

The Effects of Methadone Maintenance with Opioid Takers

A Review and Some Findings from One British City

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SUMMARY Various benefits claimed for methadone maintenance in the treatment of opioid drug takers are reviewed. It is said to stop illicit drug use, maintain treatment contact, reduce morbidity, mortality and crime, and improve social adjustment. Little firm evidence is found to support these claims. Results are reported comparing 26 drug takers on methadone prescriptions with 16 illicit opioid takers. The measures used are Stimson's (1972) 'Patterns of Behaviour' questionnaire, and direct behavioural measures of social functioning. The groups are found not to differ in terms of treatment contact, work status and involvement with other drug takers. There is some evidence that the methadone group is involved in less criminal activity. However, no association is found between amounts of drugs prescribed and numbers of local pharmacy thefts. It is concluded that the benefits of methadone maintenance have been exaggerated.

Introduction

Since the 1960s methadone maintenance has achieved great popularity as a treatment for opioid drug injectors in both Britain and the United States (Edwards *et al.*, 1976; Henry, 1974). There appear to be good reasons for this. There are some striking reports of its efficacy in rehabilitating chronic addicts (e.g. Peck and Beckett, 1976), and it is popular with the drug-takers themselves (Chappel *et al.*, 1971). It is also relatively inexpensive because it does not require elaborate facilities and can be administered quite cheaply (Jaffe *et al.*, 1969).

However, in spite of a wealth of longitudinal studies and clinical impressions, a number of writers have recently remarked on the paucity of rigorous outcome research (Martin, 1971; Chambers, 1974; Cohen *et al.*, 1976; Hawks, 1976; Peck and Beckett, 1976). We know of only one controlled outcome study comparing methadone with no drug treatment (Joseph and Dole, 1970).

Review

Methadone and illicit drug use

This was the original rationale for methadone maintenance. In appropriate doses it is said to produce a 'pharmacological blockade'; preventing the drug-taker from experiencing the usual effects of opioids if he should take some, and thereby 'blocking' the craving for narcotics (Dole and Nyswander, 1965). There is evidence that this process occurs at least in part. Evidence of reductions in drug use has been presented (e.g. by Bewley, 1973; Jaffe, 1971; Stimson, 1972). Also Bewley (1972) and Chappel (1972) reported that approximately 20 per cent of their samples achieved total abstinence within two or three years on methadone.

However, it is clear that methadone does not truly 'block' the craving for narcotics. Although a methadone prescription reduces the amount of illicit opiates taken, a majority of London addicts continue to use some (Bewley, 1972;

Mahon, 1971; Stimson, 1972). It is perhaps misleading to apply the term 'blockade' to the effects of methadone, since it is, of course, a potent opioid itself. It does not block neuronal receptors to the effects of opioids, as do the true opioid antagonists. The so-called 'heroin blockade' in methadone maintenance is merely an example of opioid cross-tolerance (Henry, 1974). Since opioid takers develop tolerance, it is hardly surprising that those on prescription use extra drugs. Few doctors are willing to prescribe increasing amounts of morphine-group drugs (Stimson, 1972).

Contact with treatment agencies

Bewley (1973) claimed for methadone maintenance the advantages that it gives unmotivated patients improved access to medical and social facilities; and that it aids data collection. The implication is that without methadone as a 'carrot' the drug-takers would not attend outpatient clinics for physical check-ups or follow-up interviews. This is a plausible idea for several reasons. Firstly, methadone maintenance is a popular treatment with addicts. Chappel *et al* (1971) reported that 75 per cent of their sample volunteered for long-term methadone when asked to choose between this and various abstinence programmes. Secondly, Bass and Brown (1973) compared retention rates on a methadone programme and an abstinence programme and found that the methadone group were significantly more likely to remain in treatment for a six-month period. However, retention rates may depend on the nature of the abstinence programme offered. A drug prescription may not be the only effective 'carrot', and simple contact with treatment agencies is not necessarily of benefit (except perhaps for the collection of information). The important question is whether the results of one treatment are better than those of another. This question has received little attention (Chambers, 1974).

Health and mortality

A maintenance prescription for pure drugs and sterile syringes might be expected to improve health by preventing non-sterile injections and the intake of crushed tablets and

impurities. If drug prescribing leads to improved contact with clinics it could be expected to result in improved health care simply through providing better access to medical facilities.

