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A Randomized Trial of Probation Case Management for Drug-Involved Women Offenders

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Abstract

This paper reports findings from a clinical trial of a probation case management (PCM) intervention for drug-involved women offenders. Participants were randomly assigned to either PCM (n=92) or standard probation (n=91), and followed for 12 months using measures of substance abuse, psychiatric symptoms, social support and service utilization. Arrest data were collected from administrative datasets. The sample (N=183) included mostly African American (57%) and White (20%) women, with a mean age of 34.7 (SD = 9.2) and mean education of 11.6 years (SD = 2.1). Cocaine and heroin were the most frequently reported drugs of abuse, 86% reported prior history of incarceration, and 74% had children. Women assigned to both PCM and standard probation showed change over time in the direction of clinical improvement on 7 of 10 outcomes measured. However, changes observed for the PCM group were no different than those observed for the standard probation group. Higher levels of case management, drug abuse treatment, and probationary supervision may be required to achieve improved outcomes in this population.

Keywords

Substance Abuse; Drug Abuse; Women; Probation; Case Management; Criminal Justice

Many women in the criminal justice system are drug-involved (Mosher & Phillips, 2006) and substance abuse, in concert with changes in drug laws and sentencing procedures, has led to increases in arrest and incarceration of women offenders (Grella & Greenwell, 2006; Prendergast, Wellisch, & Wong, 1996; Strauss & Falkin, 2001). At the end of 2005, there were 4.9 million adults on probation or parole nationally and, among probationers, 23% were women (United States Department of Justice, 2006; Glaze & Palla, 2004). In one survey of probationers, many women reported past drug (68%) or alcohol (25%) use, and 12% reported drug use at the time of the offense (United States Department of Justice, 1998). Compared to non-users, women reporting drug use were more likely to have been involved in criminal activity and to have been arrested in the past year (Substance Abuse and Mental Health Services Administration, 1997).

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In addition to substance abuse, many women offenders have mental health disorders including depression, posttraumatic stress disorder, cognitive impairments and problems controlling violent behavior (Oser et al. 2005; Henderson, Schaeffer, & Brown, 1998; Jordan et al., 2002; Teplin, Abram, & McClelland, 1996). Incarcerated women report high rates of victimization (Lake, 1993), sexual and physical abuse (Henderson, 1998; Snell & Morton, 1994), intimate partner violence (Staton, Leukefeld, & Logan, 2001), and specialized service needs upon release including family support, parenting assistance, and legal help (Alemagna, 2001). Health problems in this population include HIV infection, Hepatitis B and C, sexually transmitted diseases, and tuberculosis (Golembeski & Fullilove 2005; Hammett, Gaiter, & Crawford, 1998; Marquart, Brewer, & Mullings, 1999; Young, 1998). Social problems include stigma, lack of employment experience, and need for childcare (Draine et al., 2005; Center for Substance Abuse Treatment, 1998). Two-thirds of incarcerated women have children under age 18 (Snell, 1992) and report distance from the prison as a main reason for infrequent child visitation (Bloom & Steinhart, 1993). Prison-imposed restrictions on phone calls and letters also limit family contact, social support, and post-release planning efforts (Urban Institute, 2005). Some women experience termination of their parental rights during incarceration because of the Adoption and Safe Families Act of 1997 that allows for initiation of termination proceedings if a child has been residing in foster care for 15 months in a 22-month period (Urban Institute, 2005).

Treatment for drug involved offenders is scarce, with estimates that less than 10% receive substance abuse treatment services (Taxman, 2007). Observers have noted that increases in the number of women incarcerated is accompanied by a lack of treatment and alternative sanctions for women (Owen & Bloom, 1995), and that there is a lack of comprehensive community services that women offenders may need (United States Department of Health & Human Services, 1999). Therapeutic interventions have been designed for drug-involved offenders (Harrison, 2001; Marlowe, 2002), but few are tailored to women (Dowden & Andrews, 1999). Early mandatory treatment involved civil commitment to residential settings followed by community supervision (Anglin, 1988; Inciardi, 1988) and, in recent years, prison-based Therapeutic Communities have become widespread (Knight, Simpson, & Hiller, 1999; Prendergast & Wexler, 2004). Prison-based Therapeutic Communities have been shown effective particularly when followed by additional treatment in the community post-release (Wexler, Prendergast & Melnick, 2004; Prendergast & Wexler, 2004). Under the federally funded Residential Substance Abuse Treatment for State Prisoners (RSAT) initiative, 2,000 such programs were in place by 2001, of which 12% were women-focused (Harrison & Martin, 2003). Although the number of RSAT programs for female and male offenders had declined to 300 by 2004 (United States Department of Justice, 2005), outcome studies indicated positive results for women. Female RSAT program participants were significantly less likely to be arrested and/or convicted than were comparison group women, and the probability of reincarceration decreased as the amount of treatment increased (United States Department of Justice, 2005).

Seiter and Kadela (2003) suggest that offender re-entry policy, characterized by rehabilitation and community reintegration for much of the 20th century, has in the last decade been largely replaced by risk management and surveillance approaches (Feeley & Simon, 1992). More recently, programs developed for drug-involved offenders as an alternative to incarceration have blended, in different measures, criminal justice supervision and substance abuse treatment. Supervision for this population has been characterized by infrequent drug testing, infrequent phone or in-person contact and lack of coordination and provision of substance abuse treatment (Center on Addiction and Substance Abuse, 1998; Kleiman et al., 2003; Prendergast, Wellisch, & Falkin, 1995). Voter initiated propositions like Arizona Proposition 200 and California Proposition 36 combine a treatment mandate with probation supervision for nonviolent drug-involved offenders (Administrative Office of

the Courts, 1999; Hser et al., 2003; Jett, 2001). However, the nature and intensity of both supervision and treatment may vary widely across jurisdictions (Speiglman, Klein, Miller, & Noble, 2003). Drug courts, now numbering over 1,600 nationally (American University, 2007), offer a high level of supervision under court jurisdiction, with court-imposed sanctions and rewards, combined with treatment (Goldkamp, White, & Robinson, 2001; L. D. Harrison & Scarpitti, 2002). A recent review of drug court literature did not discuss drug court findings specifically related to women offenders, however it observed that research on client factors (including gender) constitutes a gap in current drug research (Belenko, DeMatteo & Patapis, 2007).

