

The Effectiveness of Telephone-Based Continuing Care for
Alcohol and Cocaine Dependence: 24 Month Outcomes

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Abstract

Context: Telephone-based disease management protocols have shown promise in improving outcomes in a number of medical and psychiatric disorders, but this approach to continuing care has received little study in alcohol and drug dependent individuals.

Objectives: To compare telephone-based continuing care with two more intensive face-to-face continuing care interventions.

Design: A randomized 3-group clinical trial with a two-year follow-up.

Setting: Two outpatient substance abuse treatment programs, one community-based and the other at a Veterans Affairs Medical Center facility.

Patients: Alcohol and/or cocaine dependent patients (N=359) who had completed 4-week intensive outpatient programs (IOPs).

Interventions: Three 12-week continuing care treatments: weekly telephone-based monitoring and brief counseling contacts combined with weekly supportive group sessions in the first four weeks (TEL); twice weekly cognitive-behavioral relapse prevention (RP); and twice weekly standard group counseling (STND).

Main Outcome Measures: Percent days of abstinence from alcohol and cocaine, total abstinence from alcohol and cocaine, negative consequences of substance use, cocaine urine toxicology, gamma glutamyltransferase (GGT).

Results: Participants in TEL had higher rates of total abstinence over the follow-up than those in STND ($p < .05$). In alcohol dependent participants, 24 month GGT levels were lower in TEL than in RP ($p = .005$). In cocaine dependent participants, there was a significant group by time interaction ($p = .03$) in which the rate of cocaine positive urine samples increased more rapidly in RP as compared to TEL. TEL did not differ from RP or STND on percent days abstinent or negative consequences of substance use. Participants with high scores on a composite risk indicator, based on co-occurring alcohol and cocaine dependence and poor progress toward achieving IOP goals, had better total abstinence outcomes out to 21 months if they received

STND rather than TEL, whereas those with lower scores had higher abstinence rates in TEL than in STND ($p = .04$).

Conclusions: Telephone-based continuing care appears to be an effective form of “step down” treatment for most patients with alcohol and cocaine dependence who complete an initial stabilization treatment, compared to more intensive face-to-face interventions. However, high risk patients may have better outcomes if they first receive group counseling continuing care after completing IOP.

Alcohol and drug dependence are now thought to be chronic disorders for many patients who receive formal treatment.^{1,2} Due to the relapsing nature of these disorders, some form of continuing care—also referred to as “aftercare”—is usually recommended following completion of an initial phase of treatment.³ Despite the potential benefits of continuing care, many substance dependent individuals either do not attend any continuing care, or stop attending after a relatively small number of sessions.⁴⁻⁶

Continuing care protocols that are more flexible and less burdensome than traditional face-to-face counseling sessions may be more attractive to patients, and therefore promote better adherence and improved disease management over time. One such intervention is telephone-based continuing care. The telephone is considered to have a viable therapeutic role in the monitoring and treatment of a number of disorders, including depression, obsessive-compulsive disorder, congestive heart failure, and chronic pulmonary disease.⁷⁻¹⁴ In the addictions, telephone counseling has been effective in smoking cessation programs.^{15,16} However, few studies have been done with patients with alcohol or drug use disorders, and results have been mixed.¹⁷⁻¹⁹

The present study examined the relative effectiveness of telephone-based continuing care for patients with alcohol and/or cocaine dependence who had completed a 4-week Intensive Outpatient Program (IOP). Participants were randomized to a condition that consisted primarily of brief telephone counseling contacts combined with several group support sessions early in the protocol (TEL), or to one of two comparison conditions: individualized relapse prevention (RP) or standard 12-step oriented group counseling (STND). Relapse prevention was selected as a comparison condition because it has shown efficacy in numerous research studies.²¹⁻²⁴ Group counseling was selected as a second comparison condition because it is by far the most common approach to continuing care in addictions treatment programs. Therefore, the comparison conditions represented the “state of the art” in the clinical research field and treatment as usual,

respectively. Each continuing care condition was 12 weeks in length, and participants were followed for a total of 24 months.

The primary research question was whether either RP or STND would produce better substance use outcomes than TEL. The two face-to-face conditions were not directly compared, as results from several recent studies²⁴⁻²⁸ suggested that they would yield similar substance use outcomes. In analyses of data from the first year of the follow-up,²⁹ the TEL condition did not differ from either RP or STND on percent days abstinent, total abstinence, frequency of cocaine use, or cocaine urine toxicology results. However, moderator analyses indicated that patients with high scores on a composite risk indicator measure—which included current dependence on both alcohol and cocaine and failure to achieve therapeutic goals while in the IOP program—had better total abstinence outcomes in STND than in TEL. Conversely, patients with lower scores on this measure had better total abstinence outcomes in TEL than in STND.³⁰

Although these results from the first year of the follow-up provided initial evidence of the equivalence of the telephone-based continuing care intervention with the more intensive interventions, the possibility remained that longer-term outcomes would not be as positive. In this article, data from the entire two year follow-up are presented to evaluate longer-term outcomes in the TEL condition, relative to RP and STND. Moderator analyses with the composite risk indicator were also conducted, to determine whether the interaction effects in the first year would persist into the second year of the follow-up. The outcomes that were examined were percent days of abstinence, total abstinence, negative consequences of substance use, and cocaine urine toxicology. A biological measure of heavy alcohol use obtained at the end of the follow-up—gamma glutamyltransferase (GGT)—was also examined. Finally, the treatment conditions were compared on self-help participation and additional episodes of inpatient and outpatient substance abuse treatment in the second year of the follow-up.

