Methadone Maintenance vs 180-Day Psychosocially Enriched Detoxification for Treatment of Opioid Dependence
A Randomized Controlled Trial

Karen L. Sees, DO
Kevin L. Delucchi, PhD
Carmen Masson, PhD
Amy Rosen, PsyD
H. Westley Clark, MD
Helen Rohillard, RN, MSN, MA
Peter Banys, MD
Sharon M. Hall, PhD

IN 1997, THE MOST RECENT YEAR FOR which data are available, treatment program admissions for opioid dependence surpassed admissions for cocaine abuse in the United States. Asheroin use resurfaces, evaluation and improvement of the treatment of opioid abuse are increasingly urgent needs. Methadone maintenance treatment (MMT) has been shown to improve life functioning and decrease heroin use, criminal behavior, drug use practices, such as needle sharing, that increase human immunodeficiency virus (HIV) risk; and HIV infection. However, variations in efficacy have been reported, and high illicit drug use rates in those undergoing treatment have been observed.

Most data about MMT efficacy are from program evaluation efforts, including the Drug Abuse Reporting Project, the Treatment Outcome Prospective Study, and a nationwide study completed by the Department of Veterans Affairs, all of which reported reduction in drug use and criminality following treatment.

Context Despite evidence that methadone maintenance treatment (MMT) is effective for opioid dependence, it remains a controversial therapy because of its indefinite provision of a dependence-producing medication.

Objective To compare outcomes of patients with opioid dependence treated with MMT vs an alternative treatment, psychosocially enriched 180-day methadone-assisted detoxification.

Design Randomized controlled trial conducted from May 1995 to April 1999.

Setting Research clinic in an established drug treatment service.

Patients Of 858 volunteers screened, 179 adults with diagnosed opioid dependence were randomized into the study; 154 completed 12 weeks of follow-up.

Interventions Patients were randomized to MMT (n = 91), which required 2 hours of psychosocial therapy per week during the first 6 months; or detoxification (n = 88), which required 3 hours of psychosocial therapy per week, 14 education sessions, and 1 hour of cocaine group therapy, if appropriate, for 6 months, and 6 months of (non-methadone) aftercare services.

Main Outcome Measures Treatment retention, heroin and cocaine abstinence (by self-report and monthly urinalysis), human immunodeficiency virus (HIV) risk behaviors (Risk of AIDS Behavior scale score), and function in 5 problem areas: employment, family, psychiatric, legal, and alcohol use (Addiction Severity Index), compared by intervention group.

Results Methadone maintenance therapy resulted in greater treatment retention (median, 438.5 vs 174.0 days) and lower heroin use rates than did detoxification. Cocaine use was more closely related to study dropout in detoxification than in MMT. Methadone maintenance therapy resulted in a lower rate of drug-related (mean [SD] at 12 months, 2.17 [3.88] vs 3.73 [6.86]) but not sex-related HIV risk behaviors and in a lower severity score for legal status (mean [SD] at 12 months, 0.05 [0.13] vs 0.13 [0.19]). There were no differences between groups in employment or family functioning or alcohol use. In both groups, monthly heroin use rates were 50% or greater, but days of use per month dropped markedly from baseline.

Conclusions Our results confirm the usefulness of MMT in reducing heroin use and HIV risk behaviors. Illicit opioid use continued in both groups, but frequency was reduced. Results do not provide support for diverting resources from MMT into long-term detoxification.
Despite such evidence that MMT is a useful treatment for opioid dependence, it remains controversial because of the indefinite provision of a dependence-producing medication. An effective alternative treatment that did not involve indefinite opioid use would be a valuable addition to the limited array of options available to treat heroin dependence.

Short-term methadone detoxification treatment, usually 21 days in duration, was proposed as an alternative to MMT but had poor retention and high relapse rates.\(^9-11\) Long-term detoxification (up to 180 days) was approved in 1989 as a treatment option for opioid-dependent individuals who either do not meet the federal guidelines for MMT or who reject this treatment.\(^12\)

The present study was done to determine whether 180-day methadone-assisted detoxification (M180), when enriched with intensive psychosocial services and aftercare, could provide an efficacious alternative to MMT. Data indicate that psychosocial services increase methadone treatment efficacy.\(^13,14\) We reasoned that adding such services to M180 would provide a reasonable alternative to MMT.

