

**Response to an intervention to promote parental involvement in harm reduction  
for young injection drug users**

Mary Ellen Mackesy-Amiti, Ph.D. <sup>1</sup>

Basmattee Boodram, Ph.D. <sup>1</sup>

Lawrence J. Ouellet, Ph.D. <sup>1</sup>

Susan L. Bailey, Ph.D. <sup>2</sup>

<sup>1</sup> School of Public Health, University of Illinois at Chicago, Chicago, Illinois, USA

<sup>2</sup> Benedictine University, Lisle, Illinois, USA

**Promoting parental involvement in harm reduction**

Correspondence to:

Dr. Mary E. Mackesy-Amiti  
University of Illinois at Chicago  
School of Public Health, MC 923  
1603 W. Taylor Street  
Chicago, IL 60612  
tel. 312-355-4892  
mmamiti@uic.edu

This study was funded by NIDA grant #R01DA015868 to Susan Bailey while she was at the University of Illinois at Chicago.

## **Abstract**

**Aims:** This study examined parents' responses to a family-based harm reduction intervention for young injection drug users (YIDUs). **Methods:** The intervention was comprised of group education sessions for parents, and three case-management sessions: for the parent only, YIDU only, and for parent and YIDU together. The design included a delayed intervention control group. Baseline interviews were conducted with 843 YIDUs; 41% (n=350) consented to have their parents contacted. About half of the parents (n=168) completed a baseline interview.

**Findings:** Among the parents assigned to the first-stage intervention (n=94), 53% attended at least one intervention session, and 46% completed the entire intervention. Parents who supported the use of needle exchange at baseline and those who had a history of prescription drug misuse were more likely to attend the intervention. Parents who attended the intervention had a more positive attitude toward harm reduction for their child and were more likely to support the use of needle exchange at follow-up compared to baseline. **Conclusions:** Parents who had personal experience with substance misuse, and those with a more positive view of harm reduction were more likely to participate. Participation was associated with increased support for harm reduction efforts. There were no changes in reported service use or in parent-child relationship measures.

**Keywords:** injection drug use; harm reduction; intervention; parents of injection drug users

## **Introduction**

An increasing number of adolescents and young adults are using and injecting heroin (Chatterjee, et al., 2011). Studies have shown that young injection drug users (YIDUs) engage in more HIV-risk behaviors such as sharing syringes and other injection equipment than older established IDUs (Cassin, Geoghegan, & Cox, 1998; Fennema, Van Ameijden, Van Den Hoek, & Couthinho, 1997; Kipke, Unger, Palmer, & Edgington, 1996; Rondinelli, et al., 2009). Compared to older IDUs, YIDUs are also more likely to engage in concurrent, risky sexual practices such as unprotected sex with main and casual partners who inject drugs with other IDUs (Kapadia, et al., 2007; Williams, et al., 2006), and tend to inconsistently use condoms with regular or casual partners (Kapadia, et al., 2011; Louie, Rosenthal, & Crofts, 1996).

Studies have also revealed that many YIDUs live at home with parents or guardians who continue to provide at least modest levels of support. In a large study of IDUs under 30 years old in five U.S. cities, 45% of YIDUs at baseline reported living with their parents, and 74% reported receiving income from a parent or other relative (unpublished data). In addition, 43% participated in some type of substance abuse program in the past 6 months, and more than three-quarters (77%) had ever been incarcerated. These figures suggest that substantial numbers of parents know about their children's injection drug use. Parent involvement has been found to be beneficial in a variety of substance abuse treatment and prevention programs (Austin, Macgowan, & Wagner, 2005; Brody, et al., 2012; Foxcroft & Tsertsvadze, 2011; Kumpfer, Alvarado, & Whiteside, 2003; Miller, Aalborg, Byrnes, Bauman, & Spoth, 2012). There is a need to explore the potential extent and nature of parental participation in harm reduction strategies and the ensuing effect on YIDU risk reduction. The main purpose of the current study was to determine the feasibility and effectiveness of involving parents/guardians in a harm

reduction intervention for YIDUs in the form of prevention case management. The implicit goal of the intervention was to facilitate productive communication between parents and their young adult children about the YIDU's drug use in order to move forward in harm reduction and, ideally, treatment and cessation.

## **Methods**

All study procedures were approved by the Institutional Review Board of the University of Illinois at Chicago.

### Sample Recruitment

*YIDUs.* We recruited participants between July 2003 and May 2006 in four Chicago neighborhoods known to have a high prevalence of illicit drug use and drug markets. The drug markets in these neighborhoods are frequented by IDUs who live in the suburbs, as well as those in the city. We employed several recruitment strategies, including recruiting 1) from on-site needle exchange programs (NEPs), 2) through a system of coupon-based chain referral, and 3) through referrals from a prospective research study of injection initiation among young non-injecting heroin users (NIHU). Individuals who enrolled in the study were given three coupons to pass along to eligible peers. The coupons brought in by eligible IDUs at enrollment were traced by serial number to the referring peer who was compensated \$10 per coupon. Prospective IDU participants were required to be between the ages of 18 and 25 years, speak English or Spanish, and provide evidence of current injection drug use. IDUs were asked to present a driver's license or state identification to confirm their age, and study staff asked youth to show injection marks (tracks) and/or answer detailed questions about the injection process.

