

*THE IMPACT OF ENHANCED INCENTIVES ON
VOCATIONAL REHABILITATION OUTCOMES FOR
DUALY DIAGNOSED VETERANS*

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This study evaluated the efficacy of adding contingency management techniques to vocational rehabilitation (VR) to improve treatment outcome as measured by entry into competitive employment. Nineteen dually diagnosed veterans who entered VR in the Veterans' Administration's compensated work therapy (CWT) program were randomly assigned to CWT ($n = 8$) or to CWT with enhanced incentives ($n = 11$). Over the first 16 weeks of rehabilitation, those in the incentives condition could earn up to \$1,006 in cash for meeting two sets of clinical goals: (a) remaining abstinent from drugs and alcohol and (b) taking steps to obtain and maintain a competitive job. Results indicate that relative to participants in the CWT-only group, those in the incentives condition engaged in more job-search activities, were more likely to remain abstinent from drugs and alcohol, were more likely to obtain competitive employment, and earned an average of 68% more in wages. These results suggest that rehabilitation outcomes may be enhanced by restructuring traditional work-for-pay contingencies to include direct financial rewards for meeting clinical goals.

DESCRIPTORS: vocational rehabilitation, contingency management

Although outcomes vary among vocational rehabilitation (VR) models, even in the most successful models the percentage of participants with serious mental illness who work steadily in competitive jobs peaks around 40% (Drake, McHugo, Becker, Anthony, & Clark, 1996). This is true for the Veterans' Administration's (VA) compensated work therapy (CWT) program, one of the largest vocational rehabilita-

tion programs in the United States. Administrative outcome data collected by the Northeast Program Evaluation Center suggest that about 41% of the more than 13,000 veterans who participate in CWT annually are competitively employed at discharge, whereas another 43% drop out and 26% are unemployed at discharge (Seibyl, Baldino, Corwel, Medak, & Rosenheck, 2002). These employment rates have been rising in recent years, but consumers, administrators, and researchers have called for additional efforts to improve employment outcomes (Blow, Gillon, & Dornfeld, 2001; Noble, Honberg, Hall, & Flynn, 1997; Xie, Dain, Becker, & Drake, 1997).

The modest success rates and high dropout rates observed in vocational programs are

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similar to those found in many substance abuse treatment programs. One approach that has been found to substantially improve substance abuse treatment outcomes involves the addition of contingency management techniques to existing programs (Acierno, Donohue, & Kogan, 1994; McAuliffe, 1990; Petry, 2000). These techniques have three common elements: (a) the identification of objectively and reliably measured desirable target behaviors, (b) provision of tangible reinforcers when target behaviors occur, and (c) the withholding of reinforcers when target behaviors do not occur (Higgins *et al.*, 1994). Substance abuse treatment participants typically receive reinforcers for abstinence in the form of either cash or vouchers that are exchangeable for retail goods or services. The value of the vouchers is typically small initially, but grows over time as the person stays abstinent and is compliant with treatment (Higgins *et al.*, 1991). These approaches have been studied in over 24 clinical trials (Petry, 2000) with remarkably consistent findings, suggesting that these contingency management approaches result in substantial improvements in outcome in terms of abstinence from a range of addictive substances (Acierno *et al.*, 1994; Budney & Higgins, 2000; Budney, Higgins, Radonovich, & Novy, 2000; Griffiths, Bigelow, & Liebson, 1978; Petry, 2000; Stitzer, Bickel, Bigelow, & Liebson, 1986; Xie *et al.*, 1997). The primary limitation is that the effect size is moderated when a large number of drugs are targeted simultaneously and when reinforcer values are low (Acierno *et al.*, 1994; Higgins, 1996; Petry, 2000). Contingency management techniques have also been associated with dramatic increases in client retention in treatment and compliance with treatment recommendations. For example, when contingency management techniques were added to community reinforcement substance abuse treatment, program completion rates rose from 40% to 75% (Higgins *et al.*, 1994). When contingency management techniques were added to an 8-week VA outpatient alcohol treatment program,

the completion rate rose from 22% to 84% (Petry, Martin, Cooney, & Kranzler, 2000).

Although enhanced incentive strategies similar to those used in substance abuse treatment have not been studied in a VR setting, they have been tied to work activities in substance abuse settings. In two studies, vouchers were found to be an effective reward for sustained abstinence in a work setting (Milby, Schumacher, Raczynski, & Caldwell, 1996; Silverman, Svikis, Robles, Stitzer, & Bigelow, 2001; Silverman *et al.*, 2002). In two additional studies, activities related to returning to work were rewarded directly. Silverman *et al.* found that attendance at job training was significantly improved by an incentive regimen that rewarded attendance with vouchers (Silverman, Chatuape, Bigelow, & Stitzer, 1996). Petry, Tedford, and Martin (2001) allowed participants in substance abuse treatment to select work-related goals for their contingency management program. Of the sample, 59% chose at least one work-related goal to be rewarded. Success rates varied among behaviors (e.g., working on a resume was successfully completed 50% of the time; identifying potential jobs, 66%; submitting job applications, 87%; and attending work, 69%), and all work-related goals were successfully accomplished in 79% of the cases.

