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Criminal justice referral and incentives in outpatient substance abuse treatment

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Abstract

A substantial number of substance abusers entering outpatient psychosocial counseling treatment are referred from the criminal justice (CJ) system. This secondary analysis of previously published findings from a large ($N=415$) multi-site trial of a prize-based abstinence incentive intervention (Petry et al., 2005) examined the influence of CJ referral on usual care outcomes and response to the incentive procedure. CJ referrals ($n=138$) were more likely than those not CJ referred ($n=277$) to provide stimulant negative urine samples whether missing samples were counted as positive (50 versus 41%, $p=.016$) or as missing (96 versus 91%, $p<.001$). A significant interaction term was found only for percentage of treatment completers ($p=.027$). However, on that retention variable, and three additional drug use measures, significant incentive effects were confined to participants who entered treatment without referral from the criminal justice system. The study suggests that abstinence incentives should be offered as a first priority to stimulant users entering treatment without criminal justice referral. However, incentives can be considered for use with CJ-referred stimulant users based on the observation that best outcomes were obtained in CJ referrals who also received the abstinence incentive program.

Keywords

Contingency management; Reinforcement; Cocaine; Methamphetamine; Stimulant drug addiction; Probation; Parole; NIDA Clinical Trials Network

1. Introduction

Incentive-based contingency management interventions can be highly effective in increasing abstinence from cocaine, methamphetamine, marijuana, nicotine, and alcohol during substance abuse treatment (Dutra et al., 2008; Higgins, Silverman, & Heil, 2008). These

interventions typically offer patients the opportunity to earn goods or services contingent upon drug abstinence verified by urinalysis. Because of the success of the contingency management approach in small randomized controlled trials, the approach was evaluated for effectiveness in treatment of cocaine and methamphetamine dependence in a large multi-site study sponsored by the NIDA Clinical Trials Network (Petry et al., 2005). The prize-based intervention evaluated in this study significantly increased retention in treatment, submission of negative samples, and longest duration of drug abstinence. However, there was no effect on number of positive samples submitted, which was low in both groups. A key aspect of the CTN study is that it was conducted in a geographically distinct array of community outpatient clinics that treated a heterogeneous population of stimulant abusers. Because of this patient diversity, it has been possible to conduct secondary analyses to determine whether key participant characteristics affected treatment outcomes (Killeen, Carter, Copersino, Petry, & Stitzer, 2007; Peirce et al., 2009; Roll et al., 2006; Stitzer et al., 2007). One previously unexplored characteristic of participants in the CTN study that could affect study outcomes is whether participants were referred to treatment by the criminal justice system.

Involvement in the criminal justice system is common among individuals seeking treatment for substance use disorders. In two large-scale surveys, 30.9 and 41.6% of people seeking outpatient drug-free treatment were referred by the criminal justice system (TOPS and DATOS, respectively; Craddock, Rounds-Bryant, Flynn, & Hubbard, 1997). Similarly, in the CTN study, about one third were referred to a psychosocial treatment program through the criminal justice system (Petry et al., 2005). It has long been recognized that criminal justice involvement may affect the course and outcome of treatment (McCarty & Chandler, 2009), and decades of research has produced a large menu of evidence-based practices for treatment seekers who are involved in the criminal justice system (Friedmann, Taxman, & Henderson, 2007). The menu of evidence based practices for the treatment of substance use disorders for individuals involved in the criminal justice system includes the use of incentives (National Institute on Drug Abuse, 2012). However, the evidence for the effectiveness of incentive-based contingency management interventions for individuals involved in the criminal justice system is limited.

Two studies have failed to find efficacy for low-cost contingency management interventions when applied as adjuncts to a drug court program with incentives delivered either as a supplementary intervention at drug court status hearings (Marlowe, Festinger, Dugosh, Arabia, & Kirby, 2008) or at the substance abuse treatment program to which drug court participants were referred (Prendergast, Hall, Roll, & Warda, 2008). The authors of these manuscripts suggest that the powerful consequences controlled by the court (both sanctions and rewards) were applied idiosyncratically by the drug court judges and likely overrode the effects of the small monetary benefits offered by their contingency management programs. Thus, it is quite possible that the disappointing results from these studies is a function of design features of these particular interventions rather than an indication of a fundamental inability for contingency management to work in patients involved in the criminal justice system.

