Give Them Prizes, and They Will Come: Contingency Management for Treatment of Alcohol Dependence

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This study evaluated the efficacy of a contingency management (CM) procedure that provided opportunities to win prizes as reinforcers. At intake to outpatient treatment, 42 alcohol-dependent veterans were randomly assigned to receive standard treatment or standard treatment plus CM, in which they earned the chance to win prizes for submitting negative Breathalyzer samples and completing steps toward treatment goals. Eighty-four percent of the CM participants were retained in treatment for an 8-week period compared with 22% of the standard treatment participants (p < .001). By the end of the treatment period, 69% of those receiving CM were still abstinent, but 61% of those receiving standard treatment had used alcohol (p < .05). These results support the efficacy of this CM procedure. Participants earned an average of $200 in prizes. This CM procedure may be suitable for use in standard treatment settings because prizes can be solicited from the community.

Contingency management techniques are effective for improving retention in substance abuse treatment programs and reducing drug use. For treating substance abusers, there are four central tenets of contingency management (e.g., Budney & Higgins, 1998; Higgins, Budney, & Bickel, 1994). First, the clinician arranges the environment such that substance use is readily detected. Second, tangible reinforcers are provided when abstinence is demonstrated. Third, incentives are withheld when drug use is uncovered. Finally, reinforcement from alternative sources (e.g., employment, family, or social) is increased to compete with reinforcement derived from drug use. Methadone programs sometimes use incentives such as take-home doses or increases in dose to reinforce abstinence. In settings that do not use substitution drugs, contingency management programs provide money (Shaner, Roberts, Eckman, & Tucker, 1997) or vouchers, exchangeable for retail goods, on submission of drug-free urine samples (Higgins, Budney, & Bickel, 1994; Higgins et al., 1993).

A series of studies has demonstrated that contingency management procedures are more effective than standard treatment, disease-model therapy, or behavioral counseling without contingency management. First, contingency management procedures that provide positive incentives retain participants in treatment for longer periods of time than does counseling alone. For example, 75% of cocaine-dependent outpatients assigned to a voucher condition completed a 24-week treatment program compared with 40% in a no-voucher condition (Higgins, Budney, Bickel, Foerg, et al., 1994). Contingency management procedures are also effective in reducing drug use. Higgins, Budney, Bickel, Foerg, et al. (1994) demonstrated that 55% of cocaine-dependent individuals who received behavioral therapy plus vouchers for submitting negative urine samples achieved at least 2 months of continuous cocaine abstinence in a 24-week trial. Only 15% of participants assigned to a behavioral-therapy-only group maintained this period of abstinence. In controlled trials of opioid-dependent patients, voucher incentives and clinic privileges provided contingent on objective indicators of drug abstinence significantly reduced illicit drug use (e.g., Bickel, Amass, Higgins, Badger, & Esch, 1997; Hall, Bass, Hargreaves, & Loeb, 1979; Higgins, Stitzer, Bigelow, & Liebson, 1986; Iguchi, Stitzer, Bigelow, & Liebson, 1988; Kidorf & Stitzer, 1996; Magura, Casriel, Goldsmith, Strug, & Upton, 1988; McCaul, Stitzer, Bigelow, & Liebson, 1984; Milby et al., 1978; Silverman, Wong, et al., 1996; Stitzer, Bickel, Bigelow, & Liebson, 1986; Stitzer, Bigelow, & Gross, 1989; Stitzer, Bigelow, & Liebson, 1980; Stitzer, Bigelow, Liebson, & Hawthorne, 1982; Stitzer, Bigelow, Liebson, & McCaul, 1984). Similar results were found using contingency management to reduce marijuana (Budney, Higgins, Delaney, Kent, & Bickel, 1991), nicotine (Crowley, MacDonald, Zerbe, & Petty, 1991; Shoptaw, Jarvik, Ling,
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Rawson, 1996; Stitzer & Bigelow, 1982), and benzodiazepine use (Stitzer, Iguchi, & Felch, 1992).