Interventions offering criminal justice supervision in an intermediate range have included Treatment Accountability for Safer Communities (TASC), and Intensive Supervision Probation/Parole (ISP) models (Pearson, 1988; Petersilia & Turner, 1990). TASC programs combine case management and treatment in an effort to identify drug-involved offenders and link them with treatment (Marlowe, Elwork, Festinger, & McLellan, 2003). Early findings were promising (Hubbard et al., 1989), while a later multi-site evaluation showed mixed results (Anglin, Longshore, & Turner, 1999). Marlowe et al. (2003) attribute the weak results of TASC interventions to the transfer of jurisdiction from the courts to probation. In ISP models, criminal justice supervision is intensified under probation jurisdiction. The ISP approach includes smaller caseloads for the supervising officer, frequent face to face contact with the probationer, and requirements for urinalysis testing, counseling, and work participation (Turner, Petersilia, & Deschenes, 1992). In a randomized trial, ISP participants received more drug counseling and had higher employment than did usual supervision control participants. While the groups did not differ on new criminal arrests at one year follow-up, the ISP group had more technical violations, and associated incarceration and costs. The investigators recommended that ISP programs include substance abuse treatment (Turner et al., 1992). While we did not undertake a systematic review of the literature, the papers reviewed here did not specifically address the relationship of TASC to women offenders (Anglin et al., 1999; Hubbard et al., 1989; Marlowe et al., 2003), or the specific relationship of ISP to women offenders (Pearson, 1988; Petersilia & Turner, 1990b, 1990c; Petersilia & Turner, 1991; Turner & Petersilia, 1992).

In a “national snapshot” of community-based prisoner re-entry programs, employment, education, health, housing, and family support are identified as key elements for offender post-release success (Urban Institute, 2006). Case management traditionally addresses these supports through assessment, care planning, and service procurement, connecting the client with services (Austin & McLelland, 1994). Case management also offers a strategy for integrating treatment into ISP models, and has been used with a range of substance abuse populations (Sorensen et al., 2003) including women (Brindis & Theidon, 1997; Laken & Ager, 1996). Case management has been applied in TASC programs (Marlowe et al., 2003), and has shown initial effectiveness with women offenders (Jessup, Edwards, Mason, Miller, & Katz, 2001; Siefert & Pimlott, 2001).

Case management has also been cited as a key component of Medicaid managed care programs for quality improvement in correctional care (Pollack, Khoshnood & Altice, 1999), and as a strategy for service coordination during the transfer of offenders from correctional settings to communities (Lewis, 2006; Conklin, 1996; Vigilante et al., 1999). In a study of parolees, case managed and control participants did not differ on time in treatment, days of drug use, criminal recidivism, or use of health and social services. However, for case managed parolees, more contacts with the case manager predicted fewer days of drug use and fewer property crimes (Longshore, Turner, & Fain, 2005). In one study of a mental health treatment court (n= 235; 51% females and 67 49% males), participants

receiving intensive case management had greater gains in decreasing jail time and improving psychosocial functioning, compared to participants receiving treatment as usual (Cosden, Ellens, Schnell & Yamini-Diouf, 2005). Through its focus on service linkage, case management may help meet special needs of women. Dowden and Andrews (1999) found human service intervention associated with reduced recidivism, and suggested that such programs supported the therapeutic potential of correctional treatment interventions for women.

This paper reports on a clinical trial of a probation case management (PCM) intervention tailored to the needs of drug-involved women offenders. The intervention incorporated elements of ISP, case management, and substance abuse treatment. In a prior quasi-experimental study, both PCM and standard probation participants showed some improvement over time, but outcomes did not differ between the groups (Chan et al., 2005). In the present study, an experimental design enabled a more rigorous test of effectiveness of PCM in a field setting.

Methods

Study setting

The Center for Substance Abuse Treatment (CSAT) initiated the Network Demonstration Program to support planning and coordination among agencies serving drug-involved offenders (Department of Health and Human Services, 1995). The San Francisco Adult Probation Department was funded under this initiative, from 1995 through 2001, for a case management intervention designed for women offenders (Chan et al., 2005). At the start of the project, the department fielded 87 officers to supervise an active caseload of 8,990 (San Francisco Adult Probation Department, 1996). For the demonstration project, the department was responsible to develop, implement and evaluate the intervention. The goal was to better serve women by providing treatment and related services as a means to reduce drug use, criminal recidivism and incarceration, and to improve the employment and social functioning of probationers.

Study Conditions

Standard Probation—In standard probation, officers typically supervised caseloads of 100–150 clients at any time, although this could vary based on the specific program or type of caseload (Chan, Jessup, Prem, Revels, & Guydish, 2002). The general tasks of probation include the preparation of pre-sentence investigations and reports for the Courts, supervision of those on probation and enforcement of conditions of probation, and assisting offenders in finding needed services (San Francisco Adult Probation Department, 1996).

Probation Case Management (PCM)—PCM was developed by probation staff in response to the CSAT request for applications (Department of Health and Human Services, 1995). The description of the intervention here is based on interviews with project staff and a review of documents (Chan et al., 2002). The intervention is also described in Chan et al. (2005).

Case managers were selected from among current probation officers who, in relation to clients, retained the responsibility of probation supervision. To select the case managers, the Probation Department posted a notice that they were accepting applications for the PCM program, and interviewed applicants concerning their interest and experience. Probation officers who selected as case managers were transferred internally to the PCM program. Interest in working with women probationers was one selection criteria, but no data were collected to measure attitudes or motivations of the applicants.

