Psychosocial interventions in pharmacotherapy of opioid dependence: a literature review

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Psychosocial interventions in pharmacotherapy of opioid dependence: a literature review

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Summary

BACKGROUND: Several pharmacological approaches are effective in the treatment of opioid dependence. There is a strong evidence base to support the effectiveness of methadone maintenance (MMT) and buprenorphine maintenance treatment (BMT). Evidence also exists to support the efficacy of naltrexone maintenance and pharmacologically assisted opioid withdrawal. Extensive research has been conducted on psychosocial interventions as an adjunct to pharmacotherapy in opioid dependence. This review aims to provide a systematic review of that research.

METHOD: A systematic literature search strategy was carried out to identify all relevant RCTs on psychosocial interventions (broadly defined) in the context of agonist, antagonist and withdrawal pharmacological treatment. The Cochrane Library and trials register, Medline, Embase, PsychINFO, and the reference lists of articles were searched.

RESULTS: Evidence was found to support the application of CBT and contingency management (CM) in MMT, and there was some evidence to support the use of CM in BMT. However, the applicability of CM to treatment settings outside of the USA is unknown. Also the precise “active ingredients” and minimum “dose” of these therapies as well as the longer term impact and cost effectiveness are currently unclear. There was also research support for MMT enhanced by other psychotherapies, but the generalisability of these is limited by a lack of clear definitions of the therapeutic methods. In relation to naltrexone maintenance, relatively few studies of adjunctive psychosocial intervention were available. However, there was evidence that both CM and family therapy including supervision/contracting can enhance compliance with and efficacy of naltrexone
treatment. In relation to psychosocial interventions in opiate withdrawal treatment, we found a heterogeneous group of studies. However, there was support of the efficacy of CM and CBT in enhancing treatment outcome.

CONCLUSIONS & RECOMMENDATIONS: More research of higher quality on adjunctive psychosocial treatments is recommended, particularly outside of the USA in different health systems, and including more research on cost effectiveness. There is also a need for more research on the process of treatment and subgroups most likely to benefit from psychosocial interventions. Both CBT and CM are recommended to maximise the effectiveness of MMT. However, the most effective elements and forms of CM and CBT, as well as the minimum “dose” and key “active ingredients” required for a positive outcome, remain to be established. More research is needed to clarify the effect of adjunctive psychosocial treatment in buprenorphine maintenance, particularly in settings outside of the USA. CM and family therapy combined with supervision/contracting can be used to enhance compliance with naltrexone maintenance treatment. However, more research is needed, particularly outside of the USA to establish its applicability and cost effectiveness in different treatment settings. Both CM and CBT can be used to enhance the outcome from pharmacologically assisted opioid withdrawal treatment.
Introduction

Context of this review

This literature review of psychosocial interventions in pharmacotherapy of opioid dependence has been conducted at the request of the World Health Organisation to assist the WHO Technical Guideline Group (TDG) on the development of guidelines on this subject. The lead author of this review is also a member of the UK National Institute of Clinical Excellence Guideline Development Group (GDG) which is currently developing guidelines on psychosocial interventions in drug misuse at the request of the UK Department of Health. The remit of this latter group is clearly broader than the scope of this review, in that it will cover a wide range of drug misuse, including opioids, and is not restricted to psychosocial interventions in the context of pharmacotherapy. Nevertheless, the remit of the NICE group overlaps with the WHO review. The NICE GDG is conducting a systematic review of the literature and a meta-analysis of the available and pertinent randomised controlled trials on psychosocial interventions in drug misuse and the final results should be available in October 2006. These results will inform the development of clinical guidelines on psychosocial interventions in drug misuse for the UK National Health Service. As this will be the most extensive systematic review of this literature conducted to date to include a meta-analysis, it would be sensible if this could inform the work of the WHO TDG, and agreement to share information between the two projects has been obtained. This report is therefore informed by the NICE work, but at this stage it is a systematic narrative review of the literature. It would be possible subsequently to
expand this report to include the NICE meta-analysis of the relevant literature when available in the Autumn of 2006.

Terms of reference

1. Conduct a review of the literature, including non-Cochrane and non-systematic reviews, on psychosocial interventions in pharmacotherapy of opioid dependence.
2. Submit a review of the literature to WHO Management of Substance Abuse (MSB) and revise the text, if necessary, along the comments and suggestions provided by WHO.
3. Prepare and submit to WHO MSB a draft of recommendations on "minimum", "recommended" and "desirable" psychosocial interventions in pharmacotherapy of opioid dependence, including opioid agonist and antagonist maintenance therapy, as well as psychosocial interventions in pharmacologically-assisted management of opioid withdrawal, to be included in the Guidelines on psychosocially assisted pharmacotherapy of opioid dependence.

Definitions

For the purpose of this review “psychosocial interventions” were interpreted broadly to include any non-pharmacological intervention carried out in a therapeutic context at an individual, family or group level. “Pharmacological interventions” considered were agonist (e.g. methadone, buprenorphine), antagonist (e.g. naltrexone), and
medications to assist detoxification or withdrawal from opioids. Treatments conducted in health, social care, or criminal justice contexts were considered. The full literature search strategy is discussed below under “methods”.

Pharmacotherapy for opioid dependence

There is extensive evidence from randomized controlled trials (RCTs) for the effectiveness of pharmacotherapies for opioid dependence, and maintenance agonist treatment, particularly methadone maintenance, is currently the main treatment approach for opioid dependence in most developed countries (Faggiano et al., 2006). There is also evidence to support the effectiveness of antagonist therapies and pharmacotherapies to assist opioid withdrawal. These reviews of pharmacotherapy include several Cochrane reviews. The effectiveness and cost effectiveness of methadone and buprenorphine maintenance and effectiveness cost effectiveness of naltrexone are also the subject of two ongoing technical reviews by NICE, due to be completed in the Autumn of 2006. A review of these pharmacological approaches is beyond the scope of this review.

Psychosocial interventions as an adjunct to pharmacotherapy in opioid dependence

A wide range of psychosocial interventions has been applied as adjunctive therapy in pharmacological treatments of opioid dependence. The most commonly applied approaches are currently various forms of cognitive behavioural therapy (CBT). CBT has become the leading treatment approach in a variety of psychological disorders including phobias, anxiety, obsessive-compulsive disorders, and there is evidence of
its effectiveness in depression and eating disorders (Clark & Fairburn, 1997). Recently CBT has been applied to more severe and/or pervasive disorders including post-traumatic stress disorder, and schizophrenia, with some evidence of efficacy (Marks et al., 1998; Haddock et al., 1998). CBT is now the main treatment approach in alcohol, stimulant (e.g. cocaine, amphetamine) and cannabis dependence (Curran & Drummond, 2005).

CBT in addiction is based on the principle that addictions are learned behaviours that are capable of being modified. Cognitive approaches primarily aim to change addictive behaviour through changes in faulty cognitions (e.g. dysfunctional beliefs) that serve to maintain the behaviour, or through the promotion of positive cognitions (e.g. self efficacy) or motivation to change behaviour (Beck et al., 1993). Commonly used approaches are cognitive therapy, relapse prevention, and motivational enhancement therapy. Behavioural approaches primarily aim to modify behaviours underpinned by conditioned learning: classical and operant conditioning. Such approaches are many and varied, but include interventions aimed at extinguishing classically conditioned responding (e.g. cue exposure and response prevention), or are based on instrumental conditioning (e.g. community reinforcement or contingency management) in which positive non-drug taking behaviours are positively reinforced. Behavioural approaches involving aversive conditioning are historically important mainly in the alcohol treatment field, and have some evidence of efficacy, but are not used mainly for ethical reasons.

Other psychosocial approaches include social skills training, marital and family therapy, twelve step facilitation therapy, social behavioural network therapy, problem
solving, supportive-expressive or insight-orientated psychotherapy, node link mapping. There is also a wide and heterogeneous range of approaches grouped under the terms “counselling”, “psychotherapy”, “case management”, and “psychosocially enhanced treatment”, many of which involve various elements of the above psychosocial therapeutic approaches, but are difficult accurately to define and classify.

All of the above psychosocial approaches broadly aim to either, a) modify the underlying processes that serve to maintain additive behaviour, b) encourage engagement with pharmacotherapy (e.g. compliance with methadone or naltrexone treatment), or c) treat psychiatric comorbidity that either complicates the addictive disorder or acts as a trigger for relapse. Clearly the context in which these different approaches is used will vary. Approaches to modify addictive behaviour can be used in any treatment context either as an adjunct to pharmacotherapy or as the primary treatment intervention. Psychosocial treatments to enhance compliance with pharmacotherapy are context specific. Psychosocial interventions to treat psychiatric comorbidity are clearly targeted at subgroups of addicted individuals with specific comorbidities. However, in the literature on psychosocial intervention it is often unclear what is the specific aim of the therapy or the specific comorbidities of the client group. Nevertheless, clients receiving pharmacotherapy for opioid dependence will often require psychosocial interventions with a range of the above aims.

The key to successful pharmacotherapy for opioid dependence is compliance, and this requires the client to have a sufficient level of motivation to engage in the drug treatment and refrain from illicit drug misuse. Further, psychiatric comorbidity is
common in this client group, and left untreated, can be a serious barrier to treatment engagement and result in poor treatment outcome (McLellan et al., 1983). So there are many reasons why psychosocial interventions should be helpful in the context of pharmacotherapy for opioid dependence. But this also points to the importance of comprehensive and holistic assessment of the client’s needs and disabilities to ensure that the psychosocial treatment is appropriately targeted and designed to meet the specific needs of the individual.

*Potential limitations of research on psychosocial interventions*

The evaluation of psychosocial interventions is more complex than evaluation of pharmacotherapies. Important considerations are the quality of the psychosocial intervention and the training of therapists delivering such interventions. This is seldom adequately addressed either in typical clinical practice or in many of the research studies reviewed here. The broader psychosocial treatment literature has repeatedly shown the importance of therapist skill and adherence to treatment protocols as being key determinants of outcome. Also of crucial importance is the therapeutic alliance which develops between client and therapist. This relies on key basic therapist factors amongst other things including empathy, emotional warmth, and unconditional positive regard. These factors may be more important than the specific form of psychosocial intervention being carried out. Nevertheless they are seldom assessed in the typical treatment or indeed, a research trial, context.

Therefore, results from research trials of psychosocial intervention need to be interpreted with caution when attempting to generalise to the typical clinical situation.
A research trial may fail to show psychosocial treatment efficacy because the treatment was carried out by therapists who lacked the appropriate therapeutic skills, or the therapy was inappropriately applied and lacked fidelity to the intended therapeutic approach. Alternatively, a trial may show efficacy of psychosocial intervention because it was carried out by highly skilled therapists who would not normally be available in the typical treatment context. Often psychosocial interventions as adjuncts to pharmacotherapy for opioid dependence are simply compared with pharmacotherapy alone. Hence, it is often difficult to interpret whether the specific psychosocial intervention was helpful or whether simply the extra attention received by subjects in the psychosocial arm of the trial was as important. Also it is not possible to ‘blind’ clients to the psychological intervention. It is also difficult for an independent research assessor not to become aware of the client’s treatment experience, and so remain ‘blind’ to the treatment allocation. Also only a few studies have attempted to examine the cost effectiveness of psychosocial interventions in the context of pharmacotherapy.

*Previous systematic reviews of psychosocial interventions in opioid dependence*

The most comprehensive systematic reviews of the literature on psychosocial treatments for opioid dependence have been carried out by the Cochrane Collaboration. A recent review of stand alone psychosocial treatments for opiate dependence (Mayet et al., 2004) found that ‘enhanced outreach counselling’ and contingency management had significantly better outcomes than standard therapy, but these effects were not sustained in the longer term. The authors’ conclusion was that “at present psychosocial treatments alone are not adequately proved treatment
modalities or superior to any other type of treatment.”

In terms of combined psychosocial and pharmacological agonist treatments, Amato et al. (2004a) examined 12 studies comparing 8 different psychosocial interventions plus methadone maintenance treatment (MMT), with MMT alone. This review showed additional benefit of any psychosocial intervention in terms of reduced heroin use during treatment but not in terms of retention in MMT or improved outcome at follow-up.

