Pharmacological interventions for drug-using offenders (Review)

Perry AE, Neilson M, Martyn-St James M, Glanville JM, Woodhouse R, Godfrey C, Hewitt C

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2015, Issue 6

http://www.thecochranelibrary.com

WILEY

TABLE OF CONTENTS

[Intervention Review]

Pharmacological interventions for drug-using offenders

Amanda E Perry[1], Matthew Neilson[1], Marrissa Martyn-St James[2], Julie M Glanville[3], Rebecca Woodhouse[1], Christine Godfrey[1], Catherine Hewitt[1]

[1]Department of Health Sciences, University of York, York, UK. [2]School of Health and Related Research (ScHARR), University of Sheffield, Sheffield, UK. [3]York Health Economics Consortium, York, UK

Contact address: Amanda E Perry, Department of Health Sciences, University of York, Heslington, York, YO105DD, UK. amanda.perry@york.ac.uk.

Editorial group: Cochrane Drugs and Alcohol Group.
Publication status and date: New search for studies and content updated (conclusions changed), published in Issue 6, 2015.
Review content assessed as up-to-date: 31 May 2014.

Citation: Perry AE, Neilson M, Martyn-St James M, Glanville JM, Woodhouse R, Godfrey C, Hewitt C. Pharmacological interventions for drug-using offenders. *Cochrane Database of Systematic Reviews* 2015, Issue 6. Art. No.: CD010862. DOI: 10.1002/14651858.CD010862.pub2.

ABSTRACT

Background

The review represents one in a family of four reviews focusing on a range of different interventions for drug-using offenders. This specific review considers pharmacological interventions aimed at reducing drug use or criminal activity, or both, for illicit drug-using offenders.

Objectives

To assess the effectiveness of pharmacological interventions for drug-using offenders in reducing criminal activity or drug use, or both.

Search methods

We searched Fourteen electronic bibliographic databases up to May 2014 and five additional Web resources (between 2004 and November 2011). We contacted experts in the field for further information.

Selection criteria

We included randomised controlled trials assessing the efficacy of any pharmacological intervention a component of which is designed to reduce, eliminate or prevent relapse of drug use or criminal activity, or both, in drug-using offenders. We also report data on the cost and cost-effectiveness of interventions.

Data collection and analysis

We used standard methodological procedures as expected by Cochrane.

Main results

Fourteen trials with 2647 participants met the inclusion criteria. The interventions included in this review report on agonistic pharmacological interventions (buprenorphine, methadone and naltrexone) compared to no intervention, other non-pharmacological treatments (e.g. counselling) and other pharmacological drugs. The methodological trial quality was poorly described, and most studies were rated as 'unclear' by the reviewers. The biggest threats to risk of bias were generated through blinding (performance and detection bias) and incomplete outcome data (attrition bias). Studies could not be combined all together because the comparisons were too different. Only subgroup analysis for type of pharmacological treatment were done. When compared to non-pharmacological, we found low

quality evidence that agonist treatments are not effective in reducing drug use or criminal activity, objective results (biological) (two studies, 237 participants (RR 0.72 (95% CI 0.51 to 1.00); subjective (self-report), (three studies, 317 participants (RR 0.61 95% CI 0.31 to 1.18); self-report drug use (three studies, 510 participants (SMD: -0.62 (95% CI -0.85 to -0.39). We found low quality of evidence that antagonist treatment was not effective in reducing drug use (one study, 63 participants (RR 0.69, 95% CI 0.28 to 1.70) but we found moderate quality of evidence that they significantly reduced criminal activity (two studies, 114 participants, (RR 0.40, 95% CI 0.21 to 0.74).

Findings on the effects of individual pharmacological interventions on drug use and criminal activity showed mixed results. In the comparison of methadone to buprenorphine, diamorphine and naltrexone, no significant differences were displayed for either treatment for self report dichotomous drug use (two studies, 370 participants (RR 1.04, 95% CI 0.69 to 1.55), continuous measures of drug use (one study, 81 participants, (mean difference (MD) 0.70, 95% CI -5.33 to 6.73); or criminal activity (one study, 116 participants, (RR 1.25, 95% CI 0.83 to 1.88) between methadone and buprenorphine. Similar results were found for comparisons with diamorphine with no significant differences between the drugs for self report dichotomous drug use for arrest (one study, 825 participants, (RR 1.25, 95% CI 1.03 to 1.51) or naltrexone for dichotomous measures of reincarceration (one study, 44 participants, (RR 1.10, 95% CI 0.37 to 3.26), and continuous outcome measure of crime, (MD -0.50, 95% CI -8.04 to 7.04) or self report drug use (MD 4.60, 95% CI -3.54 to 12.74).

Authors' conclusions

When compared to non-pharmacological treatment, agonist treatments did not seem effective in reducing drug use or criminal activity. Antagonist treatments were not effective in reducing drug use but significantly reduced criminal activity. When comparing the drugs to one another we found no significant differences between the drug comparisons (methadone versus buprenorphine, diamorphine and naltrexone) on any of the outcome measures. Caution should be taken when interpreting these findings, as the conclusions are based on a small number of trials, and generalisation of these study findings should be limited mainly to male adult offenders. Additionally, many studies were rated at high risk of bias.

PLAIN LANGUAGE SUMMARY

Pharmacological interventions for drug-using offenders

Background

Drug-using offenders by their nature represent a socially excluded group in which drug use is more prevalent than in the rest of the population. Pharmacological interventions play an important role in the rehabilitation of drug-using offenders. For this reason, it is important to investigate what we know works when pharmacological interventions are provided for offenders.

Study characteristics

The review authors searched scientific databases and Internet resources to identify randomised controlled trials (where participants are allocated at random to one of two or more treatment groups) of interventions to reduce, eliminate, or prevent relapse of drug use or criminal activity of drug-using offenders. We included males and female of any age or ethnicity.