*Parents.* At the conclusion of the baseline survey, YIDUs were asked if their parents knew about their heroin use. Participants whose parents knew about their drug use were asked if one of their

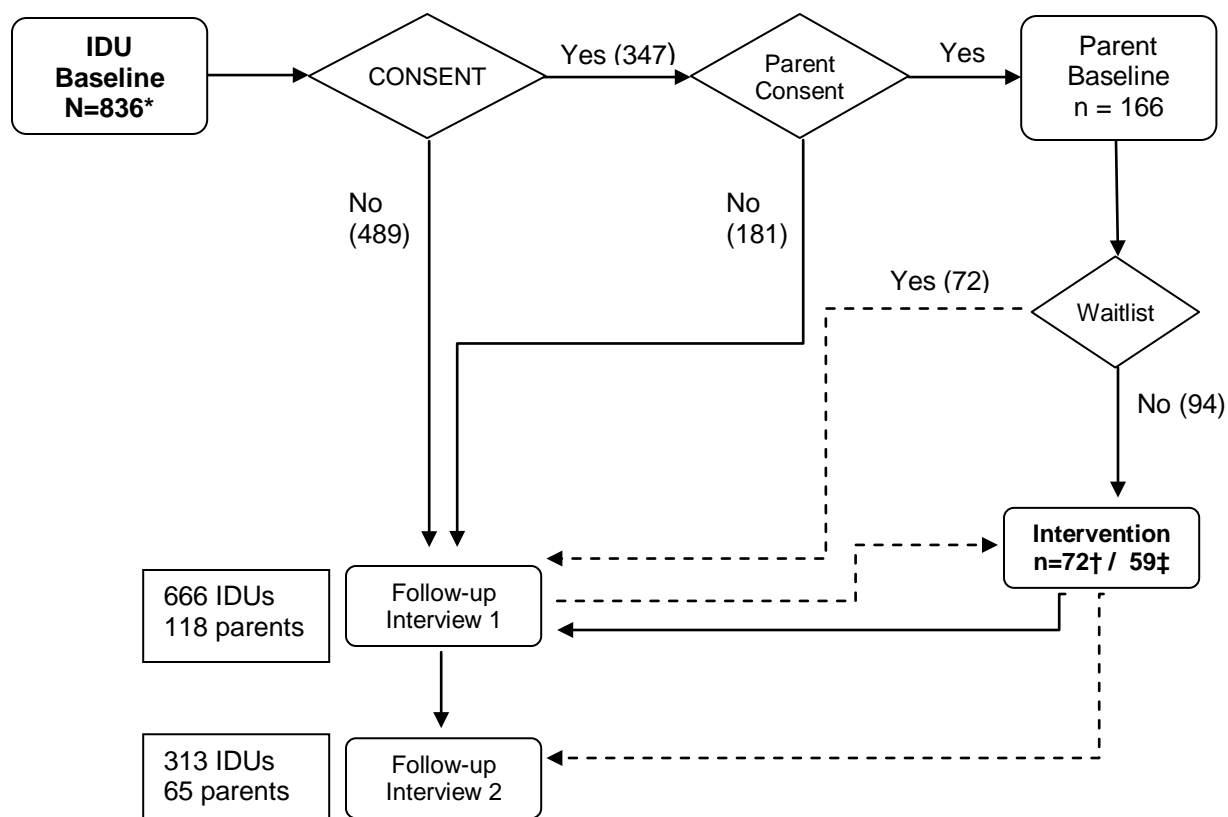
parents could be invited to participate in a survey about the family's dynamics. If the YIDU consented, senior research staff telephoned potential parent subjects, explained the study and asked parents if they were interested in participating. For those who agreed to participate or who agreed to review written details about the study, research staff mailed a packet of materials, including a description of the study, a written consent form, an answer sheet for the survey, and a stamped self-addressed envelope. Research staff then phoned the parent named by the subject to determine if he/she received and looked at the materials. For parents who agreed to participate, staff scheduled the telephone interview to begin within 48 hours at a time chosen by the parent.

### Study Design

The study design was a controlled trial with longitudinal follow-up (see Figure 1). The YIDUs attended a baseline visit during which they completed an audio-computer-assisted self-interview (ACASI) about their drug use and other relevant behaviors. Consenting parents and guardians completed a telephone survey that inquired about the parent's sociodemographic characteristics, the relationship with their child, their own drug use history, and their opinions and knowledge of harm reduction strategies. For questions about the parent's substance use, parents recorded their responses privately on the coded answer sheet and returned it by mail.

After completing the initial baseline survey, YIDUs were asked to participate in two intervention sessions: 1) a one-on-one session with the case manager, and 2) a session with the youth, the case manager, and the parent. The parents were asked to participate in three sessions: 1) an education session that examined harm reduction and was provided in a group setting including only parents, 2) a one-on-one session with the case manager, and 3) a session with the youth, the case manager, and the parent.

**Figure 1. Study Design**



\* excludes 7 unusable records

† attended at least one session

‡ completed 3 sessions

The follow-up interviews used essentially the same content and data collection methods as the baseline interview. One-half of parent-child pairs were randomly assigned to participate in the intervention during the second month after recruitment (waitlist condition), while the other half of parent-child pairs participated in the intervention during the first month after recruitment. Waitlisted participants received the first follow-up interview before the intervention to serve as the control. All intervention participants were contacted for a follow-up survey within a month after the intervention. Those who did not participate in the intervention also received follow-up interviews, with half being assigned to receive a second follow-up interview.