This pilot study evaluates the efficacy of adding contingency management initiatives to VR to improve program outcomes as measured by return to competitive employment. It examines whether enhancing traditional VR pay-for-work regimens by adding payments for meeting specific clinical goals improves the rate at which participants with comorbid psychiatric and substance use disorders transition to competitive employment. We chose to focus on dually diagnosed veterans because of the complexity of their clinical condition, their high risk for noncompliance and dropping out, and the fact that more than half of VR participants in the VA are dually diagnosed (Drebing, Fleitas, *et al.*, 2002). To our knowledge, this is the first study of contingency management techniques adapted to the specific

task of transitioning adults to competitive employment in a VR setting.

The specific behavioral targets for the proposed intervention were selected based on the "pathways to reemployment" model developed by Vinokur and Schul (2002). According to that model, intensity of job search, job-search motivation, and clinical symptoms are the most powerful predictors of gaining and maintaining a competitive job. To improve employment rates above current CWT outcomes, the incentives regimen was focused on meeting these intermediate goals as well as the ultimate goal of obtaining and maintaining competitive employment. The three intermediate behavior targets of particular importance were increasing abstinence from drugs and alcohol, increasing job-search tasks, and increasing retention in the CWT program.

In a random assignment trial of CWT versus CWT plus enhanced Incentives, we tested the following hypotheses:

1. Participants in CWT plus enhanced incentives will have (a) completed more job-search tasks and (b) reduced substance use as measured by sustained abstinence, relative to participants in the CWT-only group.

2. Participants in CWT plus enhanced incentives will demonstrate greater CWT participation, as defined by earned pay, and will demonstrate greater retention in CWT, defined as days of continued enrollment.

3. Participants in CWT plus enhanced incentives will have better employment outcomes as measured by (a) a greater likelihood of transitioning to competitive employment, and (b) a greater total number of weeks of competitive employment, relative to participants in the CWT-only group.

METHOD

Participants

Dually diagnosed veterans were recruited for this study from veterans entering the CWT program at the Bedford VA Medical Center.

Dually diagnosed veterans were defined as those with a current psychiatric diagnosis of schizophrenia, bipolar disorder, major depression, posttraumatic stress disorder, or other anxiety disorder, and current drug or alcohol dependence. Because prior studies suggest that contingency management approaches to increasing abstinence are most effective when a relatively small number of substances are targeted (Budney & Higgins, 2000; Petry et al., 2001), we chose to limit the sample to those with substance dependence for alcohol, cocaine, or opiates, with active substance abuse in the prior 90 days. Participants also had to have potential for return to competitive supported employment within 6 months, as evidenced by a history of participation in competitive employment during the previous 3 years, and acceptance of the stated goal of returning to competitive employment within 8 months. Veterans who were over the age of 55, who had chronic medical problems that would make it unlikely that they would be able to obtain and sustain a competitive job within 8 months, or who did not intend to stay in CWT for at least 4 months or live in the local region for 12 months were considered to be less likely to be seeking CWT participation as a means of gaining competitive employment, and were excluded (Drebing, Losardo, et al., 2002). Veterans who had less than 10 years of formal education and those with a history of significant head trauma (loss of consciousness for more than 1 hr) or other disorder resulting in significant cognitive impairment were also excluded due to potential difficulty in understanding the incentive program.

Twenty-one dually diagnosed veterans signed consent, completed the baseline evaluation, and completed random assignment. Two participants assigned to the payment condition withdrew from participation several days after assignment but before initiation of any drug screens or check-in meetings with study staff. They both stated that changes in residence due

Table 1
Demographics and Baseline Variables

Variable	Total sample	CWT only	CWT plus enhanced incentives	<i>U</i>	<i>p</i>
Race	19	8 (42%)	11 (58%)		1.00
Caucasian	15 (79%)	75%	82%		
African-American	4 (21%)	25%	18%		
Age (years)	46 (56)	46 (5.3)	46 (6)	41	.80
Education	13 (1.5)	13 (0.8)	13 (2)	39.5	.71
Female	1 (5%)	1 (12.5%)	0		.42
Diagnosis					
Affective disorder	14 (74%)	62.5%	82%		.60
Anxiety disorder	11 (58%)	75%	45.5%		.35
Psychosis	2 (11%)	12.5%	9%		1.00
Alcohol abuse or dependence	19 (100%)	8 (100%)	11 (100%)		
Drug abuse or dependence	13 (68%)	62.5%	73%		1.00
Receiving disability income	6 (32%)	25%	36%		.98
Months of unemployment prior to evaluation	4.3 (3.5)	4.4(2.1)	4.3(4.3)	41	.80
Job Search Behavior Scale (baseline)	3.6 (2.2)	3.1 (1.1)	4 (2.4)	29.5	.23