Method

Participants

The participants were 359 adults with DSM-IV cocaine or alcohol dependence at the time of entrance to treatment who had completed IOP, were willing to participate in research, and did not have a psychiatric or medical condition that precluded outpatient treatment. Other inclusion and exclusion criteria are described elsewhere.²⁹ The participants averaged 41.9 years of age, 12.4 years of education, 8.5 years of regular cocaine use, 18.6 years of regular alcohol use, 2.8 prior drug abuse treatments, and 3.5 prior alcohol treatments. The majority of participants were male (82.6%), African American (77.1%), and not currently married (82.6%). Participants were using alcohol or cocaine on 2 of every 3 days during the 4-month period that preceded IOP. Data on participants in each treatment condition are presented in Table 1.

[insert Table 1 about here]

Treatment

Patients participated in an IOP at one of two sites: a clinical research unit located at a community-based outpatient program or the Philadelphia Veterans Administration Medical Center. Both programs offered 9-10 hours of group therapy per week, and were 4 weeks in length. To graduate from the IOP, patients had to attend regularly and achieve a week of urine toxicology-confirmed abstinence by the end of the program. Following graduation from IOP, patients were randomly assigned to one of the following three treatment conditions, each of which is described in more detail elsewhere.^{29,31}

Standard continuing care (STND). Patients received 2 group therapy sessions per week, which were a combination of addictions counseling and 12 Step recovery practices. This condition is typical of “aftercare” as it is delivered in many outpatient clinics.

Individualized relapse prevention continuing care (RP). Patients received one individual relapse prevention session, from a protocol developed by Annis and Davis,³² and one group session per week. A treatment manual and a series of structured modules were used to guide within-session activities, as well as between-session homework assignments.³³

Telephone-based continuing care (TEL). Patients had one initial individual face-to-face session to orient them to the protocol, and thereafter completed one 15 minute telephone call per week. A workbook was used to focus and structure these contacts.³⁴ The telephone sessions began with a brief review of progress toward 1-2 goals identified in the prior session. Plans for achieving goals over the next week were then discussed, along with any other pressing issues. During the first four weeks of treatment, patients were also offered a weekly support group. The main purpose of this group was to ease the transition from clinic-based to telephone-based treatment. The therapists had the option to retain a patient in the group beyond the four week period if the patient was at high risk for relapse. Therefore, although the majority of contacts in this condition were made via the telephone, it was a multi-modal intervention that also included some face-to-face therapeutic contacts.

Therapists and adherence to treatment protocols. The 10 therapists who provided the continuing care treatments were all experienced substance abuse counselors. Each condition was delivered by a minimum of three therapists at each site. The individual sessions of RP and TEL therapists were audio-taped to monitor adherence to the protocol as described in the manuals. Individual supervision was provided weekly by the study clinical coordinator, who listened to a majority of the audiotapes, and one group supervision session was also held each week. Further information on the therapists and adherence is provided elsewhere.²⁹

Procedures

Recruitment. Participants at the Community site (N=188) were recruited through local treatment programs and social service agencies. These individuals became eligible for the study if they completed the IOP program, met inclusion criteria, and were able to provide cocaine-free urine tests at the end of the IOP. At the VA site, patients in the final week of the 4-week IOP were screened for study eligibility. Patients who met inclusion criteria (N=175) signed informed consents and were randomized at the end of the week. The study was approved by University of Pennsylvania and Philadelphia Veterans Affairs Medical Center IRBs.

Generalizability of the study samples. There were approximately 1,500 telephone inquiries at the community site from prospective participants. Individuals who appeared to meet eligibility criteria were invited for in-person screening, and of these, approximately 25% kept their appointments. The vast majority of individuals who attended these sessions were deemed eligible to participate, and entered the IOP. Analyses presented elsewhere²⁹ indicated that IOP graduates were more likely to be living in halfway houses and less likely to have used cocaine within 2 days of intake than those who did not complete IOP.

At the VA site, 417 patients with alcohol or cocaine use disorders were screened, and of these, 175 (42.0%) were eligible to participate and were enrolled in the study. The most common reasons for failure to enroll in the study were declined participation (96 of 417, or 23.0%), psychiatrically unstable (19, or 4.6%), outside of the age range (18, or 4.1%), referred to a geriatric group (17, or 4.1%), IV heroin use in the prior year (17, or 4.1%), and failure to come to the baseline assessment (14, or 3.4%).

Randomization procedures. Urn randomization procedures were used at each site.³⁵ The balancing factors are described elsewhere.²⁹ Because several of the balancing factors had highly skewed distributions, the randomization did not produce equal sample sizes across the three conditions (STND= 122, RP= 135, TEL=102).