Probation case managers were clinically supervised by a consultant weekly in the first two years of the project, bi-weekly in the third year, and monthly in the fourth year. Caseloads for officers in the program were restricted to 50 clients at any time, to support more frequent client contact and increased time spent per contact. Contact was to be maintained between the case manager and the client at least twice per month through field visits, office visits, or by phone. PCM was also differentiated from standard probation through the use of uniform assessment procedures, a therapeutic and advocacy orientation, and referrals to needed services. Therapeutic and advocacy activities conducted by case managers included more counseling with clients, and being more accessible to clients. Case management activities included attending treatment planning meetings at the client's treatment program, making home visits, and accompanying the client to court appointments, medical appointments or to the housing authority. Referral resources included health, mental health and substance abuse services, childcare and reunification services, educational and employment counseling, and housing assistance (Chan et al., 2002).

Eligibiltiy, Recruitment and Random Assignment

Screening and Eligibility—Eligible women were residents of the City and County of San Francisco, 18 years of age or older, who had a substance abuse problem and were involved in the criminal justice system (e.g., incarcerated, pre-sentence, or on probation). Substance abuse involvement was determined in the course of the screening process. Drug involvement was indicated when pending charges included possession or sale of controlled substances, or when the criminal history showed a series of likely drug-related charges (e.g., petty theft) punctuated over time by charges of sale and possession. Such charges were discussed with the participant during the screening process to further assess drug involvement. To be eligible for study, participants must have been willing to enter substance abuse treatment. If this was not part of the assessment and inclusion criteria, then willingness to enter treatment may have been unequally distributed across conditions, and PCM findings may be confounded by a difference between groups in initial willingness to enter treatment.

Women were identified as potential study participants using four methods: Daily Arrest Reports, District Attorney motions to revoke probation, Pre-Trial Release, and by referral from Probation Officers, Public Defenders, or District Attorneys. In the City and County of San Francisco, Daily Arrest reports list persons recently arrested who are in jail each morning. Most participants were identified using this strategy, and 96% of study participants were first screened while in county jail. Exclusion criteria were 1) current involvement in Drug Court, 2) court order to receive PCM services, or 3) referral by a probation officer directly to the PCM program. Current or past charges of involving violence were considered case-by-case. Women with a history of multiple violent events were excluded. Where violence occurred as a single event, some years in the past, or in the context of mutual combat the woman may have been accepted into the study.

Recruitment and Random Assignment—Women were recruited from February 1998 to June 1999. When a potential participant was identified, a case manager met with her to explain the program, conduct a screening interview, and assess participant interest. Information from the screening interview was presented to a review committee including representatives from the Office of the District Attorney and the Office of the Public Defender. This committee considered eligibility criteria, nature of violence charges, if any, and whether the current charges were likely to result in probation or prison. Women likely to receive prison sentences were screened out, so that all participants were either on probation at the time of the baseline interview, or were later placed on probation as a result of adjudication. Eligible women were referred to research staff who set an appointment to

discuss the study, administer informed consent procedures, and complete the baseline interview.

A total of 196 women completed screening and were referred to the research team. Of these, 3 refused participation, 2 failed the research appointment, 2 were found ineligible during the research interview, and 1 was transferred out of county prior to baseline. The remaining 188 completed the initial screening and the research baseline interview, and were randomly assigned. Participants then drew a sealed envelope, containing a randomly generated number, from a stack of envelopes prepared in advance. Those drawing even numbers were assigned to PCM and those drawing odd numbers were assigned to standard probation.

Following random assignment, 5 cases were determined ineligible because they were assigned to Diversion (1), on Parole (1), referred by a Probation Officer specifically to PCM services (1), already in the PCM program from a prior study (1), or because disqualifying violence charges were discovered (1). These cases were eliminated from analysis leaving 183 women assigned to either PCM (n=92) or standard probation (n=91).

Subsequent comparison between research and Probation Department records identified 6 cases in which assignment to condition was discrepant. Specifically, 3 women assigned to PCM were identified in probation records as control participants, and 3 women assigned to the control condition were identified in probation records as assigned to PCM. In an intent-to-treat approach, these women were retained in the analyses in their assigned condition.

Data Collection Measures and Procedures

Measures—Research interviews included the Addiction Severity Index (ASI) (McLellan, Luborsky, Woody, & O'Brien, 1980), Beck Depression Inventory (BDI) (Beck, 1972), Brief Symptom Inventory (BSI) (Derogatis, 1983), and the Social Support Evaluation List (Cohen, Mermelstein, Kamarck, & Haberman, 1985). To assess service utilization, follow up interviews included the Treatment Services review (TSR) (McLellan, Alterman, Woody, & Metzger, 1992). Additional service questions, not captured by the TSR, included whether participants had received dental care or visited an emergency room in the past 6 months and, for women with children, whether they had children under the age of 18 living with them, and whether they had participated in parenting classes or reunification counseling.

ASI composite scores measure problem severity in seven areas (medical, employment, legal, alcohol, drug, social, psychological) (McLellan et al., 1985). Scores are derived from questions in each area, using formulae to weight the items (McGahan, Griffith, & McLellan, 1986). Scores reflect problem severity during the 30 days preceding interview and have been shown sensitive to treatment effects (McLellan et al., 1985). Because composite scores related to Drug and Alcohol severity may be artificially lowered when individuals are in controlled environments such as jail, and because most participants were recruited while in jail, baseline drug and alcohol scores were computed using data for the 30 days prior to incarceration for all women incarcerated 15 days or more at the time of the baseline interview. To compute these scores at follow up we used past 30 days, whether or not the participant was incarcerated.

Prior research has shown that ASI composite scores are non-normally distributed (Guydish, Ponath, Bostrom, Campbell, & Barron, 2003), with high proportions of minimum (0) values for most of the measures, and high proportion of maximum (1) values for the Employment composite. To address this we converted composite scores to dichotomous measures using rules developed previously (Guydish et al., 2003). In general, zero values were grouped with the lowest one-third of the non-zero values to comprise a low severity level, and remaining values comprised the high severity level. For the Employment composite, where values

cluster at the top of the scale, values of one (1) comprised the high score level and values less than one comprised the low score level.

The BDI reflects depressive symptoms and the BSI reflects a range of psychiatric symptoms, both referring to the past 7 days. The Social Support Evaluation List includes questions regarding self-esteem, emotional support and social interactions. Responses are coded and summed to give a total score reflecting the structure and quality of social support.