Note. Entries represent numbers of subjects, percentages of subjects, or means (with standard deviations) as appropriate.

to participation in treatment programs meant that they would not be available to participate in CWT and so could not participate in the study. Because they had not initiated treatment and had not reported declining participation because of the results of the random assignment, data for these 2 participants were not available for analysis. Of the remaining 19 participants, no significant differences were found between the two treatment groups at baseline (see Table 1). Only 1 participant, assigned to the incentives condition, failed to complete the 16-week follow-up, stopping all participation in Week 15.

Design and Procedure

Veterans who entered the CWT program were screened and invited to sign informed consent at the time of CWT admission. They then completed a baseline evaluation that consisted of basic demographics, clinical assessment, and work history data, collected using a demographics questionnaire and the CWT Work History Questionnaire (Drebing, Penk, & Rosenheck, 2000). Current psychiatric and substance abuse diagnoses were determined using the Structured Clinical Interview for

DSM-IV (First, Gibbon, Spitzer, & Williams, 1996). Job-search intensity was assessed using the Job Search Behaviors Scale, a brief 13-item checklist (Vuori & Vesalainen, 1999) of job-search activities engaged in over the prior 3 months. After the baseline evaluation, participants were randomly assigned to CWT only or to CWT with enhanced incentives.

CWT only involved the basic CWT program at Bedford, which is the largest CWT program in the VA and serves an average of 300 veterans per day, approximately 56% of whom meet criteria for a psychiatric and substance abuse disorder (Rosenheck, 2001; Seibyl, Rosenheck, Corwel, & Medak, 2000). Like other CWT programs, the Bedford CWT program is a multicomponent work-for-pay VR program. Veterans are placed in structured work settings, usually in private companies in the Boston area, and are compensated for their work. They are typically paid by the CWT program, which contracts with the company for their labor. The mean hourly wage is \$7.28 (Seibyl *et al.*, 2002). While the veterans are working, CWT staff helps them negotiate and resolve difficulties on the job and prepare for obtaining their own competitive jobs. Like a growing number of

CWT programs, the Bedford program includes a supported employment component designed to assist participants in maintaining employment in their own competitive jobs through structured support and management (Bond, Becker, Drake, & Vogler, 1997; Drake, 1998). The Bedford CWT supported employment services are consistent with published guidelines and treatment fidelity criteria for supported employment services (Drebing, Penk, Van Ormer, & Krebs, unpublished data). The CWT program at Bedford is similar in structure and outcome rates to other CWT programs around the country (Rosenheck, 2001). For dually diagnosed participants, the average length of stay is 17 weeks, and the transition to competitive employment for those who do transition occurs after 22 weeks (Drebing, Penk, & Rosenheck, 2000). The only random assignment evaluation of CWT found that participation was associated with reduced drug and alcohol abuse, fewer episodes of homelessness and incarceration, and protection from a decline in physical health relative to a control group (Kashner et al., 2002).

CWT with enhanced incentives included the benefits available to those who participate in the basic CWT program, such as wages and social reinforcement, and additional cash awards. Payment of these cash payments or bonuses was contingent on the completion of specified steps leading to obtaining and maintaining employment, maintaining abstinence from substance abuse, and indirectly to more prolonged retention in CWT. The incentives regimen was designed specifically for dually diagnosed participants based on principles of successful contingency management (Petry, 2000) with close adherence to validated models whenever possible (Budney & Higgins, 2000). Although some contingency management programs limit target behaviors to a single type, such as abstinence from one specific substance, a number of studies have shown the effectiveness of offering rewards for a variety of behavioral

goals simultaneously (Bickel, Amass, Higgins, Badger, & Esch, 1997; Iguchi, Belding, Morral, & Lamb, 1997; Petry, 2000; Petry et al., 2001).

Incentives for remaining abstinent from substance abuse. Of the possible clinical symptoms to target, we chose abstinence because of its direct tie to dropout rates (Drebing et al., 2000) and its demonstrated responsiveness to contingency management (Petry, 2000). The incentives regimen for substance abuse was modeled closely after approaches developed and validated by Budney and Higgins (2000) and Higgins et al. (1994). A system of increasing cash payments was offered for drug and alcohol screens that were negative for alcohol, cocaine, or opiates. Drug and alcohol screens were conducted twice each week by research staff at unannounced times over the 16 weeks of the study. The screens consisted of first asking the participant if he or she had used drugs or alcohol since the last screening. If the response was "no," he or she was asked to provide a sample of urine. Sampling was not directly observed. Screening results had to indicate no evidence of alcohol, cocaine, or opiate use to be considered "clean." The value of the initial clean screen was \$2.50, which was then increased by \$1 for consecutive negative screens (i.e., the second consecutive negative screen was worth \$3.50, the third was worth \$4.50, etc.). Additional \$10 bonuses were paid for weeks in which all screens were negative. No payments were given if the screen was positive or if the participant did not produce a urine screen for any reason, including nonattendance due to illness. The system was thus designed to reward extended periods of drug and alcohol abstinence and to reward quick recovery from relapses. If the participant relapsed but then produced four negative screens in a row, the value of the next payment reverted to the value at the time of relapse. For example, if a participant had negative screens until he or she relapsed at Week 9, no payment was given for that positive screen and the next payment would be worth