Drug users entering community outpatient treatment programs under some form of legal coercion from the criminal justice system (e.g. parole, probation, pending trial or sentencing) but who are not under intensive monitoring may benefit from contingency management intervention. Prior research examining criminal justice involvement has generally concluded that those referred to treatment through the criminal justice system have retention and drug use outcomes equivalent to or better than those who enter treatment voluntarily (Kelly, Finney, & Moos, 2005; Ondersma, Winhusen, & Lewis, 2010; Perron & Bright, 2008; Walker, Cole, & Logan, 2008). However, the effects of contingency

management for patients with and without criminal justice involvement remain largely unexamined.

One recent study by Petry, Rash, and Easton (2011) touched on this issue in a study that compared outcomes for substance abusers entering outpatient psychosocial counseling with and without legal problems at treatment entry (defined as scores of >0 versus 0 on the ASI legal subscale). Pooled data from three randomized controlled trials of a low-cost contingency management intervention indicated worse overall outcomes (shorter treatment retention and durations of abstinence) among those endorsing any legal problems at baseline. Nevertheless, contingency management was efficacious in enhancing outcomes regardless of legal problem status. It is important to note that legal problems as measured in this study include cases beyond those in which a patient was specifically referred to treatment by the criminal justice system (e.g., they may have been recently arrested for shoplifting or other non-drug-related charges).

Thus, the evidence to date is quite limited regarding the efficacy of contingency management in outpatient settings for those with criminal justice involvement. The multi-site Clinical Trials Network randomized controlled trial provided an opportunity to examine criminal justice referral as a factor in treatment outcome. More specifically, we examined the impact of criminal justice referral on response to a 12-week contingency management intervention designed to reinforce stimulant abstinence in which participants could earn up to \$420 in retail prize items (Petry et al., 2005).

2. Materials and methods

Complete details of the participant characteristics and study procedures for the randomized controlled trial have been published previously (Petry et al., 2005). Key aspects of these methods are presented here.

2.1. Participants

All 415 participants included in the analysis of the original randomized controlled trial were included in the present analysis. The participants were outpatients at community clinics that were members of the CTN and offered psychosocial counseling (not opioid substitution) substance abuse treatment services in their regions. A total of eight clinics served as study sites. The clinics were distributed throughout the United States, with six in urban settings, one in a suburban setting, and one in a rural setting. Study-eligible patients either reported stimulant use (cocaine, methamphetamine, or amphetamine) within 2 weeks of treatment entry, reported stimulant use within 2 weeks before entry into a controlled environment that immediately preceded outpatient treatment, or submitted a stimulant-positive urine sample at treatment entry. Participants provided written informed consent, approved by local institutional review boards.

2.2. Procedures

Participants completed a baseline assessment that included the ASI-Lite (McLellan, Cacciaola, & Zanis, 1997) and the *DSM* checklist (modified from Hudziak et al., 1993). The ASI was used to determine demographic information, while the *DSM* checklist was used to determine substance use diagnoses. Whether a participant was referred by the criminal justice system was determined by their response to the question, "Did you come to this treatment program because a judge or probation/parole officer told you to go to treatment?" which appeared on a customized questionnaire used in this study. The answer to this question was not used as a basis for determining treatment requirements, and criminal justice status did not influence treatment requirements in any systematic manner. All

participants received the standard treatment services available in the outpatient clinics, including group and/or individual counseling. Further, all study participants were expected to submit urine samples twice weekly on non-consecutive days for 12 weeks. Samples were tested with an OnTrakTesTcup 5 (Roche Diagnostics), which detects cocaine, methamphetamine, amphetamine, tetrahydrocannabinol, and morphine. Samples that failed validity checks were discarded and new samples were collected.

Participants were randomly assigned to usual care with or without abstinence incentives. Those in the incentive condition could draw chips from a bowl for a chance to win prizes when their urine test results were negative for stimulants (i.e., cocaine, amphetamine, and methamphetamine) and breathalyzer results were negative for alcohol. The number of draws that a participant earned for meeting the abstinence criteria increased across weeks of negative samples and was reset to the original value in the case of a drug or alcohol positive sample or a missed sample. Prizes were kept on-site and were worth \$1 (83% of prize chips), \$20 (17% of prize chips) or \$80–\$100 (0.2% of prize chips). Total average value of the prizes that could be earned by a participant who submitted 24 negative samples was \$420.

2.3. Dependent variables

Retention in the study was defined as the number of days that elapsed between the first and last urine sample submitted (with samples submitted in week 12 for follow-up data collection disregarded if preceded by 30 days without clinical contact). Latency to the last urine submitted (used in survival analysis), number of weeks retained and number of scheduled urines submitted (out of 24) were the variables analyzed.