The TSR contains 46 individual questions concerning services received by the respondent in the past 30 days, and reflecting the same seven areas used in the ASI (McLellan et al., 1992). Some items ask about the number of days a particular service was received (e.g. number of days hospitalized for a medical problem), while other items ask about the number of times a service was received (e.g., number of times seen a physician for medical care). Over the short (30 day) reporting period responses on any single item are not well distributed, since many persons may not receive a specific service while a few persons may receive the same service many times. To compare service utilization between groups we dichotomized those questions that asked about number of days of service, to reflect whether or not a particular service was received at all. For those questions asking about number of times a service was received, we summed items within each area. For example, “number of other alcohol treatment services” reflects the sum of the number of times the participant attended alcohol education sessions, 12 step meetings, relapse prevention meetings, or had other significant discussions related to their alcohol problems.

To assess delivery of PCM, participants were asked at each follow up whether they were currently enrolled in PCM, how many times they had seen their case manager face-to-face in the past 6 months, and whether they had received case management services from another (non-probation) source. Because of the possibility of misclassification of cases by group in the Probation Department, or cross-over or contamination between groups for other reasons, these questions were asked of all participants. Last, arrest data were extracted from the San Francisco integrated court data management system reflecting, for each participant, number of arrests during the 12 month follow up period and date of first arrest occurring in that time period.

Procedures—Interviews were at baseline and at 6 and 12 months follow-up. All baseline and most follow up interviews were conducted in-person. Participants who had relocated out of state were interviewed by phone. Participants completing interviews were reimbursed $20 at baseline, $30 at 6-months, and $40 at 12 months. Clients were asked to update contact information at 3 and 9 months after baseline, by phone, and were reimbursed $5 for each call.

Data Analyses

To assess whether random assignment procedures resulted in comparable study groups, we compared groups on demographic characteristics and on outcome variables (seven dichotomous ASI composite scores, BDI, BSI, social support) measured at baseline. To assess potential sources of bias we examined study attrition, rate of incarceration and treatment enrollment at each follow up, by group. Differential incarceration rates at follow up may differentially affect drug and alcohol composite scores, as incarcerated women would have less opportunity for drug and alcohol use.

Outcome analyses assessed change over time within and between groups using both Generalized Estimating Equation (GEE) (Liang & Zeger, 1986) and mixed effects regression analyses (Littell, Milliken, Stroup, & Wolfinger, 1996). For the dichotomized ASI composite scores, we applied GEE analyses to model the probability of having a high

score (more severe problem) versus having a low score (less severe problem). These analyses allow the responses at different time points to be correlated. Similar to logistic regression, these models yield odds ratios describing the change in odds for unit changes of the predictors. For continuous outcome measures (BDI, BSI, social support) we applied mixed effects regression analyses. These analyses also allow correlated responses at each time point through the use of a random subject effect (Singer & Willett, 2003). Both types of analysis do not require complete data from each subject and data for all cases, whether or not interviewed at either follow up, were included. Outcome analyses treated time categorically and included main effects for group (PCM vs. Standard Probation), Time (baseline, 6-months, 12-months), and Group by Time interaction. Significant Group by Time interactions suggest differential patterns of change over time that may be attributable to the PCM or comparison condition.

Outcome measures may be influenced when participants are incarcerated. For example, ASI drug, alcohol and employment composite scores partly reflect number of days using drugs, alcohol or number of days employed, respectively, during the 30 days preceding interview. Women who were incarcerated for all 30 days preceding a follow up interview, consequently, would have restricted values on these measures. At 6 month follow up there were 39 women reporting incarceration for all of the past 30 days, and at 12 months there were 49 women so reporting. To assess whether main findings may be influenced by incarceration, we repeated GEE and mixed regression analyses for all outcome measures, excluding data for those women who had been incarcerated during all of the past 30 days.

As a separate criminal justice outcome, and using administrative data independent of self report, study groups were compared by the proportion in each group arrested during the one-year follow up period, the mean number of arrests per group and, in survival analysis (Kaplan & Meier, 1958), mean time to first arrest.

The PCM intervention was designed to increase access to services. To assess whether this goal was achieved, we compared PCM and comparison groups on a range of services received at each follow up point. To investigate potential effects of PCM exposure, outcome analyses described above were repeated, with two changes. First, group effects were redefined by whether or not a participant reported seeing their Probation case manager two or more times in the past 6 months, irrespective of the condition. Second, as these groups may contain different individuals at different time points, these analyses were conducted once for the period from baseline to 6 months and again for the period from 6 to 12 months.

Results

Sample Characteristics and Group Comparisons at Baseline

The sample (N=183) had a mean age of 34.7 (SD = 9.2). Over half (57.4%) were African-American, 20.2% were White, 7.7% were Latina, 3.8% were Native American, 3.3% were Asian/Pacific Islander, and 7.7% were of Other ethnicity. Cocaine, heroin, and polydrug use were most often reported as the major drug problem (see Table 1). Most (85.8%) had a history of incarceration, 77.3% were on probation or parole at baseline, and many women reported lifetime histories of physical (65%) or sexual (35.1%) abuse. There were no demographic differences by condition except that women assigned to PCM had higher mean education than those assigned to standard probation (Table 1). Between group comparisons of the proportion of respondents in the high severity category for each of the seven ASI composites at baseline, and on mean BDI, BSI and social support scores, also showed no significant differences (Table 2). Taken together, notwithstanding the single difference for education, these comparisons suggest that random assignment achieved equivalence between groups at baseline.

Attrition, Incarceration and Treatment Enrollment at Follow up

At 6 months 138 (75.4%) participants were located and re-interviewed, and at 12 months 147 (80%) were re-interviewed. The 6 month follow-up rate was 75% in the PCM condition and 75.8% in the standard probation condition. The 12 month follow up rate was 82.6% in PCM and 78% in standard probation. Follow up rates were not significantly different between groups at either time point. The proportion of women incarcerated at each time point, collapsed across groups, was 96.2% at baseline, 52.2% at 6 months, and 42.1% at 12 months. The proportion of women enrolled in substance abuse treatment at each time point, collapsed across groups, was 37.2% at baseline, 40.4% at 6 months, and 30.8% at 12 months. The proportion of women incarcerated, or enrolled in treatment, was not statistically different between groups at any time point. Consequently, it is unlikely that differential follow up rates by group, or differential rates of incarceration or treatment enrollment by group, would impact outcome analyses.