Baseline and follow-up assessments. Baseline assessments were started in the last week of IOP, prior to randomization. All patients who completed the first portion of the baseline assessment (i.e., pre-randomization) were considered to be in the study. The follow-up assessments were conducted at 3, 6, 9, 12, 18, and 24 months post baseline. The follow-up rates for self-report data were 90% or greater in the first year, 89% at 18 months, and 86% at 24 months. The treatment conditions did not differ on follow-up rates for self-report or urine toxicology data. Assessments were conducted by highly trained and experienced research staff.²⁹

Measures

Psychiatric diagnoses. The Structured Clinical Interview for DSM-IV was used to assess DSM-IV Axis I disorders.³⁶

Problem severity. The Addiction Severity Index (ASI)³⁷ was used to gather information on medical, employment, drug use, alcohol use, legal, family/social, and psychiatric problem severity. The ASI has demonstrated good internal consistency, test-retest, and interrater reliabilities in different groups of substance abusers.^{38,39}

Composite risk indicator measure. Prior work by our group and others indicated that patients who were dependent on both alcohol and cocaine and those who made little progress toward achieving the primary treatment goals of IOP were likely to have particularly poor substance use outcomes,³⁰ and might therefore be inappropriate for telephone-based continuing care. To test this hypothesis, we developed a composite risk indicator measure that was comprised of the following items: (1) current dependence at entrance to IOP on both alcohol and cocaine, versus dependence on only one substance; (2) any cocaine use during IOP; (3) any alcohol use during IOP; (4) attendance at less than 12 self-help meetings during IOP;⁴⁰ (5) score on the social support measure at the end of IOP that was below the median in the study sample;⁴¹ (6) abstinence goal at the end of IOP that was less stringent than total abstinence;⁴² and (7) self-efficacy score at the end of IOP that was less than 80%.⁴³ The items were all derived from assessment instruments with good reliability and predictive validity. Each item was coded as either 1 (indicating higher risk) or 0. A total score was obtained by summing the scores on all seven items ($m= 2.50$; $sd= 1.36$).³⁰ Psychometric analyses indicated the 7 items were adequately described by a single factor model. The procedures used to develop this measure, including rationales for the cut points that were used with the continuous measures, are described in detail elsewhere.³⁰

Self-reported substance use. Time-line follow-back (TLFB)⁴⁴ techniques were used to gather self-reports of alcohol and cocaine use during the 6 months preceding continuing care and the 24 month follow-up period. In studies with alcoholics and drug addicts, there has been good agreement between TLFB data and collateral and biological data.⁴⁵⁻⁴⁷ The primary outcome

measures derived from the TLFB were percentage of days of abstinence from both alcohol and cocaine and a dichotomous variable representing complete abstinence from both alcohol and cocaine. Both measures were computed for each 3-month segment of the 24 month follow-up.

Negative consequences of substance use. The Inventory of Drug Use Consequences (InDUC)⁴⁴ was used to gather data on negative consequences of alcohol or drug use. The total score was used in the analyses. This measure has good to excellent test-retest reliability.⁴⁸

Cocaine urine toxicology. Urine samples were obtained at each follow-up and tested for the cocaine metabolite benzoylecgonine using either the Emit assay system or FPIA analysis (with quantitative output converted to a dichotomous variable).

Biological measure of heavy alcohol consumption. Blood samples obtained at baseline and 24 months were assayed for gamma glutamyltransferase (GGT). Higher scores are typically associated with heavy alcohol consumption.⁴⁹ Because procedures for collecting blood samples were not implemented until part way through the study and occasional difficulties in getting blood samples processed, GGT values from both baseline and the 24 month follow-up were available for 148 out of 272 participants with alcohol dependence.

Treatment services and self-help participation. Days of inpatient and outpatient substance abuse treatment during follow-up were obtained from the TLFB. An 8-item self-report questionnaire was used to assess patients' participation in self-help groups. The measure had good internal consistency and scores predict subsequent alcohol and cocaine use.^{40,50}

Data Analyses

Mixed effect regressions (SAS PROC MIXED) were used for the analyses with percent days abstinent and negative consequences of substance use. The TLFB data were collapsed into a pre-continuing care baseline period (6 months, including IOP) and eight 3-month follow-up periods. Generalized estimating equations (GEE) were used to analyze the dichotomous total abstinence measure and cocaine urine toxicology. An AR(1) covariance structure was used for both models.

Preliminary analyses with each outcome measure indicated that there were significant main effects for current substance dependence diagnosis and site in each analysis (i.e., outcomes worse in patients with both alcohol and cocaine dependence and in those at the VA site), but other potential covariates were not significant in any of the analyses.²⁹ Furthermore, none of the interactions between these variables and treatment approached significance. Therefore, the final models contained main effects for site, baseline percent days abstinent (or negative consequences), treatment condition contrasts, the composite risk indicator (which included dual vs. single dependence), and time; and interactions between the treatment condition contrasts, composite risk indicator, and time. In these models, the time variable tested for changes over the course of the follow-up (i.e., from 3 to 24 months).

Potential differences between treatment condition in treatment services and self-help participation data in year 2 were analyzed with ANOVAs; treatment condition differences in GGT scores at 24 months were examined with ANCOVAs, which controlled for baseline GGT levels. Because the primary research question was whether the TEL condition would be less effective than the two face-to-face continuing care conditions, the outcome analyses focused on two planned contrasts: STND vs. TEL and RP vs. TEL.^{29,51}

Results

Comparison of Treatment Conditions at Baseline

Participants in the three treatment conditions were compared on 21 demographic, diagnostic, treatment, and problem severity variables assessed at baseline. Only one significant difference was observed; at the VA, ASI legal composite scores were higher in TEL than in the other two conditions. There were no significant differences at the community site.²⁹

Attendance in Continuing Care

The total number of continuing care sessions (telephone, group, individual) received by participants was 14.24 (sd= 7.90) in STND, 14.36 (sd= 8.47) in RP, and 10.94 (sd=5.92) in TEL.

Patients in the TEL condition received an average of 6 telephone contacts, 4 group sessions, and 1 individual orientation session. Notably, 35% of those in TEL attended more than 4 group sessions.²⁹ On average, patients in TEL received approximately half as much therapeutic contact during continuing care as those in RP or STND (428 minutes vs. 861 and 845 minutes, respectively).