Because stimulant use was the primary therapeutic and scientific target of the parent study, and because overall rates of alcohol, marijuana, and opiate use were low (99.6, 96.5, and 98.0% negative samples, respectively), only stimulant use is analyzed in the present study. Stimulant negative samples were those testing negative for cocaine, amphetamine, and methamphetamine. In addition, missing samples were coded as negative if they were surrounded by two negative samples submitted within a week before and after the missing sample; all other missing samples were counted as positive or missing depending on the analysis. Dependent variables for drug use were negative versus positive samples submitted at each collection point, total number of negative samples submitted by each participant, and largest number of consecutive stimulant negative samples (longest duration of abstinence) no matter when in the program these were submitted.

2.4. Data analysis

Participants' data were grouped on the basis of treatment condition (incentives versus usual care) and whether the participant was referred to the study from the criminal justice system, as determined by self-report. This method yielded four study subgroups for comparison, incentives with criminal justice referral (incentives-CJ; $n=68$), incentives without criminal justice referral (incentives-no CJ; $n=141$), usual care with criminal justice referral (UC-CJ; $n=70$), and usual care without criminal justice referral (UC-no CJ; $n=136$). In order to assess potential baseline differences, participant characteristics across subgroups were evaluated with chi square tests or ANOVA as appropriate, and baseline characteristics that were significantly different were included as covariates in subsequent analyses. In order to validate the CJ group, we compared ASI legal composite scores from participants who were referred from the criminal justice system to those from participants who were not referred from the criminal justice system.

Tests of main effects (incentive versus UC and CJ versus not CJ referral) and interaction were conducted as described below. In addition, since the effect of incentives within each subgroup was of primary interest in this study, Tukey's post-hoc tests were conducted between incentive and no incentive conditions within each CJ subgroup irrespective of whether the interaction term was significant. The main effect for retention was analyzed using a Cox survival test with four treatment groups. Number of weeks retained and the percentage of scheduled study urines submitted were analyzed in two-factor ANCOVA (treatment condition $\times$ criminal justice). Generalized estimating equations (GEE) were used to evaluate proportion of stimulant negative urine samples submitted during the study period, with study condition and criminal justice referral included as factors in the models. Separate GEE analyses were conducted in which missing samples were treated as stimulant positive, and in which missing samples were treated as missing, respectively. Two-factor ANCOVA's (treatment condition $\times$ criminal justice) were conducted with percentage of expected samples, percentage of drug negative samples submitted by each participant, and longest duration of abstinence (consecutive stimulant negative urine samples) as the outcome. All tests were conducted using SAS version 9.2 (SAS Institute Inc., Cary NC).

3. Results

3.1. Participant characteristics

Overall, 55% of study participants were male, 42% were Caucasian, 24% were married, and 20% were employed in a full time job. With regard to drug use diagnoses, 84% of participants were stimulant dependent, 42% were alcohol dependent, and 9% were opiate dependent. As previously reported (Petry et al., 2005), characteristics of usual care and incentive participants were similar except that those in the usual care condition were more likely to be married than their incentives condition counterparts (28.6 versus 18.7%; $p=.017$). In contrast, three significant differences were noted for participants referred versus not referred from criminal justice. CJ referrals were more likely to be male (60 versus 46%, $p=.005$), and less likely to be either stimulant dependent (75 versus 89%; $p=.001$) or alcohol dependent (33 versus 47%; $p=.005$) than participants not referred from criminal justice. These variables were therefore included as covariates in the remaining analyses. An analysis of ASI legal composite scores showed that participants referred by the criminal justice system had significantly higher composite scores than participants who were not referred by the criminal justice system (adjusted mean 0.16 versus 0.07, $p<.001$). In contrast, a comparison of incentives versus usual care groups revealed no differences in ASI legal composite score (0.11 versus 0.12, $p=.823$).

3.2. Main effects: incentives and criminal justice referral status

3.2.1. Treatment retention—Cox survival analysis showed that there was a significant main effect of incentives on treatment retention ($\chi^2=9.04$, $p=.003$, HR=0.67), but not criminal justice referral status ($\chi^2=2.87$, $p=.090$, HR=0.78). Proportion of participants in each main effect category are shown in Table 1, which also shows a main effect of incentives on mean weeks retained and mean number of urines submitted. There was also a significant interaction between CJ status and incentive condition on percentage of treatment completers ($\chi^2=4.92$, $p=.027$, HR=.65).

Post-hoc results displayed in Table 2 show significant incentive effects on two of the three treatment retention and participation variables within the non-CJ referred subgroup, but no significant effects in the CJ participants. It is also notable that best retention outcomes (56% retained to 12 weeks; adjusted mean=17.7 weeks) were seen in criminal justice referrals who received incentives, although these results were not significantly different from non-CJ

usual care outcomes ($p=.058$). Retention survival results for each subgroup are illustrated in Fig. 1.

