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### Title

Linking opioid-dependent hospital patients to drug treatment: Health care use and costs 6 months after randomization.

### Permalink

<https://escholarship.org/uc/item/7qr262wz>

### Journal

Addiction (Abingdon, England), 101(12)

### ISSN

0965-2140

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### Publication Date

2006-12-01

Peer reviewed

RUNNING HEAD: Linking Hospital Patients to Drug Treatment

Linking Opioid Dependent Hospital Patients to Drug Treatment:

Health Care Use and Costs 6-months After Randomization

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Words: 3,676 (exclusive of abstract and tables)

Abstract words: 259

Pages: 25

August 16, 2005

Revised March 2, 2006, May 5, 2006

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**Abstract**

**Aims:** Conduct an economic evaluation of the first 6 months' trial of treatment vouchers and case management for opioid-dependent hospital patients.

**Design:** Randomized clinical trial and evaluation of administrative data.

**Setting:** Emergency department, wound clinic, inpatient units, and methadone clinic in large urban public hospital.

**Participants:** The study randomized 126 opioid-dependent drug users seeking medical care.

**Interventions:** Participants were randomized among four groups. These received vouchers for six months of methadone treatment, six months of case management, both of these interventions, or usual care.

**Findings:** During the first 6 months of this study, 90% of those randomized to vouchers alone enrolled in methadone maintenance, significantly more than the 44% enrollment in those randomized to case management without vouchers ( $p < .001$ ). The direct costs of substance abuse treatment, including case-management, was \$4,040 for those who

received vouchers, \$4,177 for those assigned to case management, and \$5,277 for those who received the combination of both interventions. After 3 months, the vouchers alone group used less heroin than the case-management alone group. The difference was not significant at 6 months. There were no significant differences in other health care costs in the 6 months following randomization.

**Conclusion:** Vouchers were slightly more effective but no more costly than case-management during the initial 6 months of the study. Vouchers were as effective and less costly than the combination of case-management and vouchers. The finding that vouchers dominate is tempered by the possibility that case management may lower medical care costs.

**Key Words:** opioid users, emergency department, case management, voucher, methadone treatment, health care costs

**Linking Opioid Dependent Hospital Patients to Drug Treatment:  
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**INTRODUCTION**

Needle sharing and sexual practices place opioid dependent drug users at high risk for HIV infection, hepatitis B and C, and other infectious diseases (1). Nearly half of opioid users presenting at a public hospital needed care for bacterial infections and 22% for HIV/hepatitis, with most (72%) requiring admission (2). Drug users often delay treatment until their medical problems worsen, increasing the cost of care (3-5).

Although injection drug users have extremely high rates of emergency department usage, (6-8) few are engaged in longitudinal medical care.

The treatment of the medical consequences of heroin addiction in the United States cost 5 billion dollars in 1996, largely due to the cost of HIV/AIDS and hepatitis care (9).

Interventions that identify out-of-treatment drug users in the hospital setting and link them to drug abuse treatment have the potential to reduce these costs.

Case management holds promise as a strategy to link opioid dependent drug users identified in hospital emergency departments to drug abuse treatment. A prospective study provided intensive users of an urban emergency department with 12 months case management services, reducing their health services utilization and problem alcohol and drug use. Compared to the prior year, emergency department visits decreased from 15 to 9, emergency department costs decreased from \$4,124 to \$2,195, and hospital costs decreased from \$8,330 to \$2,786 (10). Others have found that patients randomly

assigned to case management were more likely to enter drug abuse treatment (11, 12). Recent quasi-experimental studies have shown case management to be successful when added to drug abuse treatment programs. For example, McLellan and colleagues (13) found that patients who received clinical case management while in outpatient drug abuse treatment received more services and at the 6 month follow up showed significantly more improvement in alcohol use and other life areas than those who did not receive case management. In a randomized trial of case management for homeless substance abusing veterans, Conrad (14) found that those who received transitional residential care with ongoing case management showed significantly greater improvements in substance use during treatment than those who received a 21-day hospital program with referral to community services. Although randomized clinical trials have shown that case management is effective in linking drug users with treatment, results have been mixed. Studies with negative findings include a study of case management for substance dependent persons with serious mental illness (15) and a study of substance abusers with HIV/AIDS (16).