If M180 exceeded or matched MMT in efficacy, it might provide a viable alternative treatment. On the other hand, if M180 did not equal MMT in efficacy, this study would provide additional and convincing evidence for the value of MMT.

**METHODS**

**Participants**

The study was publicized by notices, word-of-mouth, and written information. Participants met *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition (DSM-III-R)* criteria for a diagnosis of opioid dependence and had an initial urine screening test result positive for an opioid other than methadone and negative for methadone. Potential participants were excluded if they had medical conditions that contraindicated methadone treatment or a psychiatric condition that interfered with treatment, were enrolled in substance abuse treatment, had been in a methadone treatment program within the previous week or were in the follow-up phase of a previous methadone detoxification research protocol, could not be expected to remain in the study for 12 months, did not have signs of opioid withdrawal on 3 occasions, or were younger than 18 years. Women of childbearing age were required to be practicing birth control. A pregnancy test was administered, and those pregnant or breastfeeding were excluded. Participant disposition from initial contact to trial completion is shown in Figure 1.

The research took place at the San Francisco Veterans Affairs Medical Center, San Francisco, Calif. Veterans were not eligible because MMT is available on request for clinically appropriate veterans at the same site. The study was approved by the University of California, San Francisco, Committee on Human Research.

**Assessments**

Participants were assessed at baseline and monthly for 12 months. A urine specimen was collected at each assessment.

During the first 6 months, urine samples were collected weekly from participants in both study groups. In the second 6 months, 1 urine specimen was collected monthly in the M180 group and weekly in the MMT group. The differential collection of urine specimens during the second 6 months in the 2 groups reflected the anticipated difficulty of obtaining weekly urine specimens from participants in the M180 group, who no longer had the incentive of obtaining methadone to encourage them to return to the clinic. In both groups during both 6-month blocks, 1 urine sample per month from each participant was selected for data analysis.

Urine specimens were analyzed by enzyme-multiplied immunoassay technique for the presence of cocaine, heroin, amphetamines, barbiturates, benzodiazepines, tetrahydrocannabinol, and methadone.

**Outcome Measures**

Opioid use was coded as negative if the participant indicated no illicit opioid use in the last 30 days and the urine screening test result was negative for opioids other than methadone. Cocaine use was coded as negative if the participant indicated no cocaine use in the last 30 days and the urine screening test result was negative for cocaine.

The Addiction Severity Index (ASI)\(^8,15\) assesses functioning in employment, drug use, alcohol use, legal, family, and psychiatric problem areas. It was administered monthly by research interviewers.

The computerized Diagnostic Interview Schedule\(^16-18\) was administered at baseline. We obtained *DSM-III-R* lifetime diagnoses for alcohol and drug abuse or dependence disorders, posttraumatic stress disorder, major depressive disorder, dysthymic disorder, and antisocial personality disorder.
The Risk of AIDS Behavior (RAB) scale assesses drug use and sexual behaviors that increase risk for HIV infection over a 6-month period. It was administered at enrollment and 6 and 12 months.

The Treatment Services Review (TSR) is a structured interview that provides information on the type and number of services received in each ASI problem area. We developed 2 parallel forms, 1 for services received from the research program (in-program) or from an outside provider (out-of-program). The TSR was scored by summing the number of services received in-program and out-of-program separately.

**Enrollment**

Individuals who met screening criteria, gave written informed consent, and completed enrollment procedures were further evaluated by medical history and physical examination. If eligibility criteria were met, participants completed a baseline assessment. They then came to the clinic on the day before the admission day to provide a urine specimen. Those who returned the following day in opioid withdrawal were stratified by sex and ethnicity, randomly assigned from stratified blocks to either M180 or MMT, and began treatment. The randomization assignments were generated via computer software by the project statistician using varying block sizes known only to the statistician and were kept in sealed envelopes.

Participants in both groups were required to attend an HIV risk reduction education class and a session describing the program. They were given a detailed community resource manual and appropriate referrals.