Key results

We identified 14 trials of pharmacological interventions for drug-using offenders. The interventions included: (1) naltrexone in comparison with routine parole, social psychological treatment or both; (2) methadone maintenance in comparison with different counselling options; and (3) naltrexone, diamorphine and buprenorphine in comparison with a non-pharmacological alternative and in combination with another pharmacological treatment. Studies could not be combined all together because the comparisons were too different. When compared to non-pharmacological, we found low quality evidence that agonist treatments are not effective in reducing drug use or criminal activity . We found low quality of evidence that antagonist treatment was not effective in reducing drug use but we found moderate quality of evidence that they significantly reduced criminal activity. When comparing the drugs to one another we found no significant differences between the drug comparisons (methadone versus buprenorphine, diamorphine and naltrexone) on any of the outcome measures suggesting that one pharmacological drug does not preside over another. One study provided some cost comparisons between buprenorphine and methadone, but data were not sufficient to generate a cost-effectiveness analysis. In conclusion, we found that pharmacological interventions do reduce subsequent drug use and criminal activity (to a lesser extent). Additionally, we found individual differences and variation between the degree to which successful interventions were implemented and were able to sustain reduction of drug use and criminal activity.

Quality of evidence

This review was limited by the lack of information reported in this group of trials and the quality of the evidence was low. The evidence is current to May 2014.

SUMMARY OF FINDINGS FOR THE MAIN COMPARISON *[Explanation]*

Agonist pharmacological compared to no intervention for drug-using offenders

Patient or population: drug-using offenders
Settings: criminal justice
Intervention: Agonist pharmacological
Comparison: no intervention

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	No intervention	Agonist pharmacological				
Drug use (objective) hair and urine analyses Follow-up: 3 months to 4 years	**Study population**		**RR 0.72** (0.51 to 1)	237 (2 studies)	⊕⊕◯◯ **low**[1,2]	
	43 per 100	**31 per 100** (22 to 43)				
	Moderate					
	50 per 100	**36 per 100** (25 to 50)				
Drug use self reported dichotomous self report information Follow-up: 3 months to 4 years	**Study population**		**RR 0.61** (0.31 to 1.18)	317 (3 studies)	⊕⊕◯◯ **low**[3,4]	
	74 per 100	**45 per 100** (23 to 88)				
	Moderate					
	74 per 100	**45 per 100** (23 to 88)				

Drug use self reported continuous self report information Follow-up: 9 months to 4 years		The mean drug use self reported continuous in the intervention groups was **0.62 standard deviations lower** (0.85 to 0.39 lower)		510 (3 studies)	⊕⊕◯◯ **low**[5,6]	SMD -0.62 (-0.85 to -0.39)
Criminal activity dichotomous - Arrests official records Follow-up: median 9 months	**Study population**		**RR 0.6** (0.32 to 1.14)	62 (1 study)	⊕⊕◯◯ **low**[7,10]	
	55 per 100	**33 per 100** (18 to 63)				
	Moderate					
	55 per 100	**33 per 100** (18 to 63)				
Criminal activity dichotomous - Re-incarceration official records Follow-up: 7 months to 4 years	**Study population**		**RR 0.77** (0.36 to 1.64)	472 (3 studies)	⊕⊕◯◯ **low**[8,9]	
	66 per 100	**51 per 100** (24 to 100)				
	Moderate					
	83 per 100	**64 per 100** (30 to 100)				
Criminal activity continuous mean number of crime dayes Follow-up: median 9 months		The mean criminal activity continuous in the intervention groups was **74.21 lower** (133.53 to 14.89 lower)		51 (1 study)	⊕⊕◯◯ **low** [7,11]	

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
CI: Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] Across the two studies 10 of the 18 risk of bias items in total were rated as unclear.
[2] The total number of events across the two studies is less than 300. This is a threshold rule of thumb based on Muller et al Ann Intern Med. 2007; 146: 878-881.
[3] Across the three studies 17 items were rated as unclear out of a total of 27 items.
[4] The P value for heterogenity is less than 0.05 and the I^2 is 89% suggesting significant inconsistency between the studies.
[5] Across the three studies 16 of the 27 items on risk of bias were rated as unclear
[6] The P value for heterogenity is less than 0.05 and the I^2 is 99% suggesting significant inconsistency across the studies.
[7] 6 of the 9 risk of bias items were rated as unclear
[8] Across the three studies 17 of the 27 risk of bias items in total were rated as unclear
[9] The P value for heterogenity is less than 0.05 and the I^2 is 74% suggesting significant heterogenity.
[10] only 1 study with 62 participants
[11] only 1 study with 51 participants

BACKGROUND

This review represents part of a family of four reviews undertaken to closely examine what works in reducing drug use and criminal activity among drug-using offenders. Overall, the four reviews contain over 100 trials, generating a number of publications and numerous comparisons (Perry 2013a; Perry 2013b; Perry 2013c). The four reviews represent specific interests in pharmacological interventions, non-pharmacological interventions, female offenders and offenders with co-occurring mental illness. All four reviews stem from an updated previous Cochrane systematic review (Perry 2006). In this set of four reviews, we consider the effectiveness of interventions based on two key outcomes and analyse the impact of setting and intervention type. Presented here is the revised methodology for this individual review, focusing on the impact of pharmacological interventions provided for drug-using offenders.

Description of the condition

Offenders as a socially excluded group of people demonstrate significant drug use and subsequent health problems. Studies investigating the prevalence of drug dependence in UK prisons report variable results of 10% (Gunn 1991), 39% (Brooke 1996), and 33% (Mason 1997). Similar trends have been reported elsewhere. In France, 30% of prison inmates are heroin addicted, and in Australia, 59% of prison inmates report injecting (primarily heroin) drug use histories. In the US, it is recognised that many offenders are in need of treatment to tackle their drug use (Lo 2000).The link between drug use, subsequent health and social and criminological consequences is well documented in the literature (e.g. Michel 2005), and offenders have a high risk of death from opioid overdose within two weeks of release from incarceration (Bird 2003; Binswanger 2007). Substance use disorders are linked to criminal behaviour and are a significant burden on the criminal justice system. Approximately 30% of acquisitive crime is committed by individuals supporting drug use with the use of criminal acts (Magura 1995).