Blumberg's (1976) data appear to support these expectations. He compared a group of London users not receiving prescriptions with two groups on prescriptions. He found that those not on prescriptions showed higher incidences both of non-sterile injection practices and of ensuing physical complications. However, these results must be interpreted with caution. The no-prescription group had all approached clinics but had been refused maintenance treatment. They differed initially from the individuals who were taken on for maintenance, and so differences between the groups cannot readily be attributed to drug prescriptions. Other evidence is provided by Bewley (1973), who reported a slowing in the death rate of opiate takers (which had been rising by 50 per cent per year) since the opening of the British prescribing clinics.

These results are suggestive, but they do not justify the inference that differences in health and mortality are directly attributable to methadone prescribing. They must be balanced by evidence of harmful effects of methadone. Long-term maintenance produces persistent metabolic, physiological and psychological changes (Gritz *et al*, 1975; Martin, 1973). The side-effects of constipation, weight gain, drowsiness and sexual problems are well known (Gritz *et al*, 1975). The long-term effects of high doses of methadone are still unknown (Peck and Beckett, 1976). Further, if and when the methadone is eventually withdrawn a physiological disorder lasting several months ('protracted abstinence') occurs (Martin, 1973).

Suggestions of reduced mortality on methadone must also be balanced by studies in both Britain and the United States which have consistently found mortality on methadone programmes far above the rates for the general population (in the same age range) and sometimes comparable with the rates for illicit heroin users (Henry, 1974; Martin, 1971). Baden (1971) and Gearing (1971) both reported rates of over 1.2 per cent per year for methadone maintenance patients, and in London, Ogborne

and Stimson (1975) found that 6.2 per cent of their sample (on methadone or heroin scripts) died in three years. Martin (1971) asks prescribing clinics whether the alleged social gains of methadone maintenance in reducing anti-social behaviour outweigh the costs to the individual addict.

Preventive medicine

Bewley (1972, 1973) reported that the London prescribing clinics had achieved a limited success in 'containing the problem'. There is no hard evidence for this, but in the three years following their opening the rate of appearance of new cases decreased and the prices of black-market heroin and methadone increased markedly. Bewley (1972) concluded from these facts that 'following the setting up of clinics it was both more expensive and less easy to become addicted'. This may look like an argument for drug prescribing, but in fact it is an argument for more restrictions on prescribing. Before the introduction of the 'special clinics' the British system was not one of no prescribing; it was one of 'uncontrolled prescription of heroin' (Bewley, 1972).

Two further reservations have been voiced against claims for methadone as a preventive measure. Firstly, as one of us has argued at greater length elsewhere (Paxton, 1976), and as Bourne (1974), Ogborne and Stimson (1975), and Peck and Beckett (1976) mention, giving drugs to a drug-taker is, on the face of it, likely to prolong rather than stop his drug-taking. It is certainly clear that few methadone patients achieve abstinence (Bewley, 1972). A recent paper which argued in support of methadone maintenance (Newman, 1976) even deplored attempts to achieve abstinence. For the individual who receives a prescription it may well be the exact opposite of a preventive measure. A second argument concerns the risk of prescribed methadone being diverted to illicit channels (Greene *et al.*, 1975; Henry, 1974). Prevention is surely likely to be aided by reduced availability, but availability may easily be increased rather than reduced by adding legal drugs to the illegal pool. This argument is also relevant to discussions of optional methadone dosages. Whilst there is evidence (e.g.

Jaffe, 1971) that a high dose of methadone gives a slightly better chance of abstaining from illicit drugs, there must also be a greater risk that some of the drug will be diverted to the black market.

Social adjustment

Measured usually in terms of employment records, this together with reduced criminality is widely claimed as a powerful benefit of methadone maintenance (Martin, 1971). An early justification for drug maintenance (Ministry of Health, 1926) was that it would enable the addict to lead a 'fairly normal life' (Stimson, 1972). Bewley (1972) found that the percentage of his sample working increased from 22 per cent when first seen to 40 per cent after two years on methadone. Elsewhere (Bewley, 1973) he suggested rather broader benefits, reporting that 40 per cent of the patients attending prescribing clinics were functioning better in terms of stability, marriage and work after two years. Jaffe (1971), Wieland and Chambers (1971) and Williams (1971) also reported that a majority of their methadone patients were working but none of these authors gave pre-treatment data.

In spite of these claims of improvements, Mahon (1971), Blumberg (1972, 1976) and Stimson (1972) found that their samples of London maintenance patients still had many social problems. Mahon (1971), for instance, found that most had not maintained normal or satisfactory marital or family lives; and Blumberg (1976) reported 50 per cent of his sample unemployed. But with social adjustment, as with criminality, it is difficult to assess the effects of methadone maintenance without properly controlled outcome studies (Martin, 1971). Even if some improvement in social functioning can be demonstrated this may have been achieved at the cost of increased lethargy and decreased efficiency and motivation (Martin, 1971, 1973).