Although contingency management interventions are effective for treating substance use disorders, they have been criticized as being too costly. In some studies (Bickel et al., 1997; Higgins, Budney, Bickel, Foerg, et al., 1994; Higgins et al., 1991, 1993; Silverman, Higgins, et al., 1996), each participant can earn up to $1,000 worth of vouchers during treatment, with average earnings of approximately $600 (Higgins, Budney, Bickel, Foerg, et al., 1994; Silverman, Higgins, et al., 1996; Silverman, Wong, et al., 1996). One study found beneficial effects of a lower magnitude incentive procedure (earning stars on a chart exchangeable for $5 prizes; Rowan-Szal, Joe, Chatham, & Simpson, 1994), but other studies have shown direct relationships between magnitude of reinforcement and drug abstinence (e.g., Silverman, Chutuape, Bigelow, & Stitzer, 1997; Stitzer & Bigelow, 1983, 1984).

Perhaps because of the cost, contingency management treatments have not been widely implemented in standard treatment settings. Furthermore, although alcohol-dependent patients compose the majority of patients in treatment programs, there are few studies evaluating the use of contingency management procedures in this population. Some case reports suggest the efficacy of contingency management procedures in treating alcohol-dependent patients (Bigelow, Griffiths, & Liebson, 1975; Griffiths, Bigelow, & Liebson, 1978; P. M. Miller, Hersen, Eisler, & Watt, 1974). Liebson, Tommasello, and Bigelow (1978) and P. Miller (1975) demonstrated the efficacy of contingency management procedures in small controlled studies of alcohol-dependent methadone patients and chronic public inebriated individuals, respectively. In the past 20 years, however, no known controlled studies of contingency management interventions have been conducted with alcohol-dependent patients.

In a review of the literature, W. R. Miller et al. (1995) found that one of the most effective interventions for treating alcohol dependence is the community reinforcement approach (CRA; Sisson & Azrin, 1989). Contingency management and CRA share some similarities. A central feature of contingency management is to increase reinforcement from non-drug-related activities (Higgins, Budney, & Bickel, 1994), and CRA involves reinforcing the alcoholic individual's sobriety and development of activities incompatible with alcohol use, such as participation in recreational and social activities and employment. In CRA, reinforcement is provided by a significant other in the form of praise and social encouragement. Unfortunately, many alcohol-dependent patients do not have a non-drug-using significant other to reinforce their participation in non-alcohol-related activities.

In some recent contingency management studies with heroin abusers (Bickel et al., 1997; Iguchi, Beldaing, Morrel, & Lamb, 1997), therapists used vouchers to reinforce the development of pro-social, non-drug-related activities. Participants decided on three discrete activities each week that were related to their long-term treatment goals. If participants successfully completed activities as verified by receipts, they received vouchers. In three studies in which both drug abstinence and activity completion were reinforced with vouchers, correlations between the number of activities completed and the number of negative urine samples submitted ranged from .70 to .86 (Bickel et al., 1997). In a study of methadone patients, Iguchi et al. found that a condition in which vouchers were provided contingent on compliance with various activities was efficacious in reducing drug use, even when urine specimens results were not reinforced. The correlation between activities completed and negative urine samples was .44. Incorporating an incentive system based on therapy compliance may promote development of skills necessary for lifestyle changes that may lead to abstinence, especially among individuals without strong non-drug-using networks.

The purpose of this study was to evaluate the efficacy of a contingency management procedure in retaining alcohol-dependent participants in treatment and in reducing substance use. Both alcohol abstinence and completion of activities related to treatment goals were reinforced to provide a comprehensive treatment approach that incorporated features central to both CRA and contingency management. The reinforcer was a chance to draw from a bowl and win prizes ranging from $1 to $100 in value. This schedule of reinforcement was chosen because such schedules maintain long-term behavioral change (Skinner, 1961). They provide access to large magnitude reinforcers while minimizing overall cost. A similar intervention was found efficacious in changing clinic behaviors of opioid-dependent patients (Petry et al., 1998).

The procedure was implemented in an existing, non-research-based substance abuse treatment setting to evaluate its effects on retention, as well as its efficacy and effectiveness. As such, this is among the first contingency management studies conducted in a standard, community-based treatment program.