Description of the intervention

Internationally, methadone maintenance has been the primary choice for chronic opioid dependence in prisons and jails, including those in the Netherlands, Australia, Spain and Canada, and it is being increasingly implemented in the criminal justice setting (Moller 2007; Stallwitz 2007). The US has not generally endorsed the use of methadone treatment, and only 12% of correctional settings offer this option for incarcerated inmates (Fiscella 2004). Reasons for this lack of expansion suggest that public opinion and that of criminal justice system providers consider methadone treatment as substituting one addiction for another. In contrast, buprenorphine appears not to carry the same social stigma associated with methadone treatment and has been used in France, Austria and Puerto Rico (Catania 2003; Reynaud-Maurupt 2005; Garcia 2007). Naltrexone treatment has shown some promising findings, but associated problems surrounding high attrition and low medication compliance in the community and high mortality rates (e.g. Gibson 2007; Minozzi 2011) pose concerns. Trials conducted in the criminal justice setting are still lacking, and continuity of care is considered crucial in the treatment of drug-involved offenders who transition between prison and the community.

How the intervention might work

A growing body of evidence shows the effects of pharmacological interventions for drug use among the general population. Existing reviews have focused on naltrexone maintenance treatment for opioid dependence (Amato 2005; Lobmaier 2008; Minozzi 2011); and the efficacy of methadone (Marsch 1998; Faggiano 2003; Mattick 2009); and buprenorphine maintenance (Mattick 2009). Recent guidance has been provided from the National Institute for Health and Clinical Excellence on evidence-based use of naltrexone, methadone and buprenorphine for the management of opioid dependence (NICE 2007a; NICE 2007b). Five Cochrane reviews (including 52 studies) reported on the effectiveness of opiate methadone therapies (Amato 2005). Findings showed that methadone maintenance therapies at appropriate doses were most effective in retaining participants in treatment and in suppressing heroin use, but evidence of effectiveness for other relevant outcome measures such as criminal activity was weak and was not systematically evaluated.

Systematic reviews evaluating treatment programs more generally for offender populations have focused on evaluating treatment in one setting such as community-based programmes, (e.g. Mitchell, 2012a; Mitchell, 2012b); or have based their evidence on literature from one country (e.g. Germany or the US) (Chanhatasilpa 2000; Egg 2000); or a number of specific treatments (Mitchell 2006). Pharmacological systematic reviews of offender treatment appear to be sparse. We identified two previous reviews, one focusing on specific drug- and property-related criminal behaviours in methadone maintenance treatment (Marsch 1998); and an evaluation of the effectiveness of opioid maintenance treatment (OMT) in prison and post-release (Hedrich 2011). The later of these two reviews identified six experimental studies up until January 2011 (Hedrich 2011). The authors found that OMT in prison was significantly associated with reduced heroin use, injecting and syringe sharing. Use of pre-release OMT was also found to have important implications for associated treatment uptake after release, but the impact on criminal activity was equivocal.

Why it is important to do this review

The current review provides a systematic examination of trial evidence relating to the effectiveness of pharmacological interven-

tions for drug-using offenders. We believe it is important to conduct this review because the evidence about pharmacological interventions for drug-using offenders has not been evaluated in this manner before. In order to address this broad topic a series of questions will consider the effectiveness of different interventions in relation to criminal activity, drug misuse treatment setting and type of treatment. The review will additionally report descriptively on the costs and cost effectiveness of such treatment programs.

OBJECTIVES

To assess the effectiveness of pharmacological interventions for drug-using offenders in reducing criminal activity or drug misuse or both. The review addressed the following questions:

- Does any pharmacological treatment for drug-using offenders reduce drug use?

- Does any pharmacological treatment for drug-using offenders reduce criminal activity?

- Does the treatment setting (e.g. court, community, prison/secure establishment) affect outcome(s) of pharmacological treatments?

- Does one type of pharmacological treatment perform better than one other?

Additionally, this review aimed to report on the cost and cost-effectiveness of interventions.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials (RCTs)

Types of participants

We included illicit drug-misusing offenders in the review regardless of gender, age, ethnicity or psychiatric illness. Drug misuse includes individuals occasionally using drugs, or who are dependent on, or are known to abuse, drugs. Offenders are defined as individuals who were subject to the criminal justice system.

Types of interventions

Included interventions were designed, wholly or in part, to eliminate or prevent relapse to drug use or criminal activity, or both, among participants. We defined relapse as individuals who may have returned to an incarcerated setting, or had subsequently been arrested or had relapsed back into drug misuse, or both. We included a range of different types of interventions in the review.

Experimental interventions included in the review:

- Any pharmacological intervention (e.g. buprenorphine, methadone)

Control interventions included in the review.

- No treatment
- Minimal treatment
- Waiting list
- Treatment as usual
- Other treatment (e.g. pharmacological or psychosocial)

Types of outcome measures

Primary outcomes

For the purpose of our review we categorised our primary outcomes into those relating to dichotomous and continuous drug use or criminal activity, or both. Where papers reported a number of different follow-up periods, we report the longest time period, as we felt that such measures provide the most conservative estimate of effectiveness. For specific meta-analyses of sub-groupings, we reviewed all reported follow-up periods to select the most appropriate time period for combining comparable studies.

- Drug use measures were reported as:

    - self-report drug use (unspecified drug, specific drug use not including alcohol/tobacco, Addiction Severity Index drug composite scores); and
    - biological drug use (measured by drugs tested by urine or hair analysis).

- Criminal activity as measured by:

    - self-report or official report of criminal activity (including arrest for any offence, drug offences, reincarceration, convictions, charges and recidivism).

Secondary outcomes

Our secondary outcome reported on costs or cost-effectiveness information. We used a descriptive narrative for these findings. We undertook a full critical appraisal based on the Drummond 1997 checklist for those studies presenting sufficient information.

Search methods for identification of studies

Electronic searches

Electronic searches

The update searches identified records from 2004 to May 2014.