3.2.2. Stimulant use—Four drug use outcome measures are shown in Table 1. As previously reported, participants who received abstinence incentives compared with those who received usual care alone submitted more stimulant negative urine samples (adjusted mean 11.8 versus 9.0, $F=11.98$, $p=.001$), had a larger number of consecutive stimulant negative samples (10.7 versus 7.6, $F=13.79$, $p<.001$) and were more likely to be stimulant negative when missing urines were treated as positive ($p<.001$, OR=1.5, 95% CI=1.2–2.0), but not when missing data were treated as missing ($p=.195$).

Participants referred to treatment by the criminal justice system submitted a greater number of stimulant negative samples than participants who were not referred by the criminal justice system (mean=11.3 versus 9.6, $F=4.15$, $p=.042$), but were not different with respect to the longest number of consecutive negative samples submitted ($p=.166$). Criminal justice referral was also associated with a higher percentage of stimulant negative urine samples in both missing–positive ($p=.016$, OR=1.4, 95% CI=1.1–1.9) and missing–missing ($p<.001$, OR=2.7, 95% CI=1.6–4.8) analyses.

No significant interaction terms were obtained for stimulant drug use measures. However, post-hoc tests (Table 2) revealed significant differences in the non-CJ subgroups on three of four variables examined, while no incentives variables were significantly different in CJ subgroup comparisons. As with the retention variables, best outcomes were seen in the CJ incentives subgroup and these were significantly different from non-CJ usual care on three of four variables. Fig. 2 shows the percentage of negative urines over time for each group and illustrates the larger and more consistent effect of incentives in the non-CJ subgroups compared with the CJ subgroups.

4. Discussion

This study examined the influence of criminal justice referral status on outcomes for individuals who received usual care psychosocial counseling treatment with and without an added abstinence incentive procedure. This comparison is of interest because the high prevalence of criminal justice involvement in substance abuse treatment seekers, the paucity of information on the appropriateness of contingency management intervention in these individuals, and also because some previous studies have failed to support the efficacy of adding a contingency management intervention to the treatment of drug users referred to substance abuse treatment through drug courts (Marlowe et al., 2008; Prendergast et al., 2008). It was speculated in those previous papers that the strong sanctions inherent in the criminal justice system might reduce sensitivity to contingency management programs that offer only modest incentives, despite the previously documented benefits of such programs in other settings (e.g., Lussier, Heil, Mongeon, Badger, & Higgins, 2006). The present treatment sample differs importantly from those in drug court research in that they have been referred to treatment through common avenues of community corrections including judges and probation or parole officers, but they were not necessarily subject to the kind of intensive monitoring that is an essential feature of drug courts.

In this study, individuals referred through the criminal justice system as a group had significantly better substance abuse treatment outcomes than did their non-referred counterparts. For example, CJ participants submitted a significantly larger number of stimulant negative urines and a higher percentage of negative urines even when missing urines were counted as missing. Although criminal justice referral did not clearly improve treatment retention in this sample, nothing in the present analysis suggests that it hindered

retention. The finding of equal or better performance in those referred to treatment through the criminal justice system is consistent with a substantial body of previous literature (e.g. Kelly et al., 2005; Ondersma et al., 2010; Perron & Bright, 2008; Walker et al., 2008) and supports the conclusion that coerced treatment can be as beneficial as voluntary treatment.

At the same time, those referred through criminal justice channels appeared to be less responsive to the beneficial effects of abstinence incentives, as implemented here with a low-cost prize-draw system, than those not so referred. This was indicated by the observation that statistically significant effects of incentives, when observed, were seen only in comparisons involving the non-CJ referred patients (Table 2). However, this conclusion needs to be tempered by the observation of trends apparent in both retention (Fig. 1; Tables 1 and 2) and drug use data (Fig. 2; Tables 1 and 2) suggesting that the CJ-referred group did benefit from the abstinence incentive intervention to some extent but that the impact of abstinence incentives were larger and more consistent in the non-CJ subgroup of participants.

The lack of statistically significant incentive effects in the CJ referral subgroup comparisons may be at least partly attributable to the fact that CJ participants had better outcomes in usual care, which may limit sensitivity to detection of incentive effects. It is possible that a larger differential effect may have been obtained with a more powerful CM intervention, such as one with higher value incentives. Sample size may also play a role. In this analysis there were a smaller number of CJ clients included in the study, and a resultant lack of power to detect incentive effects. This, combined with the better overall outcomes in CJ referred participants, could account for the lack of statistically significant incentive effects in the CJ referral subgroup comparisons.