Method

Participants

Participants were 42 alcohol-dependent male veterans initiating intensive outpatient substance abuse treatment at the Veterans Affairs (VA) Healthcare System, Newington. Inclusion criteria were a Diagnostic and Statistical Manual of Mental Disorders (4th ed.; American Psychiatric Association, 1994) diagnosis of current alcohol dependence and age 18 years or older. The only exclusion criterion was active, uncontrolled psychosis or bipolar disorder. Other drug dependence did not exclude participants from participation. The inclusion/exclusion criteria were intentionally not very restrictive to increase generalization of the results.

Eligible alcohol-dependent patients were offered the opportunity to participate in this study within 48 hr of initiating outpatient treatment. Only 2% of eligible patients refused participation. Some participants (43% in the standard treatment group and 37% in the contingent group) received inpatient detoxification from alcohol at other facilities immediately prior to initiating the outpatient treatment program.

Minimum likelihood allocation (Aicken, 1982) was used to randomize participants to conditions: standard treatment or standard treatment plus contingency management. The purpose of this type of randomization was to achieve balance between groups on baseline characteristics that may influence outcome. The variables on which groups were stratified were as follows: age greater than 45 years, homelessness, psychiatric severity scores on the Addiction Severity Index (ASI; McLellan, Luborsky, Cacciola, Griffith, & Alterman, 1988), and other drug dependence.

Procedures

Study setting. The average census at the clinic during the period of the study was about 25. Approximately 80% of the patients treated in this clinic had a diagnosis of alcohol dependence with or without other drug dependence and were offered the opportunity to participate in this research study. The remainder of the patients treated at the facility had a diagnosis of
Standard treatment at the clinic consisted of 4 weeks of an intensive outpatient day program and then transfer to aftercare. During the intensive outpatient program, participants attended the clinic 5 days/week for 5 hr/day. The first session of the day consisted of a 12-step-oriented spiritual reading and review of the prior day’s evening planning activities. Participants then attended other group meetings focusing on life skills training, relapse prevention, coping skills training, AIDS education, social—recreational training, and 12-step-oriented meetings. The day ended with an evening planning session. Participants who required employment counseling or assistance with housing were provided with such ancillary services. After 4 weeks of intensive outpatient care, participants were transferred to aftercare, consisting of 12-step-oriented meetings held on-site, relapse-prevention groups, and social—recreational training. Number of aftercare meetings recommended ranged from one to three per week.

Groups were led by nurses, social workers, vocational rehabilitation counselors, psychologists, and psychiatrists. For the purposes of the study, we followed patients for 4 weeks of aftercare (8 weeks in total).

Standard treatment group. All the alcohol-dependent patients who consented to participate in the research study received standard treatment at the clinic described above. In addition, during the intensive outpatient treatment phase, they met with a research assistant once per day for about 2 min to provide a breath alcohol sample. Once per week, they were interviewed about any drug or alcohol use in the past week and also provided a urine specimen, which was screened for opioids, cocaine, marijuana, and benzodiazepines using the enzyme-multiplied immunosassay technique (Syva Corporation, Palo Alto, CA) and a Breathalyzer sample (breath alcohol concentration [BAC]) that was screened for alcohol using an Alcosensor IV Alcometer (Intoximeters, St. Louis, MO).

Four weeks and 8 weeks from initiating the day program, participants were contacted for a mid- and posttreatment evaluation, respectively. All the patients were invited to participate in these assessments, regardless of whether they had withdrawn from treatment. At these assessments, participants submitted urine and breath samples and completed the evaluation battery described above. To encourage participation, we offered $10 for completion of the Week 4 evaluation and $35 for completion of the Week 8 evaluation. Completion rates did not differ by group and were 95% for the Week 4 evaluation and 93% for the Week 8 evaluation. Participants who were not evaluated could not be located; only 1 participant, who relapsed to heavy alcohol use before leaving treatment, was not located for both assessments. Among the participants who missed an evaluation, the dates of first drinking episode and relapse were obtained either prior to their missed assessment or at the 8-week assessment. In the case of missing data for repeated measures analyses (e.g., ASI scores), values obtained during the most recent assessment were carried forward or the intake and Week 8 values were averaged.