\$2.50 instead of \$18.50. The participant also would not get the \$10 bonus for that week. If the participant then had four consecutive negative screens, however, the value of the next negative screen payment would return to \$18.50. A participant who remained abstinent over the entire 16-week period would earn a total of \$736. For data analyses, *continuous abstinence* was defined as the length of abstinence from the time of entry until the first positive screen.

Incentives for obtaining and maintaining a competitive job. To encourage participants to obtain and maintain a competitive job, we rewarded the following target behaviors: creating a usable resume, attending a job interview, obtaining a job, and working at a competitive job for up to 4 consecutive weeks. Instructions included the following guidelines:

1. Participants were expected to participate in the supported employment track of the CWT program. This track assists veterans in obtaining and then keeping his or her own competitive job.

2. CWT staff were available to help participants with each step in getting a job and then provided support once they were working, for as long as they wished. If they lost their jobs for any reason, staff were available to help them find other jobs.

3. Payments were available for the following tasks related to obtaining and retaining a competitive job: producing a usable resume (\$20), attending a job interview (\$30), obtaining a job and working 1 week (\$40), working a second consecutive week (\$50), working a third consecutive week (\$60), and working a fourth consecutive week (\$70), for a total possible payment of \$270.

4. \$20 could be earned for having or creating a resume that could be used to obtain a job. To earn the \$20, a resume had to meet three criteria: It (a) provided appropriate information including name address, address, phone number, educational background, and

work history; (b) was organized in a way that is typical of resumes in resume workbooks; and (c) was professional in appearance (neatly printed on clean paper).

5. To earn the \$30 for attending a job interview, participants had to produce written evidence of having had an interview or had to give research staff contact information of the interviewer for confirmation.

6. Once a participant obtained a job, he or she could receive a payment for each of the first 4 weeks in which he or she worked at least 20 hr. The payment for the 1st week was \$40. For each consecutive week, the payment increased by \$10. If he or she did not work at least 20 hr in a week, no payment was given.

7. The program was designed to encourage participants to work 4 consecutive weeks. If they earned a payment for working but then failed to earn a subsequent payment for working, the value of the next payment returned to \$40. To earn a payment for working, they had to produce pay stubs or other written documentation of their work hours. They could not earn payments for more than 4 weeks of employment.

To earn payments for abstinence or work, participants were required to be enrolled in CWT. If they were discharged from CWT for any reason, including nonattendance, lateness, or not attending psychiatric appointments, they could not earn payments. In this way, the payments indirectly rewarded compliance with CWT and attendance at psychiatric appointments. If a participant remained sober throughout the study, he or she could receive up to \$736 in payments. Participants who completed all work-related activities and obtained and maintained a job for 4 consecutive weeks could receive up to \$270 in payments. Over the 16 weeks of the study, participants had the potential to earn payments totaling \$1,006, which is equivalent to the total offered in other contingency management interventions (Budney & Higgins, 2000). Participants were paid

in cash or were given a voucher for cash that was immediately redeemable at the hospital cashier.

Data collected during the 16 weeks of study participation include measures of participation in CWT (documented in CWT clinical and financial records); wages (documented in CWT financial records and the CWT work-history form); job-search tasks completed (assessed on a weekly basis using the weekly check-ins); and abstinence from alcohol, cocaine, and opiates (assessed using biweekly urine screens). Data regarding CWT participation and wages were available from CWT clinical and financial records. Missing drug-screen data were considered positive, breaking the string of continuous abstinence. Of the 112 positive screens, 27 were based on missing data (no verbal report of drug use and no urine sample). Only 1 participant (Subject 7, enhanced incentives group) failed to complete the 4-month follow-up, resulting in no data about competitive employment income for Weeks 15 and 16 for that participant. Missing income and employment data were assumed to reflect no income and no employment.