Vouchers for free treatment have also been used to link active drug users to drug abuse treatment. Several studies have produced positive results in community settings (17, 18). When injection drug users were randomized to coupons for 90 days of treatment, 66% entered methadone maintenance within 2 months, compared to 34% in the control group. However, no test of this strategy has been reported from the hospital setting.

We undertook a randomized trial of both case management and treatment vouchers in a hospital setting. We have already reported that after 6 months, these strategies increased

participant enrollment in methadone maintenance, reducing illicit drug use (19). We now report on economic findings in the first six months of the study. We sought to determine the cost of these interventions compared to usual care. We wished to learn whether either intervention was dominant, that is, if either vouchers or case management yielded better outcomes at lower cost. Finally, we wished to determine if treatment cost were offset by reduced cost use of emergency and inpatient services, and whether this affected our conclusions about treatment dominance.

## **METHODS**

### **Setting and Participants**

Participants were opioid dependent injection drug users recruited from the emergency department, wound clinic, and inpatient units of San Francisco General Hospital, the public hospital serving medically indigent residents of San Francisco, California.

Inclusion criteria were: 18-65 years of age, current use of opiates by injection, a history of at least 2 years of dependence, two treatment failures, and no treatment within the 7 days prior to screening. Individuals were excluded if they could not provide informed consent, were currently in treatment, enrolled in another research study, had a severe medical disorder, were in police custody, were expecting to be incarcerated, or were planning to leave the area. Of the 314 individuals screened, 96 did not meet the inclusion criteria. An additional 82 did not return for the baseline interview, and 10 more participants did not consent to participate, leaving 126 participants to be randomized.

### **Interventions**

Two different interventions were tested. One intervention provided participants with a

voucher for 6 months of standard methadone treatment at no charge. The second intervention provided 6 months of case management services. Participants were randomized using a 2 x 2 factorial design, that is, to one of four groups: voucher alone, case management alone, both interventions, or usual care.

After randomization to the voucher intervention, participants were given an appointment to the methadone clinic. Participants who missed this appointment were allowed to schedule one more intake appointment. Voucher recipients were provided with 3 months of an individualized methadone dose, tapering off for the final 3 months. Each month the participant received at least 50 minutes of counseling from a certified addiction counselor and a random drug test. Individuals were discharged for missing 14 days of treatment, according to clinic policy. When the voucher-funded treatment ended, many participants arranged transfer to another program.

After randomization to case management, the case manager met with the participant and worked to provide linkages to substance abuse treatment, medical care, and social service programs.

### **Measures of Health Care Utilization and Cost**

Utilization and cost data were extracted from the medical, substance abuse, and mental health administrative systems of San Francisco County. Participants were asked at 3 month and 6 month follow-up assessments to report services received from other providers. When participants reported a hospital stay, billed charges were obtained from the hospital. All hospital charges were adjusted with the hospital-wide cost-to-charge ratio. Costs of other participant-reported services were estimated as the average cost of a



similar service provided by County providers.

A visit was defined as a day in which the participant received at least one service from a given provider. Administrative data designated each methadone treatment service as either detoxification or methadone maintenance. We used this designation to distinguish methadone detoxification from long-term methadone treatment.

We determined the total cost of substance abuse treatment, including the cost of case management services provided by the study, the cost of methadone maintenance obtained at the study site that was funded by treatment vouchers, and all other substance abuse treatment costs.