Outcome Analyses and Change Over Time

Outcome findings are summarized in Table 3, based on GEE analyses for dichotomous measures (ASI composites) and mixed regression analyses for continuous measures (BDI, BSI, social support). For dichotomized ASI scores, Odds Ratios express the increased risk of being in the high severity category associated with each predictor. All group comparisons are PCM/Comparison, so that Odds Ratios reflect the risk of being in the high severity category for the PCM group in relation to the comparison group. For continuous measures (BDI, BSI, social support), differences between means were calculated as PCM minus comparison. For BSI and BDI scores, a positive value means that the PCM group had higher severity and a negative number means that the comparison group had higher severity. This is reversed for the social support measure, where higher scores reflect more positive outcomes. Time comparisons are calculated as Later Time/Earlier Time for Odds Ratios, and as Later Time minus Earlier Time for continuous measures.

The first column in the table lists each outcome measure. Odds Ratios and confidence intervals in the second column reflect probability of the PCM group having high severity relative to the comparison group. For example, the Alcohol Odds Ratio in the second column (0.90) reflects that the PCM group has a 10 % reduction in risk, relative to the comparison group, of being in the high Alcohol severity category at 6 months. Confidence intervals and p values, however, show that none of these differences are significant either at 6 or 12 months. The next two columns show that the likelihood of being in the high severity group, for any outcome measure, did not differ by group when averaged across all time points (Group P-Value), and that there were no significant Group by Time interactions. The absence of significant interaction effects suggests that the pattern of change over time did not differ between groups. Repeating these analyses while excluding data for cases where the participant had been incarcerated for all 30 days preceding a follow up interview showed the same pattern of findings.

Given that no Group effects or Group by Time interactions were observed, Time effects were assessed with groups collapsed. Odds Ratios in Table 4 reflect the probability of being in the high severity category, for PCM and comparison participants combined, across time. Tabled data show significant time effects from baseline to 6 months, in the direction of clinical improvement, for ASI measures of Drug, Legal and Psychological problem severity, and for measures of depressive (BDI) and other psychiatric (BSI) symptoms. For example, the baseline to 6 months Odds Ratio for Drug problem severity (0.57) suggests that study participants were 43% less likely to be in high severity category at 6 months, relative to baseline, across both groups (p=.0092). Likewise, the mean difference on BDI scores (−3.33) suggests that these scores decreased by an average of 3.33 points between baseline

and 6 month follow up, across both groups (p<.0001). The absence of additional significant change on any variable from 6 to 12 months suggests that observed differences occurred between baseline and 6 months, but not thereafter. The last column shows the P-value for a global test of time across all 3 points, and suggests that changes observed between baseline and 6 months were generally maintained to 12 months. Last, while differences on the Social composite scores did not achieve significance at either 6 or 12 months, the downward trend across all 12 months was significant. With groups collapsed, significant time effects in the direction of improvement were found for 7 of 10 outcomes measured. Repeating these analyses while excluding data for cases where the participant had been incarcerated for all 30 days preceding a follow up interview resulted in a single change, such that the time effect across all time points for the ASI social composite measure no longer achieved significance.

Arrest and Time to First Arrest

The court management data system recorded arrests for 113 women (61.7%) during the follow up period. The proportion arrested in the PCM group was 65.2% (n=60), while that in the standard probation group was 58.2% (n=53; Fisher's exact = 0.364). Among those arrested at least once, the mean number of arrests was 3.45 (sd = 2.68) in the PCM condition and 3.26 (sd = 2.39) in standard probation (Mann-Whitney = 0.939). Based on Kaplan-Meier survival analysis estimates (Kaplan & Meier, 1958), mean time to first arrest was 7.26 months (se = 0.396) for PCM participants and 7.08 months (se = 0.369) for those in standard probation.

Service Utilization

Service utilization is summarized by group, at each follow up point, in Table 5. Data in the top part of the table reflect services among all women followed. The bottom part of the table reflects services relating to children, and proportions are calculated based on the number of women in each group who had children. Most variables in the table are derived from the TSR measure, which reflects self-report utilization in the 30 days preceding interview. Items indicated by footnote are not part of the TSR and refer to services received during the 6 months preceding interview. There were no significant differences between groups, at either time point or for any service measured, suggesting that PCM and control participants received similar amounts and types of services during the follow up period. Repeating these analyses while excluding data for cases where the participant had been incarcerated for all 30 days preceding a follow up interview showed the same pattern of findings. Repeating these analyses while excluding data for cases where the participant had been incarcerated for all 30 days preceding a follow up interview resulted in a single significant finding, such that 14.6% of comparison participants received medication for psychological problems in the past 30 days, compared to 2% in the PCM group ($p < .05$).

Delivery of the PCM Intervention and Exposure Analysis

At 6 months, 53.6% of PCM participants reported having seen their probation case manager, in a face to face meeting, one or more times in the past 6 months. Some comparison group participants (11.6%) also reported having seen a probation case manager (Fisher's exact, $p < .0001$). At 12 months the proportions were 43.4% in the PCM group and 8.5% in the comparison condition (Fisher's exact, $p < .0001$). Participants in both groups also reported receiving case management services from a non-probation source. At 6 months, 19.4% of PCM participants and 27.3% of controls reported having received other (non-probation) case management (Fisher's exact, $p = 0.3110$). At 12 months these proportions were 21.4% in the PCM group and 26.1% among controls (Fisher's exact, $p = 0.5574$).

In the exposure analysis there were two significant case management effects for the period from 6 to 12 months. First, participants who reported seeing a probation case manager two

or more times during this period were more likely to be in the lower drug severity category than those who did not, both at 6 and 12 months (OR = 0.24, 95% CI = 0.10, 0.58, p = 0.0015). The time by case management interaction (p= .74) shows that this effect did not vary by time. Second, participants who reported seeing a probation case manager two or more times during the period from 6 to 12 months were more likely to be in the lower social severity category than those who did not, both at 6 and 12 months (OR = 0.47, 95% CI = 0.23, 0.95, p = 0.0366). The time by case management interaction (p= .63) shows that this effect also does not vary by time.