Minozzi et al. (2005) examined 10 studies of naltrexone for opioid dependence and found that naltrexone maintenance, with or without psychosocial intervention, was more effective than placebo alone in reducing heroin use and incarceration. However, this review did not provide a clear conclusion regarding the additional benefits of psychosocial intervention combined with naltrexone.

Amato et al. (2004b) examined the effect of psychosocial interventions in the context of opiate detoxification from both methadone and buprenorphine. The results based on 8 studies showed benefits of a variety of psychosocial interventions in terms of completion of treatment, results at follow-up and compliance, but not in terms of heroin use during treatment.

**Methods**

The search strategy for studies to include in this review was as follows: All randomised controlled trials published in English, investigating psychosocial
interventions combined with pharmacological interventions; psychosocial interventions included any non-pharmacological treatment intervention in the context of health, social care or criminal justice settings; pharmacological interventions included any opioid agonist treatment, any antagonist treatment, and any detoxification treatment.

Any studies which did not allow comparison between psychosocial treatment plus pharmacotherapy and pharmacotherapy alone were excluded. The Cochrane library and trials register, Medline, Embase, PsychINFO, and the reference lists of articles were searched.

Studies were then grouped into the following categories:

**Psychosocial Interventions in Methadone Maintenance Treatment**
- Cognitive Behaviour Therapy plus MMT
- Contingency Management plus MMT
- Counselling plus MMT
- Family therapy plus MMT
- Psychotherapy plus MMT

**Psychosocial Interventions in Buprenorphine Maintenance Treatment**
- Cognitive Behavioural Therapy (CBT) plus buprenorphine
- Contingency Management plus buprenorphine

**Psychosocial Interventions in Naltrexone Treatment**
- Contingency Management plus naltrexone
- Family Therapy plus naltrexone
Structured Group Counselling plus naltrexone

Psychosocial Interventions and Pharmacologically Assisted Opioid Withdrawal

Cognitive Behavioural Therapy in opiate withdrawal

Contingency Management in opiate withdrawal

We examine each of these categories of study in turn and refer to the details of the trials summarised in tables 1-15.
Results

Psychosocial Interventions in Methadone Maintenance Treatment

Cognitive Behaviour Therapy plus MMT (Table 1)

Eight studies were identified for inclusion in the review of CBT plus MMT (Avants et al., 1999; O’Neill et al., 1996; Pollack et al., 2002; Scerhbaum et al., 2005; Drummond et al., 2004; Woody et al., 1981; 1983; 1987) (table 1). Five of these were conducted in the USA, one in Australia, one in England and one in Germany. Three of the USA papers (Woody et al., 1981; 1983; 1987) reported findings from the same trial at different stages.

Interventions

The interventions varied substantially in their approaches and content, and most studies had different aims (e.g. reducing illicit drug use, relapse prevention, reducing risk behaviours), thus making comparisons difficult.

Avants et al (1999) compared two treatment approaches (MMT plus case management) with standard care. One intervention incorporated an ‘enhanced’ treatment approach, combining standard MMT with additional therapeutic elements, including two hours per week of a manual guided CBT intervention and three additional groups on physical health, vocational skills and community resources plus referral to other services. This was compared with a high intensity day treatment...
programme, which consisted of groups in five general areas: substance abuse
treatment, physical and emotional health, community development, development of
alternative reinforcers and basic daily living skills.

O’Neill et al. (1996) incorporated a CBT relapse prevention approach that aimed to
prevent relapse to needle sharing and to unsafe sex, thus the aim was on reducing risk
behaviours rather than drug use per se.

Pollack et al. (2002) evaluated a novel CBT for interoceptive cues, which aimed to
change responses to craving cues using self control techniques. This was compared
with ‘enhanced’ treatment as usual, which consisted of 12 counselling sessions and
three booster sessions to equate for therapist contact.

Scherbaum et al. (2005) evaluated CBT psychotherapy that aimed to reduce
concomitant drug use.

Drummond et al. (2004) evaluated CBT as an adjunct to standard MMT in reducing
illicit drug use. The CBT was delivered according to a purpose designed CBT manual.

Woody et al. (1981; 1983; 1987) evaluated two psychotherapy groups in comparison
with drug counselling alone, one utilising a supportive-expressive psychotherapy
approach and one adopting a CBT psychotherapy approach. Their aim was to see
whether the addition of professional therapy to counselling services would provide
extra benefit.
All interventions were delivered by trained therapists from a variety of backgrounds.

Findings

Seven of the eight studies reported at least one positive finding of the benefits of CBT in adjunct to methadone maintenance treatment. Many studies reported multiple findings, however only the main findings relating to the outcomes of the studies are included in the review.

Avants et al. found that drug use, drug related problems and HIV risk behaviours decreased significantly for both therapeutic groups, although there were no significant differences between the two interventions (there was no control group in this study). They reported that the cost of the day treatment programme was significantly higher than the enhanced programme, and recommended the use of psychosocial intervention in conjunction with MMT.

O’Neill et al. found that the CBT group significantly reduced injecting risk behaviour among pregnant women, however there was no change in sexual risk behaviours, drug use or injection frequency. The intervention in this study appeared to focus on reductions in drug risk behaviours rather than clinical outcomes such as drug free urines, which may be reflected in the results.

Pollack et al. found that CBT was associated with reductions in illicit drug use for women but not for men. The authors suggested that this could be due to higher levels of distress in the women participating in this study, in which case the CBT may have
been effective in breaking the link between negative affect and drug use. This was a pilot study, thus has associated limitations such as small sample size and the reliance on effect size estimates rather than significance testing.

Drummond et al. (2004) did not find any significant differences between the CBT group and control group, and no significant cost differences were found. The authors proposed a number of explanations for the negative results, as can be seen in the conclusions in the table. One conclusion was that the availability of suitably trained staff to implement CBT will be a limitation to the implementation of this approach in the UK. Another reason was the limited level of recruitment into the study compared to previous US research.

The three studies by Woody et al. reported findings of one RCT comparing drug counselling with psychotherapy, including preliminary findings (Woody et al, 1981), baseline and 7 month follow up findings (Woody et al, 1987) and a 12 month follow results (Woody et al, 1987). The results from the three studies were favourable towards the psychotherapy interventions, including CBT; Woody et al., (1981) reported that psychotherapy was associated with less drug use and psychiatric symptoms, psychotherapy was associated with greater improvements and less use of medication and opiates than counselling at the 7 month follow, and at 12 months the psychotherapy groups had showed more overall improvements on a wider range of outcome measures than the drug counselling group. However, there were no significant improvements between the two psychotherapy groups.
Conclusions

The evidence suggests that CBT in adjunct to MMT can be efficacious, and can produce beneficial clinical and social outcomes. However, this is a heterogeneous group of studies which makes comparison difficult. The studies do not always report significant outcomes on a number of important measures, and the studies vary quite markedly in the aims of the intervention and models of CBT applied. Further research is needed to examine standardised CBT interventions with consistent aims and outcomes across the settings studied. Cost effectiveness studies are also needed to establish the utility of CBT as an adjunct to MMT in different health care environments.

Contingency Management plus MMT (Table 2)

We identified 15 contingency management plus MMT RCTs to be included in the review (Bronner et al., 2004; Chutuape et al., 1999; Iguchi et al., 1996; 1997, Jones et al., 2000; 2001; Petry & Martin, 2002; Piotrowski et al., 1999; Preston et al., 2000; 2002, Rhodes et al., 2003; Rowan Szal et al., 1994, Schmitz et al., 1998; Silverman et al., 1998; Stitzer et al., 1992). All of the studies were conducted in the USA.

Interventions

Several CM approaches were used across the studies. Seven studies used vouchers as the incentive to provide drug free urines and/or treatment attendance (Iguchi, 1997; Jones, 2000; 2001; Piotrowski, 1999; Preston, 2000; Preston, 2002; Silverman, 1998).
Four studies exclusively used take home methadone privileges to reinforce drug free urines and/or treatment attendance (Chutuape, 1999; Iguchi, 1996; Schmitz, 1998; Stitzer, 1992). Two studies used prize draw incentives (Petry & Martin, 2002; Rhodes, 2003), and one offered the opportunity to earn stars in exchange for prizes of varied magnitude (Rowan-Szal, 1994). One study (Brooner, 2004) used a tapering medication dose approach to motivate counselling attendance.

Findings

The majority of studies examined the use of CM to reinforce abstinence from drugs, including either opiate abstinence, cocaine abstinence or abstinence from any other illicit drug use as indicated from urine analysis. Some studies also examined the effects of CM on treatment attendance. All of the 15 studies reviewed supported the use of CM in MMT for either drug abstinence or treatment attendance, regardless of the CM schedule employed in the study. The findings for the different CM methods are summarised below.

Voucher studies

Iguchi (1997) found that the use of vouchers to reinforce completion of a treatment plan related task was associated with less illicit drug use than CM for negative urine results or standard treatment. The authors attributed the failure of CM to reinforce abstinence in this study to the low monetary value of the vouchers relative to previous studies which have shown its effectiveness.
Jones (2000) compared CM in MMT patients and CM in abstinence treated patients. MMT patients that received vouchers showed greater treatment attendance but the CM had no impact on drug abstinence. The authors suggest that more potent monetary values may be needed to achieve the desired outcomes. Jones (2001) examined escalating voucher schedules in which values escalated during treatment in pregnant women, comparing the intervention with a non-incentive control group. The intervention group was associated with greater treatment attendance and drug abstinence than the non-incentive group.

Piotrowski (1999) examined the use of CM vouchers to reinforce abstinence from illicit drug and alcohol use in ‘methadone transition treatment’ (methadone administered according to an MMT protocol). They found that the CM group had longer continuous abstinence and more drug free tests overall, however the effects were limited to the contracting period.

Preston (2000) found that the combination of behavioural contingencies (CM vouchers) and pharmacological intervention (methadone dose increase) was associated with more negative opiate urine tests during the intervention, and CM with or without dose increase was associated with greater duration of sustained abstinence. CM also produced better overall outcomes than the methadone increase group.

In a follow up to Preston et al. (2000), which included an abstinence reinforcement maintenance schedule, Preston et al. (2002) found that the maintenance CM group which received vouchers and take home doses for negative urine tests, had better
outcomes than the control group, supporting the value of extending the duration of CM in methadone treatment.

In a study that aimed to reinforce abstinence from cocaine abuse in methadone patients (Silverman et al., 1998), although cocaine abstinence was the primary outcome, the CM groups (escalating voucher schedules) produced significantly more opiate abstinence as well as cocaine abstinence than the control group, suggesting that reinforcement for cocaine abstinence can have broad beneficial effects.

**Take home methadone privileges**

Chutuape (1999) found that the CM group showed that marked reductions in drug use, with significant positive effects found in the weekly CM group, where participants received the first take home privilege for three negative urine tests, and then one take home dose for each subsequent negative test. However, this study did have a small sample with only ten or so participants in each condition.

Iguchi (1996) found that take home methadone to reinforce drug abstinence led to greater improvement in rates of abstinence from drugs and greater clinical improvement.

Schmitz (1998) compared a high frequency take home doses group, where clients received 5 take home doses and attended the clinic 2 days per week, with a low frequency take home doses, where clients received two doses and attended clinic 5 times per week. The high frequency take home group was associated with less illicit
drug use but eventually shifted to the same level as the low frequency group. However the results should be interpreted with caution and this study had a small sample size with no non-CM control group.

Stitzer (1992) found that take home doses to reinforce abstinence from poly drug use during MMT were effective in eliciting abstinence from any drug. The authors recommend the use of CM to reinforce abstinence from poly drug use.

**Prize draw incentive**

Petry and Martin (2002) evaluated a CM schedule in which participants could enter prize draws for the opportunity to win small (e.g. food coupons, bus tokens), large (e.g. television or 5 large prizes). They found that CM was associated with longer duration of continuous abstinence than patients in standard treatment, and these effects were maintained at the 6 month follow up. The authors suggest that such a prize reinforcement schedule such as this may be a suitable procedure in community settings. As the sample sizes in the two groups were fairly small, this procedure may warrant further study.

