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Facilitating Treatment Entry among Out-of-Treatment Injection Drug Users

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SYNOPSIS

Objectives. High risk injection practices are common among injecting drug users (IDUs), even following intervention efforts. Moreover, relapse to risk behaviors has been reported among those who initiate risk reduction. Substance abuse treatment offers the potential to reduce or eliminate injecting risk behaviors through drug cessation. We report on the effectiveness of two intervention strategies in facilitating treatment entry among out-of-treatment IDUs: motivational interviewing (MI), an intervention developed to help individuals resolve their ambivalence about behavior change, and free treatment for 90 days. These conditions were compared with an intervention focusing on a hierarchy of safer injecting practices, referred to here as risk reduction (RR), and no free treatment.

Methods. Nearly 200 out-of-treatment IDUs were randomly assigned to one of four experimental conditions: MI/free treatment, MI/no free treatment, RR/free treatment, and RR/no free treatment. Regardless of assignment, we assisted anyone desiring treatment by calling to schedule the appointment, providing transportation, and waiving the intake fee.

Results. Overall, 42% of study participants entered treatment. No significant differences were found between MI and RR; however, 52% of those assigned free treatment entered compared with 32% for those who had to pay. Other predictors of treatment

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entry included prior treatment experiences, perceived chance of contracting acquired immunodeficiency syndrome (AIDS) greater than 50%, "determination" stage of change, greater frequency of heroin injecting, and fewer drug-using friends.

Conclusion. These findings support the importance of removing barriers to treatment entry.

The injection of illicit drugs represents a major public health threat. Through June 1997, injecting drug users (IDUs) accounted for more than 36% of the 612,078 cases of acquired immunodeficiency syndrome (AIDS) reported in the United States.[1] During this same period, 62% of adult and adolescent female AIDS cases were associated with drug injection; more than half of all pediatric cases were due either to the mother's injection drug use or to her sex relations with an IDU. This threat may be of even greater significance in that approximately half of all new reports of human immunodeficiency virus (HIV), the etiological agent for AIDS,[2,3] are estimated to occur among IDUs.[4]

In the absence of a vaccine to prevent or cure HIV, behavioral interventions are the only means currently available to reduce the spread of the disease. HIV intervention programs have included media campaigns,[5,6] community-based street outreach,[7–9] substance abuse treatment,[10,11] syringe exchange programs,[12,13] and HIV testing and counseling.[14–16] In Denver, we began our work in this area in 1987 using a community-based street outreach approach adapted from the Indigenous Leader Outreach Model (ILOM). Indigenous members of the targeted community were hired and trained to deliver the intervention.[17] Advantages of using indigenous recovering drug users are that they have insider access to the drug-using community, they know the rules governing the social systems of the streets, and they are able to develop trusting relationships with the target population of active drug users. The ILOM emphasizes a hierarchy of behavioral options available to IDUs for the purpose of decreasing the probability of HIV transmission. The hierarchy is presented as follows:

1. Quit using drugs.
2. If you can't or won't stop using drugs, then stop injecting.
3. If you can't or won't stop injecting, then don't share needles or syringes and other works.
4. If you can't or won't stop sharing, then disinfect your needles and syringes with bleach between sharing partners.[9,18]

Although in previous studies we found the ILOM effective in reducing needle-related risk behaviors,[19,20] at least one-third of IDUs continued high risk injecting

practices,[21,22] and relapse to risk behaviors was common among those who initiated risk reduction.[23] More recently, we reported a significant reduction in the use of nondisinfected needles and syringes following intervention, from 34% to 22%.[24] However, the finding that more than one-fifth of those we intervened with continued this high risk behavior led us to believe that additional intervention efforts were required, specifically, interventions that could lead to drug use cessation.

Substance abuse treatment, in particular methadone maintenance, is one approach that has been found to be effective in modifying drug use,[25,26] as well as in reducing HIV risk behaviors[27,28] and HIV seroconversion.[29,30] Metzger and colleagues, for example, reported a 3.5% HIV seroconversion rate for those enrolled in methadone maintenance for the entire follow-up period (18 months) *vs.* a 22% HIV seroconversion rate for those who remained out of treatment.[29] These results are consistent with those of Williams and colleagues, who found a 2% HIV seroprevalence rate among IDUs who remained in methadone treatment for the duration of the 39-month follow-up *vs.* a 19% HIV seroprevalence rate for those who dropped out of treatment.[31]

Unfortunately, many IDUs do not enter drug treatment programs. In fact, it is estimated that only one out of six IDUs are in treatment at any given time.[32] Thus, increasing the number of treatment admissions remains a key objective in helping control the spread of HIV.[33,34] In order to increase treatment participation, a number of perceived and real barriers to treatment entry must be overcome. Several investigators have demonstrated that the provision of "rapid intake" significantly increases the number of IDUs who enter and remain in treatment compared with procedures that involve intake delays.[35–37] Other investigators have lowered financial barriers to increase treatment entry rates.[38,39] In New Jersey, two separate investigations reported increased treatment entry as a result of the distribution of coupons redeemable for free methadone treatment.[40,41] In more recent studies, 59% redeemed treatment coupons, including nearly half who reported no prior treatment experiences and 58% of whom tested positive for HIV.[41]

Another method of encouraging individuals to change their behavior, including quitting drug use, is motivational interviewing (MI).[42] MI was developed in the addictions field to help individuals work through their ambivalence about behavior change.[43] Based on the assumption that most people are not ready to change their addictive behaviors, MI is an intervention that attempts to increase motivation and movement toward change. It is closely tied to the theory of stages of change,[44] which says that individuals are in one of five stages relative to changing problematic behaviors:

- Precontemplation, indicated by denial or a lack of problem recognition.
- Contemplation, demonstrated by the recognition that there is a problem but with ambivalence about change.
- Determination, shown when a plan has been made to initiate change but change has not begun.
- Action, when behavior change has begun.
- Maintenance, evidenced by sustained behavior change over a period of time (typically six months or more).[45,46]

MI is designed to help individuals articulate their own reasons for concern and the need to change. Based on the stage or degree of readiness to change, a menu of strategies is presented to the individual. Examples include providing feedback on drug use; discussing the pros and cons of drug use, treatment, or drug cessation; exploring ambivalence; and setting goals regarding lifestyle changes.