- CENTRAL (Issue 5, 2014).
- MEDLINE (1966 to May 2014).
- EMBASE (1980 to May 2014).
- PsycINFO (1978 to April 2014).
- Pascal (1973 to November 2004)[a].
- SciSearch (Science Citation Index) (1974 to April 2014).
- Social SciSearch (Social Science Citation Index) (1972 to April 2014).
- ASSIA (1987 to May 2014).
- Wilson Applied Science and Technology Abstracts (1983 to October 2004)[a].
- Inside Conferences (1993 to November 2004)[a].
- Dissertation Abstracts (1961 to October 2004)[a].
- NTIS (1964 to April 2014).
- Sociological Abstracts (1963 to April 2014).
- HMIC (to April 2014).
- PAIS (1972 to April 2014).
- SIGLE (1980 to June 2004)[b].
- Criminal Justice Abstracts (1968 to April 2014).
- LILACS (2004 to April 2014).
- National Research Register (March 2004)[c].
- Current Controlled Trials (December 2009).
- Drugscope (February 2004)- unable to access.
- SPECTR (March 2004)[d].

[a] Unable to access further to 2004 search.
[b] Database not updated since original 2004 search.
[c] No longer exists.
[d] Now Campbell Collaboration searched on line.

To update the original review (Perry 2006), the search strategy was restricted to studies that were published or unpublished from 2004 onwards. A number of original databases were not searched for this update (indicated by the key at the end of the database list). Pascal, ASSIA, Wilson Applied Science and Technology Abstracts, Inside Conferences and Dissertation Abstracts were not searched. These databases are available only via the fee-charging DIALOG online host service: we did not have the resources to undertake these searches. The National Research Register no longer exists, and SIGLE has not been updated since 2005. Drugscope is available only to subscribing members. The original searches were undertaken by Drugscope staff.

Search strategies were developed for each database to exploit the search engine most effectively and to make use of any controlled vocabulary. Search strategies were designed to restrict the results to RCTs. No language restriction was placed on the search results. We included methodological search filters designed to identify trials. Whenever possible, filters retrieved from the InterTASC Information Specialists' Sub-Group (ISSG) Search Filter Resource site (http://www.york.ac.uk/inst/crd/intertasc/) were used. If filters were unavailable from this site, search terms based on existing filters were used instead.

In addition to the electronic databases, a range of relevant Internet sites (Home Office, National Institute of Drug Abuse (NIDA) and European Association of Libraries and Information Services on Alcohol and Other Drugs (ELISAD)) were searched. Directory web sites, including OMNI (http://www.omni.ac.uk), were searched up until November 2011. The review did not place any language restrictions on identification and inclusion of studies in the review.

Details of the update search strategies and results and of the Internet sites searched are listed in Appendix 1; Appendix 2; Appendix 3; Appendix 4; Appendix 5; Appendix 6; Appendix 7; Appendix 8; Appendix 9; Appendix 10; Appendix 11; Appendix 12; Appendix 13.

Searching other resources

Reference checking

We scrutinised the reference lists of all retrieved articles for further references, and also undertook searches of the catalogues of relevant organisations and research founders.

Personal communication

We contacted experts for their knowledge of other studies, published or unpublished, relevant to the review.

Data collection and analysis

Selection of studies

Two authors independently inspected the search hits by reading the titles and abstracts, and obtained each potentially relevant study located in the search as a full-text article to independently assess them for inclusion. In the case of discordance, a third independent author arbitrated. One author undertook translation of articles not written in the English language.

The screening process was divided into two key phases. Phase one used the initial seven key questions reported in the original new reference review. These were:

Prescreening criteria: phase one

- Is the document an empirical study? [If "no" exclude document.]
- Does the study evaluate an intervention, a component of which is designed to reduce, eliminate or prevent relapse among drug-using offenders?
- Are the participants referred by the criminal justice system at baseline?
- Does the study report pre-programme and post-programme measures of drug use?

- Does the study report pre-programme and post-programme measures of criminal behaviour?
- Is the study a randomised controlled trial?
- Do the outcome measures refer to the same length of follow-up for two groups?

After relevant papers from phase one had been identified, phase two screening was performed to identify papers reporting on pharmacological interventions. Criteria included the following.

Prescreening: phase two

- Is the intervention a pharmacological intervention? [if "yes" include document]

Drug-using interventions were implied if the programme targeted reduced drug use in a group of individuals. Offenders were individuals either residing in special hospitals, prisons, the community (i.e. under the care of the probation service) or diverted from court or placed on arrest referral schemes for treatment. We included studies in the review where the sample were not entirely drug-using, but reported pre- and post-measures. The study setting could change throughout the process of the study, e.g. offenders could begin in prison but progress through a work-release project into a community setting. Finally, studies did not need to report both drug and criminal activity outcomes: if either of these was reported we included the study in the review.

Data extraction and management

We used data extraction forms to standardise the reporting of data from all studies obtained as potentially relevant. Two authors independently extracted data and subsequently checked them for agreement.

Assessment of risk of bias in included studies

Five independent review authors (AEP, JMG, MM-SJ, MN, RW) assessed risk of bias in all included studies using risk of bias assessment criteria recommended in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011).

The risk of bias assessment for RCTs in this review was performed using the criteria recommended by the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011). The recommended approach for assessing risk of bias in studies included in a Cochrane Review involves the use of a two-part tool that addresses six specific domains, namely, sequence generation and allocation concealment (selection bias), blinding of participants and providers (performance bias), blinding of outcome assessor (detection bias), incomplete outcome data (attrition bias), selective outcome reporting (reporting bias), and other sources of bias. The first part of the tool involves describing what was reported to have happened in the study. The second part of the tool involves assigning a judgement related to the risk of bias for that entry in terms of low, high or unclear risk. To make these judgements, we used the criteria indicated by the *Cochrane Handbook for Systematic Reviews of Interventions* as adapted for the addiction field.

The domains of sequence generation and allocation concealment (avoidance of selection bias) were addressed in the tool by a single entry for each study.

Blinding of participants, personnel and outcome assessor (avoidance of performance bias and detection bias) was considered separately for objective outcomes (e.g. dropping out, using substance of abuse as measured by urinalysis, relapsing of participants at the end of follow-up, engaging of participants in further treatments) and subjective outcomes (e.g. duration and severity of signs and symptoms of withdrawal, participant self-reported use of substance, side effects, social functioning as integration at school or at work, family relationships).

Incomplete outcome data (avoidance of attrition bias) were considered for all outcomes except dropping out of treatment, which very often is the primary outcome measure in trials on addiction. See Appendix 14 for details.