Rhodes (2003) compared two CM conditions, one fixed schedule (cash payment on attendance) and a variable schedule (voucher prize draw on attendance). They found that there was no difference between variable and fixed reinforcement groups, but attendance was improved during the intervention. However, there was no control group in this study and it was not clear what the other outcomes were in this study.
Rowan-Szal (1994) compared three CM schedules and found that ‘high reward’ CM clients had fewer positive urine tests than ‘low reward’ and ‘delayed reward’ clients. All three groups improved counselling attendance.

**Tapered dose**

Brooner (1994) employed a CM schedule that involved negative reinforcement (providing less convenient doses) and methadone taper and possible discharge with possibility of rapid readmission for missed counselling attendance, in conjunction with stepped care treatment. It was found that CM along with stepped care was more effective than stepped care alone, as patients in this group showed higher counselling attendance, a lower rate of poor treatment response and lower rates of drug positive urines.

**Conclusions**

All of the studies included in the review suggest that contingency management in MMT to reinforce drug abstinence and/or treatment attendance is an effective way of improving outcomes in opiate dependent patients. However, the majority of the studies did not include long term follow up, therefore it is difficult to ascertain whether or not the effects of using contingencies as reinforcement mechanisms are limited to the intervention period, or whether they may have lasting effects on drug use or participation in treatment. One study (Iguchi et al., 1997) suggested that CM was not effective in a subset of severe drug abusers. Therefore, these patients may benefit from more intensive psychosocial therapy in conjunction with methadone
treatment. Another issue in CM in MMT is that there are very few studies that have studied cost effectiveness. Although CM appears to enhance drug abstinence and treatment attendance, it is important to establish whether CM overall, and which specific CM schedules, are cost effective in the various treatment settings. Finally, all of the CM studies were conducted in the USA, thus more international research is required to evaluate CM in other health care provision settings.

**Counselling plus MMT (Tables 3 and 4)**

Twelve randomised controlled trials of counselling plus MMT were found, including several large outpatient studies conducted in the USA that evaluated methadone maintenance plus standard versus enhanced counselling (Czuzhry et al., 1995; Dansereau et al., 1995; Dansereau et al., 1996; Simpson et al., 1997).

**Interventions**

There were several types of counselling employed in these studies and many were compared with ‘standard counselling’. These included ‘node link mapping’ (a visual communication tool which represents interrelationships comprising personal issues and related plans, alternatives or solutions, see Danseraeu et al., 1993) (Czuzhry et al., 1995; Dansereau et al., 1995; Dansereau et al., 1996; Dees et al., 1997; Joe et al., 1997; Knight et al., 1994; Simpson et al., 1997), optional counselling (Maddux et al., 1995) (see Table 3), and enhanced counselling (incorporating various therapeutic elements delivered in addition to standard treatment such as harm reduction, relapse
prevention etc.) (Carroll et al., 1995; Kraft et al., 1997; Margolin et al., 2003; McLellen et al., 1993) (see Table 4).

Findings

All of these studies suggest that counselling improved outcomes and decreased illicit drug use. Only Dees (1997) noted improved outcome up to six months of treatment. The Dansereau studies suggested that counselling with node link mapping appeared to reduce cultural, racial and class communication barriers, and overall the studies concur that counselling enhancements improve programme effectiveness.

A study considering optional counselling in addition to standard methadone maintenance treatment (Maddux et al., 1995), included 300 chronic opioid users, and found an improved rate of retention in the optional counselling group but noted that drug use and social performance did not differ significantly between groups when studying chronic opioid users.

Carroll (1995) specifically studied opiate-addicted pregnant women, but it is noteworthy that there was very small sample size (n=20). They considered a comparison between standard MMT and enhanced MMT (i.e. including weekly relapse prevention, pre-natal care and therapeutic childcare), but found no differences in drug use between the groups, although found enhanced engagement in maternity services in the enhanced group.
Kraft (1997) and Margolin (2003) each studied inner city USA populations, and found enhanced MMT improved rates of abstinence from heroin and reductions in risk behaviours, and illicit opiate use, respectively.

McLellan (1993) compared three treatment groups (minimum MMT versus standard MMT versus enhanced MMT) in a group of 92 male intravenous opiate users in an MMT programme. The enhanced MMT group showed significantly more improvement than the standard MMT and the minimum MMT. The addition of basic counselling was associated with increases in efficacy and the addition of on-site professional services enhanced efficacy further.

**Conclusions**

The conclusions from these studies are that the addition of enhanced counselling improves retention, decreases illicit drug use, and improves programme efficacy. Enhanced counselling also improves engagement in pregnancy services but not drug services in the pregnant group and reduces high-risk behaviours if harm reduction programmes are provided simultaneously. However, the studies are heterogeneous and several had limited statistical power and methodological quality. The exact nature of the counselling used in these studies is seldom adequately defined, making the generalisability of the research unclear. Nevertheless, it is interesting that such a mixed group of studies produced generally comparable findings.
**Family therapy plus MMT (Table 5)**

Two studies are considered in this review (Catalano et al., 1999; Fals-Stewart et al., 2001). Both were conducted in the USA.

**Interventions**

Catalano et al. (1999) compared intensive family-focused interventions with a control group with six and twelve-month follow-up. Fals-Stewart et al. (2001) examined opiate-using males entering MMT together with their female partners. The additional intervention in this study was intensive behavioural couple therapy.

**Findings**

Catalano (1999) found significant positive changes among parents in family skills training in parent skills, drug use and family management but found few changes in their children.

Fals-Stewart (2001) only contained a small sample of opiate users and their partners, but found that both opiate and cocaine use decreased, with reported increases in relationship happiness and reduced family and social problems.

**Conclusions**
Although there were only two studies of family therapy in MMT patients, they suggest that this therapy may be effective for some patients. However, further research is needed to establish the generalisability of this approach. Further, in many countries outside of the USA, a large proportion of MMT patients are not in contact with their families and have few stable relationships, making the applicability of this approach unclear.

**Psychotherapy plus MMT (Table 6)**

Eight studies were reviewed under this category. However, the studies utilised a wide range of psychotherapy interventions and therefore are not directly comparable. Therefore, they will each be briefly considered separately.

A 16-week RCT comparing MMT to MMT plus intensive 12-step facilitation or plus ‘acceptance and commitment therapy’ was conducted by Hayes et al. (2004), in the USA. The sample size was N=138. Intensive 12-step facilitation was associated with lower drug usage follow-up but not in an intent to treat analysis. Acceptance and commitment therapy was associated with lower objective opiate and total drug usage at follow-up, and in intent to treat analysis. Therefore, the authors conclude that both interventions can be effective in reducing severe drug abuse.

Manganiello (1984) in the USA, recruited 70 adult volunteers into a six-month RCT comparing hypnotherapy and psychotherapy, with a six-month follow-up. It is noteworthy that psychotherapy, in this case, is not further defined. The hypnotherapy group were found to have significantly less illicit drug use and discomfort and at six-
month follow-up. 94% of those who had achieved abstinence, had remained drug free. However, it is difficult to draw conclusions from this study and noteworthy that further studies on hypnotherapy in combination with MMT were not found in our review.

Two studies, both by Rounsaville (1983; 1986), evaluated short-term inter-personal psychotherapy in MMT. The findings suggest that additional psychotherapy intervention has limited benefit to those engaged in MMT that already includes psychotherapy components.

One study was found (Shaffer et al., 1997) comparing Hatha Yoga with psychotherapy and found no significant difference in outcomes between conventional dynamic psychotherapy and Hatha Yoga.

The efficacy of individual psychotherapy, in psychiatrically symptomatic opiate-dependent patients during MMT, was studied in a 24-week RCT by Woody et al. (1995), in three community-based MMT programmes in the USA. MMT plus drug counselling was compared to MMT plus a supportive-expressive psychotherapy. The authors found that the benefits of psychotherapy persisted, in some cases, for at least six months beyond the end of therapy.

MMT was compared with ‘psychosocially enriched’ 180-day methadone-assisted detoxification (Sees et al., 2000) (Table 7). The MMT group showed higher levels of treatment retention than the detoxification group, lower levels of heroin use and lower levels of drug-related, but no changes in HIV risk behaviours or severity score for
legal status. The authors conclude that these results confirm the usefulness of MMT in reducing heroin use and HIV risk behaviours and suggest that long-term detoxification for some patients is preferable to detoxification. However, this study did not separately examine the effects of psychotherapy.

A single study looking at maintenance with LAAM (table 8) combined with psychotherapy (Linehen et al., 2002) in the USA, considered 23 female patients with borderline personality disorder and current opiate dependence. The patients were assigned to ‘dialectical behaviour therapy’ or ‘comprehensive validation therapy’ with 12-step interventions in an RCT with a 16-month follow-up. It was found that both treatment groups achieved reductions in opiate use with retention higher in the dialectical behaviour therapy group.

Conclusions

The studies overall support psychotherapeutic interventions as an adjunct to MMT in improving retention, reducing illicit substance use, and provide specific benefits e.g. family skills training and promote abstinence. However, the heterogeneity of these studies under the general heading of ‘psychotherapy’ makes any further comparison impossible.
Psychosocial Interventions in Buprenorphine Maintenance Treatment

There were three studies included in this review that examined various psychosocial intervention in the context of buprenorphine treatment: One CBT study (conducted in Sweden) and two contingency management studies (conducted in the USA).

**Cognitive Behavioural Therapy (CBT) plus buprenorphine treatment (Table 9)**

Kakko et al. (2005) conducted a placebo-controlled RCT of buprenorphine plus CBT versus placebo plus CBT in a group of inpatients. Buprenorphine plus intensive CBT achieved a 75% one-year retention against a 0% one-year retention in the placebo plus CBT group. The authors therefore recommend that buprenorphine plus intensive psychosocial treatment be added to treatment options for opioid-dependent patients. However, this study did not examine the separate influence of psychotherapy on treatment outcome, and is therefore not eligible for inclusion in this review.

**Contingency Management plus buprenorphine (Table 10)**

Kosten et al. (2003a; 2003b) conducted two large RCT’s (USA) on outpatient cocaine-abusing opioid addicts, maintained on buprenorphine. In the first study (N=160), they evaluated desipramine or placebo plus CM or non-contingent voucher interventions. Their findings indicate that both anti-depressant and CM have independent and addictive effects in facilitating cocaine-free urines in buprenorphine-maintained patients.
In the second study (Kosten et al., 2003b)(N=75) CM and non-CM groups plus elimination of escalating contingency management showed that buprenorphine maintenance with anti-depressant treatment maintained drug abstinence after eliminating the escalating CM. They concluded that their findings indicated the need for more intensive psychosocial interventions during CM.

**Psychosocial Interventions in Naltrexone Treatment**

There were three studies included in the review that examined various psychosocial interventions in naltrexone treatment, one CM study (conducted in the USA), one family therapy study (conducted in the USA), and one counselling study (conducted in Australia).

**Contingency Management plus naltrexone (Table 11)**

Carroll et al. (2001) compared standard naltrexone treatment to naltrexone plus a voucher-based CM (N=127). The authors found that CM was associated with greater treatment retention and reduction in opioid use compared with standard naltrexone treatment.

**Family Therapy plus naltrexone (Table 12)**

Fals-Stewart and O’Farrell (2003) conducted a 24-week RCT (N=124), comparing behavioural family counselling with individual treatment in combination with naltrexone therapy. The results indicate that behavioural family counselling, together
with a family-based naltrexone compliance contract, produced better outcomes during treatment and at 12-month follow-up than individual treatment with no family involvement.

**Structured Group Counselling (Table 13)**

Tucker et al. (2004) conducted an RCT (N=97) comparing structured group counselling (CBT relapse prevention approach) plus naltrexone versus naltrexone alone with a 3-month follow-up. They found both groups significantly improved with regard to illicit heroin use and psychosocial functioning. The authors therefore concluded that it was not possible to establish whether or not group counselling provided an additional benefit to naltrexone treatment.