To date, the vast majority of research on MI has involved individuals with alcohol problems.[47] Studies that have evaluated MI effects on users of other drugs have focused on clients already in treatment. To our knowledge, MI has not been studied as an intervention to move out-of-treatment drug users, in particular IDUs, into treatment. In addition to testing the effect of MI on treatment entry (compared with our adaptation of the ILOM, referred to in this chapter as risk reduction or RR), this investigation was designed to assess the effect of free treatment, compared with a no-free-treatment condition, on the rate of entry into treatment. The data reported here were collected in the first two years of a five-year study and, therefore, must be considered preliminary.

METHODS

Beginning in February 1996, we recruited IDUs from street settings in Denver, Colorado, to participate in a study designed to assess the effectiveness of MI, as well as free treatment, in promoting entry into substance abuse treatment. Prior to recruitment, we estimated the number of IDUs residing in each of Denver's census tracts using indicators available through public records, including drug-related arrests, treatment admissions

involving injection drug use, and HIV and AIDS cases attributable to injection drug use. These estimates were then refined based on observational assessments of locations where drugs were purchased. To arrive at recruiting quotas within census tracts, we multiplied the number of subjects designated for the study by the estimated proportion of IDUs living in each census tract. The result was a nonrandom, purposefully selected sample of IDUs characterized by diversities in gender, ethnicity, age, drug injection practices, and risk behaviors.

We hired individuals familiar and comfortable with IDUs to recruit study participants, conduct interventions, and maintain contact with participants for follow-up research interviews. Interventionists were not former IDUs; however, they had prior experiences with IDUs and were knowledgeable about working in street and community settings. They performed outreach activities using a variety of methods, including on foot, at tables, from automobiles, on bicycles, and in bars. The time of day and type of outreach conducted varied, depending on the area targeted. Free condoms, bleach, and other prevention materials were offered to potential participants, along with flyers describing the project. Individuals interested in participating were informed of the eligibility requirements and, if judged eligible, were scheduled for an interview appointment. Individuals were eligible if they had injected drugs in the 30 days prior to the interview, were at least 18 years of age, and were not enrolled in drug abuse treatment in the 30 days prior to the interview. Potential subjects were informed that they would be inspected for signs of recent venipuncture and that urinalysis would be performed prior to their interview to confirm their eligibility. Informed consent was obtained prior to the interview, and participants were compensated $20 for their time. Interviews were conducted by professionally trained staff members familiar with the drug subculture. All participants were offered free HIV testing and counseling. These procedures were approved by the Institutional Review Board of the University of Colorado Health Sciences Center.

A number of structured questionnaires were used to assess study objectives. A modified version of the Risk Behavior Assessment (RBA) instrument developed by a grantee consortium of the National Institute on Drug Abuse (NIDA) served to assess demographics, drug use, sexual behaviors, medical histories, and HIV and AIDS risk behaviors. For this study, we added additional items to the RBA in order to survey other areas of interest (for example, the number of people the subject associated with who also used drugs). The risk period assessed by the RBA included the 30 days prior to the interview. Reliability and validity assessments of the RBA support its adequacy as a research tool with this population.[48,49] To assess stage of change, a critical theoretical construct in our study, we modified the Motivation Scales, including Drug Use Problems, Desire for Help, and Treatment Readiness, from the data instruments developed by Simpson and colleagues for the Drug Abuse Treatment, Assessment, and Research (DATAR) Project.[50] These measures had undergone extensive psychometric testing and were found to be acceptable.[51] The stages-of-change measure we used consisted of 23 items with a five-point response choice, from strongly disagree to strongly agree. Since only active IDUs were eligible for the study, no one was in the action or maintenance stages at baseline. Individuals were considered precontemplators if their total score was 10 or more on the following three questions: "Your drug use is a problem for you" (reverse scored); "Your drug use is more trouble than it's worth" (reverse scored); and "Your drug use is under control." Those categorized as contemplators agreed with the question "Part of you wants to keep using drugs and another part of you wants to quit" and obtained a total score from the following four questions of 13 or higher:

- "You plan to quit using drugs in the next six months."
- "You want to make changes in your use of drugs, but feel you can't right now."
- "You're going to quit using drugs someday, but not right now."
- "Part of you wants to keep using drugs and another part of you wants to quit."

Those placed in the determination stage agreed with each of the following two questions: "You are ready to quit using drugs right now" and "You plan to quit using drugs in the next 30 days." For analysis, a variable was then created to indicate the subject's overall stage. If an individual met the criteria for only one stage, that was the stage to which he or she was assigned. If the criteria for both precontemplation and contemplation or contemplation and determination were met, the assignment was to the lower stage (for example, precontemplation). Subjects who failed to meet the criteria for any of the stages, or who met the criteria for all three stages or the criteria for both precontemplation and determination, were considered "indeterminant" and were not classified. Information

on treatment entry, the primary outcome variable in the study, was obtained from the treatment clinic participating in the study. Operationally, treatment entry was defined as completing the intake procedure. Baseline data were collected over two interviews, with the second interview scheduled one to seven days following the initial interview.

MI and free-treatment effects were evaluated using a 2×2 factorial design,[52] with study participants randomly assigned to one of four conditions: MI with free treatment, MI without free treatment, RR with free treatment, and RR without free treatment. Treatment clinic counselors were responsible for recommending the most appropriate treatment modality for each client admitted. Regardless of assignment, if a subject requested treatment, we scheduled the intake appointment and provided transportation to the clinic. As an affiliate of our project, the clinic waived the customary $40 intake fee. In addition, subjects in the free treatment conditions were offered coupons redeemable for 90 days of free treatment. Recorded on the coupon were the name and identification number of the subject and the coupon's expiration date, eight weeks from the date of the assignment. Subjects were assigned to conditions following their second baseline interview. To ensure that coupons were redeemed by the same individuals selecting them, we attached a photograph of the subject and required that intake be arranged through our intervention staff. Because of our affiliation with the clinic, treatment intake could typically be arranged within three to four days of when a subject reported a desire to enter. This report includes data from IDUs who had participated in the study for at least two months, the maximum time in which free treatment coupons could be redeemed.

RR focused on modifying the behaviors that placed IDUs at risk for HIV. Interventionists working in this capacity attempted to increase AIDS awareness, encourage a realistic assessment of individual risk and offer a hierarchy of alternatives to high risk behavior, reinforce risk reduction, and encourage prevention advocacy by presenting HIV as a community problem. These elements are the same as those in the original ILOM. The major change we made to the ILOM was hiring intervention staff members who, although familiar with drug users, were not former users themselves.