Analyses with Substance Use Outcomes

Results from the repeated measures analyses with the four outcome measures are summarized in Table 2 and presented in Figures 1-5, which are based on available data (i.e., not adjusted for missing data points). Higher scores on the composite risk indicator measure predicted worse outcomes on all three self-report measures, but not on cocaine urine toxicology. Rates of total abstinence decreased significantly across the follow-ups; however, the other three measures did not change during the follow-up.

[insert Table 2 about here]

Percent days abstinent. Data on percent days abstinent from alcohol and cocaine (untransformed) within each continuing care condition are presented in Figure 1. Neither the STND vs. TEL or the RP vs. TEL contrast was significant. There were also no significant 2- or 3-way interactions between the treatment contrasts, time, and the composite risk indicator.

[insert Figure 1 about here]

Total abstinence. The percentages of participants in each treatment condition who reported total abstinence from alcohol and cocaine within each 3 months segment of the follow-up are presented in Figure 2. Abstinence rates were significantly lower in STND than in TEL ($z = -1.98, p = .047$). The STND vs. TEL contrast x composite risk indicator interaction was also significant ($z = 2.04, p = .041$). Patients with risk indicator scores of 4 or greater had higher abstinence rates in STND than in TEL through month 21 of the follow-up, whereas those with scores of 3 or less had higher abstinence rates in TEL than in STND. In months 21-24, however, abstinence rates were higher in TEL than in STND, regardless of risk indicator score. The

interaction effect that was evident through month 21 is illustrated in Figure 3, which presents data from one representative three month segment of the follow-up (i.e., months 13-15). In the comparison of RP and TEL, there was a significant interaction of the treatment contrast, composite risk indicator, and time ($z=-2.10$, $p=.036$). This effect was due to fluctuations over time in the direction of the interaction between the RP vs. TEL contrast and the composite risk indicator, and was therefore not clinically meaningful.

[Insert Figures 2 and 3 about here]

Negative consequences of substance use. Negative consequence scores (untransformed) are presented in Figure 4. Neither the STND vs. TEL or the RP vs. TEL contrast was significant. There were also no significant 2- or 3-way interactions between the treatment condition contrasts, time, and the composite risk indicator in the these models.

[insert Figure 4 about here]

Cocaine urine toxicology in cocaine dependent patients. These analyses were done with the 268 patients who had current cocaine dependence at entrance to IOP. Percentages of cocaine positive urines within each treatment condition at each assessment point are presented in Figure 5. Neither the STND vs. TEL or the TEL vs. TEL contrast reached significance. However, the rate of cocaine positive urines increased more rapidly over time in RP compared to TEL ($z=2.20$, $p=.028$), and a similar trend was obtained in STND compared to TEL ($z=1.93$, $p=.052$). The 2-way interactions between these treatment contrasts and the composite risk index were not significant, nor were the 3-way interactions that included time.

[insert Figure 5 about here]

Finally, GGT data obtained at the 24 month follow-up were examined in patients with alcohol dependence. The analyses indicated that GGT (log transformed) was significantly lower in TEL ($N=45$, $m=3.47$, $se=.10$) than in RP ($N=48$, $m=3.86$, $se=.09$) [$F(1,90)=8.45$, $p=.005$]. GGT was also lower in TEL than in STND ($N=55$, $m=3.69$, $se=.09$), but the difference only reached the level of a trend [$F(1,97)=2.76$, $p=.10$].

Additional Treatment During Follow-Up

Participants averaged 3.99 (sd=12.51) days of inpatient substance abuse treatment during months 13-18, and 4.51 (sd= 15.92) days during months 19-24. The treatment conditions did not differ at either time point [13-18 months: $F(2,318)= .42, p= .66$; 19-24 months: $F(2,304)= 2.05, p= .13$]. Participants averaged 5.67 (sd= 14.23) days of outpatient substance abuse treatment in months 13-18, and 5.83 (sd= 14.11) days in months 19-24. Once again there were no significant differences between the conditions [13-18 months: $F(2,318)= 2.07, p= .13$; 19-24 months: $F(2,304)= 2.82, p= .06$]. The conditions did not differ on self-help involvement at either 18 [F(2,291)= .73, p= .49] or 24 [F(2,294)= 2.10, p= .13] months.

Comment

This paper presented 24-month outcomes from a randomized study that compared a telephone-based continuing care intervention against two more intensive face-to-face interventions in substance dependent patients who had completed an initial phase of intensive outpatient treatment. Data from the entire follow-up were used to address two concerns that were raised in the analyses of the first year outcomes.^{29,30} The first was that outcomes in the telephone-based continuing care intervention might deteriorate faster in the second year, relative to outcomes in the two more intensive, face-to-face conditions. This was clearly not the case. There were no significant treatment condition by time interactions on the three self-report outcome measures, and rates of cocaine positive urines actually increased more rapidly during the follow-up in RP than in TEL. The TEL condition also had significantly lower GGT values at 24 months than RP. Finally, when the whole follow-up was considered, TEL produced higher rates of abstinence than STND.

The second concern was that despite the overall good performance of the telephone-based continuing care intervention, there might be some patients for whom this intervention was inadequate, at least as a first “step down” treatment. Based on prior research, we hypothesized

that patients who were dependent on both alcohol and cocaine and who failed to achieve the central IOP goals might respond better to more intensive face-to-face treatment than to a telephone-based protocol. These risk factors were operationalized using existing measures with good psychometric properties, and combined to form a composite risk indicator. The moderating effect of the composite risk indicator in the comparison of TEL vs. STND was significant in the analyses to predict total abstinence, and persisted through month 21 of the follow-up. Patients with low to moderate risk scores (e.g., 0-3) tended to have better outcomes in TEL than in STND, whereas patients with higher scores tended to have better outcomes in STND than in TEL. It is noteworthy that only 20% of the sample had composite risk indicator scores of 4 or more.