Case managers recorded time spent providing services on behalf of each participant. We estimated the cost of case manager time using an activity log and labor costs, including benefits. Case managers recorded activities on 19 randomly sampled survey dates when the study was actively providing care. The activity log divided effort into mutually exclusive categories, including delivery of case management and other activities. Case management accounted for 71% of the time spent on productive activities, which also included research and other clinical services. We divided total labor cost by the time spent on productive activities to find a cost of \$1.33 per case manager minute. This rate includes the overhead of non-working time (sick-leave and vacation) and general support (time spent on professional development, meetings with clinical supervisor, administration, etc).

Participants provided a few reports of receiving health services in county jail and state prison. Corrections agencies refused to release information on the characteristics of this

care or its cost. As a result, we excluded services received in this setting from our estimates. We also excluded participant-incurred costs, including travel and attendance at self-help groups. We thus adopted the perspective of the health care system.

### **Outcomes Assessment**

The Addiction Severity Index (ASI) (20) was administered at baseline and at 3 and 6 months after randomization. This paper focuses on the ASI item that asked the number of days heroin was used in the previous 30 days.

### **Statistical Analysis**

Economic evaluators are charged with comparing new interventions with standard care. Thus our primary statistical analyses of utilization, cost, and outcomes compared four groups, including one that received standard care.

We compared the uptake of long-term methadone treatment in the groups. We identified individuals who received any long-term methadone treatment (exclusive of treatment characterized by administrative data as detoxification). We determined statistical significance with the chi-square test for differences in proportions.

We compared the utilization and costs incurred by the four groups using non-parametric methods, as we did not want to assume that cost or utilization data are normally distributed. Many utilization observations have zero values (e.g., number of hospital stays). Exceptional events skew cost data. The Kruskal-Wallis rank test was used to test for the significance of differences between groups. Post-hoc comparisons were made using the Mann-Whitney Wilcoxon rank-sum test.

We examined the relationship between group assignment and days of heroin use reported in follow-up assessments. Since observations are not independent, we used a repeated measures analysis, the random effects regression. It includes a person-level error term to account for correlation of observations from the same respondent. The dependent variable was days of heroin use. The independent variables included group assignment, time, and the interaction of group and time.

We took advantage of the factorial study design to test the effect of case management and treatment vouchers on utilization and cost. We used the Wilcoxon test to compare participants in the two case managed groups to those in the non-case managed groups. We also compared participants in the two voucher groups to those who did not receive vouchers.

We had complete administrative data on costs incurred by all participants in the public health care system where they were enrolled. Participants were asked to report care they received outside of this system. These reports were not available for the 14 participants who missed the 3-month assessment, or for the 12 who missed the 6-month assessment. A subsequent health care utilization survey was available to characterize out-of-system costs incurred during the first 6 months of the study for all but 4 participants. We assumed that these 4 participants did not incur any cost outside the county system. We assumed that the ASI item on days of heroin use was missing at random. This method of handling missing values differs from our previously published efficacy findings (19), which dropped observations with missing values.

## RESULTS

The 126 participants were randomly assigned to either vouchers (n = 30), case management (n = 32), vouchers and case management (n = 32), or usual care (n = 32).

[Insert Table 1]

### Entry into Methadone Treatment

Table 1 reports the proportion of each group that received methadone treatment during the first 6 months of the study. A single participant could have received more than one-type of methadone treatment, so the categories of care in this table are not mutually exclusive. Long-term methadone was received by 90% of those randomized to vouchers alone and by 91% of those in the vouchers with case management group. Both were significantly greater than the 44% in the case management alone group who received this care, and the 22% of the usual care group who received it.

Methadone detoxification services were received by 10% of those randomized to vouchers alone and by 19% of those randomized to voucher with case management.

These proportions were significantly smaller than the 47% of the case management alone and 56% of the usual care group that received detoxification care.