MI, on the other hand, focused on more sweeping lifestyle changes by emphasizing the belief that IDUs could correct the dysfunctional behaviors that characterized their lives and adopt prosocial behaviors, such as seeking employment. Using a combination of role-induction techniques[52] and motivational interviewing strategies,[41] interventionists attempted to increase IDUs' motivation to quit drug use by preparing them for treatment. For example, a key characteristic of someone in the contemplation stage is ambivalence: the individual is aware that there is a problem and both considers and rejects the idea of change. Since motivation to change often occurs when there is a perception that there are more costs to the behavior than benefits, the interventionist needs to determine what is important to the individual ("motivational carrots") and develop a discrepancy between these factors and the behavior. A strategy we often use in this regard involves assisting the subject in completing a drug use "pros and cons worksheet" and exploring each positive and negative item listed with the goal of eliciting a commitment to change.

In developing the study's design, we determined that the same interventionists would deliver both the RR and MI interventions in order to minimize the possibility that study outcomes would be due to the influence of the individual delivering the intervention rather than the content of the intervention. Training in RR was provided by an ethnographer and outreach worker from the Chicago project where the model we first used in 1987 was developed. MI training was provided by a certified MI trainer who had been taught by Dr. William Miller, author of the principal text on this intervention.[41] Training in each strategy took place over a four-day period. The design called for subjects in each condition to receive five intervention sessions. The first session focused primarily on rapport building and was held following the initial interview, prior to random assignment to experimental conditions. Beginning with session two, which took place after the second baseline interview and immediately following assignment, interventions were specific to the condition of the subject and held every one to two weeks until completed. In this way, interventionists knew what intervention protocol to use (MI or RR) and whether or not the subject was offered free treatment. If the assignment was RR, treatment was not discussed unless the topic was brought up by the subject. For MI subjects, however, treatment was presented as an option, beginning with the second intervention session. To test the integrity of the two interventions as they were delivered, we randomly selected 40% of sessions two through five to be audiotape-recorded. These sessions were then rated for content by independent raters blind to the subject's assignment. In addition, interventionists completed forms on every session describing the content of the intervention, which we later compared with the rater's assessments of intervention content.

Statistical Package for the Social Sciences (SPSS) for Windows, version 6.1, was used to perform all statistical analyses.[54] Comparisons of intervention dose by assignment (MI or RR) were performed using one-way analysis of variance (ANOVA). To test the integrity of the interventions presented to subjects, we used Cohen's Kappa.[55] Univariate analyses of variables associated with treatment entry were performed using chi-square and one-way ANOVA for categorical and continuous variables, respectively. Independent variables that were tested included gender; ethnicity; age; education; marital status; living arrangement (such as house or shelter); homelessness; number of arrests; previous drug treatment; knowledge of substance abuse treatment procedures; stage of change for drug cessation; perceived chance of getting HIV; age of first injection; the number of people associated with who also use drugs; the number of people associated with who do not use drugs; and the number of times reported smoking crack, injecting cocaine, and injecting heroin in the 30 days prior to the interview. Associations with a *P* value of 0.05 or less were considered significant. Using stepwise multiple logistic regression with forward selection, variables in the univariate analyses that had a *P* value below 0.10 were tested for their independent association with treatment entry. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) were calculated from the logistic regression coefficients to assess associations between predictor and dependent variables. All analyses used two-tailed significance tests.

RESULTS

Study participants. Of the 196 subjects who were interviewed, four were judged by the interviewer as dishonest and, therefore, were excluded from the analyses. The resulting sample consisted of 192 current IDUs distributed into the four conditions as follows: 48 MI free treatment, 49 RR free treatment, 47 MI no free treatment, and 48 RR no free treatment. Their average age was 40 years (range = 18 to 79); 71% were male, 45% Hispanic, 28% white, 16% African American, and 8% Native American. More than one-third (36%) reported less than a 12th-grade education, 38% had graduated from high school or received a graduate equivalency diploma, and 26% had attended college or trade school. Twenty-four percent had never married, 38% were married or living as married, and 38% were divorced, separated, or widowed. At the time of the initial interview, 7% were employed full time and 61% were unemployed or disabled. Thirty-six percent considered themselves homeless. Only 5% indicated they had never been arrested, while 43% had been arrested more than 10 times. Subjects reported associating with an average of 3.1 other drug users and 2.4 nondrug users. Prior histories for the following medical conditions were reported: gonorrhea (25%), syphilis (5%), hepatitis B (16%), and HIV (4%). According to the stages-of-change measure, 11% were precontemplators, 73% were contemplators, 3% were in the determination stage, and 13% could not be classified.

Study participants averaged 19 years of injecting drugs in their lifetime; 60% reported injecting cocaine, 77% heroin, 39% speedball (a combination of heroin and cocaine), and 14% amphetamines. In addition, 44% reported smoking crack cocaine, with an average of eight years of smoking. The average number of heroin injections in the 30-day period prior to the initial interview was 60, cocaine 48, speedballs 19, and amphetamines 18; the total number of times all drugs were injected was 85. Subjects reporting crack use smoked an average of 39 times in the 30 days prior to the interview. According to urinalyses taken at the time of the initial interview, positive metabolites for the following drugs were detected: morphine 73%, cocaine 62%, and amphetamines 8%. Overall, 55% had previously been in drug treatment, including methadone maintenance, outpatient drug-free care, and residential treatment. In addition, 16% reported prior methadone detoxification.

In this 30-day period, 34% reported using a needle or syringe known to have been used by another injector without first attempting to disinfect it with bleach, boiling water, or alcohol. In addition, 70% had used a cooker or spoon, cotton, or rinse water with another IDU, and 76% had shared the drug solution, through backloading, frontloading, or use of the same cooker or spoon. HIV-negative subjects were asked about their chance for getting HIV; only 23% felt they had a 50% or greater chance of infection.

Intervention integrity. To assess the integrity of the interventions as they were actually delivered, we first conducted inter-rater reliability tests on 21 MI and 14 RR tape-recorded intervention sessions. Using a 15-item checklist containing eight strategies unique to MI and seven unique to RR, two raters who were unaware of the subject's assignment independently judged which specific strategies were presented to the subject in that particular intervention session. For sessions that were intended to have an MI focus, the raters agreed on 80% of the strategies listed, while an 85% agreement rate was found on sessions where the focus was to be RR. Overall, the Kappa statistic ranged from 0.18 to 1, with agreement

significantly greater than chance ($P < 0.05$) in 69% of the strategies. Next, we compared estimates between the raters' checklists, on those items where both agreed, and the interventionists' assessments of the intervention's content, which they recorded on contact forms following each session. Raters and interventionists agreed on 85% of the strategies listed for the MI intervention and 89% for strategies unique to RR. Kappa values ranged from 0.44 to 1, and 85% of the strategies rated were significant. Finally, we compared the rater evaluations of the subject's assignment with the actual assignment. For both MI and RR, a 100% agreement rate was achieved.

