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Reducing High Risk Behavior in Injection Drug Users Through Syringe Exchange

For prevention of transmission of the Human Immunodeficiency Virus (HIV) and Hepatitis C (HCV), harm reduction is one strategy that has been found increasingly effective. Both HIV and Hepatitis C are blood-borne diseases, although HIV can also be transmitted through semen, vaginal fluid, and breast milk. Harm reduction focuses on blood transmission, specifically through sharing syringes in cases of injection drug use. According to the Harm Reduction Coalition (HRC), harm reduction is a set of strategies meant to reduce the negative consequences of injection drug use, namely promoting access to clean needles through syringe exchange programs (SEPs). Since the beginning of the HIV/AIDS epidemic in 1981, injection drug use has caused more than one-third (36%) of cases in the United States. In 2000, of the 42,156 new cases of HIV, 11,635 (28%) were associated with injection drug use.¹ Additionally, it is estimated that 61% of women living with HIV were infected due to injection drug use or as the result of having sex with someone who contracted HIV from injection drug use. If infection rates among injection drug users (IDUs) are not convincing enough for the widespread adoption of SEPs, the cost of treatment per infected person should be. The lifetime cost of medical care for a single new HIV infection is roughly \$385,200.² The average cost of a syringe is \$0.97, and the cost to prevent one HIV infection via SEP is estimated between \$4,000 and \$12,000.³ SEPs make sense fiscally and as a public health approach because they exist to prevent transmission

¹ Centers for Disease Control and Prevention, "Drug-Associated HIV Transmission Continues in the United States," <http://www.cdc.gov/hiv/resources/factsheets/idu.htm> (accessed October 21, 2010).

² Harm Reduction Coalition, "Syringe Access," <http://www.harmreduction.org/article.php?list=type&type=49> (accessed October 21, 2010).

³ Centers for Disease Control and Prevention, "Syringe Exchange Programs," 2005, http://www.cdc.gov/IDU/facts/AED_IDU_SYR.pdf (accessed November 17, 2010).

between IDUs and minimize personal, social and economic costs associated with HIV/AIDS and other blood-borne diseases.

Injection drug use is considered a high-risk behavior for the transmission of HIV and HCV largely because of lack of access to clean syringes. It is often the case that IDUs cannot afford a clean syringe for every act of injection or are barred from purchasing syringes at pharmacies, where non-prescription sales are either illegal or at the discretion of the pharmacist. As a result, IDUs frequently reuse and share their syringes. Sharing syringes is a particularly risky behavior because blood from an HIV or HCV infected person can remain in or on a syringe and then be transferred directly to the next person who uses the syringe.⁴ Additionally, the amount of “dead-space” in a syringe has been proven to affect the transmission of blood-borne disease among IDUs. “Dead-space” is the area where some amount of fluid is retained in a syringe after the plunger is fully depressed. High dead-space syringes retain 1000 times more blood after rinsing than do low dead-space syringes, but are used more commonly because they are easier to obtain.⁵

As a prevention measure, SEPs began informally in San Francisco in 1970. Concerned health care workers would offer sterile syringes to patients being treated with jaundice and abscesses associated with injection drug use. The first public SEP began in 1986 in Boston, Massachusetts by Jon Parker, an ex-IDU, while he was attending Yale as a graduate student in public health. Parker initially distributed clean syringes only, and eventually moved to an exchange model where he would give IDUs clean syringes in exchange for their used ones. He was arrested numerous times for challenging the law in eleven states that made purchasing

⁴ The Well Project, “Cleaning Works,” Last modified December 2006, http://www.thewellproject.org/en_US/Living_Well/Health/Cleaning_Works.jsp (accessed November 10, 2010).

⁵ William A. Zule and others, “High Dead-Space Syringes and the Risk of HIV and HCV Infection among Injecting Drug Users,” *Drug and Alcohol Dependence* 100, no. 3 (2009): 204-213, <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2654245/?tool=pubmed> (accessed November 15, 2010).

syringes without a prescription illegal.⁶ Today, the legality of non-prescription syringe purchasing, possession and distribution, and funding varies from state to state.

In 2009, President Obama signed a bill that repealed a 21-year-old ban on federal funding of SEPs; however, the President made it clear that federal funds are not available in locations that law enforcement or health professionals deem inappropriate.⁷ Many opponents of harm reduction, and SEPs in particular, argue that it promotes injection drug use, rather than accepting it as a valid prevention strategy. Thus, IDUs and SEP providers encounter multiple hurdles in obtaining legitimacy. Syringe laws are mandated by the state, and affect how SEPs operate. Some states, such as North Carolina, have drug paraphernalia laws that make it illegal to possess “all equipment, products and materials of any kind that are used to facilitate, or intended or designed to facilitate, violations of the Controlled Substances Act, including...injecting, ...or otherwise introducing controlled substances into the human body.”⁸ This law renders SEPs illegal, and discourages IDUs from participating in SEPs. As a result, IDUs will often share a single syringe in order to reduce the likelihood of being arrested for possession. In states with drug paraphernalia laws, SEPs still operate, but do so clandestinely and without federal funding.