Among those randomized to vouchers alone, 97% received some kind of methadone treatment (either detoxification or long-term methadone). In the combined case-management and vouchers intervention group, 91% received this care. These proportions were significantly higher than the 66% in the usual care group. Of those assigned to case-management alone, 72% received treatment, a proportion that was significantly less than the voucher alone group.

[Insert Table 2]

### **Utilization Findings**

Health services utilization is reported in Table 2. The two case management groups received substantial case management services. Participants randomized to case management alone received 72 case manager actions, taking a total of 1,064 minutes. Participants randomized to case management with vouchers received 99 actions, taking a total of 1,271 minutes.

Participants randomized to vouchers alone had a mean of 115 long-term methadone visits during the first 6 months of the study. Participants randomized to vouchers with case management had 114 visits. These means were significantly greater than the 58 visits obtained by participants randomized to case management alone. The usual care group had a mean of 20 methadone visits, significantly fewer visits than the other three intervention groups.

Participants randomized to case management alone or to usual care received significantly more detoxification visits than participants in either of the two voucher groups.

Nevertheless, the two groups that received treatment vouchers received significantly more total methadone visits.

There were no other significant differences in utilization between intervention groups.

[Insert Table 3]

3.3. Cost Findings. Costs incurred by study participants are reported in Table 3.

Participants randomized to vouchers alone received a mean of \$1,546 of all types of methadone treatment services. Those randomized to case management with vouchers received \$1,556 in methadone care. These means were significantly more than the mean of \$970 of methadone care received by individuals randomized to case management alone. The usual care group incurred a mean of \$399 in methadone costs, significantly less than the other groups.

We compared the total substance abuse treatment costs, including the cost of case management services. The \$1,511 cost incurred by the usual care group was significantly less than the other treatment groups (all comparisons with  $p < .001$ ). There was no significant difference between the \$4,177 in treatment cost incurred by those who were randomized to case management alone and the \$4,040 incurred by those randomized to vouchers alone. Participants randomized to both case management and vouchers incurred \$5,277 in treatment costs, significantly more than the voucher group ( $p < .05$ ).

During the 6 months after randomization, there were no significant differences between groups in the cost of medical care services, including emergency department and inpatient services. Health care costs data are skewed by rare events, reducing the power to detect differences. There was a trend for individuals randomized to case management to incur fewer costs.

Participants randomized to case management alone incurred a mean of \$7,400 in total health care costs. Those randomized to the combination of case management and vouchers incurred \$10,411 in health care costs, while participants randomized to vouchers alone incurred \$13,087. There were no significant differences between these

three experimental groups' in total health care cost. The groups that received vouchers the one that received the combination of interventions both incurred significantly more cost than the mean of \$5,620 cost incurred by the usual care group.

### **Case Management Intervention**

We tested the overall effect of the case management intervention by comparing individuals in the two case-managed groups to the remaining participants. Those randomized to case management received an average of 86 case management sessions lasting an average of 14 minutes each, at a total cost of \$1,553 per participant. The case management group received an average of 86 long-term methadone visits, compared to 66 visits in the group that did not receive case management, a difference that was not statistically significant. Those randomized to case management incurred \$4,727 in substance abuse treatment and case management costs, significantly more than the \$2,735 incurred by the comparison group ( $p < .001$ ). There were no other significant differences in health care utilization or costs between groups defined by case management status.

### **Methadone Voucher Intervention**

We evaluated the overall effect of treatment vouchers by comparing participants randomized to the two groups that received vouchers to participants in the other two groups. Participants randomized to treatment vouchers obtained 115 long-term methadone visits, significantly more than the 39 received by the group that was not randomized to vouchers ( $p < .001$ ). The voucher group received an average of less than one detoxification visit, while the group that did not receive vouchers received an average of 7 detoxification methadone visits, a difference that was significant. Those randomized

to treatment vouchers incurred \$4,678 in substance abuse treatment and case management costs, significantly more than the \$2,844 incurred by the comparison group ( $p < .002$ ).