The study had a number of strengths which increase confidence in the validity and generalizability of the results, including a large sample, two sites, manualized treatments, assessment instruments with good psychometric properties, corroboration of self-reports of alcohol and cocaine use by biological tests, and an excellent follow-up rate. Data on other treatment services received and self-help participation during the follow-up were also gathered, to rule out these possible confounding factors. Finally, the participants were typical of patients in publicly-funded outpatient substance abuse treatment programs.^{52,53}

With regard to limitations, it is important to stress that the results of the study do not in any way suggest that telephone-based interventions will be more effective as an initial approach to the treatment of substance dependence than intensive outpatient treatment, relapse prevention, or group counseling. In that regard, cognitive-behavioral treatments have demonstrated efficacy as an initial treatment in numerous studies,^{20,22-24} although there are some studies that find no difference between CBT and other active treatments.²⁵⁻²⁸ Another limitation of the study is that it did not include a control condition that provided no continuing care. Therefore, the effectiveness of the telephone-based continuing care intervention relative to no continuing care has yet to be established.

About half of patients who started treatment in the IOPs did not completed those programs and were therefore ineligible for the continuing care study. Data suggested that IOP graduates were more likely to be in an institutional living arrangement, such as a “sober house,” than IOP dropouts, and were less likely to have used alcohol or drugs in the two days preceding entrance into IOP.²⁹ Therefore, the participants in the study should be considered as better prognosis patients who had achieved some initial success in IOP. The telephone-based protocol actually included a combination of individual, group, and telephone sessions. Moreover, the number of group sessions was flexible, so that patients who were having difficulties that threatened their continued recovery could remain in the group beyond the 4-week cutoff. In that way, the telephone condition functioned as an “adaptive” or flexible intervention.⁵⁴

Similar results were generally obtained with the self-report and corroborating data. However, we also repeated the analyses with the total abstinence outcome measure, recoding patients who reported no use but had a cocaine positive urine sample as “non-abstinent” at that follow-up. Although there were only a small number of such recodings, the rate was lowest in TEL, followed by RP and STND. These analyses produced results that did not differ from the original analyses reported here. Finally, we did not adjust alpha levels in the data analyses for the number of tests that were performed. If a somewhat more stringent alpha level had been adopted (e.g., $p < .01$), the only result that would have been significant was lower GGT levels in TEL relative to RP.

In conclusion, our findings indicated that for most substance dependent patients who complete an initial stabilization phase of outpatient treatment, telephone-based monitoring and brief counseling appears to be as effective a form of “step down” continuing care as more intensive, face-to-face treatments. Although formal economic evaluations have not been completed, it is likely that this condition will prove to be cost-effective as well. The mechanisms of action within the telephone condition are not yet known; however, it may work well for patients who have achieved initial stabilization because it is highly focused, more convenient

than face-to-face continuing care, and does not interfere as much with other responsibilities, such as employment and child care.

Telephone-based continuing care interventions with durations of longer than 3 months may lead to further improvements in the management of alcohol and drug use disorders.⁵⁵ In this regard, a recent study showed that regular contacts to assess recovery status provided over a 2 year period led to faster re-entry into treatment for patients who had relapsed and less need for further treatment at 24 months, compared to those in the control condition.⁵⁶ Furthermore, other continuing care interventions that have yielded significant effects in controlled studies have provided 12 months or more of treatment.⁶ Further research is needed to determine whether extended telephone monitoring, with the flexibility to increase the frequency or intensity of treatment when warranted through “stepped care” protocols,⁵⁷ might be an effective and economical method for further improving the management of substance dependent individuals over longer periods of time.

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Table 1

Characteristics of Participants at Entrance into Continuing Care

Variable	<u>Standard</u>		<u>Relapse Prevention</u>		<u>Telephone</u>		F-test or Chi-square	df	N
	(N=122)	(N=135)	(N=102)						
	Mean	(SD)	Mean	(SD)	Mean	(SD)			
	or %	or (N)	or %	or (N)	or %	or (N)			
Age	41.23	(8.30)	41.41	(7.95)	43.52	(8.59)	2.60	2	359
Gender (% Female)	17.2	(21)	15.6	(21)	19.6	(20)	.67	2	359
Education	12.57	(1.87)	12.24	(1.58)	12.28	(1.84)	1.26	2	359
Race							3.41	4	359
African American (%)	73.8	(90)	77.8	(105)	79.4	(81)			
White (%)	25.4	(31)	20.7	(28)	17.7	(18)			
Other (%)	.8	(1)	1.5	(2)	2.9	(3)			
Marital status							1.65	4	359
Currently married (%)	18.9	(23)	15.6	(21)	17.6	(18)			
Separated/divorced/widowed (%)	49.2	(60)	45.9	(62)	50.0	(51)			
Never married (%)	32.0	(39)	38.5	(52)	32.4	(33)			
Current cocaine dependence (%)	74.2	(92)	74.3	(101)	72.8	(75)	.08	2	359
Current alcohol dependence (%)	71.0	(88)	81.6	(111)	70.9	(73)	5.18	2	359
Major Depression (%) (lifetime)	31.1	(38)	29.6	(40)	29.4	(30)	.10	2	359