Methadone and crime

In the United States one of the major social concerns about addiction is economic, and this is largely related to the cost of acquiring illicit drugs through criminal activity. A strong model

for methadone prescribing in the USA is therefore that by facilitating social adjustment and providing a legitimate source of narcotics it decreases antisocial behaviour (Martin, 1971). In Britain drug-related crime has been on a much smaller scale, but for a majority of London heroin users studied there does appear to be an association between drug use and criminality (Mott and Taylor, 1974; Stimson, 1972).

From both Britain and the United States this crime reduction argument has been bolstered by claims that drug-takers on methadone maintenance become involved in less crime (e.g. Bewley, 1972; Blumberg, 1976; Henry, 1974). The best evidence so far has been provided by Joseph and Dole (1970), who compared arrest rates for a methadone out-patient group and a non-methadone detoxified control group. Their samples of 1,530 (methadone) and 100 (no-methadone) were matched for age, race and prior arrest rates (20 per cent and 21 per cent). In the first year of the study the arrest rates changed to 6 per cent (methadone) and 25 per cent (no-methadone). In the third year they were 2 per cent (methadone) and 19 per cent (no-methadone). These are very significant differences.

Elsewhere, however, the relations between illegal drug-taking and crime, and between drug prescribing and crime reductions are much less clear. The American 'economic necessity' argument that drug-takers are forced into crime to support their habits blurs some of the facts. Mott and Taylor (1974), Mott and Rathod (1976), and Mahon (1971) found that for opioid users in London and Crawley with criminal records, the criminal record usually antedated the regular opioid use. It is misleading, therefore, to say that illegal drug-taking causes acquisitive crime. It may or it may not, depending on the social and economic context.

Nevertheless, whatever the causal relationship, opioid use—both prescribed and illicit—is often associated with crime (Mott and Taylor, 1974; Stimson, 1972). Furthermore, Bewley (1972) reported a decrease in the number of addicts receiving prison sentences after the establishment of the London prescribing clinics. However, prison sentences give a less than

perfect measure of criminal activity and the fact of receiving a prescription ('being registered') may well alter the behaviour of law enforcement agencies towards the drug-taker. Martin (1971) remarked on police leniency towards patients and suggested that this leads to an underestimation of criminal activity and an overestimation of the efficacy of methadone maintenance.

The Effects of Methadone Prescribing in the Glasgow Area

Subjects

Below we present some results based on all regular opioid takers seen at least once at the Drug Clinic, Southern General Hospital, Glasgow during the year October 1975–September 1976. This clinic is the main centre for the treatment of opioid takers in the West of Scotland.

During the year the total number of individuals seen at least once was 48 (39 males, 9 females: mean age 25). Data from older 'therapeutic addicts' are not included. Of the 48 people seen, 21 were new to the Clinic. New referrals and re-referrals seen after January 1976, were routinely offered medical, counselling and social work facilities, but not methadone maintenance. This gave a total of 16 people who admitted to continuing regular opiate use but were not on prescription. A total of 26 old patients and new referrals seen between October 1975 and January 1976 were maintained on methadone (tablets or ampoules, collected daily from a local pharmacy). In addition to their drug prescriptions these patients were offered the same services as the no-prescription group. A further 6 people who had all been dependent on opiates but were currently off drugs were seen regularly during the year. Our comparisons of prescription and no-prescription users are mostly based on data from all the individuals in these two groups. Table IV, however, presents questionnaire results from two samples of 14 consecutive attenders; a prescription and a no-prescription group.

It will be seen from Table I that our prescription and no-prescription groups are not per-

fectly matched for age or duration of drug use. The methadone group tends to be older and to have used drugs for longer. This difference results from our method of assigning patients to treatment groups: old patients already on methadone were left on it, and new patients were not offered it. Scientifically this is less than perfect, but practically and clinically it was difficult to do otherwise. Our patient numbers are small and so it would have taken some while to accumulate enough for two matched new patient groups. But more important is the difficulty of the clinical decision to give methadone for research purposes when we know from experience how hard it is to persuade people to withdraw from it later. At any rate we would argue that the differences between the groups are not so great as to invalidate our results.