Contingency management treatment group. Participants assigned to this condition received the same standard treatment. Participants in the same BAC and urine sample monitoring schedule described above, with the exception of the education modules. Each time participants in this group provided a BAC that was negative for alcohol (<0.003 g/dl), they earned a drawing from a bowl. When they provided five negative BACs on 5 consecutive days (indicating a week of negative Breathalyzer samples), they received 5 bonus drawings. Thus, they could earn up to 10 drawings/week for negative BACs during intensive care and up to 6 drawings/week during aftercare, for a total of 64 BAC drawings. Participants were instructed that self-reports of alcohol use would not affect drawings. They were encouraged to provide honest reports of alcohol use and were assured that drawings would be earned as long as BACs read negative.

The bowl contained 250 slips of paper. Three fourths of the slips were "winning" slips, and the other 25% of the slips were nonwinning slips that said, "Sorry, try again." There were three types of winning slips in the bowl: small, medium, and large. Of the winning slips, 169 were small prizes, such as the participant’s choice of $1 coupons to the VA Canteen Store, $1 McDonald’s gift certificates, or bus tokens for use in the greater Hartford area. Seventeen of the winning slips were medium prizes—the participant’s choice of a prize worth approximately $20 in value—such as radios; watches; backpacks; art and crafts supplies; and gift certificates to Home Depot, bookstores, movie theaters, and restaurants. One of the 250 slips was a large prize—the participant’s choice of a handheld television, a boom box, or five medium prizes. Prizes of all three magnitudes were kept on-site in a large lockable cabinet. The cabinet was restocked approximately once every other week. Participants were encouraged to make suggestions for prizes in all three categories. The probabilities of winning each category of prize were delineated in the informed consent form.

In addition to drawing for providing negative breath samples, participants also earned drawings for completing steps related to their treatment goals. During each of the 8 weeks, the participant signed an activities contract indicating three specific activities related to long-term treatment goals. For example, if a long-term treatment goal was to become active in Alcoholics Anonymous (AA), the participant may have agreed to attend three AA meetings in the upcoming week or to find a sponsor at AA. If a goal was to improve relationships with his family, activities may have included writing a letter to an adult child, taking children to a community event, or taking grandchildren to the movies. If the goal was to improve health, activities may have included scheduling a doctor’s appointment or attending one. If the goal was to continue education, steps may have included calling to obtain materials for admission to a community college, filling out financial aid forms, signing up for a course, or completing homework assignments. The activity and its verification were listed on the contract. Verification consisted of receipts or signed pamphlets, with names and phone numbers listed for confirmation, and the exact form of verification was agreed on each week as the activity was set. Activity assignments were individually tailored to suit the psychosocial functioning level of each participant. A lower functioning participant could agree to attend just one AA meeting in a week or to telephone for an appointment at a low-income housing agency. Higher functioning participants were encouraged to select more involved activities, such as attending three AA meetings in a week or going to an appointment. Participants earned 1 drawing per activity completed and 5 bonus drawings if all three activities were completed in a week. During the 8 weeks of study participation, they could earn a maximum of 64 drawings for activities.
Statistical Methods

To evaluate baseline differences between groups, we used t tests for continuous variables and chi-square tests for nominal variables. Chi-square tests were used to compare groups in terms of the percentage of participants remaining in treatment and remaining abstinent for 8 weeks. Participants were considered to have withdrawn from treatment if they failed to attend groups for 2 consecutive weeks.

Survival analysis using the Kaplan-Meier-Breslow model was used to evaluate differences between groups in time until first drinking episode and time until first relapse to heavy drinking. A definition of relapse was chosen based on evidence that risks of short- and long-term alcohol consumption increase at about 60 g/day for men (Babor, Korner, Wilber, & Good, 1987). Relapse was therefore defined as drinking five or more standard drinks on an occasion.

The percentage of participants submitting urine specimens positive for illicit drugs is presented. (In cases in which participants had verified medical prescriptions for opioids or benzodiazepines, they were not considered positive for these drugs. Rates of prescriptions were similar between groups.) Differences between the groups with respect to the percentage of participants submitting urine specimens positive for illicit drugs were evaluated using repeated measures analyses for categorical data (PROC CATMOD; Stokes, Davis, & Koch, 1995). The model included factors representing group (standard or contingent), time (pretreatment, Week 4, and Week 8), and their interaction.