YIDU were compensated \$35 for the baseline assessment, and parents or guardians were compensated \$25 for the baseline telephone survey. For each of the two follow-up assessments, YIDUs were compensated \$40. YIDUs who participated in the intervention were compensated \$10 per session. Parents were compensated \$30 for each follow-up assessment, but did not receive compensation for participating in the intervention sessions. All intervention participants were reimbursed up to \$10 for transportation costs.

*Case Manager.* Case management used an “indigenous leader” approach (Wiebel, 1993). The case manager was within the age range of most parents, had adolescent children, and was a former injection drug user, all of which enhanced her credibility with both the YIDU and the parents. She was also an experienced, patient and persistent staff member with a demonstrated ability to work well with people. These characteristics contributed to building trust with study participants and modeled behavior that conformed to the intervention’s ideal outcomes.

*Group Session.* A 90-minute group session was held with parents to educate them on harm reduction and resources available to help with their children’s drug problems. The case manager

and the study coordinator conducted these sessions, which were held at the School of Public Health at the University of Illinois at Chicago.

*Case Manager Intervention Procedures.* The same case manager participated in the three sessions for 1) parent only, 2) YIDU only, and 3) both parent and YIDU. Sessions were held at service sites or at the School of Public Health, and each lasted approximately 2 hours. The goals of the sessions were to 1) provide individualized HIV risk-reduction counseling, 2) facilitate referral services for medical, social, and psychological needs, and 3) help clients be compliant with services they may have sought. Referral services included substance abuse treatment, public entitlements, family counseling, food, housing, legal representation, mental health treatment, primary care, transportation, HIV/AIDS counseling and testing, long-term case management, and employment/vocational training, parenting classes.

The structure and procedures of the case management sessions were modeled after those established by the AIDS Foundation of Chicago for HIV/AIDS case management (AIDS Foundation of Chicago, 1996). The focus of the YIDU/case manager session was two-fold. First, the case manager and YIDU discussed his or her drug use and potential risk behaviors. Second, case managers assessed the nature of their family processes, particularly the relationship of the YIDU with his or her parents. The procedures included:

1. Intake: The case manager formed a relationship with the YIDU and gathered information necessary to form an initial assessment of need and preliminary intervention strategy.
2. Assessment: The case manager focused on understanding the YIDU's strengths and weaknesses and evaluated the YIDU's relationship with his or her parent (and other family members as appropriate).



3. Strategy development and revision: The case manager engaged the YIDU in formulating an intervention strategy that met the needs defined during the assessment process. This was an interactive process, and every effort was made to solicit the YIDU's input and consensus. The case manager and YIDU 1) identified and ranked problems needing resolution, 2) identified resources available to the parent and YIDU, and 3) identified the roles the YIDU and case manager would take in accessing services.
4. Strategy monitoring: The case manager made at least one phone call to the YIDU to monitor the appropriateness of the strategy, and acted as a liaison between YIDUs and service providers to help facilitate implementation of the strategy. The case manager also provided supportive counseling and encouragement to YIDUs who had not implemented a strategy, no matter what the reason.

At the close of the session, the case manager encouraged the YIDU to actively encourage his/her parent to attend the next session. The individual parent session was identical to the YIDU session, including at least one follow-up phone call to monitor the strategy. The case manager did not share with parents any information that was discussed in the YIDU session at this time.

The final session involved the case manager, the YIDU, and the parent. The content of this session also focused on both the YIDU's risk behavior and the nature of the relationship between the parent and the young adult child. With the permission of each party, the case manager presented the assessment information and strategy formulated in the YIDU session to the parent and the parent to the YIDU. Case managers emphasized similarities as a way to illustrate shared goals. Differences were discussed and preliminary conflict management was employed. Parent and child were then encouraged to discuss the individual responsibilities they

were willing to take to achieve the goals determined in the individual and dyad sessions. The case manager facilitated negotiation and revisions of the strategy as necessary. At the close of the session, the parent and child were asked to sign a contract promising to fulfill their respective parts of the solutions. Then, both parent and child were encouraged to continue case management and follow-up on referrals, as appropriate.

### Measures

*Background.* YIDUs answered questions about their living situation, demographic characteristics (e.g. age, gender, race, employment, homelessness), income received from parents, drug treatment in the past year (e.g. type, number of times, number of days in treatment), number of days in jail, prison, juvenile detention, or mental health facility in the past year, and if they had received medical treatment at a private doctor's office, free health clinic, or hospital emergency room in the past year. Parents answered questions about their relationship to the YIDU in the study, number of months the child lived at the parent's home in the past year, and demographic characteristics (e.g. age, gender, race, marital status, employment).

*Parent-child relationship.* YIDUs and parents answered questions about the parent-child relationship in the past year, including communication, attachment, conflict, problem solving, discipline and supervision (see Appendix A). Responses on these items were "Does not Apply," "Almost Never," "Sometimes," and "Often". Responses were coded 0 (does not apply) to 4 (often). Exploratory and confirmatory factor analyses were conducted on YIDU baseline responses to assess the performance of these measures. Based on these analyses, three items were removed, and one item was moved from the supervision scale to the discipline scale.<sup>1</sup> The mean

---

<sup>1</sup> Deleted items were "\_\_\_ said things to you that would have been better left unsaid" (communication), "You wished you were not \_\_\_'s responsibility" (attachment), and "\_\_\_ argued heatedly with you when you were having a disagreement" (conflict). The supervision item, "\_\_\_ told you when to be home at night" was moved to the discipline scale.

of the items on each scale was computed. Alpha reliabilities for YIDUs and parents, respectively, were: communication 0.74 and 0.58, attachment 0.81 and 0.72, problem solving 0.69 and 0.55, conflict 0.86 and 0.80, discipline 0.81 and 0.78, and supervision 0.79 and 0.68.