The voucher group had 13 outpatient medical visits during the initial 6 months of the study, significantly more than the 7 visits by the group that did not receive vouchers.

There were no other significant differences in health care utilization between groups defined by vouchers. Participants randomized to vouchers incurred significantly higher total health care costs, \$11,706 per enrollee, compared to \$6,510 to participants who did not receive vouchers ( $p < .01$ ).

[Insert Table 4]

### **Self-Reported Days of Heroin Use**

Table 4 compares drug use status of study participants based on repeated measure (random-effects) regression. Reported values represent the sums of the appropriate regression parameters. Statistical significance was determined from the variance-covariance matrix.

At the 3 month follow-up interview, participants randomized to vouchers alone reported heroin was used on an average of 2.2 of the previous 30 days. This was significantly less than the participants randomized to usual care or case management alone. Participants randomized to vouchers with case management also reported significantly less heroin use than the usual care or case management alone groups.

There were no differences between the four groups at the 6-month interview. Individuals randomized to vouchers alone reported significantly more heroin use at the 6-month



follow up than they did at three months.

## **DISCUSSION**

The voucher strategy was more successful than case management in engaging participants in methadone treatment during the first 6 months of this study. Among participants randomized to receive a voucher for 6 months of methadone treatment without case management, nearly all (90%) obtained some long-term treatment during the first 6 months of this study. These participants obtained an average of 115 long-term methadone visits and incurred \$1,535 in methadone treatment costs. This 90% enrollment rate in this group was significantly higher than the enrollment among those randomized to receive case management without a voucher. Just 44% of this group obtained any long-term methadone treatment (a significantly smaller fraction,  $p < .001$ ). They obtained an average of 58 visits (significantly fewer,  $p < .001$ ) and incurred significantly less long-term methadone treatment cost (\$771,  $p < .001$ ).

Although the voucher strategy was more effective in getting participants enrolled in methadone treatment, total substance abuse treatment costs incurred by those randomized to vouchers were no greater than case management.

While the addition of case management to vouchers added additional cost, it did not significantly improve the rate of treatment uptake, increase the number of long-term methadone visits, or increase total cost of the methadone services that were obtained.

These results suggest that the cost of obtaining treatment is the key factor that limits opioid dependent individuals entry into therapy. Opioid dependent individuals identified in a public hospital were given an appointment to enroll in a methadone treatment at no

cost, and 90% of them availed themselves of this opportunity.

Individuals from this same population, provided with a case manager to help motivate them to seek treatment and to advocate their enrollment in community treatment programs, were able to access long-term methadone treatment at about half of this rate. In the context of a community where publicly funded methadone treatment slots are limited, this suggests that financial barriers are a more important impediment to treatment than ignorance of community resources or the lack of other assistance that a case manager can provide.

Vouchers for free long-term methadone treatment also resulted in better outcomes, but the effect was not sustained. Participants who received vouchers reported significantly less heroin use at the 3-month assessment than the other groups. After 6 months, the groups did not differ. In the interim, the methadone dose had been tapered to prepare participants for discharge from voucher-funded care. Other studies have found that the benefits of 6 months of methadone treatment are not sustained (21).

The study has some limitations. Although 314 opioid dependent individuals were screened, only 126 were randomized (40.1%). The remainder did not meet study eligibility criteria, failed to attend the baseline interview or were unwilling to give informed consent. Those who met eligibility criteria but did not enroll in the study may have availed themselves of treatment if it was offered more immediately, or if it was available without the limitations imposed by research: only a 50% chance of free treatment and required participation in research assessments. Replication of the voucher intervention in other clinical settings might not suffer this same attrition.

Findings from this study may not generalize to settings other than public hospitals, to communities with greater access to treatment, or to patients with different socioeconomic status or drug use patterns. Exclusion of the cost of services received in jail and prison and costs incurred by patients (including self-help groups) understates the economic costs of health services used by study participants.