**Follow-up**

Research interviewers located and assessed participants. Individuals who missed appointments were contacted by telephone and mail. When necessary, interviewers used contact information to find participants and interview them in the community. Interviews took 35 to 90 minutes to complete. Respondents were paid $15 for each of the first 5 interviews, $35 for assessments occurring in months 6 through 11, and $50 for the 12-month interview. If participants completed all assessments for months 6 through 11, a $50 bonus was given at 12 months; thus, participants could earn $100 for the final interview. To increase the probability of locating participants, participants were paid $20 for verified changes in locator information.

**Treatment**

In both groups, the initial methadone dosage was 30 mg/d, increased to 80 mg/d within the first 3 treatment weeks. The maximum methadone dosage was 100 mg/d, reached by day 44. Participants could be evaluated for an increase in methadone dosage at any time if the current dosage was less than 100 mg/d or for a lower dosage if the participant had consistent opioid-free urine screening test results. Methadone dosages were adjusted based on test results. Breath tests for alcohol content were conducted if alcohol intoxication was suspected.

Dosing occurred 7 days a week, with take-home medication provided on holidays. Participants who missed medication for 3 consecutive days were reevaluated before restarting treatment. Participants who missed medication for 7 consecutive days were discharged from treatment.

**Counselors**

Counselors had master’s degrees in social work or behavioral sciences and a minimum of 4 years of counseling experience and were supervised by a psychiatrist and psychologist. The same staff treated patients in both groups. Assessments were conducted by research interviewers.

**Early Discharge**

Early discharge occurred if a participant violated program rules (eg, criminal behavior on hospital grounds), failed to attend treatment program activities, requested discharge or transfer, or was incarcerated.

**Methadone Maintenance**

In the MMT group, participants were eligible for 14 months of methadone maintenance, followed by a 2-month detoxification. Fourteen months of maintenance were provided to assess the effects of maintenance (at month 12) before the potential psychological effects of impending detoxification. Participants were required to attend 1 hour per week of substance abuse group therapy for the first 6 months of maintenance and 1 hour per month of individual therapy. After the first 6 months, group attendance was optional. Participants who failed to comply with treatment requirements were discharged.

Twenty-four MMT participants were discharged for failure to attend clinic or comply with program rules. Eleven were jailed, 1 elected a self-taper, and 1 transferred to another program. Of the 24 discharges, 15 applied for and were readmitted at least once.

**180-Day Methadone Detoxification**

In M180, participants were eligible for 14 months of substance abuse treatment. During months 1 through 6, 120 days of induction or maintenance were followed by 60 days of dosage reduction. During the first 6 months of treatment, participants were required to attend 2 hours per week of substance abuse group therapy, 1 hour per week of cocaine group therapy if cocaine was noted on their admission urine screening test result and 2 subsequent screening test results (continued attendance was required until urine specimens tested cocaine-free for a month), a series of 14 weekly 1-hour substance abuse education classes, and weekly individual therapy sessions.

During months 7 through 14, participants were offered 8 months of aftercare (nonmethadone) treatment that included weekly individual and group psychotherapy and liaison services with the criminal justice system, medical clinics, and social service agencies.

Forty M180 participants were discharged for failure to attend clinic or comply with program rules. Ten were jailed and 6 transferred. Most discharges were participants who failed to appear for the last few detoxification doses. Participants who failed to comply with treatment recommendations or re-
quested early detoxification were not eligible to restart methadone treatment. However, they were eligible to receive nonmethadone substance abuse treatment, and 14 did so.

**Statistical Methods**

Sample size was based on a type I error rate of .05, a type II error rate of .20, nondirectional testing, and effect sizes found in relevant literature and pilot data. Analyses were based on an intent-to-treat model with all collected data used in analyses—complete-case-only analyses were not used.

Treatment retention was the number of days between study enrollment and the last day a participant received any psychosocial service. Heroin and cocaine use was measured by self-report of abstinence or use, with abstinence confirmed by the monthly urinalysis screening tests. For participants who had provided more than 1 urine specimen per month, the specimen collected nearest to the interview (within 4 days before or after the scheduled monthly assessment) was tested.