For studies identified in the most recent search, the review authors attempted to contact study authors to establish whether a study protocol was available.

Measures of treatment effect

The mean differences (MD) were used for outcomes measured on the same scale and the standardised mean difference (SMD) for outcomes measured on different scales. Higher scores for continuous measures are representative of greater harm. We present dichotomous outcomes as risk ratios (RR), with 95% confidence intervals (CIs).

Unit of analysis issues

To avoid double counting of outcome measures (e.g. arrest and parole violation) and follow up time periods (e.g. 12, 18 months) all trials were checked to ensure that multiple studies reporting the same evaluation did not contribute towards multiple estimates of programme effectiveness. We followed Cochrane guidance and where appropriate we combined intervention and control groups to create a single pairwise comparison. Where this was not appropriate we selected one treatment arm and excluded the others.

Dealing with missing data

Where we found data was missing in the original publication, we attempted to contact the study authors via email to obtain the missing information.

Assessment of heterogeneity

Heterogenity was assessed using I^2 and Q statistics (Higgins 2011).

Data synthesis

The RevMan software package was used to perform a series of meta-analyses for continuous and dichotomous outcome measures (Review Manager 2014). A random-effects model was used to account for the fact that participants did not come from a single underlying population. A narrative review were performed to address each of the key questions outlined in the objectives. The narrative tables included a presentation of study details (e.g. author, year of publication, and country of study origin), study methods (e.g. random assignment), participants (e.g. number in sample, age, gender, ethnicity, age, mental health status), interventions (e.g. description, duration, intensity, setting), outcomes (e.g. description, follow-up period, reporting mechanism), resource and cost information and resource savings (e.g. number of staff, intervention delivery, estimated costs, estimated savings), and notes (e.g. methodological and quality assessment information). For outcomes of criminal activity, data were sufficient to allow the review authors to divide this activity into "re-arrest" and reincarceration categories.

Subgroup analysis and investigation of heterogeneity

A separate subgroup analysis of the studies was planned by different types of treatments and different settings.

Sensitivity analysis

When appropriate, sensitivity analyses were planned to assess the impact of studies with high risk of bias. Because of the overall high risk of bias of the included studies, this analysis was not conducted.

RESULTS

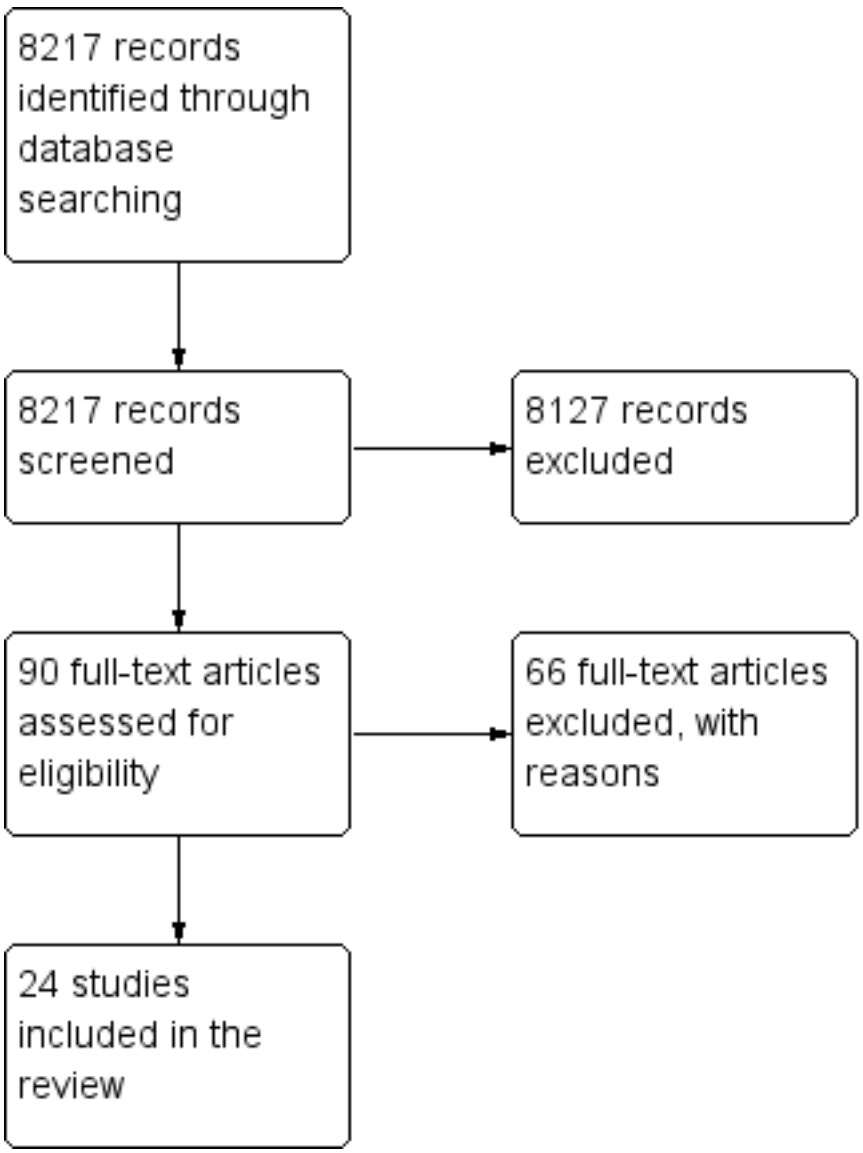
Description of studies

Results of the search

Original review

The original searches spanned from database inception to October 2004. This identified a total of 8217 records after duplication. We acquired a total of 90 full text papers for assessment and excluded 66 papers, bringing 24 trials to the review (see Figure 1).