*HIV/HCV Knowledge.* Ten items were used to measure knowledge about HIV, HCV, and risk reduction (see Appendix A) for both YIDUs and parents. Questions were answered true, false, or don't know. Items were scored as correct or incorrect, with "don't know" responses scored as incorrect, and the number of correct items was computed for the knowledge score (alpha = 0.81 for YIDUs, and 0.64 for parents).

*Risk behavior.* YIDUs were asked how often (never, sometimes, or always) in the past year did they 1) use a new sterile needle, 2) draw from the same cooker as someone else, 3) use the same cotton as someone else, 4) use the same rinse water with someone else, 5) shoot up with a needle after someone else had squirted drugs into it from their needle, 6) use a needle that they knew had been used by someone else, 7) get their needles and cookers from a needle exchange program, 8) use condoms with a sex partner they knew well, 9) use condoms with a sex partner they did not know well.

*Self-reported Prior Serological Testing.* YIDUs were asked to report if they had ever been tested for hepatitis B, hepatitis C, HIV, and sexually transmitted diseases, and what the result was the last time they were tested.

*Other Risk Behaviors.* YIDUs were asked if they had ever 1) traded sex for money, drugs, food, or a place to sleep, 2) had unprotected sex with someone they knew had HIV, 3) shared syringes or other injection equipment with someone they knew had hepatitis C, and 4) (for males) had sex with men.

*Support for Harm Reduction.* Two measures of parent support for harm reduction were used; one referring to harm reduction approaches in general, and one specific to the YIDU child. Parents were asked to rate their agreement with six statements about harm reduction in general: 1) needle exchange is an effective way to limit the spread of HIV, 2) giving away condoms is an effective way to limit the spread of HIV, 3) needle exchange programs encourage young people to use drugs, 4) giving away condoms encourages young people to have sex, 5) the only way to limit the spread of HIV among drug users is to enroll them all in drug treatment, and 6) the only way to limit the spread of HIV among young people is to prevent them from having sex. Responses were scored from 0 (strongly agree) to 3 (strongly disagree). The first two questions were reverse-scored, and the items were summed (with missing values treated as zero), yielding a measure ranging from 0 to 18 with higher scores indicating greater support.

Parents were also asked if they would be more angry or relieved or wouldn't care if they 1) found out their child was using a needle exchange program, 2) found condoms in their child's bedroom, 3) found out that their child was talking to health care professionals about how to inject drugs more safely, 4) their child got tested for HIV, 5) their child asked them to get condoms, and 6) their child asked them for a ride to the needle exchange program. A total score was calculated as the number of items answered "more relieved."

*Help Seeking.* Parents were asked to indicate if they had ever used and/or planned to use or refer their YIDU child to services to help with his/her drug problem. Services included needle exchange program, psychological counseling, methadone treatment, residential treatment, self-help or 12-step treatment programs, spiritual counseling, emergency medical assistance, social services such as welfare or homeless shelters, and medical care from regular physicians. They were also asked if they ever had and/or planned to have their YIDU child arrested.

## Promoting parental involvement in harm reduction

*Parent Substance Use.* Parents were asked if they had drunk alcohol in the past year, had ever had five or more drinks in one sitting, had five or more drinks at one time in the past year, had ever driven a car while drunk, had ever been addicted to tobacco, had ever used illegal drugs, had ever taken psychoactive prescription drugs without a doctor's prescription, and had ever been in drug treatment, including self-help groups such as AA or NA.

### Analyses

*Participation.* We examined both YIDU and parent willingness to participate. Bivariate analyses (chi-square and t-test) and multivariate logistic regression analysis were conducted to compare consenting and non-consenting YIDUs on sociodemographic variables (age, gender, race/ethnicity, employment, homelessness, income from parents); past year substance abuse treatment, incarceration, and emergency room visits; HIV/HCV knowledge, needle exchange use, prior HCV testing, and injection risk practices; sex trading and condom use; and parental relationship measures. Variables with associations having a p-value of 0.10 or less were entered into a multivariate logistic regression. Among consenting YIDUs, we evaluated parental relationship measures, HIV/HCV knowledge, and risk behavior by parent baseline participation. Similarly, parents who attended the intervention were compared to those who did not on sociodemographic variables, substance use, HIV/HCV knowledge, attitudes toward harm reduction approaches, and parent-child relationship measures.

*Intervention Outcomes.* Due to a low rate of intervention participation in the waitlisted group (see below), the planned control group comparison was not feasible. Therefore, the outcome analysis focused on comparisons between intervention participants and non-participants, without regard to assigned condition. For non-participants, the first follow-up interview was used in the analysis, and for participants the first post-intervention follow-up interview was used. Length of

time elapsed from baseline to follow-up interview was included as a control variable in the analyses.

*Parent Outcomes.* Seven parent outcomes were examined: 1) support for harm reduction approaches in general, 2) attitudes favoring harm reduction for their child, 3) HIV/HCV knowledge, 4) use of needle exchange programs, 5) planning to use a needle exchange program, 6) use of methadone maintenance therapy, and 7) planning to use methadone maintenance therapy. GEE regression analyses were conducted, with intervention attendance (at least one session attended versus none) or completion (attended all sessions versus not all sessions attended), time (follow-up versus baseline), and the interaction of attendance or completion and time, and number of days from baseline interview to follow-up interview, parent gender, parent age, and number of months child lived at home as covariates.