To insure rapid and accurate onsite urine screening, the OnTrak TestCup 5 and the OnSite Alcohol Assay (Roche Diagnostics Inc.) were used. The TestCup 5 provides a simultaneous screen for a panel of the five drugs most commonly abused by CWT participants: cocaine, marijuana, amphetamines, PCP, and morphine (300 ng/ml) (Drebing et al., 2000). Separate results are provided for each substance. Performance data supplied by the manufacturer indicates a greater than 99% accuracy of the TestCup 5 for all five target substances and greater than 95% precision (Roche Diagnostics Inc., 1998b). Similar manufacturers' data indicated a 98% accuracy of the OnSite Alcohol Assay and good sensitivity and specificity (Roche Diagnostics Inc., 1998a). After completion of the study, we were informed by the manufacturer that a potential manufacturing error might have resulted in the alcohol assays

resulting in an elevated false-negative rate. We reviewed the 4-month follow-up retrospective reports of all participants as to their substance abuse, and found one instance in which a participant in the incentives condition reported having used alcohol but received a negative finding on the alcohol assay. That data point was changed to reflect the participant's report. During the study, all assays were conducted discreetly in a public restroom. The screenings provided results in less than 3 min, and staff gave immediate feedback and payment to those in the incentives group.

All participants, regardless of treatment group, were asked to provide urine screens. The payments to the enhanced incentives group for completing the urine screens were described above. Payments were also created for the CWT-only group to insure that urine-screen data and other ongoing data could be collected. For each week that they provided two urine screens at random times, participants in the CWT-only group were paid \$5, for a total of \$80 over the 16 weeks. To insure that the urine screens for this group did not unintentionally influence sobriety, participants in the CWT-only group were instructed and reminded on a weekly basis that the \$5 payment was paid regardless of outcome and that other people, including their clinicians and CWT staff, did not have access to the results of the urine screens. Outcomes of the urine screening were not provided to participants in the CWT-only group. At the 4-month follow-up, job-search and competitive employment variables were assessed using the CWT work-history form and the Job Search Behaviors Scale. Money included in the analysis of wages did not include money earned as a study payment or subject compensation.

All participants were compensated for their time spent providing data. For completing the intake evaluation, participants were paid \$30 and for completing the follow-up exam, they received \$20. Given the amount of the

payments that participants assigned to the enhanced incentives condition could earn, we were concerned that participants assigned to the CWT-only group might be disappointed after random assignment and would drop out of the study at a higher rate than nonparticipants. For this reason we added an additional payment of \$30 for completing the final interview. Participants in the CWT-only group could receive up to \$160 for completing all data collection.

Data Analysis

Comparisons of the two treatment groups were made on baseline characteristics, including demographic variables, work history, and job search intensity, using Mann-Whitney *U* tests for ordinal variables and Fisher exact tests for nominal variables. The research hypotheses were also tested using Mann-Whitney *U* tests for ordinal variables and Fisher exact tests for nominal variables. The criterion for significance (α) was set at .05. Baseline comparisons and post hoc comparisons were all two tailed, and all tests of the research hypotheses were one tailed. This meets Cohen's (1988) criteria for the appropriate use of a one-tailed test, given that the intervention is costly and would be used only if it was found to have a positive impact on target variables.

Hypothesis 1. Two strategies were used to test Hypothesis 1. To determine whether time to first event (resume completion, first job interview, first job, first positive screen) was different, survival analysis was used, with Cox regressions to test the difference between the groups. To determine whether the payment condition raised the frequency of a broader range of job search activities than those being directly rewarded, scores on the Job Search Behaviors Scale collected at follow-up were compared using a Mann-Whitney *U* test.

Hypothesis 2. Noncompliance with VR participation is reflected not only in unplanned discharge (i.e., dropping out or termination due to rule infraction) but also in reduced hours of

participation and reduced or unproductive work performance (which is reflected in the type of jobs to which participants are subsequently assigned). Weekly paid earnings from CWT participation is the outcome variable that best reflects all aspects of participation. Total wages earned were computed for each participant over the course of the study, and the group means were compared using a Mann-Whitney *U* test. To determine whether time to first event (dropout, defined as discharge from CWT) was different, survival analysis was used, with Cox regressions to test the differences between the groups.

Hypothesis 3. To determine whether time to first event (first competitive employment) was different, survival analysis was used, with Cox regressions to test the differences between the groups. Mann-Whitney *U* tests were used to compare the groups with respect to the number of weeks of competitive employment worked and the mean number of hours worked per week.

RESULTS

When time to first events (resume completion, first job interview, first job, first positive screen) was examined, participation in the enhanced incentives condition was associated with shorter time to resume completion (hazard ratio [HR] = 10.78, 95% confidence interval [CI] = 1.35–85.92, $p < .05$) and first job interview (HR = 6.23, 95% CI = 1.31–29.64, $p < .05$), and longer time to first positive screen (HR = 0.22, 95% CI = 0.05–0.93, $p < .05$). Scores on the Job Search Behaviors Scale at Week 16 were significantly higher for the enhanced incentives group (see Table 2).