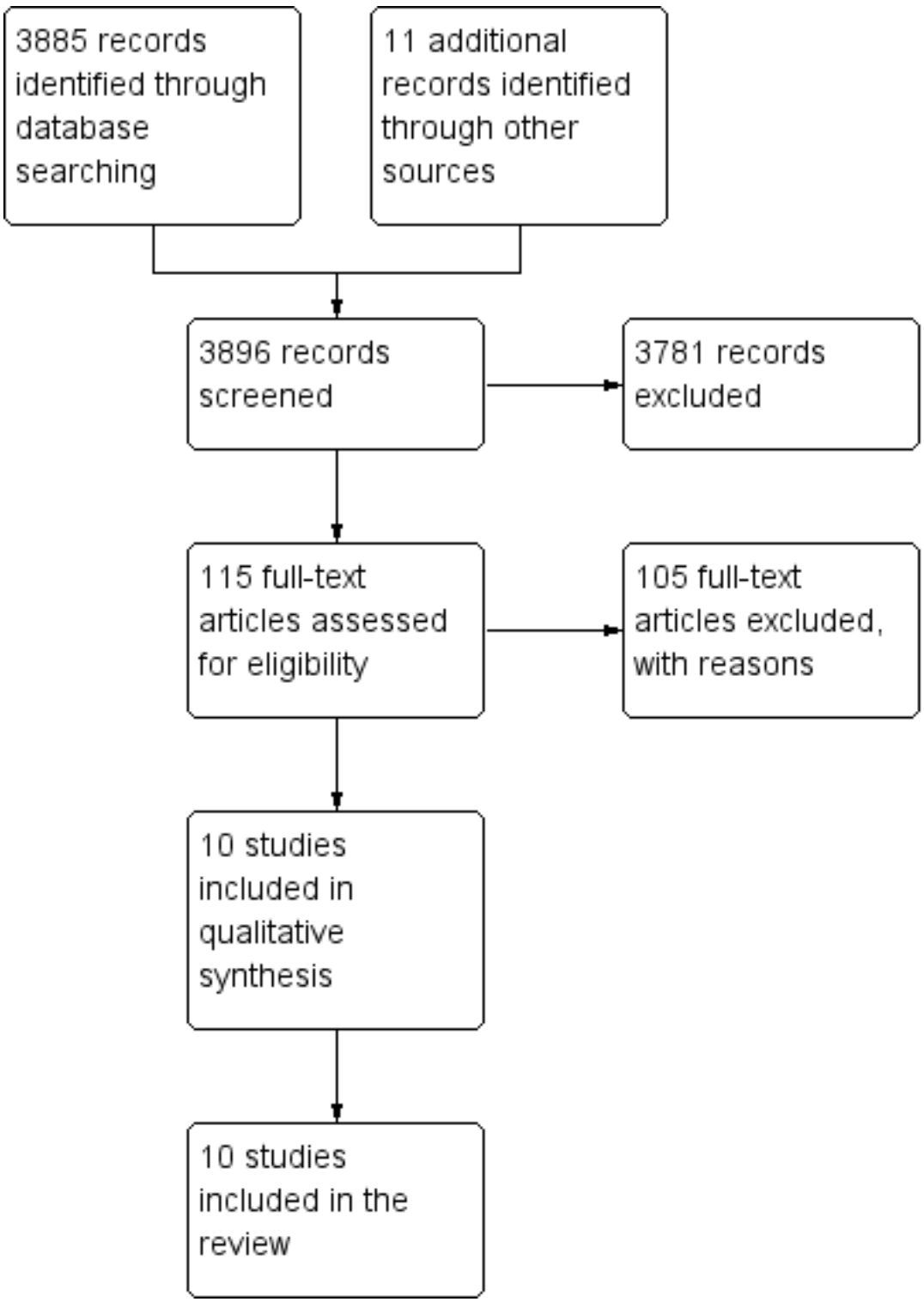
Figure 1. Study flow diagram of paper selection: Original Review



First update

The updated searches spanned from October 2004 until March 2013. This identified a total of 3896 records after duplication. We acquired a total of 115 full text papers for assessment and excluded 105 papers, bringing 10 new trials to the review (see Figure 2).

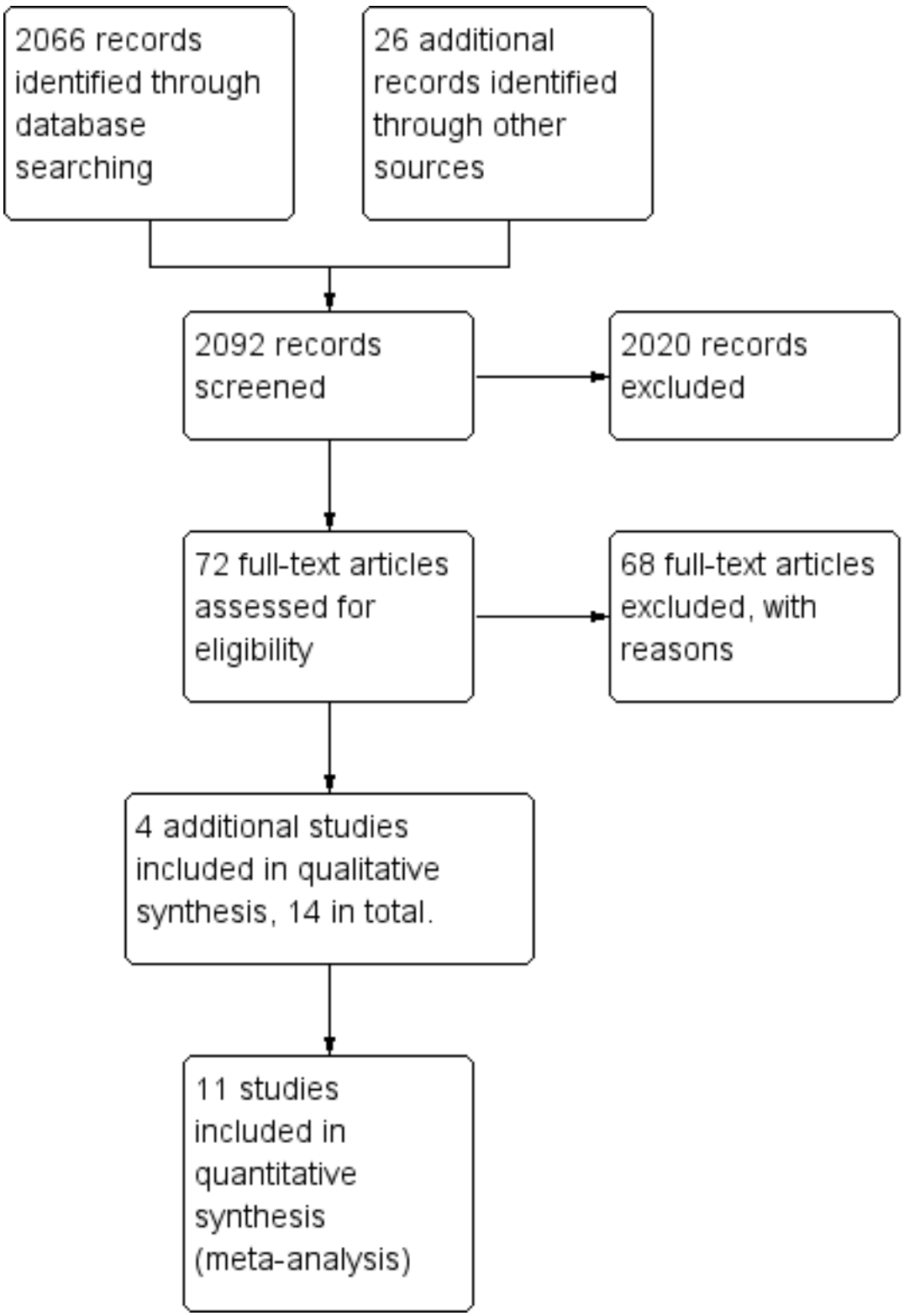
Figure 2. Study flow diagram of paper selection: First Update