**Psychosocial Interventions and Opiate Withdrawal**

We found ten RCTs of psychosocial intervention in methadone withdrawal treatment (Hall 1979, Higgins 1984, Higgins 1986, Rawson, 1983, McCaul 1984, Robles 2002; Grouber et al., 2000; Katz et al., 2002; Jones et al., 2005; Yandoli, 2002) and one in buprenorphine detoxification treatment (Bickel, 1997). Six of the studies examine CM plus detoxification, two examine CBT, on family therapy, one psychotherapeutic counselling.
Cognitive Behavioural Therapy in opiate withdrawal (table 14)

Grouber et al. (2000) studied the 3-month outcomes of an RCT of relapse prevention behaviour therapy (N=52), in opiate detoxification patients. The relapse prevention behaviour therapy required outpatient clinic attendance for 7 days a week versus treatment referral controls (i.e. standard after-care). The findings indicate that relapse prevention behaviour therapy achieved an improved level of abstinence from heroin and cocaine at 30 days, and illustrates the short-term efficacy for relapse prevention behaviour therapy in the maintenance of abstinence.

Similarly Jones et al. (2005), conducted a 12-month RCT evaluating reinforcement-based therapy to enhance abstinence outcomes (N=130) in an outpatient opioid-dependent population. Reinforcement-based therapy increased abstinence from illicit opiates and cocaine, relative to usual care at one and three months, indicating that intensive reinforcement-based therapy offered improved outcomes. However the authors noted that further study was required of the specific efficacy of component parts of such interventions.

Contingency Management in opiate withdrawal (Table 15)

Katz et al. (2002) conducted an RCT evaluating CM (involving an abstinence contingent voucher incentive programme) in an inpatient detoxification population. No significant differences in treatment retention, drug-free urines, or duration of continuous abstinence were found, suggesting that this voucher programme is ineffective.
Five other studies of CM in methadone detoxification were studied which involved either payment for drug free urine tests or methadone dose increases (Hall, 1979; Higgins, 1984; 1986; McCaul, 1984; Robles, 2002). One further study examined the Community Reinforcement Approach (which can be viewed as a form of CM) in the context of buprenorphine detoxification (Bickel, 1997). Overall these studies showed that CM led to significantly better outcomes compared to control detoxification, in terms of improved treatment compliance and drug use outcomes.

Other psychotherapy in opiate withdrawal (Table 16)

The one study of family therapy (Yandoli, 2002) showed significantly more clients receiving family therapy were abstinent at follow-up compared to controls. The study of psychotherapeutic counselling in opiate withdrawal (Rawson, 1983) showed no significant treatment effects.

Conclusions

Again this group of studies is highly heterogeneous. Nevertheless, both CBT and CM show evidence of effectiveness in improving treatment outcome in opioid withdrawal.
<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Design</th>
<th>Outcomes</th>
<th>Interventions</th>
<th>Results</th>
<th>Conclusions</th>
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<td><strong>PSYCHOSOCIAL + MMT: CBT</strong></td>
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<td>Avants et al, 1999</td>
<td>Community Based, inner city MMT programme in USA</td>
<td>N=291 Opiate dependent MMT patients</td>
<td>12 week RCT with 6 month follow up comparing day treatment versus enhanced standard MMT (active treatment comparisons).</td>
<td>UA (twice weekly). Treatment Services Review (monthly). ASI and HIV Risk (Baseline, end of 12 week treatment and 6 months f/u) Programme costs</td>
<td>- MMT + case management (all) - Enhanced MMT programme (2 hrs per week of manual guided CBT group intervention + 3 additional groups, n=146) - MMT + High intensity day treatment programme (5 hrs per day, 5 days per week of manual guided programme groups in 5 areas, n=145).</td>
<td>No sig difference between two groups in either opiate or cocaine use Drug use, drug-related problems, HIV risk behaviours decreased significantly for both conditions at end of treatment and at 6 month f/u (p&lt;.05) Cost day treatment programme sig. higher</td>
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<tr>
<td>Goldstein et al, 2002</td>
<td>Community MMT and outreach in New York City, USA</td>
<td>N=175 MMT drop outs who had left treatment in last 12 months</td>
<td>3 month RCT comparing an Alternative Program intervention with a comparison group with 6 month follow up</td>
<td>Sociodemographic and drug use variables CMRS ASI Risk Behaviour Assessment Instrument Attitudes towards methadone</td>
<td>- Comparison group (no details, n=64) - Alternative Programme: 3 components (n=111) 1. Outreach worker contact (min 1 per week for 1 month) 2. CBT group sessions 4 days per week for up to 3 months 3. Individual counselling</td>
<td>Intervention subjects who attended 2+ CBT groups were more likely to have returned to treatment during 6 month f/u that those who attended 0-1 groups or the comparison group (p&lt;0.05)</td>
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<td>O’Neill et al 1996</td>
<td>Maternity MMT clinic in Sydney, Australia</td>
<td>N=92 Pregnant women enrolled on MMT programme</td>
<td>RCT comparing intervention group with control group with 9 month follow up</td>
<td>HRBS Self Reported Drug Use (pre + post intervention and 9 month follow up)</td>
<td>-MMT + 6 session CBT relapse prevention (n=40) -Control group – MMT alone (n=40)</td>
<td>No change in drug use or needle risk post intervention At 9mf/u, intervention group significantly reduced injecting risk behaviours (p&lt;0.016). No effect on sexual risk behaviours, change in drug use or injection frequency</td>
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<tr>
<td>Pollack et al 2002</td>
<td>MMT programme in Boston, USA</td>
<td>N=23 Outpatients who had failed to control illicit drug use despite 3+ months of MMT</td>
<td>12 week RCT pilot study comparing a novel CBT treatment with a programme of increased counselling with 6 month f/u</td>
<td>UA (weekly) ASI HARS HRSD (baseline, post-treatment &amp; 6m fu)</td>
<td>-MMT + CBT to reduce illicit drug use (12 weekly individual sessions + 3 booster sessions. N=12) -Enhanced treatment as usual (MMT + 12 sessions of counselling + 3 booster sessions, n=11)</td>
<td>CBT programme &gt; reductions in illicit drug use for women (effect size: d=1.0) but not for men</td>
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<tr>
<td>Scherbaum et al 2005</td>
<td>MMT programme in Germany</td>
<td>N=73 Opiate addicts</td>
<td>RCT comparing MMT with group CBT psychotherapy</td>
<td>UA (5 per month) Intensity of drug use assessed at end of treatment and 6th month f/u</td>
<td>-MMT (local routine. N=32) -MMT + CBT group psychotherapy (20 90min sessions. N=41)</td>
<td>CBT Psychotherapy group &lt; drug use (cocaine) than controls at 6 month follow up (p&lt;0.02)</td>
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Table 1 continued…

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<tr>
<td>Drummond et al., 2004</td>
<td>10 Community based MMT clinics in 3 regions in England</td>
<td>N=60 Opiate dependent patients stabilised on methadone</td>
<td>6 month RCT measuring efficacy and cost effectiveness of CBT and MM with 1 year f/u</td>
<td>TLFB EuropASI Severity of Drug Dependence Quality of life BSI Compliance MMT Health economics Coping Responses Inventory Stage of Change Drug Taking Confidence</td>
<td>- MMT alone (minimum fortnightly keyworking sessions, n=31) - MMT + CBT (up to 24 weekly CBT sessions over 6 months, n=29)</td>
<td>No statistically significant differences on any of the outcome measures between the two groups No significant cost differences between the two groups MMT group &gt; quality of life (p&lt;0.05)</td>
<td>Negative results possibly due to implementation difficulties in UK treatment settings, low statistical power, lower doses of CBT received than planned, insufficient training of CBT specialists</td>
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<tr>
<td>Woody et al, 1981</td>
<td>MMT programme in Philadelphia, USA</td>
<td>N=75 Opiate addicts</td>
<td>Preliminary results of Woody et al, 1983</td>
<td>Not stated</td>
<td>As in Woody et al, 1983</td>
<td>All groups show improvements, but psychotherapy patients were using fewer drugs and reported fewer psychiatric symptoms, than counselling group</td>
<td>Opiate addicts are receptive to psychotherapy, and it may add to routine counselling services</td>
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<th>Outcomes</th>
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<th>Results</th>
<th>Conclusions</th>
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<tr>
<td>Woody et al 1983</td>
<td>MMT programme in Philadelphia, USA</td>
<td>N=110 Opiate addicts beginning a new MMT programme</td>
<td>6 month RCT comparing counselling with psychotherapy with 7 month follow up</td>
<td>BDI, MPI, SCL-90, Shipley Institute of living scale, SADS-L, SADS-C, ASI, Methadone Dose, UA (weekly)</td>
<td>MMT + drug counselling alone, MMT + supportive-expressive psychotherapy, MMT + cognitive behavioural psychotherapy</td>
<td>All 3 treatment groups showed significant improvements but 2 psychotherapy groups showed greater improvement and less use of medication and less use of opiates (p&lt;0.05) than those who received counselling alone</td>
<td>1/3 were interested and benefited from psychotherapy. Severity of psychiatric symptoms and diagnosis are substantial predictors of the benefits received by adding psychotherapy</td>
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<td>Brooner et al 2004</td>
<td>Outpatient MMT program in Baltimore, USA</td>
<td>N=127 Opioid Dependent patients</td>
<td>RCT comparing stepped care and behavioural contingencies and stepped care alone</td>
<td>SCID Methadone Dose Counselling attendance UA (Weekly)</td>
<td>- MSC: Motivated Stepped Care (SC + CM to motivate counselling attendance – less convenient MM dosing + MM taper with possible discharge and rapid readmission, n=65) SSC – Stepped Care alone (Control group), n=62</td>
<td>MSC &gt; counselling attendance (p&lt;0.001) MSC &lt; rate of poor treatment response (p&lt;0.01) MSC &lt; rates of opioid positive and any drug positive specimens (p&lt;0.05)</td>
<td>Behavioural contingencies were well tolerated and strongly associated with excellent counselling attendance</td>
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<td>Chutuape et al 1999</td>
<td>Behavioural Pharmacology Research Unit, Baltimore, USA.</td>
<td>N= 29 Opioid dependent patients admitted for MMT and completing first 5 weeks of treatment with &gt;80% opioid or cocaine + UA over a five week period</td>
<td>RCT of methadone take home doses and contingency management</td>
<td>UA (3x weekly)</td>
<td>Raised MMT + either 1. Daily contingent condition (1 day take home privilege for negative UA) n=11 2. Weekly contingent condition (1st take home privilege for 3 negative UA, and 1 take-home dose for each subsequent UA. Positive UA reset the contingency back to 3 UA requirement) n=10 3. No take-home control (no take home privileges) n=8</td>
<td>24% patients assigned to one of two CM conditions showed marked reductions in drug use. No subjects in control group met these criteria. Positive UA decreased by 14% (daily CM, p&lt;.07) and 18% (weekly CM, p&lt;.05) from baseline compared to decline of 2% in control group</td>
<td>The findings demonstrate that take home incentives can be effective for reducing during treatment use of opiates and cocaine in MMT patients with poor prognosis related to persistent multiple drug use</td>
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<td>Iguchi et al, 1996</td>
<td>MMT clinic in New Jersey, USA</td>
<td>N=66 Opiate dependent patients with 1 year of opiate use and negative methadone test.</td>
<td>24 week RCT comparing contingent reinforcement of psychoeducational group therapy participation and illicit drug abstinence with 12 week f/u</td>
<td>UA (3x weekly)</td>
<td>- TIPS – Training in interpersonal problem solving. (+ take home medications to reinforce attendance) n=34 - UA (take home medications to reinforce drug free urines) n=32</td>
<td>UA group &gt; improvement in rates of abstinence from unauthorized drugs (p&lt;.01) UA group &gt; clinical improvement (p&lt;.01)</td>
<td>Take home medications can be used to reinforce abstinence from illicit drugs in MMT patients. Reinforcing psychoeducational group attendance with take-home medications also increases participation in treatment.</td>
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<td>Iguchi et al 1997</td>
<td>MMT clinic in New Jersey, USA</td>
<td>N=103 Opiate dependent patients</td>
<td>12 week RCT comparing the use of vouchers to reinforce abstinence or completion of treatment plan related tasks (TP) with standard treatment</td>
<td>ASI UA (3x weekly)</td>
<td>- STD ( Standard condition, no additional intervention, n=35) - Negative UA (STD + 10 vouchers for each negative UA, n=27) - TP – (STD + up to 30 vouchers per week for completing treatment plan tasks, n=41)</td>
<td>TP &lt; illicit drug use than either negative UA or STD group (p&lt;.01). These effects were maintained even after CM discontinued</td>
<td>The relative success of TP intervention demonstrates usefulness and cost-effectiveness of reinforcing behaviours other than abstinence. CM not effective in subset of severe drug abusers.</td>
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<td>PSYCHOSOCIAL + MMT: CONTINGENCY MANAGEMENT (CM)</td>
<td>Centre for Addiction and pregnancy in Baltimore, USA.</td>
<td>N= 93 25 MMT and 68 abstinence treated (AT) pregnant opiates/cocaine dependent women</td>
<td>RCT of effectiveness of low-magnitude voucher incentives in improving attendance for AT and MMT patients</td>
<td>Treatment Attendance UA (daily)</td>
<td>- Incentive group (standard care + $5 voucher and bonuses during first 7 days of outpatient treatment for attending min 4 hrs daily) or for providing drug free UA (MMT patients, n=12)</td>
<td>Incentive group did not significantly improve attendance in AT patients or impact drug abstinence in MMT patients. MMT patients that received the incentive &gt; treatment attendance than non incentive subjects (p&lt;.03)</td>
<td>Although modest monetary incentives improved attendance in MMT patients, more potent interventions are needed to improve attendance and maintain abstinence in this high-risk population</td>
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<tr>
<td>Jones et al 2000</td>
<td>Centre for Addiction and pregnancy in Baltimore, USA.</td>
<td>N= 80 Opiate dependent pregnant MMT women</td>
<td>RCT of effectiveness of short-term CM for eliminating cocaine use and increasing treatment attendance</td>
<td>Treatment attendance UA (daily)</td>
<td>- Escalating Voucher incentive schedule (voucher for each full day of attendance for 7 days, then for each full day of attendance and -cocaine UA. Values escalated during treatment, n=44)</td>
<td>Escalating Voucher schedule &gt; full day treatment attendance and drug abstinence compared to non incentive schedule (p&lt;0.05)</td>
<td>Reinforcing the co-occurrence of treatment attendance and drug abstinence is effective and may be an important adjunct to MMT in pregnant drug dependent women</td>
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<td>Setting</td>
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<td>Outcomes</td>
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<td>Petry &amp; Martin 2002</td>
<td>MMT clinic in Connecticut, USA</td>
<td>N=42 Cocaine using methadone patients</td>
<td>RCT of effectiveness of low cost CM in reducing opioid and cocaine use in MMT patients</td>
<td>ASI TLFB UA (2-3x weekly)</td>
<td>- Standard Treatment (n=23)</td>
<td>CM patients &gt; durations of continuous abstinence than patients in standard treatment (p&lt;0.05). These effects were maintained at 6 month follow up</td>
<td>This prize reinforcement procedure may be suitable for community based settings.</td>
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<tr>
<td>Piotrowski et al 1999</td>
<td>Methadone detoxification centre in California, USA</td>
<td>N= 102 Opioid dependent patients who had applied for methadone detoxification</td>
<td>RCT of effectiveness of CM targeting abstinence from illicit drug and alcohol use in methadone transition treatment (MTT)</td>
<td>UA (twice weekly) Breath analysis (weekly) ASI CDISR Drug History chart</td>
<td>- MTT + CM (monetary reinforcers targeting abstinence) (n=51)</td>
<td>CM group &gt; continuous abstinence (p&lt;.005) and drug free tests overall (p&lt;.04). Effects were limited to the contracting period</td>
<td>CM using monetary reinforcers may be useful for achieving abstinence from multiple drug abuse during MTT.</td>
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<td>Preston et al 2000</td>
<td>MMT clinic in Baltimore, USA</td>
<td>N=120 Opiate dependent patients</td>
<td>8 week RCT evaluating a behavioural intervention, a pharmacological intervention and a combination of both interventions</td>
<td>UA (3x weekly) Breath Analysis (3a weekly) Self reported drug use Lifestyle changes questionnaire Craving questionnaire</td>
<td>- MMT + CM (vouchers) for opiate negative UA (n=29) - MMT + Methadone dose increase to 70 mg/d (n=31) - MMT + Methadone increase + CM (n=32) - MMT alone (n=28)</td>
<td>CM + Methadone increase &gt; opiate negative UA during intervention (p&lt;.05) CM with or without dose increase &gt; duration of sustained abstinence (p&lt;.05) Dose increased, with or without CM &gt; self report frequency of drug use and craving</td>
<td>CM + dose increase were each effective in reducing drug use. CM produced greater decreases in opiate use and had sig. effects on more outcome measures than the methadone dose increase group.</td>
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Table 2 continued…..