When participation in CWT (as measured by total wage earnings) was examined, total wages for the enhanced incentives group were significantly greater than for the CWT-only group (see Table 2). When participation was examined in terms of retention in CWT over the 16 weeks of participation, retention rates were

Table 2
Outcomes

Variable	CWT only	CWT plus enhanced incentives	<i>U</i>	<i>p</i>
Job-search intensity at Week 16	3.4 (2.4)	7.6 (2.9)	10.5	<.01
Total wages	\$2,795.63 (\$964.71)	\$4,700.64 (\$3,193.13)	20	<.05
For total sample				
Weeks of competitive employment	0.8 (1.8)	4.2 (5.8)	31	.28
Hours worked per week	14.1 (8.9)	17.4 (22.6)	31	.28
For those who transitioned to competitive employment				
Weeks of competitive employment	3 (5)	9.2 (2.8)	1	.12
Hours worked per week	16.5 (12.0)	38.2 (13.1)	1	.12

Note. Values reported are means, with standard deviations in parentheses.

found to be similar for the two groups, with no statistically significant differences (HR = 0.83, 95% CI = 0.17–4.15, $p = .83$).

When the outcome of CWT was analyzed in terms of successful transition to competitive employment as a function of consecutive treatment weeks, modest rates of competitive employment were noted for both groups (see Figure 1). Higher rates of competitive employment and earlier transition to competitive employment were noted for participants in the enhanced incentives condition, but no statistically significant difference was found with respect to time to first job (HR = 2.35, 95% CI = 0.45–12.18, $p = .31$). The mean number of weeks of competitive employment and the number of hours worked per week for the enhanced incentives group were higher than those of the CWT-only group, although the differences were not statistically significant (see Table 2). When only those participants who transitioned to competitive employment by discharge were examined, the mean number of weeks of competitive employment and the number of hours worked per week were higher for the enhanced incentives group, although the differences were not statistically significant.

DISCUSSION

These results are encouraging in a number of ways. First, the enhanced incentives condition was effective at increasing the likelihood of

meeting intermediate goals needed for treatment success, including achieving a more rapid and intense job search and minimizing substance abuse relapse. According to Vinokur and Schul (2002), these intermediate factors are the most predictive of a successful transition to competitive employment and are typically not a central focus of VR programs. The higher scores on the Job Search Behaviors Scale at Week 16 for the enhanced incentives group suggests activation of a broader array of job-search activities. It is noteworthy that 5 of 8 participants in the CWT-only group had lower scores on the Job Search Behaviors Scale 4 months after entry in CWT relative to their scores at the time of entry (see Table 3). In contrast, 2 of 10 participants in the enhanced incentives condition had lower scores and 6 of 10 had higher scores. This provides some suggestion that the payments for job-search activities had effects well after they were available, whereas paid activities in CWT only may function as a disincentive to search for jobs for some participants.

Also consistent is the finding that the payments were related to significant differences in sustained drug and alcohol abstinence. Drebing et al. (2000) have noted that substance abuse relapse is one of the most common causes of dropout and treatment failure in VR. Although the payments did appear to influence drug and alcohol abstinence, there is less evidence that lapses in drug and alcohol

Table 3
Results for Individual Participants

Participant	Job-search tasks (week completed)			JSBS		Total wages	Total CM earnings	Weeks to 1st relapse	Total weeks of sobriety
	Resume	First interview	Obtained first job	Baseline	Follow-up				
CWT only									
02		11	11	4	6	\$2,787	\$0	5	6
04				3	6	\$1,160	\$0	4	14
05		16	16	3	2	\$1,993	\$0	4	10
08				4	3	\$4,301	\$0		16
09				2	1	\$3,071	\$0	4	12
14				4	0	\$3,423	\$0		16
16				1	6	\$2,336	\$0	4	9
19	5			4	3	\$3,294	\$0	1	15
CWT plus enhanced incentives									
01	4	4	4	4	8	\$7,841	\$1,005		16
03		9	9	0	7	\$4,280	\$75	2	1
06	8			0	12	\$5,396	\$712		16
07	1	3	4	5	— ^a	\$12,400	\$708	15	15
10		2	2	4	4	\$1,513	\$985		16
11	3	7	14	8	6	\$4,430	\$826		16
12	13	13		5	10	\$4,746	\$692		16
13	2			6	5	\$3,593	\$755		16
15	13	13		1	11	\$3,636	\$785		16
17	2	14		4	4	\$3,398	\$725	16	15
18	2	7		7	9	\$474	\$558	8	14

Note. JSI=Job Search Behaviors Scale; CM=contingency management.

^aData unavailable.

abstinence were directly tied to dropout or discharge from CWT (see Figure 1). Examination of individual cases makes it clear that participants who relapsed but who continued to attend CWT were either not identified by CWT staff as having relapsed or were not discharged if the relapse was brief and they agreed to seek additional treatment. Participants who relapsed and then left their residences or did not attend CWT were more promptly discharged. Four participants who relapsed and were not discharged were still able to transition to competitive jobs.