Second update

The updated searches spanned from March 2013 until May 2014. This identified a total of 2092 records after duplication. We acquired a total of 72 full text papers for assessment and excluded 68 papers, bringing four new trials to the review making a total of 14 trials (see Figure 3).

Figure 3. Study flow diagram of paper selection: Second Update



Included studies

- The studies were published between 1969 and 2014 and represented 14 trials, including 2647 participants. The 14 trials consisted of 18 trial publications on different interventions (Bayanzadeh 2004; Brown 2013; Cornish 1997; Cropsey 2011; Coviello 2010; Dolan 2003; Dole 1969; Howells 2002; Kinlock 2005; Kinlock 2007; Lobmaier 2010; Lobmann 2007; Magura 2009; Wright 2011). Two trials represented data from multiple follow-up publications. The Dolan studies published data on the primary study and four year follow-up data (Dolan 2003); and Kinlock and colleagues reported on outcome measures and a secondary analysis of the data in two subsequent publications (see Kinlock 2007). See Table 1 for a summary of study information and outcomes.

- A number of studies produced different comparisons and were combined appropriately according to time point of measurement (e.g. 1 month, 3 months, 6 months, 12 months) and type of outcome.

Treatment regimens and settings

- Thirteen studies used methadone as the intervention or for comparison (Bayanzadeh 2004; Brown 2013; Dolan 2003; Dole 1969; Howells 2002; Kinlock 2005; Kinlock 2007; Lobmaier 2010; Lobmann 2007; Magura 2009; Wright 2011). Brown 2013 compared specialist treatment plus suboxone or methadone versus primary care plus suboxone; Lobmann 2007 compared methadone with diamorphine; and Magura 2009 and Wright 2011 compared methadone with buprenorphine. One study compared methadone to lofexidine (Howells 2002). All other studies compared methadone maintenance with interventions where there was no drugs administration (waiting list or counselling alone).

- Three studies used naltrexone in oral and implantation formats in comparison with probation or parole (Cornish 1997); psychosocial therapy (Coviello 2010); and methadone (Lobmaier 2010).

- One study compared the use of buprenorphine with a placebo (Cropsey 2011).

- The studies were categorised by setting; five studies were conducted in the community (Cornish 1997; Lobmann 2007; Coviello 2010; Cropsey 2011; Brown 2013); and the remainder in secure settings (Dole 1969; Dolan 2003; Bayanzadeh 2004; Kinlock 2005; Kinlock 2007; Magura 2009; Lobmaier 2010; Howells 2002; Wright 2011).

- One study was conducted using a jail diversion scheme for either a drug treatment court or Treatment Alternative Program (TAP) (Brown 2013).

- Different outcome measures were presented for each study, and just over half of all studies reported four or more outcome measures (see Table 1). Criminal justice and drug outcomes were measured by all studies except four. Cornish 1997 and Lobmann 2007 reported on criminal activity outcomes only; and Bayanzadeh 2004, Brown 2013, Dolan 2003, Cropsey 2011 and Wright 2011 reported on drug use only.

Countries in which the studies were conducted

- Nine studies were published in the US, two in England, one in Iran, one in Australia, one in Norway and one in Germany.

Duration of trials

- Most studies (n = 10) reported outcomes of six months or less, and the longest follow-up period was four years.

Participants

- The fourteen studies included adult drug-using offenders: twelve of the fourteen studies used samples with a majority of men and one study used female offenders only (Cropsey 2011). In two studies, gender was not reported (Lobmann 2007; Wright 2011).

- The average age of study participants ranged from 27 years to 40.9 years.

Excluded studies

We excluded 165 studies. See Characteristics of excluded studies for further details. Reasons for exclusion were: lack of criminal justice involvement in referral to the intervention; not reporting relevant drug or crime outcome measures or both at both the pre- and post-intervention periods; allocation of participants to study groups that were not strictly randomised or did not contain original trial data. The majority of studies were excluded because the study population were not offenders. One study was excluded because follow-up periods were not equivalent across study groups (Di Nitto 2002); and Berman 2004 was excluded because the intervention (acupuncture) did not measure our specified outcomes of drug use or criminal activity. One study reported the protocol of a trial only (Baldus 2011); while another only contained conference proceedings (Kinlock 2009a). We were unable to obtain the data for one trial (Cogswell 2011); or the full-text version of another (Rowan-Szal 2005).

Risk of bias in included studies

See Figure 4 and Figure 5 for further information.

Figure 4. Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.