A repeated measures analysis of variance evaluated changes from baseline throughout the treatment period on other variables: ASI Severity, SCL-90-R Global Severity Index (GSI), and Beck Depression Inventory (BDI) scores. Time (intake, Week 4, and Week 8), group, and the interaction between time and group were included as main and interaction effects in these analyses. Correlations between number of medium and large prizes won during the first 3 days and retention and days to first drink were conducted for the contingent group.

Results

Characteristics of the Sample

Table 1 shows demographic characteristics of participants assigned to the two treatment groups. These data depict a group of long-term chronic alcohol-dependent individuals. The majority had a history of other drug dependence, primarily cocaine. The two groups did not differ at intake on demographic or drug use characteristics.

Retention in Treatment

Figure 1 shows retention rates for the two groups of participants. Participants in the contingency management condition were retained in treatment significantly longer than participants in the standard treatment condition. In fact, 84% of the participants in the contingency management group were retained in treatment for the entire 8-week period compared with 22% in the standard treatment group, \( \chi^2(1, N = 42) = 16.24, p < .001. \)

Analysis of Time Until First Drinking Episode

In the standard treatment group, 61% of the participants reported alcohol use by Week 8 compared with only 31% of the participants in the contingent group, \( \chi^2(1, N = 42) = 3.58, p = .06. \) Kaplan-Meier curves showing the distribution of time to first alcohol use (see Figure 2) indicated a significant difference between the two groups. In the standard treatment group, the median time until consumption of the first drink was 45 days. In contrast, the median time to first alcohol use was beyond 56 days in the contingent group.
Analysis of Time Until Relapse

In the standard treatment group, 61% of the participants had relapsed to heavy alcohol use by the end of the 8-week period compared with 26% in the contingent group, \( \chi^2(1, N = 42) = 5.02, p < .05 \). A survival analysis (see Figure 3) also revealed that time until first relapse was significantly different between groups, \( \chi^2(1, N = 42) = 5.15, p < .05 \). In the standard treatment group, median time to relapse was similar as time until first drinking episode—45 days. This indicates that participants in the standard group drank heavily on first drinking. Median time to relapse in the contingent group was beyond 56 days.

Breathalyzer and Urinalysis Results

Table 2 shows descriptive data of the percentage of participants submitting positive BAC and urine samples at intake and at the Week 4 and Week 8 evaluations. Although no participants in the contingent group submitted positive breath samples at these evaluations, these participants in the control condition provided positive alcohol breath tests. At intake, the percentage of participants providing urine samples positive for any illicit drugs was equivalent between groups (17% and 21%, respectively). However, more participants in the standard treatment group submitted urine samples positive for illicit drugs at the mid- and posttreatment evaluations, with up to 43% of the participants in the standard treatment group submitting urine samples positive for illicit drugs compared with only 10% in the contingency management group. The group, \( \chi^2(1, N = 42) = 4.82, p < .05 \), and the Group \times Time interaction, \( \chi^2(2, N = 42) = 6.64, p < .03 \), effects were significant. Post hoc comparisons revealed that the groups did not differ at intake, but they were significantly different in the percentage of positive urine samples submitted at the Week 4 and Week 8 evaluations, \( \chi^2(1, N = 42) = 6.98 \) and \( 6.94, p < .01 \), respectively.

While participants remained in treatment, urine specimens were collected weekly and breath samples were collected daily during intensive treatment and weekly during aftercare. These data are not included in Table 2 because the number of participants submitting samples throughout treatment varied by group because of differential attrition. Three participants in each treatment group submitted positive breath alcohol samples during treatment. Sixty-nine percent of the participants in the contingent condition submitted urine samples negative for all drugs of abuse while attending the treatment program compared with 52% of the participants in standard treatment.