All comparisons: ns

Table 2

Results of Repeated Measures Outcome Analyses

Predictor Variables	<u>% Days Abstinent</u>		<u>Total Abstinence</u>		<u>Negative Consequences</u>		<u>Cocaine Urine Toxicology</u>	
	T	P	OR	P	T	P	OR	P
Baseline substance use	1.35	.18	1.00	.55	3.22	.001	1.00	.43
Site (1=community, 0= VA)	1.87	.062	1.62	.005	-2.60	.009	.46	.0003
Composite Risk Indicator	-2.91	.004	.51	.0001	3.60	.0003	1.20	.46
Time	-1.56	.12	.95	.046	1.16	.25	.97	.46
Composite Risk Indicator x Time	.67	.50	1.02	.082	-1.61	.11	1.01	.47
<u>STND vs. TEL Contrast (1=STND, 0=TEL)</u>								
Treatment	-1.18	.24	.28	.047	1.80	.072	.80	.79
Treatment x Time	-.46	.64	1.01	.70	-.16	.87	1.10	.053
Treatment x Risk Indicator	1.42	.15	1.61	.041	-1.58	.12	1.10	.75
Treatment x Risk Indicator x Time	-.55	.58	.99	.33	.40	.69	.97	.081
<u>RP vs. TEL Contrast (1=RP, 0=TEL)</u>								
Treatment	-.77	.44	.44	.24	1.23	.22	.26	.16
Treatment x Time	.45	.65	1.04	.31	-.78	.43	1.12	.028
Treatment x Risk Indicator	1.48	.14	1.60	.056	-1.63	.10	1.34	.36
Treatment x Risk Indicator x Time	-1.35	.18	.97	.036	1.56	.12	.97	.11

Note: Output from mixed effect regressions (continuous outcome) and GEE (dichotomous outcome) analyses. OR= odds ratio. Time effects cover the follow-up period (i.e., 3 month to 24 month follow-ups). In the mixed effect analyses, degrees of freedom= 2181 for percent days abstinent and 1157 for negative consequences. In the GEE analyses, degrees of freedom =1 for both total abstinence and cocaine urine toxicology.

Figures

Figure 1: Mean percent days abstinence at baseline and each 3-month follow-up interval, by continuing care condition. Note: the 6 month baseline period includes the 4 weeks of IOP and any treatment received immediately before IOP.

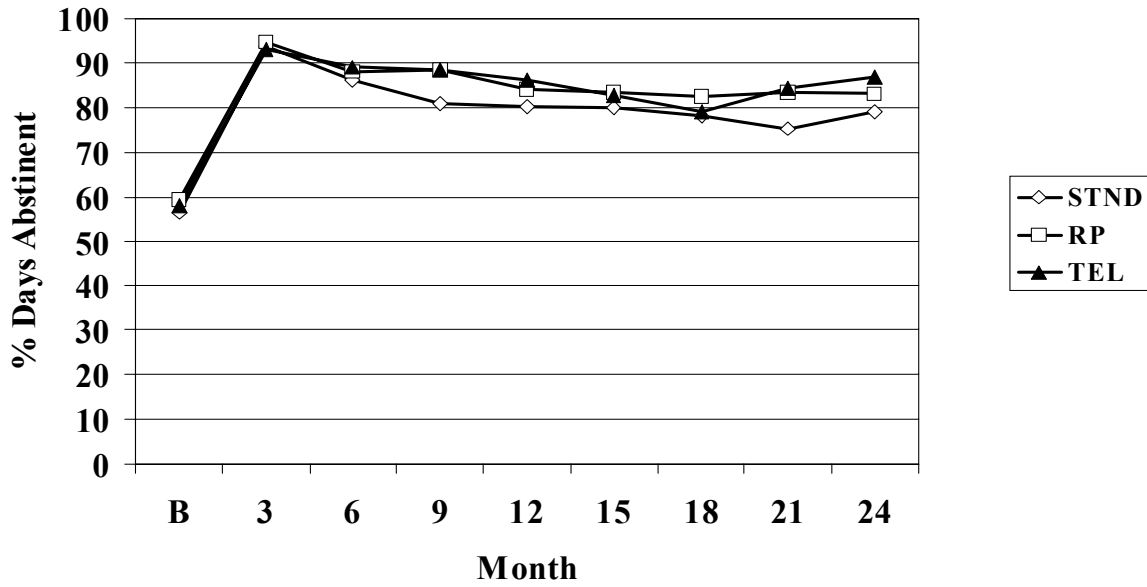
Figure 2: Rates of total abstinence from alcohol and cocaine within each of the 3-month follow-up intervals, by continuing care condition.

Figure 3: Rates of total abstinence from alcohol and cocaine, as a function of the interaction of continuing care treatment condition and composite risk indicator measure.

Figure 4: Mean scores on the negative consequences of substance use measure (InDUC) at baseline and each follow-up, by continuing care condition.