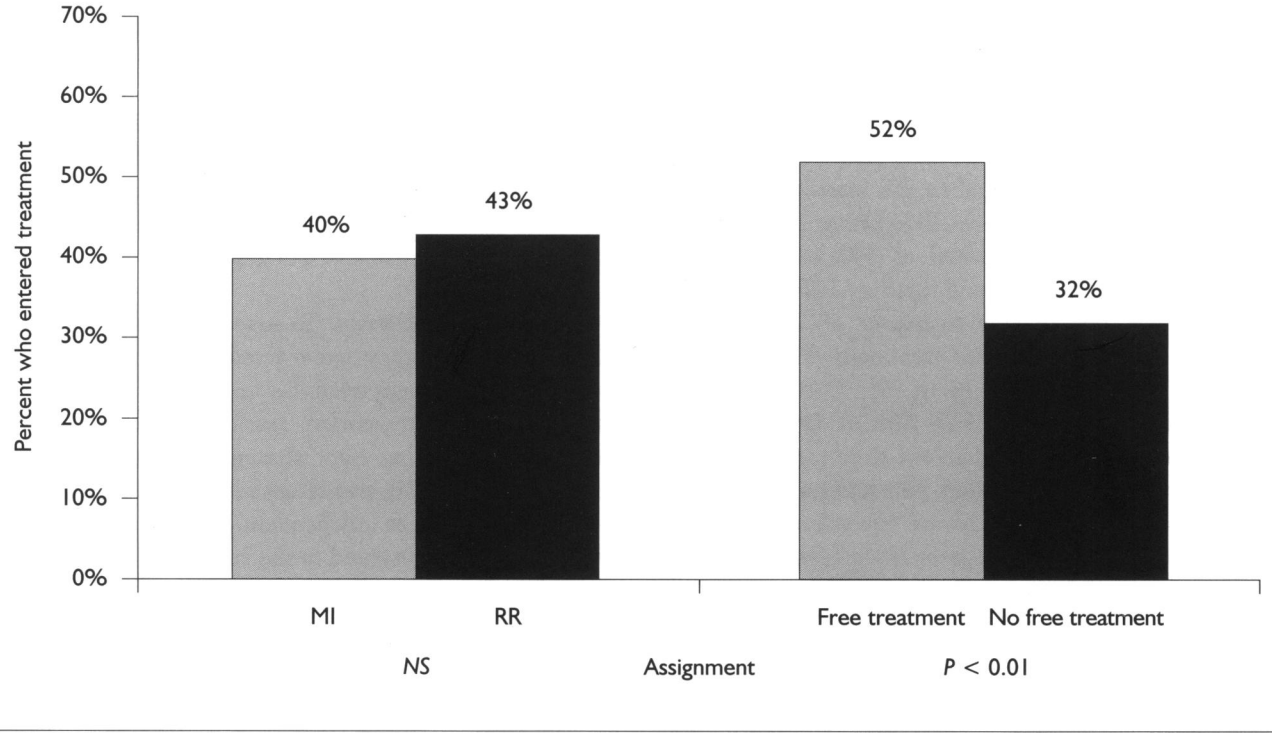
Table 1. Average intervention dose delivered by assignment

	Motivational interviewing	*Risk reduction*
Number of sessions attended	3.92	3.97
Average length of session (min)	32.69	29.38
Number of condoms distributed	9.68	11.05
Number of bleach kits distributed	3.02	3.07
Number of timers distributed	1.10	1.40

In addition to these comparisons, we also assessed the intervention dose each study participant received. Table 1 presents these findings. Although our goal was for each subject to participate in five intervention sessions, the average number of sessions actually received was four, with an average duration of 29 to 32 minutes per session. Overall, interventionists distributed approximately 10 condoms, 3.5 bleach kits, and one timer to each subject. Timers were 30-second "hourglasses" intended to assist IDUs in estimating the amount of time bleach was used in cleaning needle and syringes. The only significant difference observed between subjects in the two conditions was on the length of the sessions ($F = 6.75$; $P < 0.05$).

Treatment entry. Overall, 42% of the IDUs participating in the study entered substance abuse treatment, including 40% in MI and 43% in RR. These differences were not significant; however, we did observe a significant difference according to whether treatment was free: 52% of those offered free treatment entered compared with 32% of those who were required to pay for their treatment. Within the four conditions, the highest rate of treatment entry occurred in MI free treatment (54%) followed by RR free treatment (49%), RR no free

Figure 1. Treatment entry by assignment



treatment (38%), and MI no free treatment (26%). This finding was significant ($X^2 = 9.54$, $P < 0.05$). The average length of time between assignment to experimental condition and treatment entry was 25.4 days. There were no significant differences according to assignment and the average time to enter treatment. Of the 80 subjects who entered, 67 were admitted to methadone maintenance, five to 180-day methadone detox, four to 31-day methadone detox, and four to drug-free outpatient care. Figure 1 illustrates the rates of treatment entry according to assignment.

We also were interested in other variables that might account for entry into treatment with this population. No significant differences were found on gender, age, education, marital status, living arrangement, homelessness, number of prior arrests, knowledge of substance abuse treatment procedures, age of first injection, number of drug users and nondrug users that the subject spent time with, and treatment entry. Figures 2 and 3 summarize the significant findings we observed. African Americans were more likely to enter treatment than other ethnic groups, particularly non-Hispanic whites and Native Americans. IDUs who perceived their chance for getting HIV to be 50% or greater also were more likely to enter treatment than were those who felt they had little or no chance to become infected. Consistent with the stages-of-change theory, subjects in the determination stage had the highest rate of treatment entry, with more than four times the rate of treatment entry compared with subjects who were precontemplators. Prior treatment also predicted entry into treatment, with individuals who had previous treatment being twice as likely to enter as those without previous experience.