Other Outcome Measures

Table 3 shows ASI Severity, BDI, and SCL–90–R GSI scores from the intake, Week 4, and Week 8 evaluations. No group effects were significant, and the only Time \times Group interaction effect that reached statistical significance was for ASI Medical Severity scores, \( F(2, 39) = 5.07, p = .01 \). With the exception of the Legal and Medical Severity scores, time effects were statistically significant for all the other ASI Severity, SCL–90–R, and BDI scores, with \( F \) values ranging from 4.62 to 33.91 (\( p < .05 \)).

In the contingent group, participants earned an average of 90 drawings. On average, participants won 60 small and 8 medium prizes. Four participants won a large prize. No significant correlations between number of medium and large prizes earned in the first 3 days of treatment and retention (\( r = .04 \)) or time until first drinking episode (\( r = .14 \)) were noted.

Discussion

Results from this study demonstrate that this reinforcement system is efficacious in retaining alcohol-dependent individuals in treatment and in reducing time to relapse to alcohol use. We discuss these findings and their implications for the use of positive-
Participants who completed treatment reported no alcohol use during the 8 weeks. In the standard group, all 5 in the contingent group (19%) who stayed in treatment reported treatment, all 3 reported they had relapsed. Three other participants among participants in the contingent group who withdrew from treatment, TLFB reports of alcohol use were positive readings would indicate a relapse to heavy drinking. Compared with the standard treatment group, significantly more participants in the contingent group were still abstinent at the end of the 8-week treatment period. These effects are also similar to those reported when voucher incentives are provided (cf. Higgins, Budney, Bickel, Foerg, et al., 1994; Higgins et al., 1991, 1993).

First, in terms of retention, this reinforcement procedure was successful in retaining 84% of the participants in treatment at least 8 weeks. In contrast, only 22% of the participants receiving standard treatment attended the clinic for 8 weeks. The effects of this procedure on retention are comparable with those reported when voucher incentives are provided (cf. Higgins, Budney, Bickel, Foerg, et al., 1994; Higgins et al., 1991, 1993).

Second, this procedure was effective in increasing time until first reported drinking episode and time until relapse to heavy drinking. Compared with the standard treatment group, significantly more participants in the contingent group were still abstinent at the end of the 8-week treatment period. These effects are also similar to those reported when voucher incentives are provided (Higgins, Budney, Bickel, Foerg, et al., 1994; Higgins et al., 1991, 1993).

One potential criticism of these results is that self-reports were used to evaluate one of the major outcome variables—alcohol use. While participants remained in treatment, both self-reports and Breathalyzer samples were used to assess alcohol use. Although BACs can measure alcohol use for only a limited period of time, positive readings would indicate a relapse to heavy drinking among those who continued to attend the treatment program. Once participants withdrew from treatment, TLFB reports of alcohol use at the Week 4 and Week 8 evaluations were used, along with breath samples submitted at these evaluations, as indices of alcohol use. In no case did a breath sample reveal alcohol use when the participant denied use. Although we recognize the limitations of self-reports in ascertaining alcohol use, it seems unlikely that participants who remained in treatment (84% in the contingent group) relapsed to heavy alcohol use undetected by treatment staff. Among participants in the contingent group who withdrew from treatment, all 3 reported they had relapsed. Three other participants in the contingent group (19%) who stayed in treatment reported alcohol use during the 8 weeks. In the standard group, all 5 participants who completed treatment reported no alcohol use during the 8-week treatment period, but 72% of those who withdrew from treatment reported alcohol use by the Week 8 evaluation. Moreover, because many participants did not have stable housing, all the participants provided the name and phone number of a family member or friend who assisted in locating them for the monthly assessments. Locators often offered information about participants’ whereabouts as well as drinking patterns. In no cases were discrepancies noted between participants’ and locaters’ reports of alcohol use. Thus, we are fairly confident of the validity of self-reported data of alcohol use.

Another potential criticism of these results is that long-term follow-up data are not yet available. This study found the addition of contingency management to be more efficacious than standard treatment alone throughout an 8-week period, but future research should evaluate long-term effects of the intervention.

This study is one of the first demonstrations of the efficacy of contingency management procedures for treating alcohol-dependent patients (for a review, see Higgins & Petry, 1999). Although the use of contingency management procedures for reinforcing alcohol abstinence presents some technical difficulties due to limitations of BAC and alcohol urine testing techniques, these data suggest that contingency management procedures may be useful in treating this population. Other possible applications of contingency management procedures to alcohol-dependent patients include reinforcing compliance with medications, such as disulfiram or naltrexone.