The RAB subscale scores assessing HIV-related drug and sexual risk behaviors over the past 6 months served as measures of HIV risk behaviors. The number of times a participant reported using a needle to inject drugs in the week before the assessment was used as a second indicator of drug-related HIV risk behavior. Psychosocial functioning was determined by ASI composite scores in 5 problem areas: psychiatric, family, legal, employment, and alcohol use. Treatment services used, both in-program and out-of-program, were assessed using the TSR.

Retention in treatment was tested using Kaplan-Meier survival estimates and a Wilcoxon signed rank test to compare the groups. For all other hypotheses, a treatment group by assessment generalized linear model was the prototypical model. While all participants were scheduled for monthly assessments, the actual time they were interviewed varied around the scheduled date by 7 days. In the data-analysis models, the assessment point (days from enrollment) was treated as a continuous time-varying covariate. Study participants dropped out of treatment and from assessment interviews over time. The resulting missing data were not imputed; rather, the models used all observed data at each assessment for parameter estimation. Tests were based on the marginal effects using the generalized estimating equation approach with a 1-step autoregressive covariance structure. SAS version 6.12, GENMOD procedure (SAS Institutes, Cary, NC) was used to estimate and test all models. For models with a dichotomous outcome (eg, drug use), a binomial distribution with logit link function was used; for counts, a Poisson distribution with log-link function was used ($\alpha = .05$ for all tests).

**RESULTS**

**Demographic, Drug Use, and Diagnostic Characteristics**

As shown in Table 1, there were no significant differences between groups at baseline for demographic, drug use, diagnostic, HIV-risk, or psychosocial functioning variables, with 1 exception: alcohol abuse or dependence ($\chi^2 = 5.54; P = .02$).

**Table 1.** Demographic Characteristics, Drug Use, and Lifetime Psychiatric Diagnosis by Treatment Condition

<table>
<thead>
<tr>
<th>Characteristic or Diagnosis</th>
<th>Methadone-Assisted Detoxification (n = 88)</th>
<th>Methadone Maintenance Treatment (n = 91)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, mean (SD), y</td>
<td>39.4 (7.91)</td>
<td>39.4 (8.57)</td>
</tr>
<tr>
<td>Men</td>
<td>53 (60)</td>
<td>52 (57)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>46 (50)</td>
<td>46 (50)</td>
</tr>
<tr>
<td>African American</td>
<td>23 (26)</td>
<td>31 (34)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>15 (17)</td>
<td>8 (9)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (5)</td>
<td>6 (7)</td>
</tr>
<tr>
<td>High school education</td>
<td>69 (78)</td>
<td>64 (70)</td>
</tr>
<tr>
<td>Employed</td>
<td>42 (48)</td>
<td>42 (46)</td>
</tr>
<tr>
<td>Married</td>
<td>18 (20)</td>
<td>19 (21)</td>
</tr>
<tr>
<td>Living situation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With family or friends</td>
<td>74 (84)</td>
<td>76 (84)</td>
</tr>
<tr>
<td>Alone</td>
<td>10 (11)</td>
<td>9 (10)</td>
</tr>
<tr>
<td>No stable living arrangements</td>
<td>4 (5)</td>
<td>4 (4)</td>
</tr>
<tr>
<td>Controlled environment</td>
<td>0 (0)</td>
<td>2 (2)</td>
</tr>
<tr>
<td><strong>Drug Use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heroin use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years, mean (SD)</td>
<td>15.7 (9.26)</td>
<td>16.6 (9.42)</td>
</tr>
<tr>
<td>Grams/wk</td>
<td>6.8 (4.73)</td>
<td>7.2 (8.65)</td>
</tr>
<tr>
<td>Lifetime incarceration, mo</td>
<td>54.8 (66.59)</td>
<td>54.0 (74.52)</td>
</tr>
<tr>
<td>Illegal income in past 30 d, mean (SD), $</td>
<td>1696 (2276)</td>
<td>1353 (1659)</td>
</tr>
<tr>
<td>Employment income in past 30 d, mean (SD), $</td>
<td>926 (1299)</td>
<td>786 (1210)</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posttraumatic disorder</td>
<td>26 (30)</td>
<td>27 (30)</td>
</tr>
<tr>
<td>Major depression</td>
<td>23 (26)</td>
<td>16 (18)</td>
</tr>
<tr>
<td>Dysthymic disorder</td>
<td>10 (11)</td>
<td>9 (10)</td>
</tr>
<tr>
<td>Antisocial personality disorder</td>
<td>32 (36)</td>
<td>32 (35)</td>
</tr>
<tr>
<td>Alcohol abuse or dependence</td>
<td>61 (69)</td>
<td>47 (52)†</td>
</tr>
<tr>
<td>Cocaine abuse or dependence</td>
<td>44 (53)</td>
<td>45 (49)</td>
</tr>
<tr>
<td>Nicotine dependence</td>
<td>62 (70)</td>
<td>72 (79)</td>
</tr>
</tbody>
</table>