The frequency with which drugs were injected or smoked was associated with rates of treatment entry. Heroin injectors who entered treatment averaged 2.3 injections a day in the 30 days prior to their initial interview compared with 1.7 for heroin injectors who did not enter treatment. The reverse was observed among both cocaine injectors and crack smokers. Cocaine injectors entering treatment

Figure 2. Predictors of treatment entry

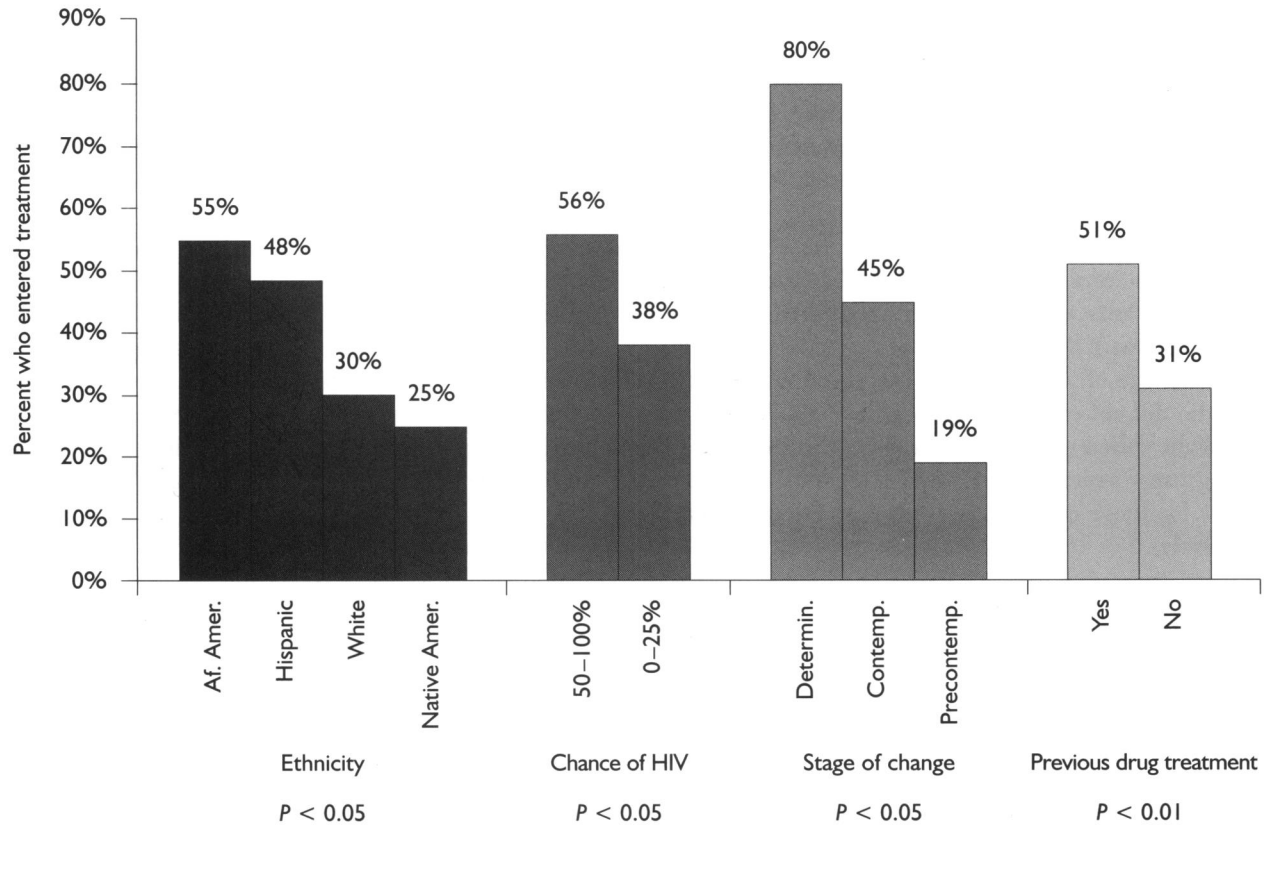
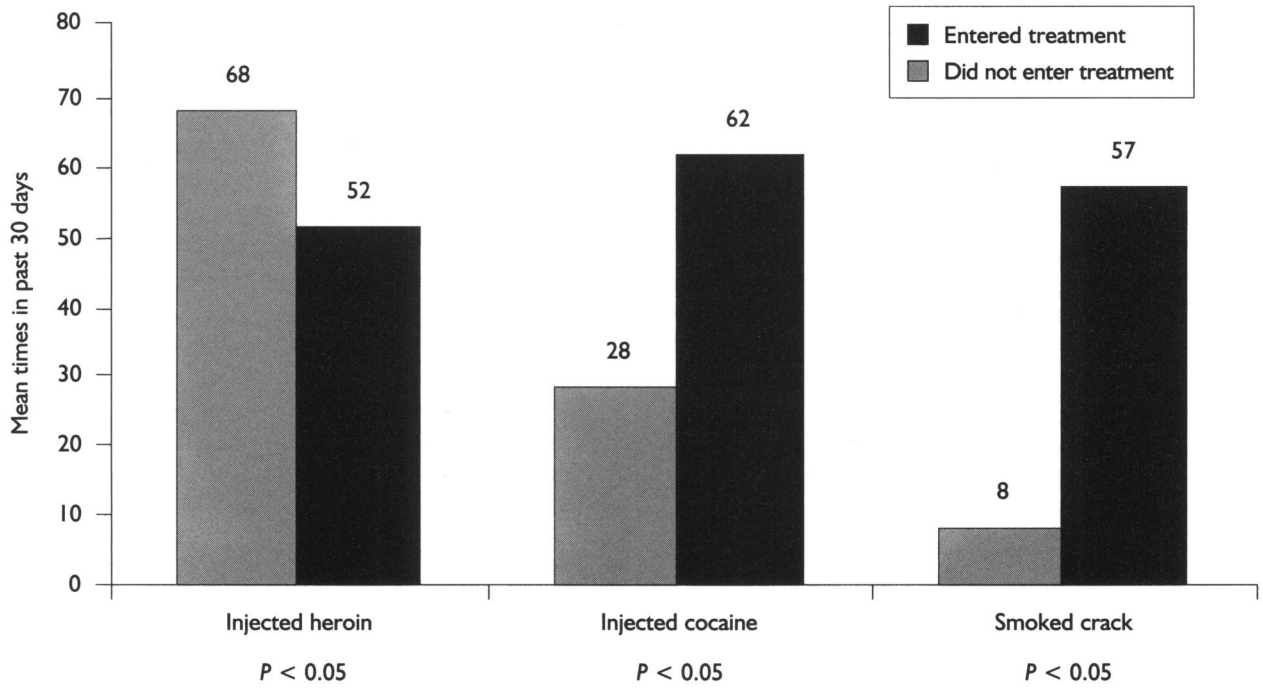


Figure 3. Drug use as predictors of treatment entry



averaged less than one injection per day, while those not entering treatment averaged 2.1 daily injections. Similarly, crack smokers who entered treatment averaged 0.3 occasions of smoking a day compared with nearly twice a day for those choosing not to enter drug treatment.