Whether this reinforcement procedure is efficacious in treating individuals with other substance use disorders (e.g., cocaine-dependent patients) is an important question. A large proportion of participants in this study used illicit drugs. Those assigned to the contingent condition showed reductions in other drug use during treatment, even though illicit drug use was not specifically targeted by the intervention.

The efficacy of this reinforcement procedure may be related to its similarities to the voucher incentive contingency management procedures. In voucher trials, participants can request purchase of desired items, and personal preferences were accommodated in the present study by having numerous desired prizes available in each category from which participants could choose. Roll, Higgins, and
Badger (1996) demonstrated the necessity of escalating and bonus systems for promoting long periods of continuous drug abstinence. This study provided bonus drawings for continuous abstinence and completion of all assigned activities each week. Silverman et al. (1997) and Stitzer and Bigelow (1983, 1984) found that large reinforcer magnitude is necessary to engender positive effects. The present system included large magnitude reinforcers ($100 prizes).

As in a recently published voucher incentive contingency management study of opioid-dependent individuals (Bickel et al., 1997), participants in the contingent condition were reinforced for completing steps toward their treatment goals each week as well as for submitting drug-free urine samples. Activities were assigned in an attempt to improve psychosocial functioning, integrate features of CRA, and teach relapse-prevention skills. On average, participants completed over 80% of their activities. These ranged from attending AA meetings to enrolling in vocational rehabilitation programs. Although only one Group X Time interaction effect was noted in ASI Severity scores, these scales may not be sensitive indicators of the specific changes in psychosocial functioning that the activities were targeting. More research is needed to evaluate if participants would complete activities without contingent reinforcement and whether the procedure is necessary for enhancing treatment retention and reducing alcohol use or whether these beneficial effects can be found when reinforcement is provided only for submission of negative specimens. High compliance rates, nevertheless, indicate patient acceptability of this procedure (see also Bickel et al., 1997; Iguchi et al., 1997).

This contingency management intervention was successful in improving outcomes, with possibly lower costs than the voucher incentive system. In the present study, participants in the contingent condition earned an average of $200 worth of prizes compared with an average of $600 worth of vouchers in other contingency management studies (e.g., Higgins, Budney, Bickel, Foerg, et al., 1994). Although the duration of the treatment conditions varied between voucher studies and the present study, each additional week in treatment results in an average of only $25/week in prizes, making this system less costly even if treatment time were extended. Not only is cost of the reinforcers less using this schedule of reinforcement, but staff time for management is also reduced. In voucher incentive programs, requests for goods and services are made by participants and research assistants typically purchase requested items several times each week to ensure rapid turnaround between request and receipt of items. In contrast, prizes were purchased every other week in the present study. Thus, this system may be less costly than vouchers in terms of both the amount of reinforcement provided and in personnel time.

Importantly, the present study provides evidence of the adaptability, acceptance, and initial efficacy and effectiveness of contingency management procedures in a community-based, drug-free substance abuse treatment program. It may be possible to implement similar procedures in other community clinics where attrition and relapse rates are high. Some clinics may be willing to provide the initial costs of purchasing prizes because standard reimbursement rates range up to $200/day for intensive outpatient treatment. Thus, a single extra day of attendance can cover the costs associated with the reinforcement system described in this report. Clinics may also solicit prize donations from community retailers. Initial attempts at solicitation in Connecticut resulted in positive response from community retailers, and a report from Toronto also demonstrated feasibility of soliciting donations (Amass, Ennis, Mikulich, & Kamen, 1997).

The reinforcement schedule chosen for this study was designed to provide, on average, one medium ($20) prize per week. Participants could earn up to an average of 16 drawings each week, and each drawing provided approximately 1/16 chance of winning a $20 prize. Lower probabilities or magnitudes of reinforcement may also be effective. Although additional research is needed to further evaluate the use of this reinforcement procedure in a variety of clinical settings, this report demonstrates initial efficacy and effectiveness of the procedure for treating alcohol-dependent outpatients.

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