff and volunteers.

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Skilled in project management, community and program development, Paul is the Harm Reduction Project Officer for Ottawa Public Health. In his role, Paul is responsible for the coordination and development of harm reduction programs and services aimed at reducing the spread of HIV and Hepatitis C among Ottawa substance users. Paul brings over 10 years of direct HIV/HCV prevention experience in working with marginalized populations.

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Shaun has a Bachelor of Social Work degree and has been working in the social and health field for over 20 years. Committed to harm reduction for the past 15 years, Shaun has been the Manager of The Works, the Toronto Public Health Needle Exchange Program. During her time at The Works, the program has grown to include a low threshold methadone program, 30 community partnerships for needle exchange services and 20 staff.