Discussion

This study tested the effectiveness of a PCM intervention for drug-involved women offenders. Women assigned to both PCM and standard probation showed change over time in the direction of clinical improvement on 7 of 10 outcomes measured. However, changes observed for the PCM group were not different than those observed for the standard probation group. The groups also did not differ at follow up on the proportion currently incarcerated or enrolled in drug treatment, or on the number and type of services received. Women reporting a minimum exposure to PCM, defined as two or more meetings with the probation case manager in the past 6 months, were more likely to report lower severity of both drug and social problems at both follow up points. These exposure effects may warrant additional consideration. Participants were randomly assigned to PCM vs. standard conditions, but they may arrive in the post hoc exposure categories for other reasons. It seems likely, for example, that participants in the lower drug severity and social severity categories were more compliant with the PCM intervention. Consequently, a conservative interpretation is that these differences are not due to the PCM intervention. At the same time, these findings suggest that a reliably higher dosage of case management services may result in better outcomes for the PCM group, and this offers a direction for further investigation.

Women in both groups were equally likely to be arrested during the one-year follow up period, and time to first arrest was similar in both groups. While results showed no advantage for PCM over standard probation, findings are of interest because PCM combined intensive supervision with drug treatment and case management, because in this model probation officers served as case managers, and because the study was directed to a growing criminal justice population for whom few interventions have been tested and reported. As intervention strategies for drug-involved women in the criminal justice system are developed and implemented, it is important for research to test and give direction and insight as to what may or may not work.

A finding of no differential effect for PCM is consistent with mixed results reported for TASC interventions incorporating case management (Anglin et al., 1999), with negative findings from a controlled trial involving parolees (Inciardi, Martin, & Scarpitti, 1994), and with trials of case management in drug abuse treatment, where results varied by trial (Sorensen et al., 2003). The finding of no differential effects for PCM is also consistent with a prior study of PCM using a quasi-experimental design (Chan et al., 2005). We did not find a PCM advantage for employment outcome as was found for ISP (Turner et al., 1992), or a PCM advantage for drug use outcome as was found for case managed parolees (Longshore et al., 2005), although our measures differed from those studies. As our measure of arrest was not disaggregated to reflect technical violations or property crimes, we cannot comment on effects for type of arrest or charges reported in prior research (Longshore et al., 2005; Turner et al., 1992).

This study tested the PCM intervention in the field setting of a county probation department. Clinical trials research in field settings carries the potential benefit of increased generalizability of findings, but also carries the cost of decreased scientific control (Carroll et al., 2002). The Network intervention, like many community and criminal justice programs, was not a previously tested or manualized intervention. Rather, it was developed by probation staff in response to the CSAT request for applications (Department of Health and Human Services, 1995). The description of the intervention is based on process evaluation interviews conducted with eight staff members and other stakeholders, and review of project documents (Chan et al., 2002, available from first author). A key limitation in this trial concerns the low level of face to face contact with probation case managers, as reported by study participants. While PCM was designed to enable more contact with the client, and although PCM staff reported engaging in a variety other contacts and advocacy activities on behalf of participants (Chan et al., 2002), only 54% of PCM participants reported face to face contact with their probation case manager in 6 months after program entry.

Other possible reasons underlying a finding of no differential outcome between study groups include the use of probation officers as case managers, the ability to access drug treatment independent of the PCM intervention, that the PCM program could refer participants to an array of services but did not have funding set aside to pay for those services, and that the observation period may have been too brief. It may be that the therapeutic and advocacy role of case management is not well matched with the supervision and monitoring role of probation, although findings that higher exposure to PCM was associated with better outcomes suggest that case management by probation officers may have benefit for at least some drug involved women. At a more general level, it may be that what agency and who specifically in that agency is providing services may impact on the results of case management intervention. That participants in both conditions received similar types and amounts of service may reflect a service-rich environment, at least with respect to drug abuse treatment, and one in which the addition of PCM does not translate into additional or more appropriate services. During the period of study recruitment (Fiscal Year 1998–99), the publicly funded drug abuse treatment system in San Francisco had undergone 2 years of funding increases and served over 27,000 drug treatment admissions in a total budget of over 45 million dollars (Guydish et al., 2000). McLellan and colleagues have suggested that having the case management program pay for services, rather than make referral to services reimbursed under general county contracts, may result in greater service utilization (McLellan et al., 1999). Last, while participants were followed for one year post-randomization, this may be a brief period in which to observe group differences for this type of intervention or for this population, and it is possible group differences may emerge after groups experienced longer periods at risk in the community.

Outcome measures used in this study were based on self-report, with the exception of arrest records. If respondents under-reported alcohol and drug use at follow-up, the impact would be to make both interventions appear more effective. Under-reporting would not affect the conclusion that outcomes achieved in each group were similar, unless there was differential under-reporting by condition. Self-report measures of drug use have been shown to be valid (Barbor, Brown, & Del Boca, 1990; Maisto, McKay, & Connors, 1990) and reliable (Sobell, Kwan, & Sobell, 1995; Weatherby, Needle, Cesari, Booth, et al., 1994). Interviews were confidential and there were no consequences of reporting drug abuse, two conditions that increase validity of self-report (Kosten, Gawin, & Schumann, 1988). Incarceration in this study was also measured by self report, using an ASI question that asks respondents on how many of the past 30 days they were incarcerated, and did not distinguish between incarceration in jail versus prison. At 6 month follow up, 39 women had been incarcerated for all of the preceding 30 days, and at 12 months follow up 49 women had been

incarcerated for all of the past 30 days. However, only 11 had been incarcerated for all of the past 30 days at both time points, suggesting lengthy incarceration that may be consistent with a prison sentence (7 Network, 4 Control, Fisher's exact = 0.536). A review of locator and reimbursement records showed that 14 women were tracked through the prison system. Based on this information we believe that most of those women incarcerated during the follow up period were in jail rather than prison.