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<th>Study</th>
<th>Setting</th>
<th>Participants</th>
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<th>Outcomes</th>
<th>Interventions</th>
<th>Results</th>
<th>Conclusions</th>
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</thead>
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<tr>
<td>Preston et al 2002</td>
<td>MMT clinic in Baltimore, USA</td>
<td>N=110 Opiate dependent patients participating in Preston et al 2000</td>
<td>Abstinence reinforcement maintenance (12 weeks) and 3, 6 and 12 month follow up to Preston et al 2000 - Participants re-randomized to receive vouchers and take-home methadone doses contingent on opiate-negative UA</td>
<td>UA Self reported drug use ASI</td>
<td>- MMT + maintenance CM (vouchers and methadone take home on negative UA, n=55) MMT alone (non-contingent, n=55)</td>
<td>The maintenance CM group had better outcomes than the noncontingent group, including opiate abstinence (p&lt;.005). Enrolment in MMT after first study predicted good outcomes. More participants in the maintenance CM group transferred directly to another MMT program</td>
<td>Findings support the therapeutic value of extending the duration of CM and long-term MMT.</td>
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<td>Rhodes et al 2003 (study 2 only) (abstract only)</td>
<td>Inner city MMT programme in USA</td>
<td>N=52 Methadone maintenance patients</td>
<td>RCT comparing variable rates of reinforcement to fixed rates</td>
<td>Counselling attendance</td>
<td>- MMT + Variable reinforcement (vouchers prize draw on attendance) - MMT + Fixed reinforcement ($3.25 dollars on attendance)</td>
<td>No difference between variable and fixed reinforcement groups Poor attenders significantly improved counselling attendance during intervention</td>
<td>Targeting poor attenders with CM techniques may be a cost-effective method if improving counselling attendance, and may be particularly effective early in treatment.</td>
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<td>Rowan-Szal et al. 1994 (abstract only)</td>
<td>Community based MMT programme in Texas, USA</td>
<td>N=?</td>
<td>RCT comparing three contingent reward schedules, clients earned stars for counselling attendance and clean urines</td>
<td>UA ?</td>
<td>- High reward (4 stars per prize) &lt;br&gt;- Low reward (8 stars per prize) &lt;br&gt;- Delayed reward (3 month delay in receiving a prize)</td>
<td>All clients attended significantly more counselling sessions during the months that CM was available than the months prior to and after to intervention. &lt;br&gt;UA indicated that high reward clients had fewer positive UA than the low reward and delayed reward clients.</td>
<td>A simple system of recognising client progress with stars and modest prizes for performing specific behaviours can be an effective tool in increasing clinic attendance rates and reducing positive urines.</td>
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<tr>
<td>Schmitz et al 1998 (study 1 only)</td>
<td>Treatment research clinic in Texas, USA</td>
<td>N=32 opiate dependent patients</td>
<td>RCT examining contingent take-home medication doses during treatment of opiate dependence</td>
<td>SCID ASI Drug History Interview UA (2x weekly)</td>
<td>- High Frequency Take Home group (HFTH, clinic attendance 2x week, 5 take home doses, n=15) &lt;br&gt;- Low Frequency Take Home group (LFTH, clinic attendance 5x week, 2 take home doses received, n=17) &lt;br&gt;Note: CM took place in both groups in a 12 week period, then contingencies were removed</td>
<td>HFTH group &lt; illicit drug use during first 6 weeks of CM (p&lt;.05), but then shifted to the same level of the LFTH group.</td>
<td>The take-home dose contingency in this study, which failed to produce long lasting effects, may have been due to the potency of the reinforcer, or the performance requirements for earning the reinforcer.</td>
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<tr>
<td>Silverman et al 1998</td>
<td>MMT programme, Baltimore, USA</td>
<td>N=59 Cocaine using methadone patients</td>
<td>RCT comparing escalating reinforcement for abstinence of cocaine abuse in methadone patients</td>
<td>ASI DIS BDI SCL-90 Shipley Institute of Living Scale UA (3x weekly) BA (3x weekly) Self reported drug use (3x weekly)</td>
<td>- Escalating Reinforcement (value &gt; by $2.96 for each negative UA, n=20) - Escalating reinforcement + start-up bonus (value &gt; by $1.50 for each negative UA + $50 bonuses (1st 6 negative UA, and then for 2 consecutive negative UA, n=20) Yoked control group (vouchers were received independent of UA results, n=19)</td>
<td>Both CM conditions &gt; increased cocaine abstinence and opiate abstinence (p&lt;.05) CM conditions &lt; reports of cocaine craving. Start up bonuses did not improve outcome</td>
<td>These results show that cocaine abstinence reinforcement can have broad beneficial effects.</td>
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<tr>
<td>Stitzer et al 1992</td>
<td>MMT programme in Baltimore, USA</td>
<td>N=53 Opiate users admitted to MMT</td>
<td>RCT examining effect of contingent take-home interventions on drug use in MMT patients</td>
<td>UA (3x weekly)</td>
<td>- Contingent take home group (max 3 take home doses per week for negative UA) (n=26) - Non contingent take home group (take home doses received independent of UA) (n=27)</td>
<td>CM group &gt;abstinence for any drug than non CM group (p&lt;.05) Lower baseline rate of drug free urines strongly associated with successful outcome</td>
<td>CM take home incentives are recommended to motivate abstinence from poly drug use during MMT.</td>
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<tr>
<td>Czuzhry et al 1995 (abstract only)</td>
<td>MMT clinic in Texas, USA</td>
<td>N=93 Opioid addicted clients who had been in treatment for 6+ months</td>
<td>RCT comparing mapping enhanced counselling with standard counselling</td>
<td>Self report attention related problems UA</td>
<td>- MMT+ standard counselling - MMT + node-link mapping enhanced counselling</td>
<td>Mapping enhanced counselling group had lower % of UA positive for heroin and cocaine.</td>
<td>Results suggest mapping has greater benefits in terms of session attendance and program perception for clients with poor attentional stamina</td>
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<tr>
<td>Dansereau et al 1995 (abstract only)</td>
<td>MMT clinic in Texas, USA</td>
<td>N=331 Opiate dependent patients</td>
<td>RCT comparing mapping enhanced counselling with standard counselling</td>
<td>UA Counsellor ratings Attention</td>
<td>- MMT + standard counselling - MMT + mapping enhanced counselling</td>
<td>Mapping group &lt; percentages of positive cocaine/opiate UA during treatment, and were rated as having higher rapport, motivation and self confidence by counsellors</td>
<td>Clients with poor attention more likely to have positive UA, but this tendency appears to be reduced in the mapping enhanced counselling group.</td>
</tr>
<tr>
<td>Dansereau et al 1996</td>
<td>3 MMT programmes in Texas, USA</td>
<td>N=320 Opioid addicts admitted to 3 MMT clinics participating in a Drug Abuse Treatment for AIDS risk reduction and in treatment 6m+ (as in Joe et al, 1994)</td>
<td>RCT comparing node-link mapping with standard counselling (as in Joe et al 1994) but comparing effects of ethnicity on treatment outcome</td>
<td>UA (monthly) Client participation Counsellor evaluation</td>
<td>- MMT+ standard counselling - MMT + node-link mapping enhanced counselling</td>
<td>MMT + mapping group had fewer drug-positive urines for opiates, missed fewer counselling sessions and had more positive ratings by counsellors. Significant interactions between ethnicity and counselling condition.</td>
<td>Mapping was more effective for African Americans and Mexican Americans. Mapping appears to reduce cultural, racial and class communication barriers</td>
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Table 3 continued…