Because access to money is widely recognized as a trigger of relapse, we were concerned that the payments would lead to substance abuse. This does not seem to have been the case. The incentive regimen did contain a partial stopgap against relapse in that money could not be earned following recent drug use.

With respect to the intensity of participation in CWT, the results are somewhat mixed.

Those with the payments worked more, earned more, and were somewhat less likely to have dropped out by Week 16, although dropout rates for both groups were fairly similar. A range of studies in substance abuse treatment settings have shown enhanced compliance secondary to payments that directly or indirectly reward participation and retention. It is possible that dropout in substance abuse programs is more closely tied to relapse, so payments for abstinence have a greater impact on dropout rates. It is also possible that the failure to note differences in retention may be due to the impact of noncontingent payment for the CWT-only condition. With respect to the intensity of participation, we were concerned that a cash payment program might reduce the likelihood of transitioning to competitive work by reducing the need for cash. That was not found to be the case, in that the average wage earnings for those in the enhanced incentives group was \$1,900 more than the wages of those

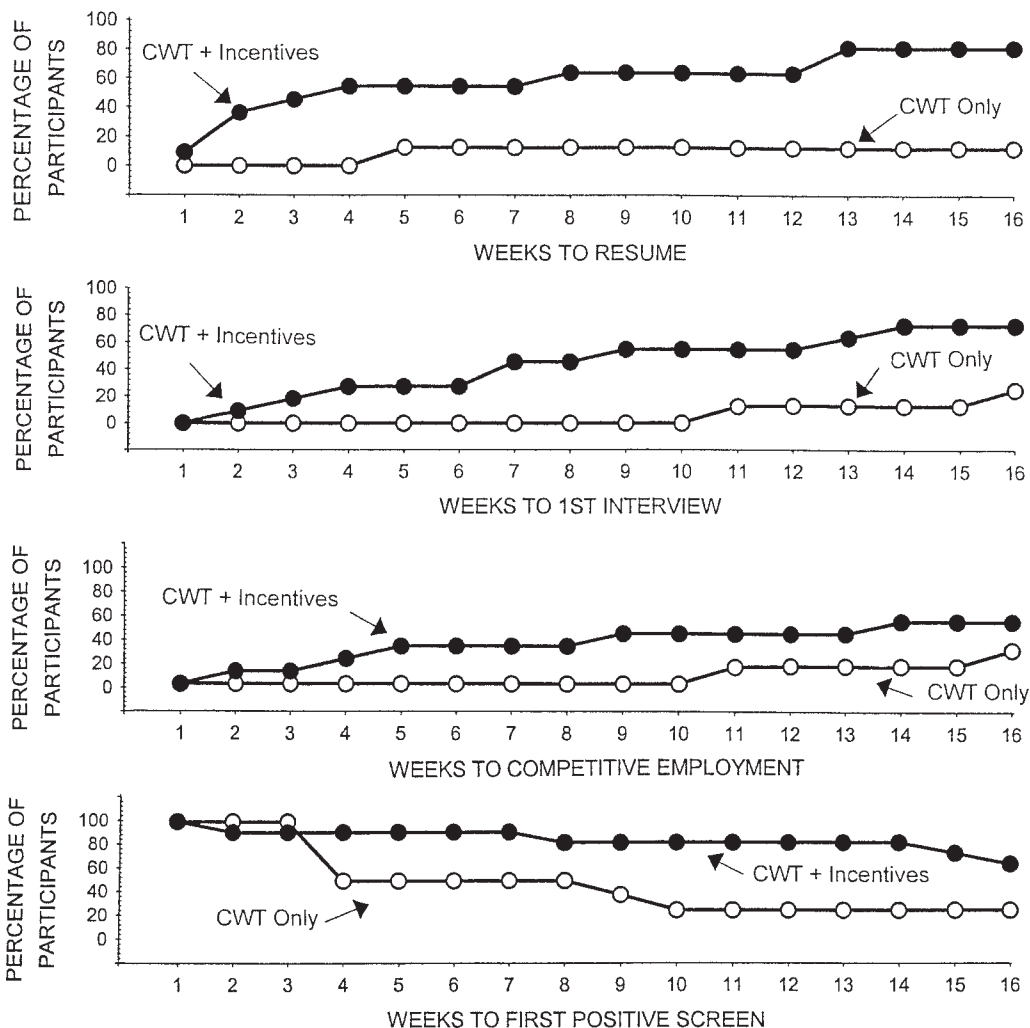


Figure 1. Completion of job-search tasks and abstinence by dually diagnosed participants receiving CWT only or CWT with enhanced incentives.

in the CWT-only group. Instead of reducing earned income, the payments spurred further earnings.