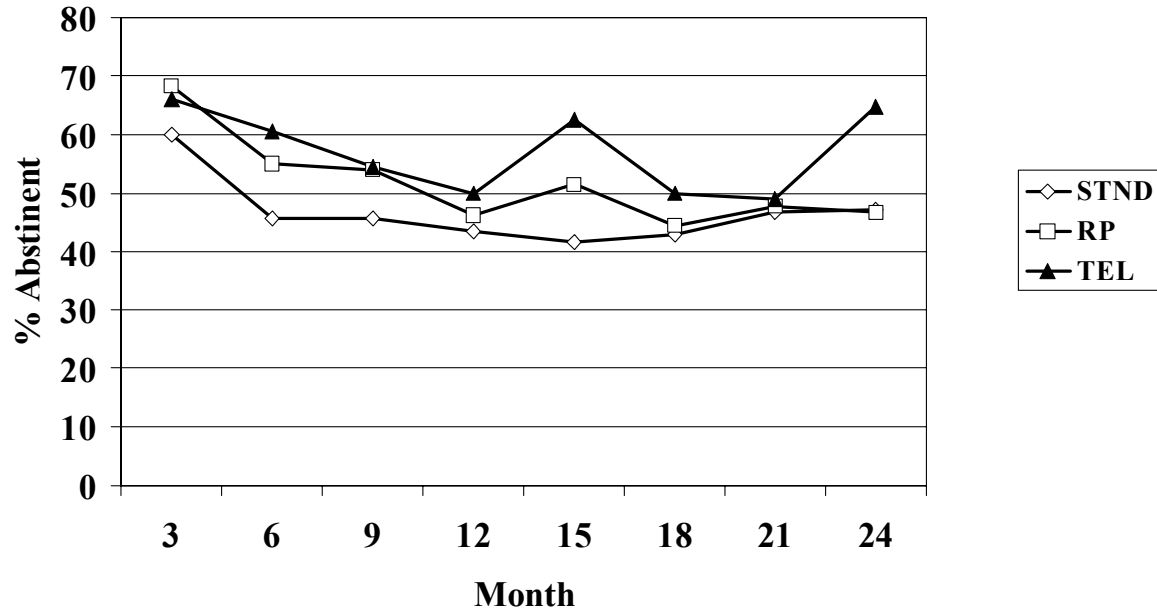
Figure 5: Rates of cocaine positive urine toxicology tests at each follow-up, by continuing care condition. These analyses were limited to the 268 participants with current cocaine dependence at baseline.