Similarly, exposure to the PCM intervention was measured using self-report. Meetings of the Probation Case Management team occurred twice per month. These were supplemented by as needed meetings between the assigned Probation Officer and the Supervisor (C. Marsh), to discuss individual cases. However, Probation Officers managed their own calendars and used their own individual calendar systems for arranging client contacts. There was no independent research tracking of contacts between Probation Officers and their assigned cases, and such adherence monitoring would likely support greater exposure to the intervention.

At the same time, this study overcomes some limitations of prior research concerning PCM and similar interventions. The randomized design effectively distributed individual characteristics at baseline, so that confounding due to baseline differences between groups is unlikely. As the PCM intervention had been operational for 9 months prior to recruitment, it is also unlikely that the intervention had not matured sufficiently to achieve full effect. High follow up rates and the absence of differential follow up by group reduce the likelihood of attrition-related bias. That similar proportions of participants in both conditions were incarcerated, or enrolled in substance abuse treatment at each follow up, reduces likelihood of bias from these sources. Administrative arrest records, independent of self report, showed no differences between groups and so offer findings consistent with self-report measures.

Improving outcomes for drug-involved women offenders may require a balance of criminal justice supervision and access to treatment and other services, like that offered in TASC interventions, California's proposition 36, or drug court models. Guidance for practitioners and policy makers working in this area, based on findings reported here, is that moderate levels of treatment access and probationary supervision may not be sufficient to develop significantly improved outcomes. Specific strategies, such as supervisory monitoring, automated reminders, or other staff supports may be needed to monitor delivery of intensive supervision models and ensure that participants receive the intended level of supervision. Increased levels of service provision or service linkage may also be needed to ensure that participants receive intended drug abuse treatment and related services. In this study, and for any follow up time point, 30% to 40% of women were enrolled in drug treatment, about half of those in the PCM condition reporting seeing their probation case manager one or more times in 6 months, and fewer than 20% reported a recent urinalysis test for drug use. Rates of employment or participation in school or training ranged from under 10% to 27% depending on group and time point, suggesting that a greater focus on employment and skills development may strengthen interventions for this population. Implications of study findings are that case management efforts based on reduced caseloads, specialized probation officer training, and efforts to increase contact between probation officer and probationer may not be effective, or may require higher rates of both drug treatment and probationary supervision, as well as other services, in order to be effective.

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Table 1

Participant Demographic Characteristics at Baseline (N=183)

	Probation Case Management (n= 92)	Standard Probation (n= 91)	P value*
Age (Mean, SD)	35.4 (8.6)	34.0 (9.7)	.2840
Years of education (Mean, SD)	11.9 (2.0)	11.2 (2.2)	.0123
Ethnicity (%, n)			.2987
African-American	52.2 (48)	62.6 (57)	
White	20.7 (19)	19.8 (18)	
Latina	7.6 (7)	7.7 (7)	
Asian	5.4 (5)	1.1 (1)	
American Indian	3.3 (3)	4.4 (4)	
Other	10.9 (10)	4.4 (4)	
Major Problem Drug (%, n)**			.3433
Alcohol	7.7 (7)	5.6 (5)	
Heroin, other opiates	24.2 (22)	22.5 (20)	
Amphetamines	2.2 (2)	4.5 (4)	
Cannabis	9.9 (9)	9.0 (8)	
Cocaine	27.5 (25)	39.3 (35)	
Alcohol + Drug	3.3 (3)	5.6 (5)	
Polydrug	25.3 (23)	13.5 (12)	
History of Injection Drug Use, Yes (%, n)	26.1 (24)	19.8 (18)	.3808
History of Incarceration, Yes (%, n)	88.0 (81)	83.5 (76)	.4050
On Probation or Parole, Yes (%, n)	80.2 (73)	74.4 (67)	.3792
Prior Treatment Episodes (Mean, SD)	5.7 (11.9)	5.5 (9.9)	.4992
Currently pregnant (%, n)	3.3 (3)	5.5 (5)	.7204
Median number of pregnancies	3	3	.8827
Median number of biological children	1	2	.4018
Lifetime history of sexual abuse (%, n)	39.1 (36)	33.0 (30)	.4423
Lifetime history of physical abuse (%, n)	70.7 (65)	59.3 (54)	.1227

* Mean and median comparisons were made using Mann-Whitney tests. Proportions were compared using Fisher's exact test.

** Self-report based on past 30 days. Two participants had missing data. Four women reported no major drug problem.

Table 2

Comparison of Outcome Measures at Baseline (n=183)

Outcome Measure	Probation Case Management (n=92)	Standard Probation (n=91)	p value*
ASI Composite Scores(% high severity)			
Alcohol**	19.8%	19.8%	1.000
Drug**	50.5%	51.6%	1.000
Employment	78.3%	81.1%	.7137
Legal	58.9%	58.9%	1.000
Medical	47.8%	43.3%	.5554
Psychological	47.3%	45.6%	.8819
Social	36.3%	39.6%	.7601
BDI (Mean, SD)	14.6 (9.1)	14.6 (10.6)	.5240
BSI (Mean, SD)	0.91 (0.67)	0.95 (0.79)	.9794
Social Support (Mean, SD)	40.8 (10.8)	40.7 (11.3)	.9310

* Comparisons were made using Fisher's exact test for dichotomous and Mann-Whitney Test for continuous variables.

** Women who were incarcerated 15 or more of the past 30 days were asked to respond to Drug and Alcohol questions in terms of the most recent 30 day period when they were actively using drugs and/or alcohol.