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<td>Dees et al 1997</td>
<td>MMT clinic in Texas, USA</td>
<td>N=155</td>
<td>12 month RCT comparing node-link mapping counselling with standard counselling</td>
<td>UA (monthly) Session reports</td>
<td>- Node-link mapping counselling (n=82)</td>
<td>Mapping clients &lt; opiate positive UAs during months 2-6 of treatment (p&lt;.01)</td>
<td>Session attendance was a significant predictor of cocaine positive UYA over months 2-12 for mapping clients Mapping-enhanced counselling is an effective method for improving outcomes during the first 6 months of treatment, is low cost and is easily administered</td>
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<tr>
<td>Joe et al 1997</td>
<td>3 MMT clinics in Texas, USA</td>
<td>N=180</td>
<td>12 month follow up study of RCT comparing effectiveness of node-link mapping (Simpson et al 1993)</td>
<td>UA (12m f/u) Self reported drug use HIV risky behaviour Criminal activities Self-reported psychosocial status</td>
<td>- MMT+ standard counselling, (n=99) - MMT + node-link mapping enhanced counselling, (n=81)</td>
<td>MMT + enhanced mapping counselling reported less criminal activity (p&lt;.05) Clients who stayed less than 6m in treatment had fewer UA opiate positives (p&lt;0.05)</td>
<td>Mapping-enhanced counselling may be especially beneficial for clients who leave treatment prematurely</td>
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<tr>
<td>Knight et al 1994 (abstract only)</td>
<td>MMT programme in Texas, USA</td>
<td>N=108</td>
<td>RCT comparing node-link mapping and standard counselling</td>
<td>Unknown</td>
<td>- MMT + standard counselling (n=51). - MMT + node-link mapping counselling, (n=57).</td>
<td>MMT + mapping &gt; favourable ratings of therapeutic engagement and progress</td>
<td>Clients viewed individual sessions as being more valuable than group counselling, but use of mapping increased</td>
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<td>Maddux et al, 1995 (abstract only)</td>
<td>MMT in USA</td>
<td>N=300 Chronic Opioid users</td>
<td>RCT comparing three approaches to a MMT programme</td>
<td>Drug Use Social Performance</td>
<td>- Standard treatment</td>
<td>Retention of optional counselling group &gt; other two groups (borderline significance) Patient-regulated dose group did not lead to a general escalation of dose Drug use and social performance did not differ significantly among the 3 groups</td>
<td>Findings support patient participation in decisions about methadone dose and the frequency of counselling</td>
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<tr>
<td>Simpson et al 1997</td>
<td>3 MMT clinics in Texas, USA</td>
<td>N= 527 Daily opioid users who remained in methadone maintainece for a minimum of 3 months</td>
<td>RCT comparing two counselling conditions</td>
<td>UA (monthly; opioid and cocaine use) Psychosocial functioning (TCU self rating form)/Preadmission motivation for treatment Engagement in treatment Therapeutic relationship Treatment Tenure</td>
<td>- Node link Mapping counselling. - Standard counselling</td>
<td>Node link mapping &gt; therapeutic relationships, patient engagement Therapeutic relationships associated with lower during treatment drug use and longer treatment retention</td>
<td>Pre-treatment motivation, program engagement, therapeutic relationship (drug treatment processes) and their interrelations with retention were specified. Counselling enhancements can improve programme effectiveness.</td>
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<td>Carroll et al 1995</td>
<td>Maternity MMT in USA</td>
<td>N= 20 Opiate addicted women</td>
<td>RCT comparing enhanced vs standard methadone maintenance</td>
<td>Maternal drug use</td>
<td>- Standard MMT (daily MM, weekly group counselling, 3x weekly urine toxicology screening)</td>
<td>No differences by treatment group in maternal drug use</td>
<td>Enhanced treatment was effective for the pregnancy but not for reducing maternal drug use.</td>
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<tr>
<td>(abstract only)</td>
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<td>Prenatal care visits, Gestation length Birth weight</td>
<td>- Enhanced MMT (weekly prenatal care, relapse prevention, CM, therapeutic childcare)</td>
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<td>Kraft et al 1997</td>
<td>MMT clinic in Philadelphia, USA</td>
<td>N= 100 methadone-maintained opiate users</td>
<td>6 month evaluation of 24 week RCT comparing three treatment groups (McLellan et al, 1997)</td>
<td>Urine analysis for drug use + ASI (Baseline, 24 weeks and 6 months) Treatment Services Review (weekly) Cost Measures</td>
<td>- Minimum MMT (n=31) - Standard MMT (MMT + counselling, n=36) - Enhanced MMT (MMT + counselling, medical and psychosocial services, n=33)</td>
<td>Standard MMT was most cost effective. Enhanced MMT &gt; rates of abstinence from heroin (p=0.02)</td>
<td>Large amounts of support to MMT are not cost-effective, but moderate amounts are better than minimal amounts</td>
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<td>Margolin et al 2003</td>
<td>Inner city MMT in Connecticut, USA</td>
<td>N= 90 HIV-seropositive injecting drug users entering MMT programme</td>
<td>6 month RCT comparing HIV Harm Reduction Program to an active control group with 6 and 9 month f/u</td>
<td>UA (3x weekly) – Heroin + cocaine HIV Risk Behaviour + Risk Assessment Battery ASI, Medication Adherence Aids information, motivation and behavioural skills</td>
<td>- Enhanced MMT (E-MMT: MM + weekly counselling + case management + 6 HIV risk reduction sessions, n=45). - HIV+ Harm Reduction Programme (HHRP+) (Enhanced MMT + 2x weekly group therapy sessions, n=45)</td>
<td>Both groups showed reductions in risk behaviours HHRP+ less likely to use illicit opiates (p&lt;0.01) and more likely to adhere to medications and have lower ASI scores (p&lt;0.04) and less likely to engage in various risk behaviours (p&lt;0.05).</td>
<td>Enhancing MMT with intervention targeting HIV-seropositive IDUs produces clinical benefits, and increases harm reduction and health promotion behaviours</td>
</tr>
<tr>
<td>McLellan et al 1993</td>
<td>MMT clinic in Philadelphia, USA</td>
<td>N=92 Male intravenous opiate users in MMT</td>
<td>6 month RCT comparing three treatment groups</td>
<td>ASI (baseline + 24 weeks) UA for drug use and breathalyzer for alcohol use (weekly)</td>
<td>- Minimum MMT (n=32) - Standard MMT (MMT + counselling + behavioural contingencies, n=29) - Enhanced MMT (MMT + counselling, medical and psychosocial services, n=31)</td>
<td>Enhanced MMT &gt; standard MMT and minimum MMT group (P&lt;0.05) Standard MMT group &gt; Minimum MMT (p&lt;0.05)</td>
<td>The addition of basic counselling was associated with major increases in efficacy and the addition of onsite professional services was even more effective</td>
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<td>Catalano et al 1999</td>
<td>2 MMT clinics in Seattle, USA</td>
<td>N=144 MMT patients and there children (N=178, age range 3-14 years)</td>
<td>RCT comparing intensive family focused interventions with control group with 6 and 12m f/u</td>
<td>PSI Family management practices, deviant peer networks, domestic conflict Self reported drug use validated with random UA</td>
<td>- MMT alone (n=81) - MMT + family training (33 sessions) + home-based case management (9months, n=97)</td>
<td>Significant positive changes among parents in family skills training in parent skills, drug use, deviant peers, family management (p&lt;.05). Few changes found in children</td>
<td>Family skills training may be important adjunct to MMT, helping to strengthen family bonding and reduce parents’ drug use</td>
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<tr>
<td>Fals-Stewart et al 2001</td>
<td>Two community based MMT clinics in New York, USA</td>
<td>N = 36 Heterosexual opiate using males entering MMT and their female partners</td>
<td>RCT comparing individual based MMT (IBMM) with intensive behavioural couples therapy (BCT) (no f/u)</td>
<td>DAS – Relationship adjustment MHS - ASI CSQ-8 SCID (baseline and post treatment 4m later) UA (weekly)</td>
<td>- MMT + IBMM (males only- 2 60min therapy sessions per week, n=17) - MMT + BCT (1 60 min individual session + 1 60 min couples therapy per week, n=19)</td>
<td>Male partners in BCT group &lt; opiate and cocaine-positive UA than male partners in IBMM BCT couples &gt; relationship happiness BCT patients &gt; reductions in drug use severity, family and social problems from baseline to posttreatment</td>
<td>BCT may improve treatment response for married or co-habitating MMT patients</td>
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<td>Hayes et al 2004</td>
<td>Community based MMT clinics in Nevada, USA</td>
<td>N= 138 Had received methadone for at least 30 days and who had used opiates during that time</td>
<td>16 week RCT comparing MMT to MMT + Intensive 12 step facilitation (ITSF) or MMT + Acceptance and Commitment Therapy (ACT) with 6 month f/u</td>
<td>Mini- SCID Urine Analysis for polydrug use (objective measure – twice weekly) ASI (subjective measure). SAS-SR, BDI, SCL-90-R</td>
<td>- MMT alone. - MMT + ACT (48 sessions (32 individual 1hr sessions + 16 90min group sessions) over 16 weeks of therapy. - MMT + ITSF (48 sessions (32 individual + 16 90min group sessions) based on 12 step therapy</td>
<td>ACT associated with lower objective opiate and total drug use at f/u and in intent-to-treat analysis. ITSF associated with lower drug use at f/u but not in intent-to-treat analysis. No difference in adjustment and psychological distress measures.</td>
<td>ACT and ITSF can be effective in reducing severe drug abuse</td>
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<td>Manganiello 1984 (abstract only)</td>
<td>MMT programme in USA</td>
<td>N=70 Adult volunteers at a MM programme</td>
<td>6 month RCT comparing hypnotherapy and psychotherapy with 6 month follow up</td>
<td>Methadone Dose Incidence of Illicit Drug Use Degree of discomfort</td>
<td>- Standard Clinical treatment (psychotherapy control group) - Standard Clinical Treatment + Hypnotherapy (experimental)</td>
<td>Experimental group significantly less illicit drug use and discomfort and a significantly greater number of withdrawals. At 6month f/o, 94% of experimental group who had achieved withdrawal remained narcotic free</td>
<td>none</td>
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Table 6 - Psychotherapy plus MMT
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<td>Rounsaville et al 1983</td>
<td>MMT programme in Connecticut, USA</td>
<td>N= 72 Methadone maintained opiate addicts</td>
<td>RCT evaluating short term interpersonal psychotherapy as treatment for psychiatric disorders in opiate addicts</td>
<td>SADS-L (psychiatric diagnosis) Programme measures (including UA for opiate use) Psychological symptoms Personality Social functioning</td>
<td>-MMT (incl weekly 90 min group psychotherapy and behavioural contingencies and 12 week intensive initiation) -MMT + short term ITP (1hr per week) -MMT + low contact treatment (1 20min session per month with psychiatrist)</td>
<td>The outcomes for the two groups were similar. Both groups showed significant clinical improvements</td>
<td>Little to suggest that additional psychotherapy is of benefit to a MMT programme that already includes psychotherapy.</td>
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<tr>
<td>Rounsaville et al 1986</td>
<td>MMT programme in Connecticut, USA</td>
<td>N=66 Opiate addicts who participated in Rounsaville et al 1983</td>
<td>2.5 year follow up of RCT evaluating short term interpersonal psychotherapy (Rounsaville et al 1983)</td>
<td>Psychological symptoms Social functioning Long term outcome</td>
<td>As Rounsaville et al 1983</td>
<td>Both treatment groups experienced significant improvement in ratings of symptoms and social functioning No significant differences in long-term outcome</td>
<td>Subjects who made gains during the treatment phase tended to maintain them, but those that did not gain were not barred from further improvement</td>
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<td>Shaffer et al 1997</td>
<td>Outpatient MMT programme – USA?</td>
<td>N=61</td>
<td>RCT comparing Hatha yoga with psychotherapy</td>
<td>Symptom checklist ASI</td>
<td>-MMT + Hatha yoga (alternative - weekly session in group setting) MMT + group dynamic psychotherapy (conventional)</td>
<td>No meaningful differences between groups. Both treatments contributed to significant reductions in drug use and criminal activity Psychopathology related to programme participation</td>
<td>Alternative MMT not more effective than conventional MMT, though some patients may benefit more from this approach</td>
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<td>Woody et al 1995</td>
<td>Three community based MMT programmes in Philadelphia, USA.</td>
<td>N=84</td>
<td>24 week RCT testing the efficacy of individual psychotherapy in psychiatrically symptomatic opiate-dependent patients during MMT with 1m and 6m f/u</td>
<td>BDI MPI SCL-90 Shipley Institute of living scale SADS-L ASI UA (weekly) Methadone dose</td>
<td>-MMT + drug counsellor (weekly for 6 months) -MMT + supportive-expressive psychotherapy (weekly for 6 months)</td>
<td>No difference in opiate use between groups Psychotherapy group lower methadone dose and fewer cocaine positive urine samples. At 6m f/u, the gains made by psychotherapy group still evident whereas in counselling group they had diminished</td>
<td>Additional counselling is associated with early benefits, but the gains do not persist. The benefits of psychotherapy persist, in some cases for at least 6 months at end of therapy</td>
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<tr>
<td>Sees et al, 2000</td>
<td>Research clinic in drug treatment setting</td>
<td>N=179 Opiate dependent patients</td>
<td>RCT comparing MMT with psychosocially enriched 180-day methadone assisted detoxification</td>
<td>Treatment retention UA (monthly) SLE freport drug use HIV risk behaviour ASI</td>
<td>- MMT (2 hours of psychosocial therapy per week for 1st 6 months (n=91) - Detoxification (3 hours psychosocial therapy per week, 14 education sessions, 1 hour cocaine group therapy for 6 months, aftercare for 6 months (n=88)</td>
<td>MMT &gt; treatment retention than detoxification MMT &lt; heroin use than detoxification MMT &lt; drug related, but not sex related HIV risk behaviours and severity score for legal status. No differences between groups in employment or family functioning or alcohol use.</td>
<td>Results confirm the usefulness of MMT in reducing heroin use and HIV risk behaviours. Illicit opioid use continued in both groups, but frequency was reduced. Results do not support diverting resources into long-term detoxification</td>
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<td>Linehan et al 2002</td>
<td>Mental health and substance abuse clinics in Washington, USA</td>
<td>N= 23 Female Borderline Personality Disorder (BPD) patients with current opiate dependence</td>
<td>12 month RCT to evaluate Dialectical behaviour therapy (DBT) and Comprehensive Validation Therapy with 12 step (CVT+12S) in heroin dependent women with BPD with 16 month follow up</td>
<td>UA (3x weekly) SCID-I TLFB Parasuicide History Interview Social History interview BSI</td>
<td>- LAAM + DBT - LAAM + CVT+12S</td>
<td>Both treatment groups effective in reducing opiate use DBT group &lt; opiate use through 12 months active treatment period CVT+12S group &gt; opiate use during last 4 months of treatment Retention higher in DBT group. At 16m f/u, both groups &lt; levels of psychopathology</td>
<td>Study supports DBT as a treatment for opioid-dependent women with BPD, and also shows promise of reinforcement and acceptance therapy, such as CVT+12S.</td>
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</table>
Table 9 –Cognitive Behaviour Therapy (CBT) plus buprenorphine treatment