In addition to these findings, we also observed a significant relationship between the number of drug users study participants associated with and treatment entry (figure not shown). IDUs who entered treatment associated with an average of 2.0 drug users compared with 3.9 for those who did not enter treatment ($F = 7.65$, $P < 0.01$). Only slight differences were noted in the number of nondrug users associated with and treatment entry (2.6 and 2.4 for those entering and not entering treatment, respectively).

Multivariate predictors of treatment entry. In addition to the significant variables presented earlier, we included variables from the univariate analyses that had a P value of less than 0.10 in a stepwise multiple logistic regression model designed to predict treatment entry. The additional variables were age and marital status. Three dummy variables were created to assess ethnicity, with white IDUs serving as the reference group.

IDUs entering treatment were 2.7 times more likely to have received free treatment, and they were more than three times as likely to have been in treatment previously, than those who did not enter treatment. Those who entered treatment also were 3.6 times more likely to perceive themselves as having at least a 50% chance of getting AIDS. For each move from the precontemplation to the contemplation to the determination stages of change, the likelihood of treatment entry increased by a factor of 4.2. For each incremental increase in the frequency of heroin injection, as well as in the number of drug-using friends, subjects were 1.02 and 1.3 times, respectively, more likely to enter treatment (see Table 2).

DISCUSSION

To determine the effect of two different intervention approaches, as well as free treatment, on facilitating treatment entry, we recruited and followed nearly 200 out-of-treatment IDUs. Findings revealed that MI had approximately the same effectiveness as RR in the percent of IDUs who entered treatment, but that subjects assigned to free treatment were far more likely to enter than those who had to pay for their treatment. The

Table 2. Logistic regression analysis of factors associated with treatment entry among IDUs

Variable	Adjusted odds ratio	95% confidence interval	P <
Free treatment	2.67	1.19–6.03	0.02
Prior treatment	3.10	1.36–7.03	0.01
Perceived chance of AIDS>50%	3.57	1.29–9.85	0.02
Stage of change	4.23	1.17–15.27	0.05
Frequency of injecting heroin	1.02	1.01–1.03	0.0001
Number of drug-using associates	1.28	1.09–1.50	0.01

outcome relative to MI *vs.* RR was not expected, since a focus of MI was on drug cessation through treatment entry, while RR focused on a hierarchy of safer injection practices. We investigated this finding further and found that, although ratings of the audiotape-recorded intervention sessions indicated that each of the two interventions was unique, the strategies presented in the MI condition were not specific to the particular stage of change of the subject, as intended by the model. In other words, the MI intervention that was delivered contained strategies consistent with the model, but it was not stage specific. A key component in MI is that if the behavior-change intervention message is further along than the individual, resistance is likely.[43] This may account for why MI was not more successful. The finding that, among those who had to pay for their treatment, 38% of those in RR entered, compared with only 26% of those in MI, offers support for this interpretation. Since we became aware of these results, our MI intervention has been made much more specific to the individual's particular stage of change. Future analyses will determine if we were successful in implementing the model as it was designed and if the model can successfully move IDUs along the stages-of-change continuum.

The overall effectiveness of free treatment compared with nonfree treatment was expected. It is consistent with the work of others who have reported that free treatment increases the rate of treatment entry into both methadone detoxification and methadone maintenance programs.[38–41] On the other hand, we are uncertain of the implications of the finding that nearly one-third of those who had to pay for their treatment entered. Our facilitation of treatment entry for all subjects who wanted to enter may have accounted for this rate. Clearly, however, free treatment is more effective in increasing treatment entry than removing other barriers, such as intake fees and transportation. In view of the estimated lifetime cost of treating individuals with HIV[56] and the relationship found between treatment and lower HIV seroconversion,[29–31] it may be cost-effective to provide free drug treatment to IDUs. Further research is required, however, to deter-mine whether subjects receiving free treatment reduced their drug use and HIV risk behaviors. As this study progresses, we will undertake these analyses.

Of note was the finding that only four of the 80 IDUs entering treatment entered a modality other than methadone maintenance or methadone detox. In designing this study, we targeted IDUs regardless of the particular drug injected. We determined that the decision as to the recommended treatment plan would be made between the counselor at the clinic and the client. Our data regarding treatment entry showed that more frequent injectors of heroin were more likely to enter treatment, as were less frequent injectors of cocaine and less frequent crack cocaine smokers. Thus, it appears that the availability of methadone for opiate users and the lack of alternative medications for cocaine users may have accounted for these findings. Others have shown that cocaine use is associated with treatment attrition in both cocaine outpatient[57] and methadone maintenance clinics.[58,59] Clearly, new treatment strategies are required to improve both the attractiveness and outcomes of treatment for cocaine users.

A number of other important findings were noted in this study. First, in both univariate and multivariate analyses, stage of change was a significant predictor of treatment entry. This finding offers empirical support for the theory and points to the importance of moving individuals from the precontemplation and contemplation stages to the determination stage. It also underscores the need for stage-specific interventions that do not go beyond what the individual is willing to accept in terms of behavior change. Second, a 50% or greater perceived chance for contracting AIDS also predicted treatment entry. An analysis of HIV risk behaviors (for example, sharing needles without disinfecting, sharing other

paraphernalia, and sharing the drug solution) revealed that IDUs who entered treatment were at higher risk than those who did not enter.[60] Thus, the perception that they were at greater risk for AIDS was accurate and, perhaps, a reason why they entered treatment. Increasing perceptions about the threat of AIDS, even among those engaging in lower risk behaviors, would appear to be an important component of any HIV prevention strategy. Third, subjects who entered treatment associated with half as many other drug users as those who did not enter. Others have reported that drug users reduce their number of IDU network associates during methadone treatment.[61] Our work extends this finding by suggesting that the number of drug-using associates prior to treatment entry may be lower as well. It also illustrates the importance of addressing the social ties and environments that characterize IDUs, especially those attempting to recover from their addiction.

There are several limitations to this study that should be considered. The results were based on self-reports. Consequently, findings may have been affected by recall and social desirability. However, the short time period (30 days) subjects were asked to recall may have minimized recall error. Moreover, while social desirability cannot be eliminated, the outcome measure used in these analyses was obtained from the treatment program, not the study participant. In addition, because of the unknown size of the IDU population in Denver, this study could not be based on a random sample and does not purport to generalize to all drug users. Although we attempted to estimate the number of drug users in each census tract and based our sampling plan on this estimate, the clandestine nature of illicit drug activity precludes knowing the exact size and composition of this population.