With respect to outcome, the enhanced incentives group had an earlier transition to competitive employment and a greater number of days of employment, but the differences were not statistically significant. The difference between the two groups diminished between Weeks 12 and 16, although gains continued to accrue in both groups. It is possible that the payments encouraged a more rapid transition

for those who would eventually move to a competitive job without the payments. It is noteworthy that of all the job-related payments, those for getting a competitive job were the least likely to be earned. This is due in part to the fact that they were contingent on the other rewarded behaviors (e.g., creating a resume and going on a job interview). In general, obtaining a job is also more difficult in terms of total amount of effort and the potential risk of failure, so participants' ambivalence about obtaining a job is likely to be greater than their

ambivalence about job-search tasks. Results from other contingency management studies suggest that, in principle, extending the time for which payments are available or increasing the amount of the payment for obtaining a job would be likely to further increase the number of participants in competitive jobs (Petry, 2000; Petry *et al.*, 2001). It should also be noted that in trying to keep the payments for abstinence similar to the published guidelines, we designed the payments with an imbalance in the total payments available favoring abstinence (\$736) over obtaining and maintaining work (\$270). In retrospect, for a study of VR, this may have been a mistake. In our subsequent work, we have shifted the balance in favor of work payments.

Overall, these findings are promising. There appears to be a natural synergy between VR programs like CWT and contingency management techniques, in that each addresses the other's limitations. CWT is often undermined by misuse of drugs and alcohol and by participants' concerns about transitioning to competitive employment, but it has the advantage of providing long-term reinforcement in the form of both earnings and less tangible rewards such as social status and self-esteem. Contingency management techniques can enhance the ability to meet treatment goals such as retention or abstinence, but can result in a decline in effects when the contrived reinforcers are removed. By combining VR and contingency management, both short- and long-term outcomes in VR participants may be enhanced. VR programs also appear to be a more natural setting for contingency management than other clinical programs. Petry (2000) notes that "despite compelling evidence regarding their efficacy and the wide acceptability and applicability of these procedures, contingency management approaches are rarely implemented in [substance abuse] treatment programs" (p. 9). This appears to reflect distaste for the artificiality of paying clients

for meeting clinical goals, discomfort with working with money, and concern about the impact of contingency payments on total program cost. These factors are less relevant to VR settings. Financial payments are already used in VR, including pay for work as well as bonuses for meeting goals. In a recent national survey of CWT programs, 18% were already offering some form of cash bonus to participants who were participating constructively (Drebing, Rosenheck, & Penk, 2001). Restructuring the existing financial payments to include explicit links to clinical goals is a relatively small step for VR programs. Second, the infrastructure needed to support payment programs is already in place in CWT programs, and resources in the form of the Special Therapeutic and Rehabilitation Activities Fund can easily be set aside from current contracts.

This initial study suggests that enhanced payments could improve outcomes for VR programs. It is important to remain cautious in our conclusions. First, this is a relatively small study that needs replication with a larger sample. A replication is under way. Second, the brief follow-up period limits the conclusions that can be drawn. With respect to competitive employment, differences in the two groups diminished toward the end of the 16 weeks. A longer follow-up may show that the payments result in a quicker move to work but that both conditions actually result in similar numbers of participants moving to work. It is possible that by encouraging a more rapid job search, the payments result in participants transitioning to competitive jobs before they are ready to maintain those jobs. Additional data are needed to document that a more intensive job search and an earlier transition to competitive employment do not result in shorter job tenure or any other unintended negative outcomes. The withdrawal of 2 participants after assignment to the enhanced incentives condition raises the question of whether, despite their self-reports, assignment to this condition encouraged them

to withdraw. This has not been noted as a problem in prior contingency management studies, but it is worth monitoring carefully in future efforts, particularly given this new application to a VR setting. Four participants in the CWT-only condition had missing urine-screen data resulting in positive results, compared to none in the enhanced incentives condition. The assumption that missing data should be treated as evidence of substance abuse may be inaccurate and may inflate the relapse rate among the CWT-only group. Similarly, the lack of observed urine screens may add error to the substance use data, because incentives for clean urine screens may have motivated some to substitute clean urine for a true sample. Finally, a major concern about this type of intervention is the cost. An additional cost of \$1,000 in payments would almost double the cost of care per CWT participant (Blow et al., 2001). Further study is needed to determine (a) the relation between the total cost of payments and outcome, (b) whether the payments result in secondary costs or savings in terms of changes in use of other health services, and (c) whether it is feasible and effective to fund payments out of employer contracts.

In summary, this study demonstrates that the addition of a contingency management intervention to a VR program can have a positive impact on program compliance and outcome in dually diagnosed participants. Further study is needed to address questions regarding the amount and structure of the reinforcement schedule, the additional benefit derived from payments for drug and alcohol abstinence relative to the impact of the work-related payments, and the long-term impact of payments on job attainment and tenure.

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