These results, from the first 6 months of an 18-month long study, suggest that vouchers may dominate case management, providing somewhat better outcomes at no greater direct treatment cost. Vouchers also dominated the combination of both interventions, providing equivalent outcomes at lower cost.

This conclusion must be tempered by the possibility of a different effect of the interventions on health care costs. While there were no significant differences between groups, there was a trend for lower medical care cost in the case managed groups. The longer follow-up now underway may help answer whether case management offsets its extra cost by reducing other health care cost. The longer follow-up will also determine whether participants randomized to case management were retained longer in methadone treatment, a possibility if the case manager helped them secured treatment that lasted beyond the six-month limit on study-provided services.

## Hospital Patients and Drug Treatment

Table 1. Effect of Case Management and Vouchers on Uptake of Opioid Substitution Therapy During First 6 Months Following Randomization

Percent of Participants Randomized to Each Treatment Group Receiving Service

	Usual care	Case Management Only	Voucher Only	Case Management and Voucher
	%	%	%	%
Long-term Methadone at Study Site	15.6% <sup>B,C</sup>	21.9% <sup>D,E</sup>	90.0% <sup>B,D</sup>	90.6% <sup>C,E</sup>
Long-term Methadone at Other Sites	9.4%	25.0%	0.0%	6.3%
Any Long-Term Methadone	21.9% <sup>B,C</sup>	43.8% <sup>D,E</sup>	90.0% <sup>B,D</sup>	90.6% <sup>C,E</sup>
Methadone Detoxification	56.3% <sup>b,C</sup>	46.9% <sup>d,e</sup>	10.0% <sup>b,d</sup>	18.8% <sup>C,e</sup>
Any Methadone Service	65.6% <sup>b,c</sup>	71.9% <sup>d</sup>	96.7% <sup>b,d</sup>	90.6% <sup>c</sup>
Subjects in Group	32	32	30	32

Percentages in same row that share same subscript are significantly different

Capital subscripts denote  $p < .001$ , lower case subscripts  $p < .05$

A=Usual vs. case management

B=Usual vs. voucher

C=Usual vs. both

D=Case management vs. voucher

E=Case management vs. both

F=Voucher vs. both

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Table 2. Mean Count Per Participant of Substance Abuse Treatment and Other Services for Each Intervention Group During the First 6 Months

	Usual care	Case Management Only	Voucher Only	Case Management and Vouchers
Case Management Activities	0 <sup>A,C</sup>	72.5 <sup>A,D</sup>	0.0 <sup>D,F</sup>	99.3 <sup>C,F</sup>
Case Management Services- Minutes	0 <sup>A,C</sup>	1063.8 <sup>A,D</sup>	0.0 <sup>D,F</sup>	1270.9 <sup>C,F</sup>
Long-Term Methadone Maintenance Visits	20.3 <sup>a,B,C</sup>	58.4 <sup>a,d,e</sup>	115.1 <sup>B,d</sup>	113.9 <sup>C,e</sup>
Methadone Detoxification Visits	5.5 <sup>B,c</sup>	8.7 <sup>D,e</sup>	0.1 <sup>B,D</sup>	0.6 <sup>c,e</sup>
Sub-Total, All Methadone Visits	25.8 <sup>a,B,C</sup>	67.1 <sup>a,d,e</sup>	115.2 <sup>B,d</sup>	114.5 <sup>C,e</sup>
Residential Substance Abuse Treatment Stays	0.44	0.56	0.57	0.69
Residential Substance Abuse Treatment Days	9.4	17.1	21.0	16.8
Other Substance Abuse Treatment Visits	2.7	1.4	7.3	6.3
Outpatient Mental Health Care Visits	1.1	2.0	3.9	5.8
Inpatient Mental Health Care Stays	0.03	0.00	0.13	0.09
Inpatient Mental Health Care Days	0.2	0.0	6.2	2.0
Hospital Stays	0.41	0.22	0.53	0.31
Hospital Days of Stay	3.3	0.8	3.9	1.2
Emergency Department Visits	1.2	1.6	1.5	1.1
Outpatient Medical Visits	8.6	6.4	14.1	12.3