*Youth Outcomes.* Outcomes for youth included measures of service use, and communication and problem solving with parent. Service use included 1) self-reported HBV, HCV, HIV and STD testing, 2) drug treatment, 3) mental health services, and 4) needle exchange. Communication and problem solving with parent included talking about problems, talking about heroin use, and parent help-seeking (“\_\_\_\_ tried to help you solve your problems by seeking professional counseling and help”). GEE logistic regression analyses were conducted on binary outcomes of service use, and GEE regression analyses were conducted on continuous outcomes of communication and problem-solving with parent, with intervention attendance or completion, time, the interaction of attendance or completion with time, and number of days from baseline interview to follow-up interview, parent gender, parent age, and number of months child lived at home as covariates.

## Results

### Baseline Participation.

The study enrolled 843 eligible YIDUs; 836 had usable data, and 347 of these (42%) consented to contact a parent or guardian. In multivariate logistic regression analysis (not shown), the likelihood of consenting increased with older age (OR = 1.11, 95% CI 1.03-1.19), unemployment (OR = 1.61, 95% CI 1.18-2.19), having received income from parents (OR = 1.53, 95% CI 1.06 - 2.20), having received emergency medical treatment (OR = 1.60, 95% CI 1.12 - 2.27), having a self-reported positive HCV test result (versus not tested, OR = 2.62, 95% CI 1.30 - 5.26), and more communication with parent (OR = 1.48, 95% CI 1.07 - 2.04). Variables that were significant in bivariate analyses but not significant in the multivariate model were past year incarceration, past year homelessness, past year substance abuse treatment, ever traded sex, needle exchange participation, and parental supervision. Consenting and non-consenting YIDUs did not differ on gender, race, HIV/HCV knowledge, injection risk practices, condom use, or parental relationship measures other than communication.

Out of the 347 parents approached, 166 (48%) completed a baseline survey. Selected characteristics of these 166 YIDU-parent pairs are shown in Table 1. Most of the participating parents were female (88%) and biological parents (89%); about half (52%) were married, and 20% were unemployed. YIDUs whose parent did not participate in the baseline interview reported slightly more conflict ( $t = 1.99, p = .048$ ). Parental participation was not associated with YIDU risk behavior, but was positively associated with needle exchange use ( $\chi^2 = 8.03, p = 0.018$ ); 37% of parents of consenting youth who never used needle exchange completed a baseline interview, while 56% of parents of those who always used needle exchange to obtain needles did so. YIDUs whose parent participated also had higher HIV/HCV knowledge scores ( $t$

= 3.07,  $p = .002$ ), and were more likely to have traded sex for money or drugs ( $\chi^2 = 4.60$ ,  $p = 0.032$ ).

**Table 1. Characteristics of participants with parent baseline interview (N = 166)**

	YIDU		Parent	
	N	%	N	%
<b>Sex</b>				
Male	108	65%	20	12%
Female	58	35%	146	88%
<b>Race/ethnicity</b>				
White	133	80%	133	80%
Hispanic	23	14%	21	13%
Other	10	6%	12	7%
<b>Employment</b>				
Employed full or part-time	71	43%	133	80%
Unemployed	93	56%	33	20%
Student	2	1%		
<b>Marital Status</b>				
Not married			80	48%
Married			86	52%
<b>Income Contribution</b>				
No income from parent	28	17%		
Some income from parent	138	83%		
<b>Homeless<sup>a</sup></b>				
No	107	64%		
Yes	59	36%		
<b>Substance Abuse Treatment<sup>a</sup></b>				
No	74	45%		
Yes	92	55%		
<b>Incarceration<sup>a</sup></b>				
No	75	45%		
Yes	91	55%		
<b>Medical Treatment in ER<sup>a</sup></b>				
No	114	69%		
Yes	51	31%		
<b>Needle Exchange Program Use<sup>a</sup></b>				
Never	38	23%		
Sometimes	57	34%		
Always	70	42%		
<b>Prior HCV Testing</b>				
Never/Don't Know	46	28%		
Yes: Negative	100	60%		
Yes: Positive	19	11%		
Yes: Don't Know	1	1%		

<sup>a</sup> Past year



### Intervention Participation

Seventy-two parents (43% of baseline participants) attended at least one session of the intervention, and 59 (35%) of the parent-child pairs completed the 3-session intervention. However, participation was much lower among the waitlisted participants; 21 (30%) of the waitlisted parents attended at least one intervention session compared to 51 (53%) of those not waitlisted, and 15 waitlisted pairs (21%) completed the intervention, compared to 44 (46%) of those not waitlisted.

Among parents who completed a baseline interview, those who attended at least one intervention session were older (mean 51 vs. 49,  $t = 2.14$ ,  $p = 0.034$ ) and more likely to have taken prescription drugs without a doctor's prescription (18/70 vs. 2/91,  $\text{Chi}^2 = 18.11$ ,  $p < .0001$ ). Although most parent participants were women, men who completed a baseline interview were more likely to attend the first intervention session (7/20 men versus 85/143 women,  $\text{Chi}^2 = 4.54$ ,  $p = .033$ ). Parent baseline knowledge, harm reduction attitudes, and parent-child relationship measures did not differ by intervention attendance.