Regardless of their legal status, SEPs have been the subject of many scientific studies to determine their validity as a disease prevention measure for IDUs. The CDC promotes a comprehensive strategy for HIV prevention among injection drug users (IDUs) that includes access to sterile injection equipment, and the National Institutes of Health cites studies showing

⁶ Sandra D. Lane, “Needle Exchange: A Brief History,” *The Kaiser Forums*, <http://www.aegis.com/law/journals/1993/HKFNE009.html> (accessed November 10, 2010).

⁷ Kim Krisberg, “Funding ban repeal a step forward for needle exchange: Support could bolster HIV prevention,” *The Nation’s Health* 40, no. 2 (2010): 1-13, <http://thenationshealth.aphapublications.org/content/40/2/1.2.full> (accessed November 11, 2010).

⁸ Scott Burris, “Impact of Criminal Laws on the Safe Disposal of Used Syringes by Injection Drug Users North Carolina,” *Academy for Educational Development*, http://www.temple.edu/lawschool/phrhcs/nc-criminal_laws.htm (accessed November 11, 2010).

reduction in risk behavior as high as 80 percent in IDUs with an estimated 30 percent reduction in HIV transmission as their emphatic argument for the implementation of SEPs.^{9, 10}

In 1990, a study was conducted on the New Haven Needle Exchange Program where 60 percent of the city's 500 reported HIV cases had been linked to injection drug use. The researchers developed a syringe tracking and testing system to create a mathematical model of HIV transmission among IDUs. HIV test results of washes from returned needles of the Program were used to construct a statistical model that estimated the SEP to have reduced HIV incidence in clients by 33%. The model has been independently reviewed and judged to be a sound and possibly conservative estimate of the program's success in promoting the reduction of high-risk behaviors.¹¹

In a study of 81 U.S. cities with HIV seroprevalence data for IDUs from 1988-1993, researchers found that seroprevalence, on average, increased 5.9% per year in the 52 cities that did not have SEPs, and decreased by 5.8% in the 29 cities that did have SEPs. The average net difference per year in seroprevalence was 11% lower in cities with SEPs ($p = .0004$, 95% confidence interval (CI) = -17.6, -3.9).¹² The study suggests a significant correlation between SEPs and effective HIV prevention among IDUs.

A study conducted from 2003-2006 through a small, legal Michigan SEP that provided sterile syringes, safer injection materials, condoms, and HIV testing to IDU's found at final follow-up that participants were significantly less likely to report giving another IDU a

⁹ "Drug-Associated HIV Transmission..." CDC.

¹⁰ "Interventions to Prevent HIV Risk Behaviors," *National Institutes of Health Consensus Development Conference Statement*, February 11-13, 1997, <http://consensus.nih.gov/1997/1997PreventHIVRisk104html.htm> (accessed November 11, 2010).

¹¹ Edward H. Kaplan & Elaine O'Keefe, "Let the Needles Do the Talking! Evaluating the New Haven Needle Exchange," *Interfaces* 23, no. 1 (1993): 7-26, <http://www.jstor.org/stable/25061700> (accessed November 11, 2010).

¹² SF Hurley and others, "Effectiveness of needle-exchange programmes for prevention of HIV infection," *Lancet* 349, (1997): 1797-1800, <http://www.ncbi.nlm.nih.gov/pubmed/9269214> (accessed November 17, 2010).

previously used syringe ($p = 0.042$), reused their syringes significantly fewer times before getting new ones ($p = 0.012$), and were significantly more likely to clean their skin with alcohol either before or after injection than the baseline group of participants ($p = 0.01$). Follow-up participants, although non-significantly, were also less likely to report sharing syringes or other equipment, and more likely to report exchanging syringes than baseline participants.¹³ The shift recorded in this study represents a reduction in high-risk behaviors of IDUs that could decrease the incidence of HIV transmission among the population. In a cumulative examination of studies of behavioral changes within SEPs, it was reported that 10 SEPs saw a reduction in sharing frequency of participating IDUs, four saw no change, and none saw an increase in sharing frequency.¹⁴