*Data are presented as number (percentage) unless otherwise indicated. $P^* = .02$.  

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The M180 participants were more likely to be diagnosed as having an alcohol abuse or dependence disorder. Alcohol disorder was not a significant predictor of any outcome variable. Comparison of baseline values of outcome measures among participants who dropped out before the final assessment vs those who remained produced only 1 significant difference: dropouts had lower mean RAB drug risk scores (P = .05).

Across groups, cocaine use at enrollment was nonsignificantly related to less time in treatment (P = .09). Also, the greater the percentage of cocaine positive assessments, the fewer the days in treatment (P = .02), an association that was significantly stronger in the M180 (r = 0.35; P < .001) than in the MMT group (r = 0.06; P = .59).

**Methadone Dose During Treatment**

To compute the average methadone dose received by each participant, we excluded doses before day 17 (the induction phase) and, for the M180 group, doses received after day 120 (the taper phase). Also excluded were doses taken under an early taper (eg, a taper due to rule violations) and clinic-withheld doses. We assumed that unobserved doses such as take-home or hospital inpatient doses were taken as scheduled. Eight individuals who participated only in the induction phase (4 in each group) were omitted. Mean methadone dose in the 2 groups did not differ (M180 group [n = 84], mean [SD], 85.3 [12.01] mg/d; MMT group [n = 87], mean [SD], 86.3 [12.88] mg/d; t(170), 0.52; P = .60).

The number of services used in each group was computed to determine whether, as planned, M180 participants did receive more in-program services than MMT participants during the first 6 months of the study. As shown in Figure 2, group, assessment, and group-by-assessment effects for the TSR in-program score were all statistically significant. The significant interaction reflected the fact that the M180 group used more services during months 1 through 4 than the MMT group, and fewer during months 5 through 12. Assessment and group-by-assessment effects were significant for out-of-program scores, but the group main effect was not. Participants in the 2 groups did not differ markedly in out-of-program services during the first 5 months of the study, but beginning at month 6, the M180 participants reported more use of out-of-program services.

**Retention**

As shown in Figure 3, group time in treatment differed. The MMT participants remained in treatment longer (median days, 438.5; 95% confidence interval [CI], 413.4-441.5) than the M180 participants (median days, 174.0; 95% CI, 161.1-181.1). The 2 conditions also differed in the proportion of participants available at each monthly assessment (Wilcoxon χ², 8.58; P = .01). Sample size available at each monthly assessment declined over time to a low at the month 11 assessment (75/91 MMT [82.4%] and 52/88 M180 participants [59.1%]). At the month 12 assessment, there were 77 MMT and and 57 M180 participants.

At each time point (t) there was no correlation between the results of the urine screening test for heroin and the probability of the participant being present for assessment (t + 1). There was a negative relationship between the proportion of heroin-positive urine screening test results and the number of days in treatment (r², 0.10; P < .001) that, while statistically significant, explained so little of the variance that it was unimportant for clinical purposes. Given the consistently high levels of continued heroin use and the lack of a lag-1 correlation between heroin use and the probability of dropout, we treated the missing data as random in the sense that they were not related to the unobserved outcome variable.

**Illicit Opioids**

Neither group nor assessment effect was significant for opioid use. Group-by-assessment interaction reached the P < .05 level of significance. As Figure 4 shows, participants in the 2 treatment groups differed little until month 5, when use rates for the M180 group increased markedly and remained greater than that of the MMT group until month 12. Reanalyzing these data under the assumption that the missing data were drug-positive did not produce any important differences from the analysis that
did not impute heroin use. Illicit opioid use rates were greater than 50% for both groups at any assessment.