<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>Participants</th>
<th>Design</th>
<th>Outcomes</th>
<th>Interventions</th>
<th>Results</th>
<th>Conclusions</th>
</tr>
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<tbody>
<tr>
<td>Kakko et al, 2005</td>
<td>Inpatient addiction clinic in Stockholm, Sweden.</td>
<td>N=40 Opioid-dependent who did not fulfil legal criteria for MMT</td>
<td>RCT placebo controlled trial of buprenorphine with CBT relapse prevention</td>
<td>UA (3x weekly) ASI</td>
<td>- Buprenorphine + CBT inc CM (fixed dose 12m) &lt;br&gt;- Buprenorphine placebo + CBT inc CM (tapered 6 day dose)</td>
<td>75% 1 year retention in treatment group 0% in Placebo group &lt;br&gt;Urine Screens were UA 75% negative for illicit opiates and other drugs in patients remaining in treatment</td>
<td>Buprenorphine and intensive psychosocial treatment is safe and highly efficacious, and should be added to treatment options.</td>
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Table 10 - Contingency Management (CM) plus buprenorphine

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<tr>
<th>Study</th>
<th>Setting</th>
<th>Participants</th>
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<th>Interventions</th>
<th>Results</th>
<th>Conclusions</th>
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<tr>
<td>Kosten et al 2003</td>
<td>Outpatient BM in Connecticut, USA</td>
<td>N=160 Cocaine abusing opiate addicts maintained by buprenorphine</td>
<td>12 week RCT evaluating Desipramine or placebo plus CM or a non-contingent voucher</td>
<td>UA (3x weekly) BA (2x weekly) Self-reported cocaine and opiate use Opiate withdrawal symptoms SCID ASI CES-D Hamilton Rating Scale</td>
<td>- DMI alone - DMI + CM - Placebo alone - Placebo + CM (n = 40 per cell)</td>
<td>DMI + CM &gt; opiate and cocaine free UA than the other three groups (50% more) (p&lt;0.01). DMI and Placebo + CM have faster rate of increase of cocaine and opiate free UA than DMI and placebo alone.</td>
<td>DMI and CM have independent and additive effects in facilitating cocaine free urines in buprenorphine maintained patients. The antidepressant appeared to enhance responsiveness to CM reinforcement.</td>
</tr>
<tr>
<td>Kosten et al 2003</td>
<td>Outpatient BM in Connecticut, USA</td>
<td>N=75 Cocaine abusing opioid addicts who completed 12 week RCT of BM + DMI and/or CM (Kosten et al, 2003) and who entered a 12 week CM reduction phase.</td>
<td>Comparison of the CM and non-CM groups from a 3 month RCT and the elimination of escalating CM (Kosten et al 2003)</td>
<td>UA (3x weekly)</td>
<td>- DMI + CM group - Placebo + CM group (12 weeks of escalating CM was eliminated during months 5 and 6 and the response requirement for vouchers was increased)</td>
<td>After eliminating the escalating CM, the CM group showed &gt; decline in opioid and cocaine free UA The decline within CM group was greater in those treated with DMI than placebo</td>
<td>BM with DMI maintained drug abstinence after eliminating the escalating CM, but not after increasing the response requirement, suggesting need for more intensive psychosocial interventions during CM</td>
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Table 11 – Contingency Management (CM) plus naltrexone

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<th>Study</th>
<th>Setting</th>
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<tbody>
<tr>
<td>Carroll et al 2001</td>
<td>Outpatient and inpatient detox clinics in Connecticut, USA</td>
<td>N= 127 Opioid dependence who completed outpatient detox</td>
<td>RCT examining behavioural therapies to enhance naltrexone treatment of opioid dependence</td>
<td>Treatment compliance, UA, Frequency of cocaine use, Substance Abuse Calendar, ASI, HIV Risk Assessment Battery</td>
<td>Standard Naltrexone Treatment, Naltrexone + voucher based CM</td>
<td>CM associated with &gt; treatment retention (p=.05) and reduction in opioid use (p=.04) compared with standard Naltrexone treatment</td>
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Table 12 –Family Therapy plus naltrexone

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<th>Study</th>
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<th>Design</th>
<th>Outcomes</th>
<th>Interventions</th>
<th>Results</th>
<th>Conclusions</th>
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<tr>
<td>Fals-Stewart &amp; O’Farrell 2003</td>
<td>2 community outpatient clinics in North-Eastern USA</td>
<td>N=124 Male Opioid dependent patients</td>
<td>24 week RCT comparing behavioural family counselling (BFC) with individual based treatment (IBT)</td>
<td>TLFB ASI UA (each treatment session and assessment interview) Treatment participation, compliance and satisfaction (CSQ)</td>
<td>Naltrexone + IBT (3 sessions per week (2 individual, 1 group) first 16 weeks, 1 individual session per week last 8 weeks) Naltrexone + BFC (3 sessions per week (1 individual, 1 group, 1 BFC session) first 16 weeks, 1 individual session per week last 8 weeks)</td>
<td>BFC group &gt; naltrexone, attended more treatment sessions, days abstinent from opioids and other drugs during treatment At 1 year follow up, BFC group &lt; drug-related, legal and family problems.</td>
<td>BFC with a family-based naltrexone compliance contract produced better outcomes during treatment and 12 months follow up that IBT with no family involvement</td>
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<td>Study</td>
<td>Setting</td>
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<tr>
<td>Tucker et al 2004</td>
<td>Alcohol and Drug clinic in Melbourne, Australia</td>
<td>N=97 Opiate dependent clients</td>
<td>RCT comparing structured group counselling (CBT relapse-prevention approach) and naltrexone alone with 3m f/u</td>
<td>OTI BDI SF-36</td>
<td>Experimental (Naltrexone + 12 week of structured group counselling) Control Group (Naltrexone + case management)</td>
<td>Both groups significantly improved heroin use and psychosocial functioning. Control group &gt; level of physical functioning</td>
<td>Not possible to conclude from these results whether or not group counselling provides additional benefit to Naltrexone treatment</td>
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Table 14 – Cognitive Behaviour Therapy (CBT) plus opiate withdrawal

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<tr>
<th>Study</th>
<th>Setting</th>
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<th>Outcomes</th>
<th>Interventions</th>
<th>Results</th>
<th>Conclusions</th>
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<tr>
<td>PSYCHOSOCIAL + WITHDRAWAL - CBT</td>
<td>Inpatient chemical dependency unit in Baltimore, USA</td>
<td>N=52 Opiate positive detoxification patients</td>
<td>3 months outcome of RCT of Reinforcement based therapy (RBT- relapse prevention behaviour therapy) to enhance abstinence</td>
<td>UA ASI AUDIT BDI STAI Treatment participation and housing Relapse to first drug use</td>
<td>RBT (outpatient clinic attendance for 7 days a week for 2 weeks then 3x weekly for next 6 weeks and 2x weekly for remaining 4 weeks, n=28)</td>
<td>RBT &lt; return to drug use (p&lt;0.05) 50% RBT patients vs 21% of controls reported 30 days abstinence from heroin and cocaine (UA, p&lt;0.05). RBT &lt; BDI scores than controls (p&lt;0.050, and showed less alcohol use and higher rates of employment)</td>
<td>This study establishes the short-term efficacy for RBT and support continued development and evaluation of this new outpatient behavioural treatment.</td>
</tr>
<tr>
<td>Gruber et al 2000</td>
<td>Inpatient chemical dependency unit in Baltimore, USA</td>
<td>N=52 Opiate positive detoxification patients</td>
<td>3 months outcome of RCT of Reinforcement based therapy (RBT- relapse prevention behaviour therapy) to enhance abstinence</td>
<td>UA ASI AUDIT BDI STAI Treatment participation and housing Relapse to first drug use</td>
<td>RBT (outpatient clinic attendance for 7 days a week for 2 weeks then 3x weekly for next 6 weeks and 2x weekly for remaining 4 weeks, n=28)</td>
<td>RBT &lt; return to drug use (p&lt;0.05) 50% RBT patients vs 21% of controls reported 30 days abstinence from heroin and cocaine (UA, p&lt;0.05). RBT &lt; BDI scores than controls (p&lt;0.050, and showed less alcohol use and higher rates of employment)</td>
<td>This study establishes the short-term efficacy for RBT and support continued development and evaluation of this new outpatient behavioural treatment.</td>
</tr>
<tr>
<td>Jones et al, 2005</td>
<td>Medically tapered programmes in Baltimore, USA</td>
<td>N=130 Opioid dependent patients who had completed the taper programme and were not prescribed or discharged with a prescription for opioid medication</td>
<td>12 month evaluation of an RCT evaluating reinforcement based therapy (RBT) to enhance abstinence outcomes</td>
<td>UA ASI BDI</td>
<td>RBT (outpatient clinic attendance 7 days per week first 3 weeks then 4 days a week in weeks 4-12, n=66)</td>
<td>RBT &gt; self-report and UA negative results for opioid and cocaine relative to usual care at 1 and 3 months during treatment but not at 6 or 12m f/u. RBT group &gt; no. of days worked and legal income at 3, 6 &amp; 12 months</td>
<td>Intensive reinforcement based therapy is a promising approach but evidence is needed to determine the role of treatment intensity and specific efficacy of intervention component parts</td>
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<td>Study</td>
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<tr>
<td>Katz et al 2002</td>
<td>Inpatient detoxification program in Baltimore, USA</td>
<td>N=52 Opiate dependent patients enrolled in outpatient drug free programme.</td>
<td>RCT evaluating abstinence contingent voucher incentive programme</td>
<td>Treatment retention UA</td>
<td>CBT + Voucher (vouchers earned for each negative UA for cocaine and opiates, first voucher value $2.50 increasing by $1.25 for subsequent negative UAs, n=29) CBT alone (=23)</td>
<td>No sig differences on treatment retention, drug free urines, duration of continuous abstinence or % of participant abstinent for 4 weeks.</td>
<td>Findings suggest voucher programs must be better tailored to the clinical population and behavioural targets being addressed.</td>
</tr>
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Table 15 – Other psychotherapy plus opiate withdrawal (incomplete)
Conclusions

The overall conclusions of this review are that the group of studies considered here are generally of medium to low methodological quality, with a some clear exceptions. Sample sizes are generally small, outcome measures are often not validated, little attempt has been made to minimise sources of bias particularly inherent in RCTs of psychological intervention. This necessarily limits the conclusions which can be drawn about the effectiveness of psychosocial interventions, compared to equivalent research in pharmacotherapies for opioid dependence. However, many of these problems are inherent in the psychosocial literature more broadly, and are not unique to the addiction field.