Methadone and illicit drug use

Our results in Glasgow on the use of illicit drugs by people on methadone maintenance are similar to those reported above from London clinics. A majority admit to regular illicit use. Because of the difficulties of obtaining accurate information on amounts of drugs taken we did not attempt to compare amounts of illicit drugs used by script and no-script users. We have simply looked at whether patients on methadone report additional drug use and have checked these results by means of urine tests. We found that only 4 of the 26 people on methadone (15 per cent) did not use additional opioids at least weekly.

We had little success in achieving abstinence with either the prescription or no-prescription

groups. Three in each group (N = 26, 16 respectively) dropped drug-taking during the year, but of these only one in each group did so outside prison.

Contact with a treatment agency

We used attendance rates at the drug clinic as a measure of contact with a treatment agency. We arranged an interview with each individual approximately every three weeks. These interviews were for medical, counselling and social work help, and for dispensing syringes to patients receiving methadone ampoules. Table I summarizes attendance rates for all regular opiate users (except older 'therapeutic addicts') seen more than once during the year October 1975–September 1976.

Surprisingly, the group admitting to regular opioid use but not receiving a prescription showed rather better attendance rates than those on methadone. This finding may be partly due to differences between the mean numbers of appointments sent to individuals in different treatment groups. The methadone group were mostly old patients who were therefore contacted throughout the year. No-methadone people were more frequently drawn from those who first appeared during the year. Consequently people in the methadone group were asked to attend more appointments than those in the no-methadone group. Table II demonstrates this difference.

Even allowing that this difference may account for the higher attendance rates shown by the no-methadone group, these results clearly do not support the common assumption that

TABLE I
Attendances

	N	Mean age	Mean years of regular opiates use	Total no. of appointments attended	Total no. of appointments sent	% appointments attended
Prescription group ..	26	27	7	135	260	51.9
No-prescription but regular opiate use	16	23	3	80	123	65.0
Ex-users	6	22	4	40	61	65.6
Total	48	25	5	255	444	57.4

TABLE II
Number of appointments sent to individuals in different treatment groups

	N	Mean number of appointments sent per person	
Prescription group ..	26	12.1	.025 < P < .05
No-prescription but regular opiate use ..	16	9.1	
Ex-users ..	6	8.1	
Total ..	48	10.8	

drug prescriptions are necessary in order to maintain contact with opiate users. We have maintained very adequate contact and medical care with both drug-users and ex-users without giving prescriptions.

Social functioning and criminality

This section includes measures of employment, sources of income, criminal behaviour and involvement with other opiate takers.

1. Work status

Firstly we compared work status (employed v. unemployed) when last seen during the year (or at 30 September 1976, whichever was earlier) with work status when first seen during the year. If an individual was unemployed

when first seen but employed when last seen, we called this 'work progress'. If he changed from employed to unemployed we called this 'work deterioration'. Table III shows changes in work status for the whole populations of prescription and no-prescription drug-users and ex-users seen during the year.

In both the prescription and no-prescription groups rather more people achieved work progress than work deterioration. Nevertheless, in all three groups it was still only a minority who were working (or in full-time study) when last seen. There is no significant difference between the numbers working in the two drug-taking groups.

2. Patterns of behaviour questionnaire

We used a slightly modified version of Stimson's (1972) questionnaire to obtain further measures of the variables in this section and to compare prescription with no-prescription drug-takers. The questionnaire elicits and quantifies information from subjects on their recent employment record, sources of income, criminality, and involvement with addicts. Table IV summarizes the results.

The no-prescription group have slightly higher work ratings, a greater variety of income sources, higher criminality scores, and very slightly greater involvement with addicts. Only the sources of income and criminality scores are significantly different ($P = .05$; $P = .025$).

TABLE III
Work status of prescription, no-prescription and ex-drug-user groups

	Prescription		No-prescription (but regular opiate use)		Ex-users	
	N	%	N	%	N	%
Work progress	5	19	2	12.5	0	0
Working throughout year ..	4	15	2	12.5	1	16.7
Total working when last seen ..	9**	34	4**	25	1	16.7
Work deterioration	3	12	1	6	0	0
Not working throughout year ..	14	54	11	69	5	83
Total not working when last seen	17**	66	12**	75	5	83
Group total	26	100	16	100	6	100

** $\chi^2 = 0.097$, $df = 1$, $.70 < P < .80$; not significant.

TABLE IV
 Mean 'patterns of behaviour' scores of prescription and no-prescription groups