### Parent Baseline Knowledge and Attitudes

Parents were less well informed than their YIDU children about HIV and HCV risk and prevention; YIDU averaged nearly 80% correct, while parents averaged about 71% correct ( $t = 4.85$ ,  $p < .0001$ ). Most parents at least somewhat agreed, and two-thirds strongly agreed that needle exchange and condom distribution are effective ways to limit the spread of HIV. However, about one-third of parents at least somewhat agreed that needle exchange programs encourage young people to use drugs, and that giving away condoms encourages them to have sex. Nearly half somewhat or strongly agreed that the only way to limit the spread of HIV among drug users is to enroll them all in treatment, and 39% somewhat or strongly agreed that the only

way to limit the spread of HIV among young people is to prevent them from having sex. Most parents said they would be more relieved than angry if they found out their child was using a needle exchange program (79%), was using condoms (93%), or was talking to health professionals about how to inject drugs more safely (77%).

### Intervention Outcomes

There were 92 parents and YIDUs with at least one follow-up interview who were included in the outcome analysis. Youth outcomes for intervention attendance are shown in Table 2. Results for intervention completion (not shown) were similar. Self-reported HCV testing increased significantly among YIDU whose parents did *not* attend the intervention ( $p = .046$ ). Self-reported HBV testing increased from baseline to follow-up regardless of intervention attendance ( $OR = 2.69$ , 95% CI 1.31 - 5.54); nominally more so among those whose parents did *not* attend the intervention, but the interaction term was not statistically significant. There were no effects of intervention attendance or completion on reported needle exchange use, mental health service use, or participation in drug treatment. There were also no intervention effects and no significant changes over time on measures of communication and problem-solving.

Parent outcomes for intervention attendance are shown in Table 3. Results for intervention completion (not shown) were similar. Parents who attended at least one intervention session had a more positive attitude toward harm reduction *for their child* at follow-up than at baseline ( $B = 0.49$ ,  $p = .037$ ), while those who did not attend any intervention sessions showed no change. The effect was similar for intervention completion ( $B = 0.52$ ,  $p = .027$ ). There were no effects of intervention attendance or completion on attitudes toward harm reduction approaches *in general*, or HIV/HCV knowledge.

**Table 2. Young IDU Intervention Outcomes (N = 92†)**

Outcome	Attended Intervention	Baseline		Follow-up		Predictor	GEE Regression‡		
		N	%	N	%		OR	95% CI	p
Prior HBV Testing	Yes	47	72%	47	81%	Attended Intervention	1.09	[0.40, 2.93]	0.868
	No	43	63%	44	86%	Follow-up	4.35	[1.49, 12.72]	<b>0.007</b>
						Follow x Attend	0.40	[0.09, 1.69]	0.213
Prior HCV Testing	Yes	47	77%	45	82%	Attended Intervention	1.20	[0.43, 3.38]	0.727
	No	43	70%	44	93%	Follow-up	6.19	[1.93, 19.82]	<b>0.002</b>
						Follow x Attend	0.23	[0.05, 0.97]	<b>0.046</b>
Drug Treatment	Yes	47	57%	47	51%	Attended Intervention	1.18	[0.48, 2.90]	0.717
	No	45	56%	45	56%	Follow-up	0.99	[0.51, 1.94]	0.977
						Follow x Attend	0.76	[0.30, 1.94]	0.563
Mental Health Services	Yes	47	11%	47	11%	Attended Intervention	2.26	[0.45, 11.46]	0.324
	No	45	9%	45	11%	Follow-up	1.26	[0.48, 3.33]	0.635
						Follow x Attend	0.69	[0.18, 2.62]	0.585
Any NEP Use	Yes	47	89%	40	85%	Attended Intervention	2.44	[0.71, 8.45]	0.159
	No	45	76%	45	89%	Follow-up	2.68	[0.89, 8.09]	0.080
						Follow x Attend	0.24	[0.05, 1.21]	0.084
Discuss Problems, often	Yes	47	32%	47	34%	Attended Intervention	0.85	[0.34, 2.15]	0.738
	No	45	38%	45	47%	Follow-up	1.45	[0.67, 3.11]	0.343
						Follow x Attend	0.76	[0.26, 2.27]	0.624
Discuss Heroin, often	Yes	47	49%	47	45%	Attended Intervention	1.36	[0.56, 3.26]	0.496
	No	42	42%	45	51%	Follow-up	1.41	[0.64, 3.14]	0.397
						Follow x Attend	0.59	[0.19, 1.80]	0.353
Tried to Help, often	Yes	47	23%	47	23%	Attended Intervention	0.93	[0.31, 2.86]	0.905
	No	45	18%	45	29%	Follow-up	1.91	[0.89, 4.10]	0.098
						Follow x Attend	0.53	[0.18, 1.52]	0.234

† Parent-YIDU pairs with follow-up data

‡ covariates included days to follow-up, parent age and gender, and number of months lived with parent.