To our knowledge, this is the only investigation conducted to date on the effects of MI on increasing admissions to treatment. Although the data presented are preliminary, they suggest that MI, as delivered, did not lead to increased rates of treatment entry compared with an intervention that did not stress treatment. However, this finding may have been due to an insufficient focus in the MI intervention on the individual's exact stage of change. As indicated we have modified the MI based on these findings. Future analyses will determine whether this change results in greater success. On the other hand, the finding that we were able to achieve a 42% treatment entry rate overall, with a range between 26% and 54% according to assignment, should not be discounted, particularly in light of the population participating in this study. The subjects we recruited averaged nearly 20 years of injecting, they injected nearly three times a day, and they reported high rates of HIV-related risk behaviors. In addition, 45% had never been in treatment. The treatment entry rates reported in this study are a testimony both to the need IDUs have for treatment as well as to the importance of removing barriers to entry, particularly fees for treatment.

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References

1. Centers for Disease Control and Prevention (US). HIV/AIDS surveillance report 1997;9:8–12.
2. Barre-Sinoussi F, Chermann JC, Rey F, Nugeyre MT, Chamaret S, Gruest J, et al. Isolation of a T-lymphotropic retrovirus from a patient at risk for acquired immune deficiency syndrome (AIDS). Science 1983;220:868–71.
3. Friedland GH, Klein RS. Transmission of the human immunodeficiency virus. N Engl J Med 1987;317:1125–35.
4. Holmberg SD. The estimated prevalence and incidence of HIV in 96 large US metropolitan areas. Am J Public Health 1996;86:642–54.
5. Power R, Hartnoll R, Daviaud E. Drug injecting, AIDS, and risk behavior: potential for change and intervention strategies. Br J Addict 1988;83:649–54.
6. Bortolotti F, Stivanello A, Armi AD, Rinaldi R, La Grasto F. AIDS information campaign has significantly reduced risk factors for HIV infection in Italian drug abusers. J Acquir Immune Defic Syndr 1988;1:412–3.
7. Booth RE, Wiebel WW. The effectiveness of reducing needle-related risks for HIV through indigenous outreach to injection drug users. Am J Addict 1992;1:277–88.
8. Colon HM, Robles RR, Freeman D, Matos T. Effects of a HIV risk reduction education program among injection drug users in Puerto Rico. Puerto Rico Health Sci J 1993;12:27–33.
9. Watters JK, Downing M, Case P, Lorvick J, Cheng Y, Fergusson B. AIDS prevention for intravenous drug users in the community: street-based education and risk reduction. Am J Community Psychol 1990;18:587–96.
10. Ball JC, Lange WR, Myers CP, Friedman SR. Reducing the risk of AIDS through methadone maintenance treatment. J Health Soc Behav 1988;29:214–26.
11. Hartger C, van den Hoek A, Krijnen P, Coutinho RA. HIV