Another important observation is that most of this research has been conducted in the USA which has a very different health and social care system compared to many other developed and developing countries. It is possible that differences in the availability of resources, trained personnel and expertise, may produce different results. This problem may be particularly apposite in relation to psychosocial, rather than pharmacological, interventions, which rely in large part on the expertise and skill of therapists. There may also be differences in the type of opioid dependent clients accessing treatment in the USA compared to other countries. Even within the USA there may be differences between psychosocial interventions delivered in the context of an RCT, which tend to be conducted in better resourced, research affiliated centres, compared to the typical clinical practice more widely applied.
Often the precise nature of the psychosocial interventions under study, or the context in which the therapy is applied is not clearly defined. So the generalisability of the findings of this review is, in many cases, unclear.

Nevertheless, it is the case that some forms of psychosocial intervention have been more extensively studied in a wider variety of clinical settings with a wider range of subject populations. This tends to strengthen the conclusions that can be made. We will now summarise the conclusions in relation to each of the categories of study reviewed.

*Psychosocial Interventions in Methadone Maintenance Treatment*

The largest amount of research has been conducted on psychosocial interventions in the context of MMT. MMT in itself is an effective treatment for opioid dependence and is the main treatment approach in most developed countries. Nevertheless, it has long been claimed by many authorities in the field that not only is MMT a means of bringing opioid addicts into contact with psychosocial therapies, the psychosocial interventions themselves need to be an integral part of an effective methadone programme. Ball and Ross (1991), for example, in an influential observational study of a large number of methadone programmes in the USA, found that the quality and availability of psychosocial interventions was related to successful treatment outcome. However, this was a non-randomised study, and one needs to look to RCTs for evidence of the additive effect of psychosocial intervention.
The largest number of RCTs (N=15) and the greatest evidence of effectiveness was found in relation to CM plus MMT. Most of these studies show positive treatment outcome effects in relation to reduced illicit drug use. There is also evidence of effects on attendance, treatment compliance, at least for the duration of the CM. The longer term impact of CM is however unclear, as is the cost effectiveness. All of these studies have been conducted in the USA, so its impact in other countries with different treatment systems and arguably different client characteristics and expectations remains to be established. Nevertheless, these findings appear robust and suggest that more research should be conducted in other countries to replicate the US results.

A wide range of CM techniques appear to be effective and so the most effective method of delivery and target of CM remain to be established. It is possible that in different countries and treatment systems, different incentives will be more effective. For example, some treatment systems routinely provide incentives (e.g. travelling expenses, free primary health care) to encourage attendance, which may limit the effectiveness of providing other forms of incentive. However, this needs to be fully evaluated in a range of treatment systems. It is also possible that the ethical implications of paying addicts to remain in treatment will prove difficult to accept in some health care systems. However, CM in MMT remains the psychosocial approach with the strongest research support, at least in the USA.

CBT in a wide variety of forms is the next most studied form of psychosocial intervention in MMT. Eight studies were identified, which broadly supported the efficacy of CBT in MMT in relation to reduced illicit drug use, and some studies
showed increased compliance with MMT. However, the studies were heterogeneous and hence, difficult to compare directly. It is also unclear what the most effective method of delivery of CBT, or the key “active ingredients”, or the optimal “dose” of intervention is. This type of “dose” and process research has been more fully carried out in relation to other mental disorders, and should be carried out in this field also. There is a lack of adequate cost effectiveness research in the psychosocial intervention field generally, and the CBT in MMT field in particular. One direct cost effectiveness study (Drummond et al., 2004) showed that CBT was more cost effective than simple case management, although the CBT overall did not produce significantly better outcomes due to limited statistical power.

Of course, CM is also a form of behavioural intervention. However, the main difference between CBT and CM is that the former requires more face to face client contact, and arguably more therapist skill and training to deliver. So in comparing the relative cost effectiveness of CBT and CM it is possible that the extra cost of therapist training and time for CBT may be offset by the cost of monetary or other incentives in CM. This is an important area for future study.

We identified several studies examining a wide range of other psychotherapies under the headings of “counselling”, family therapy, and “psychotherapy”. These were clearly a heterogeneous group of interventions with a wide range of targets for the therapy and employing a wide range of often overlapping techniques. In some cases the therapy was specifically designed to deal with particular problems the clients were experiencing (e.g. marital or family disharmony, or psychiatric comorbidity), whereas in other cases the therapy was intended to deal with the underlying addictive
behaviour. Hence it is difficult to form clear conclusions about which approach might be the most successful in the context of MMT. Future research should make a distinction between therapies targeted at specific client groups or problems experienced by subgroups of clients, and that directed more generally at the addictive behaviour itself. It may also be the case that psychological interventions targeted at specific identified problems that the client may have and recognise in themselves, may be more acceptable to clients than psychological interventions aimed at addictive behaviour more generally. Often clients in MMT do not perceive themselves as having “mental health problems” and hence, being in need of psychological treatment, whether this is objectively the case or not.

That being said, the overall conclusion is that MMT can be enhanced by a wide range of psychosocial interventions. Whether this is a characteristic of the specific therapies employed, or specific qualities thereof, or more generally because therapy clients are simply receiving more attention than controls remains to be established. Very few of the studies examined here attempted to assess if the process of therapy and improvement was the result of (or at least in keeping with) the theoretical model of psychosocial intervention applied. This process research should be an important focus for future research (Curran & Drummond, 2005).

Psychosocial Interventions in Buprenorphine Maintenance Treatment

In comparison to psychosocial intervention research in MMT, relatively little has been carried out in the context buprenorphine maintenance, perhaps simply as it is a relatively new approach compared to MMT. Of the research that has been conducted,
the effect of CM in buprenorphine treatment appears consistent with the effect of CM in MMT. While it is clearly important to study similarities and differences between the effects of psychosocial intervention in MMT and buprenorphine maintenance, it is unclear if the effects of psychosocial treatments differ between these two forms of pharmacological maintenance therapy. Hence it would be difficult to justify a large programme of psychosocial research replicating the MMT field. It would however, be useful to examine the adjunctive effects with buprenorphine maintenance of the most promising psychosocial interventions in MMT (particularly CM and CBT). As buprenorphine maintenance becomes more widely used internationally, it will be important to establish the most cost effective means of deliver, including adjunctive psychosocial interventions.

**Psychosocial Interventions in Naltrexone Treatment**

Naltrexone maintenance treatment has less evidence of effectiveness than has either MMT or buprenorphine maintenance, even although naltrexone is completely effective in blocking opioid agonist effects. The difference is likely to be due to client compliance, which may in part be influenced by the lack of positive hedonic effects and side effects of naltrexone. Therefore it is important to examine methods of increasing naltrexone compliance. The two most promising approaches here are CM, and family therapy combined with a compliance contract and supervision. Although we have identified only one study of each modality of psychosocial intervention, both supported their use as an adjunct to naltrexone. Structured group counselling, on the other hand, was not supported by evidence from one study. So while CM and family therapy combined with supervision/contracting are promising adjuncts to increase
naltrexone compliance, these studies need to be replicated, particularly in different countries and treatment systems. There is also non-randomised data suggesting that naltrexone may have utility in the context of criminal justice, or employee assistance programmes, where there are clear sanctions and contingencies to encourage compliance, this area lacks good quality RCTs and this should be a priority for future research. This is particularly important as court mandated naltrexone treatment is increasing widely used in spite of a lack of clear evidence to support its use.

*Psychosocial Interventions and Opiate Withdrawal*

We found a reasonable number of studies that combined psychosocial interventions with opioid withdrawal treatment. Overall, these showed that both CBT and CM improved treatment outcome compared to withdrawal alone, with more studies on CM than on CBT. The study of family therapy showed limited effects and the study on psychotherapeutic counselling, which was of limited methodological quality was not effective. However, again most of these studies was conducted in the USA, and the generalisability to other countries and settings is unclear.

**Recommendations**

*Recommendations for future research*

1. More research of higher methodological quality is required to provide more definitive evidence of the effectiveness and cost effectiveness of adjunctive psychosocial treatments in the pharmacotherapy of opioid dependence.
2. Future research needs to take account of advances in the methodology of RCTs of psychosocial intervention, including methods to minimise bias, effects of therapist factors, and greater understanding of treatment process.

3. It is difficult to know the generalisability of psychosocial research conducted mainly in the USA to other countries and treatment systems. Hence, more research on psychosocial interventions needs to be conducted outside of the USA.

4. Greater clarity on the precise methods of psychosocial intervention is needed in future research. The cross cultural implementation and testing of psychosocial interventions would be assisted by publication of treatment manuals used in research studies.

5. Future research on psychosocial interventions in opioid addicts needs to have greater clarity about the precise target(s) of the interventions, and hence which subgroups of clients the interventions are most likely to be helpful for.

**Recommendations for psychosocial intervention in MMT and buprenorphine maintenance**

1. The outcome of MMT is enhanced by adjunctive psychosocial interventions, including reduced illicit drug use, improved attendance, greater MMT compliance, and reduced injecting risk behaviours. Therefore, adjunctive psychosocial interventions are recommended to maximise MMT effectiveness.

2. The greatest evidence of benefit is in relation to CM followed by various forms of CBT. However, the most effective elements and forms of CM and CBT, as well as the minimum “dose” and key “active ingredients” required for
a positive outcome, remain to be established. However, CM and CBT are recommended as having the strongest research support.

3. The cost effectiveness of CM and CBT in the context of MMT needs to be determined, as does the relative effectiveness and cost effectiveness of the two modalities of intervention.

4. Specifically in relation to CM, its applicability and effectiveness in treatment settings outside of the USA needs to be determined as it has so far only been studied in the USA.

5. There is research support for CM as an adjunct to buprenorphine maintenance, but very few studies of other forms of adjunctive psychosocial intervention have been conducted to allow clear recommendations concerning other approaches. More research is needed to clarify the effect of adjunctive psychosocial treatment in buprenorphine maintenance, particularly in settings outside of the USA.

Recommendations for psychosocial interventions in naltrexone treatment

1. CM and family therapy combined with supervision/contracting can be used to enhance compliance with naltrexone maintenance treatment. However the evidence in support of this is limited.

2. Research on the impact of adjunctive psychosocial intervention on naltrexone compliance and outcome is needed, particularly in settings outside of the USA.
3. RCTs of psychosocial intervention as an adjunct to naltrexone
maintenance in the context of criminal justice and employee assistance
programmes are needed.

Recommendations for psychosocial interventions and opiate withdrawal

1. Both CM and CBT can be used to enhance the outcome from
pharmacologically assisted opioid withdrawal treatment.
2. The effect of psychosocial treatment as an adjunct to pharmacologically
assisted opioid withdrawal should be examined in countries outside of the
USA.
References (incomplete)


randomized controlled trial. *JAMA.*, 283 (10), 1303-1310.


Final report to the Department of Health Research and Development Directorate.