IDU: Injection drug user; HBV, hepatitis B; HCV, hepatitis C; NEP, needle exchange program

**Table 3. Parent Intervention Outcomes (N = 92†)**

Outcome	Attend Intvtn	N	Baseline %	N	Follow-up %	Predictor	OR	95% CI	p
Used NEP	Yes	46	15%	45	31%	Attended	6.11	[1.06, 35.29]	<b>0.043</b>
	No	43	5%	42	7%	Follow-up	1.69	[0.29, 9.77]	0.556
						Follow x Attend	1.78	[0.23, 13.46]	0.578
Planned to Use NEP	Yes	46	48%	45	82%	Attended	0.73	[0.29, 1.83]	0.496
	No	43	60%	42	64%	Follow-up	1.22	[0.58, 2.56]	0.601
						Follow x Attend	4.12	[1.37, 12.37]	<b>0.012</b>
Used MM	Yes	44	68%	45	76%	Attended	1.14	[0.42, 3.06]	0.802
	No	41	54%	43	60%	Follow-up	1.52	[0.79, 2.93]	0.206
						Follow x Attend	0.93	[0.36, 2.39]	0.885
Planned to Use MM	Yes	44	59%	45	80%	Attended	1.02	[0.39, 2.68]	0.972
	No	41	61%	43	81%	Follow-up	2.52	[1.29, 4.93]	<b>0.007</b>
						Follow x Attend	1.09	[0.43, 2.76]	0.861
		N	Mean (Std.)	N	Mean (Std.)		Beta	95% CI	p
Harm Rdxn in General	Yes	47	12.6 (3.5)	47	12.9 (3.7)	Attended	0.72	[-0.53, 1.97]	0.262
	No	45	12.1 (3.0)	45	11.9 (3.0)	Follow-up	-0.52	[-1.36, 0.31]	0.220
						Follow x Attend	0.18	[-0.99, 1.35]	0.758
Harm Redxn for Child	Yes	47	4.9 (1.3)	47	5.5 (0.8)	Attended	0.08	[-0.43, 0.58]	0.761
	No	45	4.8 (1.2)	45	5.0 (1.2)	Follow-up	0.10	[-0.23, 0.44]	0.540
						Follow x Attend	0.49	[0.03, 0.95]	<b>0.037</b>
HIV/HCV Knowledge	Yes	47	0.8 (0.1)	47	0.8 (0.1)	Attended	0.03	[-0.03, 0.09]	0.352
	No	45	0.8 (0.1)	45	0.8 (0.1)	Follow-up	0.01	[-0.02, 0.04]	0.571
						Follow x Attend	0.01	[-0.04, 0.05]	0.715

† Parent-YIDU pairs with follow-up data

NEP: Needle exchange program; MM: methadone maintenance

Parents who attended the intervention were six times more likely than those who did not attend to report use of or referral to a NEP at baseline (OR = 6.11, 95% CI 1.06 - 35.29). In addition, there was an overall increase in the use of needle exchange programs at follow-up regardless of intervention attendance (OR = 2.63, 95% CI 1.08 - 6.39). There was a significant time by intervention effect for planning to use needle exchange ( $p = .012$ ); at follow-up, parents who attended the intervention were three times more likely to say that they planned to use or refer their child to a NEP compared to those who did not attend (OR = 2.99, 95% CI 1.03 - 8.71), and five times more likely than they had been at baseline (OR = 5.02, 95% CI 2.22 - 11.35). Use of methadone maintenance did not change significantly from baseline to follow-up, however there was an overall increase in the likelihood of planning to use this service, regardless of intervention attendance (OR = 2.64, 95% CI 1.65 - 4.22).

## **Discussion**

A sizable proportion (41%) of YIDUs agreed to have their parents contacted for the study. YIDUs who had experienced negative outcomes such as unemployment, self-reported HCV infection, and medical emergencies were more likely to consent to parental contact. Those who had received monetary support from their parent and those who had more communication with their parent were also more likely to consent to parental contact.

Over 25% of parents in the non-delayed condition attended at least the first intervention session. Given that the YIDUs are legal adults, responsible for themselves, this level of involvement is encouraging. Parental participation was greater for YIDUs who were using needle exchange and were more knowledgeable about HIV/HCV risks. Although they comprised a minority, parents who actively supported the use of needle exchange at baseline and those who had a history of prescription drug misuse were more likely to attend the intervention. About ten

percent ( $n = 16$ ) of consented parents ( $n = 166$ ) reported that they used or referred their child to a needle exchange program, and most of these attended ( $n = 12$ ) and completed ( $n = 11$ ) the intervention. Twelve percent ( $n = 20$ ) of consented parents reported prescription drug misuse, and nearly all of these attended ( $n = 18$ ) and most completed ( $n = 15$ ) the intervention. Parents who have a history of substance misuse themselves may be more motivated to participate.

Parents who attended the intervention expressed more positive attitudes toward harm reduction strategies, particularly needle exchange, upon follow-up compared to those who did not attend. In addition, regardless of intervention attendance, parents were more likely to recommend needle exchange use for their YIDU child at follow-up, and more likely to consider methadone maintenance treatment, compared to baseline. These findings suggest that the telephone interview with parents by itself may have had some effect.

Self-reported testing for hepatitis B increased among YIDU regardless of intervention participation, while testing for hepatitis C increased significantly among non-participants (from 70% to 93%). These effects may be due to interactions with staff at the study site. No effects were seen on YIDU ratings of parent-child communication.

*Limitations.* Follow-up interviews were conducted with only 55% of parents who completed a baseline interview, and 65% of intervention participants. Parents who failed to complete a follow-up interview may have had less positive opinions on harm reduction. The waitlist control group design was also a suboptimal design for this population, and contributed to the small number of participants available for the outcomes analysis. Whether dealing with substance users or their family members, interventions should be available as soon as possible to maximize uptake.

Although socially desirable responding regarding risk behaviors is probable, the use of computerized self-interviews for YIDUs instead of a face-to-face interview may have minimized this occurrence. For parents, although interviews were administered by telephone, which has been shown to have reporting biases similar to face-to-face interviews, the more sensitive questions on substance use were recorded privately on the mail-in answer sheet. Finally, In the Chicago area, injection drug use among young adults appears to be concentrated in the suburbs. Parents of YIDUs are, therefore, diffused across large geographic areas, making it difficult to find centralized intervention locations easily accessible to a majority of parents.