Table 3

Analysis of Group Differences and Group by Time Interactions (N=183)*

	At 6 months		At 12 months			
Measure	**Odds Ratio**	**P-value**	**Odds Ratio**	**P-value**	**Group P-value**	**Group xTime P-value**
Alcohol	0.90 (0.40, 2.04)	.8000	1.41 (0.63, 3.14)	.4019	.7743	.6833
Drug	1.21 (0.60, 2.42)	.5953	0.64 (0.32, 1.27)	.2004	.6489	.3514
Employment	1.21 (0.53, 2.74)	.6540	1.16 (0.52, 2.58)	.7236	.8221	.8487
Legal	1.97 (0.91, 4.27)	.0853	0.57 (0.25, 1.31)	.1843	.8675	.0880
Medical	1.27 (0.61, 2.63)	.5276	1.53 (0.57, 4.08)	.3976	.2374	.9112
Psychological	0.95 (0.45, 2.02)	.8985	0.77 (0.31, 1.94)	.5821	.7783	.7651
Social	1.15 (0.56, 2.36)	.7130	0.49 (0.22, 1.09)	.0797	.3290	.2322

	At 6 months		At 12 months			
Measure	Mean Difference ** (95% CI)	P-value	Mean Difference (95% CI)	P-value	Group P-value	Group xTime P-value
BDI	0.81 (−2.33, 3.96)	.6129	−2.19 (5.96, 1.58)	.2551	.7318	.1830
BSI	−0.04 (−0.26, 0.18)	.7287	−0.22 (−0.46, 0.03)	.0801	.2751	.2670
Social Support	0.71 (−3.63, 5.05)	.7487	2.90 (−0.99, 6.78)	.1438	.4065	.3941

* Note: Data reported in Table 3 include all participants. In a re-analysis excluding 7 women who were not in county jail at the time of initial screening, two significant findings emerged at 12 months. There was a group by time interaction for the Drug composite, such that the Network group was more likely to be in the high severity category at 6 months and in the low severity category at 12 months. For the Social composite score, the Network group was less likely to be in the high severity group at 12 months. In this secondary analysis, all Odds Ratios fell within the range of the confidence intervals reported above.

** Difference (probation case management – comparison) in Least Squares Means from mixed model with group, time and group by time effects.

Table 4

Analysis of Changes Over Time Collapsed Across Groups (N=183).

	Baseline to 6 months		**6 months to 12 months**		**All Times**
Measure	**Odds Ratio**	**P-value**	**Odds Ratio**	**P-value**	**P-value**
Alcohol	1.09 (0.68, 1.72)	.7221	0.99 (0.58, 1.69)	.9741	.9203
Drugs	0.57 (0.38, 0.87)	.0092	0.92 (0.60, 1.43)	.7135	.0065
Employment	0.57 (0.32, 1.02)	.0581	0.75 (0.45, 1.25)	.2636	.0136
Legal	0.25 (0.16, 0.40)	<.0001	0.69 (0.40, 1.20)	.1898	<.0001
Medical	0.76 (0.49, 1.16)	.2094	1.06 (0.56, 2.00)	.8524	.3963
Psychological	0.58 (0.39, 0.86)	.0072	0.94 (0.56, 1.59)	.8201	.0037
Social	0.80 (0.52, 1.23)	.3093	0.64 (0.40, 1.06)	.0833	.0096
	Baseline to 6 months		6 months to 12 months		All Times
Measure	Mean Difference * (95% CI)	P-value	Mean Difference (95% CI)	P-value	P-value
BDI	−3.33 (−4.98, −1.68)	<.0001	0.34 (−1.26, 1.95)	.6762	.0004
BSI	−0.19 (−0.30, −0.07)	.0017	0.42 (−.08, 0.17)	.5089	.0043
Social Support	−0.36 (−2.58, 1.86)	.7505	1.06 (−1.14, 3.25)	.3437	.6238

* Difference (6 mo - baseline or 12 mo – 6 mo) in Least Squares Means from mixed model with group, time and group by time effects.

Table 5

Comparison of Service Utilization Between Groups at each Time Point*

	Six Months		Twelve Months	
	E (n=69)	C (n=69)*	E (n=76)	C (n=71)
	% Reporting		% Reporting	
Hospitalized for medical problems	***1.4%***	***1.5%***	***1.3%***	***7.0%***
Paid for working	11.6%	17.6%	17.3%	**26.8%**
Enrolled in school or training	15.9%	7.4%	14.7%	**21.1%**
Received medication for drug detoxification	5.8%	2.9%	5.3%	**4.2%**
Received medication to maintain/stabilize drug use	4.3%	5.9%	2.7%	**7.0%**
Received urinalysis test for drug use	15.9%	13.2%	17.3%	**14.1%**
Received medication for psychological problems	5.8%	13.2%	6.7%	**9.9%**
Visited emergency room**	31.3%	20.9%	28%	**33.8%**
Received dental care**	**44.9%**	**46.4%**	**35.5%**	**42.3%**
	Mean (SD)		Mean (SD)	
Number of days received medication for medical problem	***6.56 (10.72)***	***7.07 (11.21)***	***5.49 (10.53)***	***4.79 (9.20)***
Number of other medical services	3.83 (7.28)	4.48 (11.23)	3.13 (7.02)	**2.70 (8.93)**
Number of days received inpatient alcohol or drug treatment	5.85 (11.23)	6.9 (12.28)	4.37 (10.18)	**2.56 (7.88)**
Number of other alcohol treatment services	1.23 (2.88)	1.66 (4.34)	2.24 (5.62)	**2.08 (6.31)**
Number of other drug treatment services	5.41 (11.43)	6.97 (14.53)	5.65 (11.84)	**4.10 (9.10)**
Number of other employment services	0.94 (3.74)	0.96 (4.18)	1.89 (5.07)	**1.37 (4.43)**
Number of legal services	1.48 (2.71)	1.71 (4.20)	1.44 (2.88)	**0.91 (1.24)**
Number of other psychological or family counseling services	**2.19 (6.10)**	**1.85 (3.52)**	**3.09 (8.16)**	**1.46 (3.06)**
Women with children	*(n=48)*	*(n=52)*	*(n=54)*	*(n=53)*
	% Reporting		% Reporting	
Mothers living with children	***14.6%***	***15.4%***	***16.7%***	***7.5%***
Participated in parenting classes***	23.5%	20.8%	20.8%	**17.0%**
Received counseling about conditions of reunification***	**10.4%**	**7.8%**	**15.1%**	**13.2%**

* Mean test calculated using Mann Whitney, proportions tested using Fisher's exact.

** Sample size varies from 67 to 69 per variable due to missing data.

*** Question refers to past 6 months. All other questions in the table refer to past 30 days.