Additionally, a study commissioned by the University of Illinois at Chicago of IDUs recruited from 1997-2000 found results supporting SEPs. Researchers collected data of IDUs who obtained at least half of their syringes from a SEP ($n = 558$), and IDUs who did not use a SEP ($n = 175$). The analysis found that regular SEP users, compared to SEP nonusers, were less likely to receptively share needles (adjusted odds ratio (AOR) = 0.30, 95% CI = 0.19, 0.46), lend used needles (AOR = 0.48, 95% CI = 0.31, 0.71), share cookers (AOR = 0.39, 95% CI = 0.25, 0.61), cottons (AOR = 0.48, 95% CI = 0.32, 0.72), or water (AOR = 0.41, 95% CI = 0.27, 0.63), or use a needle for more than one injection (AOR = 0.15, 95% CI = 0.08, 0.27). Of those IDUS that shared needles, regular SEP users were significantly more likely to share for a fewer

¹³ Andrea K Knittel, Patricia A. Wren, & Lemont Gore, "Lessons learned from a peri-urban needle exchange," *Harm Reduction Journal* 7: 8 (2010), <http://www.harmreductionjournal.com/content/7/1/8#B1> (accessed October 21, 2010).

¹⁴ David Vlahov and Benjamin Junge, "The Role of Needle Exchange Programs in HIV Prevention," *Public Health Reports* 113, no. 1 (1998): 75-80, <http://www.jstor.org/stable/4598276> (accessed November 11, 2010).

proportion of injections, with fewer partners and persons closer socially, and to have always disinfected used needles with bleach before injecting.¹⁵

In a 2004-2006 study funded by the US National Institute on Drug Abuse, researchers compared IDU risk behaviors in Newark, New Jersey where SEPs are illegal and New York City, where SEPs have been legal since 1992. Their sample consisted of 214 (41%) participants from Newark and 312 (59%) from NYC, all of whom were active IDUs with a mean monthly injection frequency of 75 times. Through self-reporting by the participants, researchers found that only 5% of Newark participants obtained new sterile syringes from an SEP or pharmacy, while 93% of NYC participants obtained new syringes from those sources (AOR = 0.004, 95% CI = 0.001, 0.01). Instead, 93% of Newark participants reported obtaining “new” syringes from illegal sources, and were almost 100 times more likely to do so than NYC participants (AOR = 117.1, 95% CI = 47.88, 286.33), with three quarters of Newark participants reporting that they obtained illegal “new” syringes from street purchases, and one fifth reporting having obtained them from friends or family. Additionally, Newark participants were much more likely to engage in high risk injecting behavior than NYC participants. They were twice as likely to inject with a syringe used by another injector (19% vs. 8%, AOR = 2.32, 95% CI= 1.07, 5.04), three times more likely to reuse their own syringes (38% vs. 14%, AOR = 2.99, 95% CI = 1.63, 5.50), and over five times less likely to report always using a new sterile, sealed syringe for only one injection (90% vs. 60%, AOR = 5.43, 95% CI = 2.86, 10.30). The researchers also tested 487 of their participants for HIV and HCV, and 469 for Hepatitis B (HBV). Newark participants, after adjustment for race, ethnicity, and years since initiating injection use, were more than three times more likely to test HIV positive (26.1% vs. 5.2%, AOR = 3.2, 95% CI = 1.6, 6.1), more than

¹⁵ L Ouellet and others, “HIV risk practices among needle exchange users and nonusers in Chicago,” *Journal of Acquired Immune Deficiency Syndromes* 37, no. 1 (2004): 1187-96, <http://www.ncbi.nlm.nih.gov/pubmed/15319680> (accessed November 17, 2010).

three times more likely to test HCV positive (82.4% vs. 53.4%, AOR = 3.0, 95% CI = 1.8, 4.9), and more than four times more likely to test HBV positive (69.6% vs. 27.1%, AOR = 4.4, 95% CI = 2.8, 6.9) than NYC participants.¹⁶

Syringe exchange programs have been proven time and again to be an effective public health intervention for high-risk behaviors among injection drug users. In locations where SEPs have been instated, IDUs tend to engage in high-risk behaviors, such as sharing and reusing needles and equipment, less than IDUs who do not have access to or choose not to use a SEP, or who live in a location where law prohibits the distribution of new sterile needles. There is also a significantly lower seroprevalence of HIV and HCV among SEP users compared to nonusers. While SEPs do not exist to treat IDUs for their addiction, they use the harm reduction philosophy of meeting each client “where they’re at” to decrease the negative implications of injection drug use, and to prevent blood-borne diseases that are detrimental to one’s quality of life. Disease prevention and public health interventions of this nature are the first step to promoting healthy decision-making to IDUs, and should also be considered for their part in a comprehensive strategy to prevent HIV and HCV across all populations.

¹⁶ Alan Neaigus and others, “Greater Drug Injecting Risk for HIV, HBV, and HCV in a City Where Syringe Exchange and Pharmacy Syringe Distribution are Illegal,” *Journal of Urban Health* 85, no. 3 (2008): 309-322, <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2329750/?tool=pubmed> (accessed November 15, 2010).

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