As a second index of heroin use, we analyzed days of heroin use in the previous month, as reported on the ASI. Effects for assessment, group, and group-by-assessment were significant. Heroin use in both groups markedly decreased from baseline, but the decrease was greater in the MMT group during the last 6 months of treatment (Figure 4).

**HIV Risk Behaviors**

The RAB drug-risk subscale scores indicated a significant group by assessment interaction; at months 6 and 12, the level of HIV drug-risk behavior reported by MMT participants was lower than that reported by M180 participants. Group and assessment main effects were not significant. There were no significant effects on the RAB sex-risk behaviors scale (Table 2).

For the number of times participants reported injecting heroin in the week before each assessment, neither the main effects for group or assessment were significant, but the group-by-assessment interaction was significant and favored less needle use in the MMT group during months 6 through 12.

**Psychosocial Functioning**

No significant effects for group-by-assessment were found for the ASI psychiatric and family composite scores, which were uniformly low across time, or the employment composite score, which was uniformly high. The ASI legal composite score was uniformly low with a mean of 0.20 or less at all assessments. There were no significant assessment or group main effects for legal composite scores, but the assessment-by-group interaction was significant. From 6 months on, the M180 participants reported significantly higher legal composite scores than did the MMT participants, although the magnitude of differences and the low absolute level suggest that the finding may be of little clinical importance.

**Cocaine Use**

Statistically significant differences were found for assessment and assessment by group. During months 4 through 7 and 9 through 12, M180 participants had lower cocaine use rates than MMT participants. Main effects for group were not significant. Interpretation of these data was confounded by differences between the 2 groups in the strength of the relationship between days in treatment and cocaine use, with cocaine users more likely to drop out of M180 than MMT.

There is little basis for assuming that a missing assessment should be counted as positive for cocaine for all missing participants. To examine the stability

![Figure 4. Proportion of Participants Using Heroin and Mean Days of Heroin Use in Previous 30 Days](https://jama.jamanetwork.com/)

Table 2. ASI Composite Scores and Risk of AIDS Behavior Scale at Enrollment, 6 Months, and 12 Months by Treatment Group*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Enrollment Mean (SD)</th>
<th>At 6 Months Mean (SD)</th>
<th>At 12 Months Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M180 (n = 88)</td>
<td>MMT (n = 91)</td>
<td>M180 (n = 60)</td>
</tr>
<tr>
<td>ASI Composite Scores</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>0.17 (0.277)</td>
<td>0.22 (0.336)</td>
<td>0.11 (0.254)</td>
</tr>
<tr>
<td>Employment</td>
<td>0.77 (0.227)</td>
<td>0.81 (0.254)</td>
<td>0.79 (0.248)</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>0.09 (0.145)</td>
<td>0.09 (0.161)</td>
<td>0.08 (0.137)</td>
</tr>
<tr>
<td>Drug use</td>
<td>0.37 (0.092)</td>
<td>0.37 (0.098)</td>
<td>0.27 (0.146)</td>
</tr>
<tr>
<td>Legal status</td>
<td>0.19 (0.213)</td>
<td>0.20 (0.202)</td>
<td>0.16 (0.200)</td>
</tr>
<tr>
<td>Family or social status</td>
<td>−0.03 (0.192)</td>
<td>−0.06 (0.178)</td>
<td>−0.12 (0.154)</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>0.15 (0.179)</td>
<td>0.15 (0.171)</td>
<td>0.15 (0.222)</td>
</tr>
<tr>
<td>Risk of AIDS Behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injection risk</td>
<td>6.00 (6.436)</td>
<td>6.51 (6.694)</td>
<td>4.07 (5.792)</td>
</tr>
<tr>
<td>Sexual risk</td>
<td>4.26 (2.971)</td>
<td>5.00 (3.670)</td>
<td>3.69 (3.070)</td>
</tr>
</tbody>
</table>