Percentages in same row that share same subscript are significantly different

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A=Usual vs. case management

B=Usual vs. voucher

C=Usual vs. both

D=Case management vs. voucher

E=Case management vs. both

F=Voucher vs. both

Table 3. Mean Cost Per Participant of Substance Abuse Treatment and Other Services for Each Intervention Group During the First 6 Months (U.S. Dollars)

	Usual Care	Case Management Only	Voucher Only	Case Management and Vouchers
Case Management	0 <sup>A,C</sup>	1,415 <sup>A,D</sup>	0 <sup>D,F</sup>	1,690 <sup>C,F</sup>
Long-Term Methadone Maintenance	283 <sup>a,B,C</sup>	771 <sup>a,d,e</sup>	1,535 <sup>B,d</sup>	1,535 <sup>C,e</sup>
Methadone Detoxification	116 <sup>B,c</sup>	198 <sup>D,e</sup>	11 <sup>B,D</sup>	20 <sup>c,e</sup>
Sub-Total, All Methadone Treatment	399 <sup>a,B,C</sup>	970 <sup>a,d,e</sup>	1,546 <sup>B,d</sup>	1,556 <sup>C,e</sup>
Residential Substance Abuse Treatment	931	1,698	2,088	1,674
Other Substance Abuse Treatment	181	95	405	356
Sub-Total, Substance Abuse Treatment and Case Management	1,511 <sup>A,B,C</sup>	4,177 <sup>A</sup>	4,040 <sup>B,f</sup>	5,277 <sup>C,f</sup>
Outpatient Mental Health Care	274	302	731	1,001
Inpatient Mental Health Care	120	0	936	275
Sub-Total, Mental Health Care	394	302	1,667	1,276
Hospital Care	2,592	1,778	5,397	2,602
Emergency Department Care	252	386	341	299
Outpatient Medical Care	870	757	1,642	1,058
Sub-Total, Medical Care Services	3,715	2,921	7,380	3,859
Total Cost, All Services	5,620 <sup>b,c</sup>	7,400	13,087 <sup>b</sup>	10,411 <sup>c</sup>

Percentages in same row that share same subscript are significantly different

Capital subscripts denote  $p < .001$ , lower case subscripts  $p < .05$

A=Usual vs. case management

B=Usual vs. voucher

C=Usual vs. both

D=Case management vs. voucher

E=Case management vs. both

F=Voucher vs. both

Table 4. Effect of Case Management and Vouchers on Self-Reported Heroin Use in Prior 30 Days At 3 Months and 6 Months Following Randomization

	Usual care	Case Management Only	Voucher Only	Case Management and Vouchers
3 months after randomization	11.75 <sup>B,c</sup>	14.13 <sup>D,E</sup>	2.16 <sup>B,D</sup>	4.85 <sup>c,E</sup>
6 months after randomization	10.26	11.47	8.00	8.81
Change	-1.48	-2.66	5.84 <sup>*</sup>	3.96

\* significant change from 3 months observation

Heroin use reported in same row that shares the same subscript are significantly different

Capital subscripts denote  $p < .001$ , lower case subscripts  $p < .05$

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**Acknowledgements**

This work was supported by grants from the National Institute on Drug Abuse (P50DA14922, K05DA16752, K01DA00408, U10DA15815, R01DA14922). The authors thank Fumi Mitsuishi, Robyn Sera, Tawni Gamaza, Catherine Jacob, Greg Roth, Nel O'Neil, Valerie Gruber, Kevin Ahern, Binh Dam, Kevin Delucchi, and the staff and patients of the Division of Substance Abuse and Addiction Medicine, San Francisco General Hospital.



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