	Prescription (N = 14, 10 males, 4 females, mean age 26, mean years of regular opiate use 6)	No-prescription but regular opiate use (N = 14, 11 males, 3 females, mean age 23, mean years of regular opiate use 4)	
<i>Employment rating</i>			
Range: 0-2	0.57	0.79	NS
High score means more work			
<i>Sources of income</i>			
Range: 0-7	1.64	2.93	.025 < P < .05
High score means many and illicit sources			
<i>Criminal activity</i>			
Range: 0-5	1.36	2.5	P < .025
High score means more criminality			
<i>Involvement with addicts</i>			
Range: 0-15	6.5	6.7	NS
High score means more involvement			

The criminality score requires some qualification owing to the content of the questions. One question in this section asks: 'Have you been in illegal possession of drugs in the last three months?' All members of the no-script group must answer this in the affirmative, since the group is defined as consisting of illegal drug-users. This group's criminality scores may therefore be inflated. We tested this by deleting this question from the protocols of both groups and reanalysing the results. When this was done the difference between the criminal activity scores was no longer significant ($P > .05$).

3. Methadone prescribing and pharmacy thefts

There is little evidence that illicit opioids are brought into Glasgow. The police view (J.B.) is that most illicit opioids used in the area are obtained by thefts from local pharmacies. In spite of this there is relatively little drug-related crime. One of us (J.B.) has suggested

that the reasons for these facts are geographical—Glasgow is situated in a fairly static drug-taking population and a high level of police knowledge and control. As the drug-taking is of such local character, we wondered whether the number of pharmacy thefts was influenced by the quantity of opioids prescribed by the clinic. We correlated yearly totals of pharmacy thefts with mean opioid prescription size, and number of people receiving prescriptions during the period 1970-76. These annual statistics were averaged from bi-monthly Home Office returns. The results are presented in Table V. Neither of the Pearson Product Moment Correlation Coefficients shown there is significant. Prescribing policies cannot be shown to have influenced this aspect of drug-related crime.

Conclusions

Our review, like several other recent reviews (Chambers, 1974; Henry, 1974; Martin, 1971; Peck and Beckett, 1976) revealed almost no

TABLE V
Pharmacy thefts, quantities of opioids prescribed and number of people on prescriptions

Year	A Number of pharmacy thefts	B Mean daily prescription (mg)	C Mean number of people on prescriptions
1970	10	114.0	4.7
1971	27	84.0	20.3
1972	21	75.3	43.0
1973	7	82.7	36.3
1974	15	66.4	31.7
1975	27	59.7	23.7
1976	21	51.3	18.5

Pearson product moment correlation coefficients:

$r_{AB} =$	$r_{AC} =$
.516	-.004
(not significant)	(not significant)

systematic research on the effects of methadone maintenance. Claims that it aids rehabilitation were found not to be backed up by firm evidence. We did find evidence that methadone is a popular treatment with drug-takers themselves (Chappel *et al.*, 1971) and also some evidence that methadone prescribing can reduce crime (Joseph and Dole, 1970).

Our comparison of drug-takers receiving methadone prescriptions and those using illicit drugs in Glasgow does not support many of the claims made for drug maintenance. Most of the maintenance group continued to use illicit drugs. We did not find that methadone was necessary to maintain treatment contact. We maintained adequate contact and medical care with the no-methadone group. In fact this group attended out-patient appointments slightly more reliably than people maintained on methadone. We found no significant difference between the numbers working in the two groups. Only a minority in each group worked. We also found no difference in terms of amount of involvement with other drug-takers. We found some evidence from self-report measures that methadone reduced criminal activity and variability of income sources. On the other hand we found no evidence that changing patterns of methadone prescribing had any influence on the numbers of thefts of drugs from local pharmacies.

Although our groups were not fully matched for age or duration of drug use, these results deserve consideration. It might be argued, indeed, that the differences between the groups strengthen our conclusions that methadone conveys little benefit. The older and more experienced methadone group might be expected to be 'maturing out' and so increase the apparent benefits of methadone.

However, we would not suggest on the basis of our own or previous evidence that prescribing is never justified. Drug-taking is a complex social phenomenon which varies greatly from one city to another. In some cities methadone may indeed be important in reducing crime. Unfortunately we have little firm evidence on this. In Glasgow it is not clear that it does so. One of us (P.M.) has suggested that the time spent on prescribing might have been put to better use in the development of a drug-free social recovery service which is still not available in Glasgow. Our argument is that there are disadvantages as well as advantages in methadone maintenance, and that the advantages are not as clear as some writers have claimed. Moreover, the effects that can sometimes be demonstrated (e.g. reduced crime) tend to be to the advantage of society rather than of the drug-taking individual. We would urge a careful look at both advantages and disadvantages before embarking on prescribing.

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