Figure 1: Percent Days Abstinent



Note: No significant treatment condition main effects or interactions

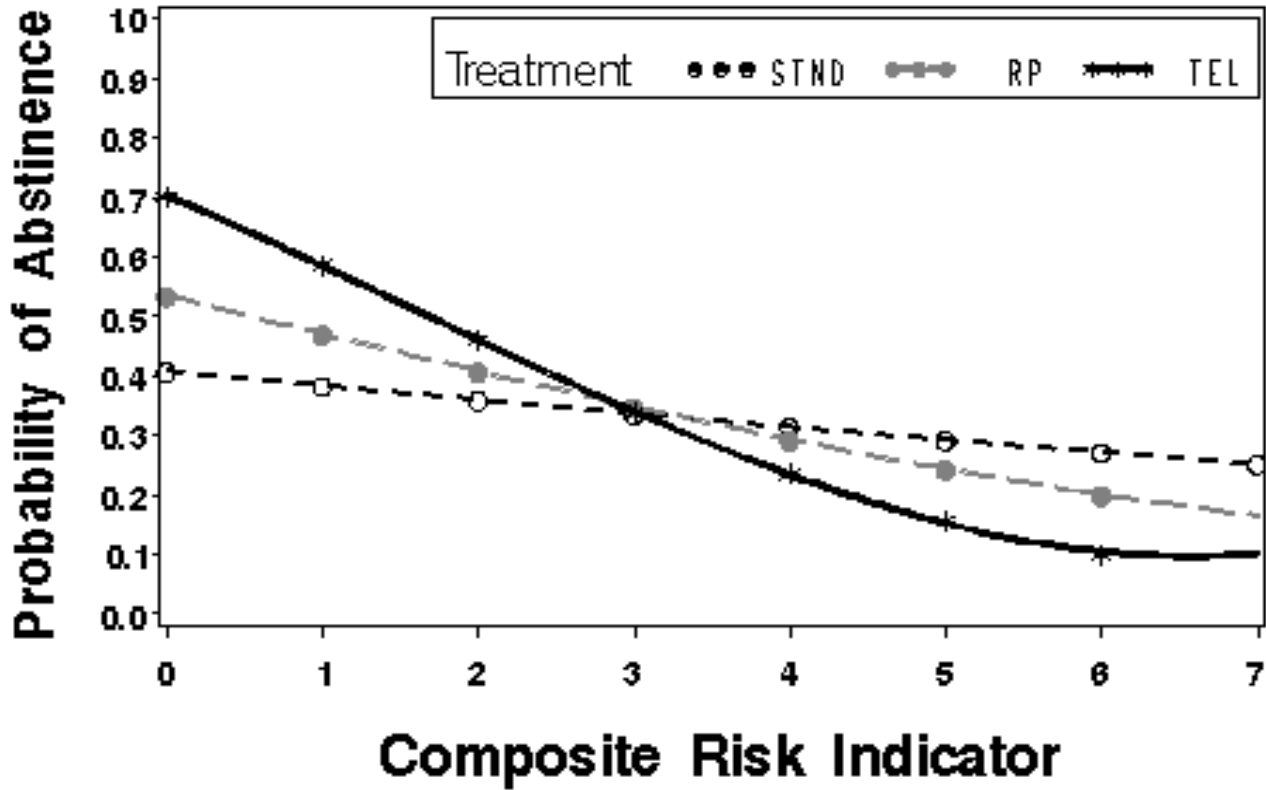
Figure 2: Total Abstinence Rates



Note: Treatment Condition Main Effect: TEL > STND, $p < .05$

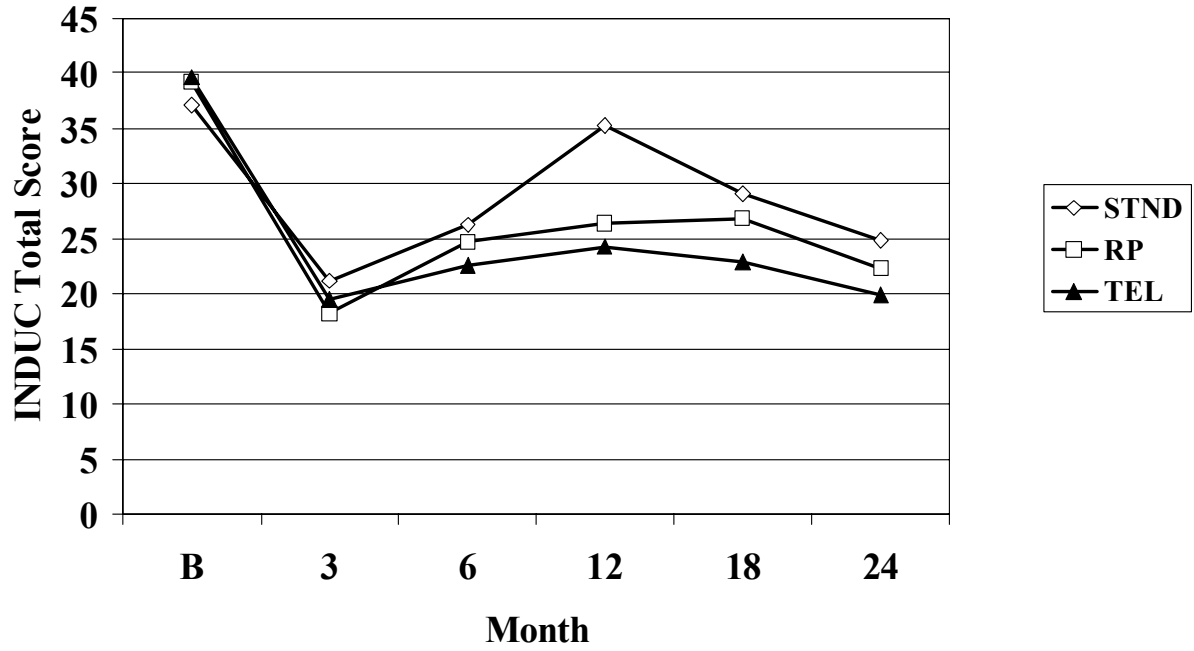
Figure 3: Risk Indicator by Treatment Condition Interaction

Months 13 to 15



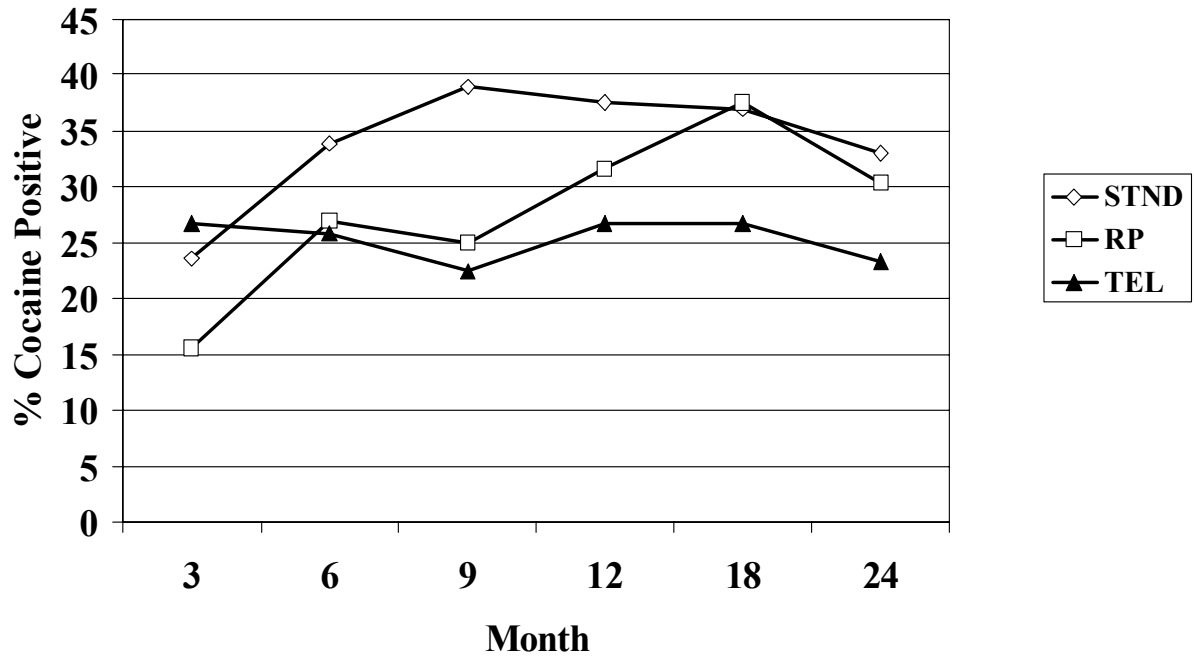
Note: Treatment Condition by Risk Indicator Interactions: TEL vs. STND, $p = .04$; TEL vs. RP, $p = .31$

Figure 4: Negative Consequences of Use



Note: No significant treatment condition main effects or interactions

Figure 5: Cocaine Urine Toxicology



Note: Group by Time Interactions: TEL vs. RP, $p = .028$; TEL vs. STND, $p = .053$