A final and salient point of interest in the present analysis is that the best results were consistently obtained across measures in CJ referred participants who received the abstinence incentive intervention (Fig. 1; Table 2). This finding is of both practical and theoretical interest. Practically, the observation supports the view that abstinence incentives at least under some circumstances, may further enhance outcomes for those referred from criminal justice and should be considered for them. Theoretically, the finding suggests that a combination of positive (abstinence incentives) and negative (threat of criminal justice sanctions) reinforcers can have additive effects and therefore be more potent than either alone. This is consistent with a behavioral theoretical perspective, but as previously noted abstinence incentives have had no impact on outcomes in drug court settings where negative sanctions are relatively salient and certain (Marlowe et al., 2008; Prendergast et al., 2008). In the present study, there was no information available about the actual or perceived threat of criminal justice sanctions based on poor treatment performance. This suggests that more research is needed and warranted examining the effects of combined positive and negative reinforcement contingencies and conditions under which these may have additive effects.

Limitations of this study include the retrospective design, the imbalance in number of participants who were and were not referred from the criminal justice system, and a lack of detailed information about the conditions of criminal justice referral. Strengths include the large and regionally diverse study sample that supports generality of findings, and use of a relatively low cost abstinence incentive intervention that may be sustainable in the real world.

In conclusion, criminal justice referrals are common in outpatient counseling treatment, constituting about one third of all enrollees. These individuals may be expected to have equal or better than usual care outcomes compared to those without current criminal justice involvement. In the present study, abstinence incentives added on to counseling treatment

improved outcomes overall, with significant effects seen only among those not referred from the CJ system. Nevertheless, there were trends toward better retention and less drug use as in CJ referrals who received abstinence incentives. Thus, especially in the face of limited resources, abstinence incentives may best be offered as a first priority to stimulant users entering treatment without criminal justice referral, but should also be considered for use with CJ-referred stimulant users if resources allow.

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Fig. 1. Percent of participants retained in the study. Each line represents one of the four study subgroups. Retention is shown as a function of urine samples collected twice weekly during the 12-week intervention.

Fig. 2.

Percentage of stimulant negative urines submitted during twice weekly urine collections as a function of usual care versus abstinence incentive treatment group. Data are shown separately for CJ referred (top panel) and CJ not referred (bottom panel) participants. Missing samples were treated as positive in this figure.

Table 1

Retention, participation, and stimulant use main effects.

	Incentives (n=209)	No incentives (n=206)	<i>p</i>	CJ referral (n=138)	No CJ referral (n=277)	<i>p</i>	Interaction <i>p</i>
Retention and participation							
% retained to week 12	48.8	35.4	.003*	50.0	38.3	.090*	.027*
Mean weeks retained	17.2	15.0	.013*	16.7	15.6	.241*	.791*
Mean no. of urines submitted	13.1	10.2	<.001*	12.4	10.9	.063*	.439
Stimulant use							
Mean no. of stimulant Negative Urines	11.8	9.0	.001*	11.3	9.6	.042*	.503
Longest no. of consecutive stimulant negative samples	10.7	7.6	<.001*	9.7	8.5	.166	.610
% stimulant negative urine missing/missing	92.1	93.5	.195	96.1	90.8	<.001*	.198
% stimulant negative urine missing/positive	49.8	38.5	<.001*	50.2	41.2	.016*	.377

Data shown are adjusted means and significance tests. Comparisons that were significant in the unadjusted analysis are indicated with an asterisk.

Table 2

Post-hoc comparisons.

Variable	Condition			
	CJ incent (n=68)	CJ UC (n=70)	NCJ incent (n =141)	NCJ UC (n=136)
Retention and participation				
% retained to week 12	55.9 ^a	44.3	45.4 ^b	30.9 ^{a,b}
Mean weeks retained	17.7	15.7	16.8	14.4
Mean no. of urines submitted	13.6 ^a	11.3	12.7 ^b	9.2 ^{a,b}
Stimulant use				
Mean no. of stimulant negative urines	12.4 ^a	10.1	11.2 ^b	7.9 ^{a,b}
Longest no. of consecutive stimulant negative samples	11.0 ^a	8.4	10.3 ^b	6.8 ^{a,b}
% stimulant negative urine missing/missing	94.7	97.6 ^a	90.7	90.9 ^a
% stimulant negative urine missing/positive	54.0 ^a	46.4 ^b	47.8 ^c	34.4 ^{a,b,c}

Shared superscripts indicate a significant between group difference in Tukey's post hoc test ($p < .01$ in all cases).