*ASI indicates Addiction Severity Index; AIDS, acquired immunodeficiency syndrome; M180, 180-day methadone-assisted detoxication; and MMT, methadone maintenance treatment. Enrollment N ranges from 86 to 88 for M180 and from 86 to 91 for MMT; 6-month N ranges from 54 to 60 for M180 and from 68 to 77 for MMT.
of differences between group and cocaine use given the missing assessment data, we reestimated the statistical model by setting the missing assessments to cocaine-positive use under 3 assumptions: positive enrollment cocaine test, more than half of assessments cocaine-positive, and any assessment cocaine-positive. Under all 3 assumptions, the difference between the groups was no longer significant, suggesting that the difference initially observed resulted from the higher probability of cocaine users dropping out of M180 than MMT. At each assessment, only 30% to 50% of participants assessed in either group were abstinent from cocaine.

Alcohol Use
The average ASI alcohol use composite score was low. On a scale from 0 to 1, with 1 the most problematic, mean scores were 0.11 or less at all assessments. There were no significant effects.

COMMENT
Methadone maintenance was found to increase retention and be more effective in decreasing heroin use than M180. Methadone maintenance treatment resulted in a lower level of drug use HIV risk behavior and lower ASI legal composite scores scores during the second 6 months of the assessment period, when provision of methadone to M180 participants had ended. The ASI psychiatric, family, employment, and alcohol use composite scores and the RAB HIV-related sex behavior subscale score were not affected. Heroin and cocaine use rates were high in both groups over the entire 12-month period. There was evidence that participants using cocaine were more likely to drop out of M180 than MMT.

The rate of continued use of heroin in both groups is of concern. Methadone dosages were adequate by current practice standards. Dosages could reach 100 mg/d if warranted and averaged well over 80 mg/d. Too low a methadone dose, therefore, does not appear to be the reason for the failure of either treatment to markedly curtail heroin use. Persistent use may reflect the participants’ goals when they entered treatment—only 50% of the sample reported to us that they had a goal of total abstinence from illicit opioids.

The dropout rate from M180 was high throughout the course of the study. This may reflect more stringent requirements about attendance at psychosocial treatment than in the MMT group. An acceleration in dropout occurred at around 120 days, the point at which methadone dosage began to be decreased in this group.

The M180 group received psychosocial treatment for continued cocaine use; nevertheless, this group failed to suppress cocaine use rates. Psychosocial treatments have been shown to be effective in reducing cocaine use. However, successful treatments were manualized and adapted from psychotherapeutic interventions, rather than the generic drug counseling provided by drug counselors in the present study.

Methadone maintenance treatment was more successful in retaining cocaine users in the treatment system than M180; however, it did not appear to affect the level of cocaine use because the 2 groups did not differ under several reasonable assumptions about cocaine use in participants with missing data.

Neither treatment had a marked effect on psychosocial functioning. It may be that the psychosocial services provided were inappropriate. For example, while most patients were marginally employed, no vocational rehabilitation services were available.

This study has implications for the treatment of opioid dependence. First, improvement is needed. That 50% of participants used an illicit opioid at least once a month is not encouraging. Given that methadone doses were adequate, failure may rest in the realm of psychosocial treatment. Neither program in this study provided extensive legal, employment, family, or psychiatric services. Participants showed little change in these areas. A cost-effectiveness study of the benefits of adding these services to methadone treatment is needed. Second, cocaine use remains a problem in methadone maintenance programs.

While a pharmacological treatment for cocaine dependence has not emerged, there is considerable evidence that cocaine use is responsive to a variety of psychological interventions, including group drug counseling, group-administered cognitive behavior therapy, individual relapse prevention interventions, and contingency management. Such specific, promising interventions need to be integrated into methadone treatment programs for cocaine users.

The generalizability of the results in the current study is limited in that the study represents only 1 clinical trial. The participants were a small subset of those who originally contacted the project and may differ from other methadone maintenance patients in unknown ways. However, the current study does not provide support for diverting resources from methadone maintenance to long-term detoxification, no matter how ideologically attractive the notion of a time-limited treatment for opioid abusers is.

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My task which I am trying to achieve is by the power of the written word, to make you hear, to make you feel—it is, before all, to make you see. That—and no more, and it is everything.
—Joseph Conrad (1837-1924)