prevalence and risk behavior among injecting drug users who participate in "low-threshold" methadone programs in Amsterdam. Am J Public Health 1992;82:547–51.
12. Watters JK, Estilo MJ, Clark GL, Lorvick J. Syringe and needle exchange as HIV/AIDS prevention for injection drug users. JAMA 1994;271:115–20.
13. Des Jarlais DC, Marmour M, Paone D, Titus S, Shi Q, Perlis T, et al. HIV incidence among injection drug users in New York City syringe-exchange programmes. Lancet 1996;348:987–91.
14. Calsyn DA, Saxon A, Freeman G Jr. Lack of efficacy of AIDS education in reducing HIV high-risk transmission behaviors among injection drug users. Am J Public Health 1992;82:573–5.
15. Casadonte PP, Des Jarlais DC, Friedman SR, Retrosen JP. Psychological and behavioral impact among intravenous drug users of learning HIV test results. Int J Addict 1990;25:409–26.
16. Skidmore CA, Robertson JR, Roberts JJK. Changes in HIV risk-taking behavior in intravenous drug users: a second follow-up. Br J Addict 1989;84:695–6.
17. Wiebel WW. The indigenous leader outreach model: intervention manual. Rockville (MD): National Institute on Drug Abuse (US); 1993. DHHS Pub. No. (NIH) 93-3581.
18. Wiebel WW. Combining ethnographic and epidemiologic methods in targeted AIDS interventions: the Chicago model. In Battjes RJ, Pickens RW, editors. Needle sharing among intravenous drug abusers: national and international perspectives. National Institute on Drug Abuse Research Monograph 80. Washington: Government Printing Office; 1988. p. 137–50. DHHS Pub. No.: (ADM) 89-1567.
19. Booth R, Koester S, Brewster JT, Wiebel WW, Fritz RB. Intravenous drug users and AIDS: risk behaviors. Am J Drug Alcohol Abuse 1991;17:337–53.
20. Booth R, Wiebel WW. Effectiveness of reducing needle-related risk behaviors for HIV through indigenous outreach to injection drug users. Am J Addict 1992;1:277–87.
21. Battjes RJ, Pickens RW. Trends in HIV infection and AIDS risk behaviors among injecting drug users in selected US cities. Abstract No. PO-C15-2950. IX International Conference on AIDS; 1993 Jun; Berlin, Germany.
22. Booth RE. Predictors of unsafe needle practices: injection drug users in Denver. J Acquir Immune Defic Syndr 1994;7:504–8.
23. Des Jarlais D, Abdul-Quader A, Tross S. The next problem: maintenance of AIDS risk reduction among intravenous drug users. Int J Addict 1991;26:1279–92.
24. Booth RE. The effectiveness of outreach interventions in reducing HIV risk behaviors among drug injectors and crack smokers. Presented at the Third Science Symposium: HIV Prevention Research: Current Status and Future Directions; 1995 Aug; Flagstaff, AZ.
25. Simpson DD. Treatment for drug abuse: follow-up outcomes and length-of-time spent. Arch Gen Psychiatry 1981;38:875–80.
26. McLellan AT, Luborsky L, O'Brien CP. Alcohol and drug abuse treatment in three different populations: is there improve-ment and is it predictable? Am J Drug Alcohol Abuse 1986;12:101–20.
27. Ball JC, Lang WR, Myers CP, Friedman SR. Reducing risk of AIDS through methadone maintenance treatment. J Health Soc Behav 1988;29:214–26.
28. Longshore D, Hsieh S, Danila B, Anglin MD. Methadone maintenance and needle/syringe sharing. Int J Addict 1993;28(10):983–96.
29. Metzger DS, Woody GE, McLellan AT, O'Brien CP, Druley P, Navaline H, et al. Human immunodeficiency virus seroconversion among intravenous drug users in- and out-of-treatment: an 18-month prospective follow-up. J Acquir Immune Defic Syndr 1993;6:1049–56.
30. Moss AR, Vranizan K, Gorter R, Bacchetti P, Watters J, Osmond D. HIV seroconversion in intravenous drug users in San Francisco, 1985–1990. AIDS 1994;8(2):223–31.
31. Williams AB, McNelly EA, Williams AE, D'Aquila RT. Methadone maintenance treatment and HIV type 1 seroconversion among injecting drug users. AIDS Care 1992;4(1):35–41.
32. Schuster CR. Intravenous drug use and HIV prevention. Public Health Rep 1988;103:261–6.
33. Brown BS, Beschner GM. AIDS and HIV infection—implications for drug abuse treatment. J Drug Issues 1989;19:141–62.
34. Brickner PW, Torres RA, Barnes M, Newman RG, Des Jarlais DC, Whalen DP, et al. Recommendations for control and prevention of human immunodeficiency virus (HIV) infection in intravenous drug users. Ann Intern Med 1989;110:833–7.
35. Woody G, O'Hare K, Mintz J, O'Brien C. Rapid intake: a method for increasing retention rate of heroin addicts seeking methadone treatment. Compr Psychiatry 1975;16:165–9.
36. Dennis ML, Ingram PW, Burks ME, Rachal JV. Effectiveness of streamlined admissions to methadone treatment: a simplified time series analysis. J Psychoactive Drugs 1994;26:207–16.
37. Festinger DS, Lamb RJ, Kirby KC, Marlowe DB. The accelerated intake: a method for increasing initial attendance to outpatient cocaine treatment. J Appl Behav Anal 1996;29:387–9.
38. Sorensen JL, Costantini MF, Wall TL, Gibson DR. Coupons attract high-risk untreated heroin users into detoxification. Drug Alcohol Depend 1993;31:247–52.
39. Wells EA, Fleming C, Calsyn DA, Jackson TR, Saxon AJ. Users of free treatment slots at a community-based methadone maintenance clinic. J Subst Abuse Treat 1995;12(1):13–8.
40. Jackson JF, Rotkiewicz LG, Quinones MA, Passannante MR. A coupon program—drug treatment and AIDS education. Int J Addict 1989;24:1035–51.
41. Bux DA, Iguchi MY, Lidz V, Baxter RC, Platt JJ. Participation in a coupon distribution program for free methadone detoxification. Hosp Community Psychiatry 1993;44:1066–72.
42. Miller WR, Rollnick S. Motivational interviewing: preparing people to change addictive behavior. New York: Guildford Press; 1991.
43. Rollnick S, Heather N, Bell A. Negotiating behavior change in medical setting: the development of brief motivational interviewing. J Ment Health 1992;1:25–37.
44. Prochaska JO, DiClemente CC. Toward a comprehensive model of change. In: Miller WR, Heather N, editors. Treating addictive disorders: processes of change. New York: Plenum Press; 1986. p. 3–27.
45. Prochaska JO, DiClemente CC. Transtheoretical therapy: toward a more integrative model of change. Psychother: Theory Res Pract 1982;19:276–88.
46. Prochaska JO, DiClemente CC. The transtheoretical approach: crossing traditional boundaries of therapy. Homewood (IL): Dow Jones/Irwin; 1984.
47. Saunders B, Wilkinson C, Phillips M. The impact of a brief motivational intervention with opiate users attending a methadone programme. Addiction 1995;90:415–24.
48. Weatherby NL, Needle R, Cesari H, Booth R, McCoy CB, Watters JK, et al. Validity of self-reported drug use among injection drug users and crack cocaine users recruited through-street outreach. J Ed Prog Plan 1994;17:347–55.
49. Dowling-Guyer S, Johnson ME, Fisher DG, Needle R, Watters J, Andersen M, et al. Reliability of drug users' self-reported HIV

risk behaviors and validity of self-reported recent drug use. Assessment 1994;1:383–92.
50. Simpson DD, Chatman LR. TCU/DATAR forms manual: improving drug abuse treatment, assessment, and research (DATAR) project. Fort Worth (TX): Institute of Behavioral Research; 1995.
51. Knight K, Holcom M, Simpson DD. TCU psychosocial functioning and motivation scales: manual on psychometric properties. Fort Worth (TX): Institute of Behavioral Research; 1994.
52. Friedman LM, Furberg CD, DeMets DL. Fundamentals of clinical trials. 2nd ed. St. Louis (MO): Mosby Year Book; 1985.
53. Hoehn-Saric R, Frank J, Imber S, Nash E, Stone A, Battle C. Systematic preparation of patients for psychotherapy: effects on therapy behavior and outcome. J Psychiatr Res 1964;2:267–81.
54. Norusis MJ. SPSS for Windows. Release 6.1. Chicago: SPSS, Inc.; 1994.
55. Cohen J. A coefficient of agreement for nominal scales. Educ Psychol Measurement 1960;20:37–46.
56. Hellinger FJ. The lifetime cost of treating a person with HIV. JAMA 1993;270:474–8.
57. Alterman AI, Kampman K, Boardman K. A cocaine-positive baseline urine predicts outpatient treatment attrition and failure to attain initial abstinence. Drug Alcohol Depend 1997;46:79–85.
58. Grella CE, Wugalter SE, Anglin MD. Predictors of treatment retention in enhanced and standard methadone maintenance treatment for HIV harm reduction. J Drug Issues 1997;27:203–24.
59. Farley TA, Cartter ML, Wassell JT, Hadler JL. Predictors of outcome in methadone programs: effect of HIV testing and counseling. AIDS 1992;6:115–21.
60. Booth RE, Kwiatkowski CF, Pinto F, John D. Greasing the skids: outreach to facilitate treatment entry and retention and reduce HIV risk behaviors. Presented at the Fourth Science Forum: Research Synthesis Symposium on the Prevention of HIV in Drug Abusers; 1997 Aug 3–5; Flagstaff, AZ.
61. Willems J, Iguchi MY, Lidz V, Bux DA. Changes in social networks of injection drug users during methadone maintenance treatment: a study using snowball recruitment and intensive interviews. Subst Use Misuse 1997;32:1539–54. ■