### *Conclusions.*

Our study showed a fair degree of willingness by parents of YIDU to participate in family-based interventions, and the intervention had a modest effect on acceptance of harm reduction among parents. Some positive attitude change was also observed regardless of intervention attendance, suggesting that a brief telephone interview in itself may provide some benefit. the difficulty in finding suitable intervention locations for this largely suburban, geographically dispersed population, suggests that remote (i.e. telephone or internet-based) interventions should be considered for parents interested in addressing drug-related harms faced by their YIDU children. A remote intervention could also be used to inform parents about the benefits and availability of Naloxone for immediate overdose treatment. Harm reduction might also be integrated into programs for family members of substance users, such as that described by Copello and colleagues.

## ACKNOWLEDGEMENT

The authors thank Estella Rivers-Goolsby for her committed case management, Maggie Parker for data analysis, the study participants for the time and effort they contributed to this study, and the project staff who administered the coupon referral system, collected data, and otherwise operated field sites in a manner welcoming to potential participants.



## References

- AIDS Foundation of Chicago. (1996). Northeastern Illinois Case Manager Cooperative: Case Management Standard Operating Procedures Manual. Chicago.
- Austin, A. M., Macgowan, M. J., & Wagner, E. F. (2005). Effective family-based interventions for adolescents with substance use problems: A systematic review. *Research on Social Work Practice, 15*(2), 67-83. doi:10.1177/1049731504271606.
- Brody, G. H., Chen, Y. F., Kogan, S. M., Yu, T. Y., Molgaard, V. K., DiClemente, R. J., et al. (2012). Family-centered program deters substance use, conduct problems, and depressive symptoms in Black adolescents. *Pediatrics, 129*(1), 108-115. doi:10.1542/peds.2011-0623.
- Cassin, S., Geoghegan, T., & Cox, G. (1998). Young injectors: A comparative analysis of risk behaviour. *Irish Journal of Medical Science, 167*(4), 234-237.
- Chatterjee, S., Tempalski, B., Pouget, E., Cooper, H., Cleland, C., & Friedman, S. (2011). Changes in the prevalence of injection drug use among adolescents and young adults in large U.S. metropolitan areas. *AIDS and Behavior, 15*(7), 1570-1578. doi:10.1007/s10461-011-9992-0.
- Fennema, J., Van Ameijden, E., Van Den Hoek, A., & Coutinho, R. (1997). Young and recent-onset injecting drug users are a higher risk for HIV. *Addiction, 92*(11), 1457-1465.
- Foxcroft, D. R., & Tsertsvadze, A. (2011). Universal family-based prevention programs for alcohol misuse in young people. [Review]. *Cochrane Database of Systematic Reviews, 9*, Art. No. CD009308. doi:10.1002/14651858.CD009308.
- Kapadia, F., Latka, M. H., Hudson, S. M., Golub, E. T., Campbell, J. V., Bailey, S., et al. (2007). Correlates of consistent condom use with main partners by partnership patterns among young adult male injection drug users from five US cities. *Drug and Alcohol Dependence, 91*(Supplement 1), S56-S63.
- Kapadia, F., Latka, M. H., Wu, Y., Strathdee, S. A., Mackesy-Amiti, M. E., Hudson, S. M., et al. (2011). Longitudinal determinants of consistent condom use by partner type among young injection drug users: The role of personal and partner characteristics. *AIDS and Behavior, 15*(7), 1309-1318. doi:10.1007/s10461-009-9569-3.
- Kipke, M. D., Unger, J. B., Palmer, R. F., & Edgington, R. (1996). Drug use, needle sharing, and HIV risk among injection drug-using street youth. *Substance Use and Misuse, 31*(9), 1167-1187.
- Kumpfer, K. L., Alvarado, R., & Whiteside, H. O. (2003). Family-based interventions for substance use and misuse prevention. *Substance Use and Misuse, 38*(11-13), 1759-1787. doi:10.1081/Ja-120024240.
- Louie, R., Rosenthal, D., & Crofts, N. (1996). Injecting and sexual risk-taking among young injecting drug users. *Venereology, 9*(2), 114-118.
- Miller, B. A., Aalborg, A. E., Byrnes, H. F., Bauman, K., & Spoth, R. (2012). Parent and child characteristics related to chosen adolescent alcohol and drug prevention program. *Health Education Research, 27*(1), 1-13. doi:10.1093/her/cyr109.
- Rondinelli, A. J., Ouellet, L. J., Strathdee, S. A., Latka, M. H., Hudson, S. M., Hagan, H., et al. (2009). Young adult injection drug users in the United States continue to practice HIV risk behaviors. *Drug and Alcohol Dependence, 104*(1-2), 167-174. doi:10.1016/j.drugalcdep.2009.05.013.

Wiebel, W. (1993). The Indigenous Leader Outreach Model: Intervention Manual. Rockville, MD: US Department of Health and Human Services.

Williams, M. L., Ross, M. W., Atkinson, J., Bowen, A., Klov Dahl, A., & Timpson, S. C. (2006). An investigation of concurrent sex partnering in two samples of drug users having large numbers of sex partners. *International Journal of STD and AIDS*, 17(5), 309-314. doi:10.1258/095646206776790123.