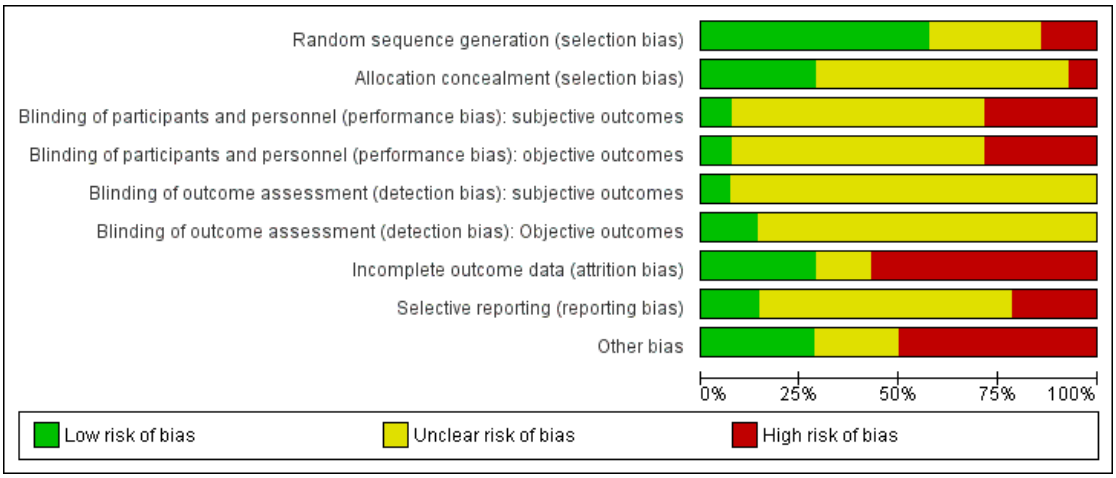
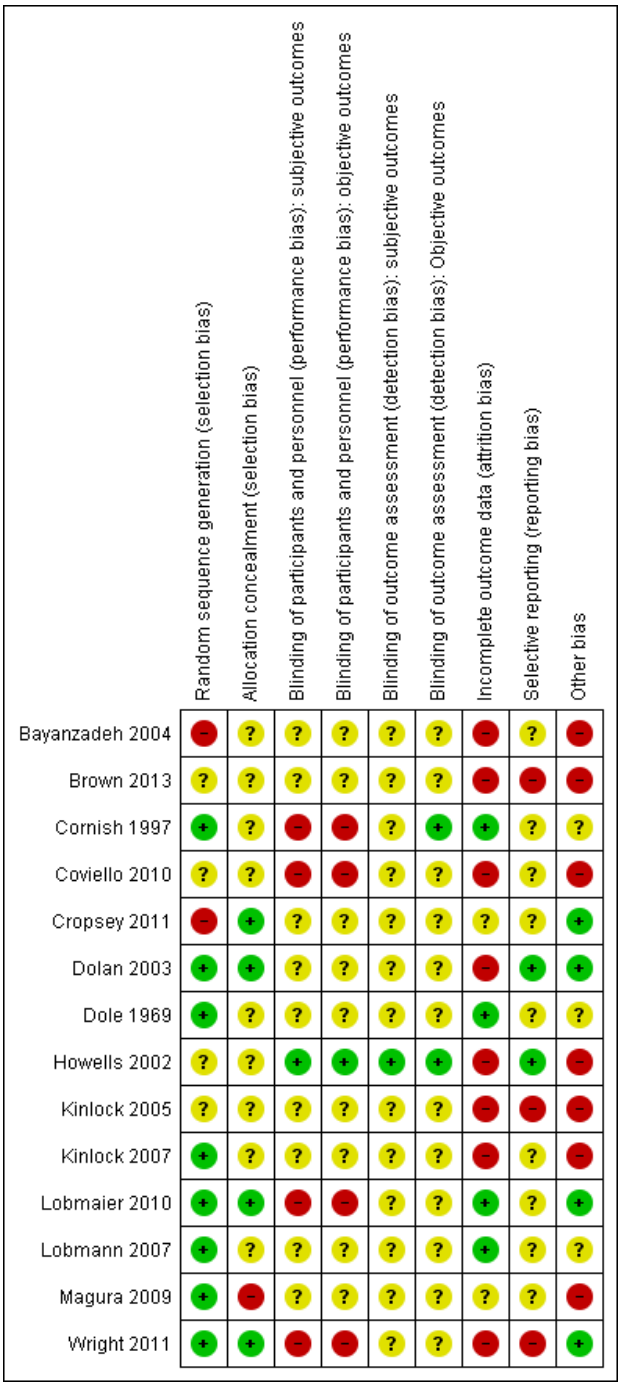


Figure 5. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.



Allocation

Randomisation: All of the 14 included studies were described as randomised. In four studies, the reporting of this information was noted as unclear, as it was difficult to find an accurate description of the methodology used (Brown 2013; Coviello 2010; Howells 2002; Kinlock 2005). Two studies were reported at high risk of bias (Bayanzadeh 2004; Cropsey 2011); and the remaining eight studies at low risk of bias.

Allocation concealment: Of the 14 included studies, only four reported that the allocation process was concealed and were rated at low risk of bias (Cropsey 2011; Dolan 2003; Lobmaier 2010; Wright 2011). One study was rated at high risk of bias (Magura 2009). All of the remaining nine studies were rated as unclear, and the review author was not able to decide whether allocation concealment had occurred within the studies.

Blinding

Blinding was assessed across four dimensions considering performance and detection bias across subjective and objective measures (see Appendix 14). Nine studies were rated as unclear risk of bias providing no information on blinding across all four domains (Bayanzadeh 2004; Brown 2013; Cropsey 2011; Dolan 2003; Dole 1969; Kinlock 2005; Kinlock 2007; Lobmann 2007; Magura 2009). Four studies were rated at high risk of bias for participant and personnel blinding (Cornish 1997; Coviello 2010; Lobmaier 2010; Wright 2011). Cornish 1997 was rated at low risk of outcome assessors on objective measures.

Incomplete outcome data

Four studies were noted at low risk of bias (Cornish 1997; Dole 1969; Lobmaier 2010; Lobmann 2007); eight studies were noted at high risk of bias; and two studies were rated as unclear (Cropsey 2011; Magura 2009).

Selective reporting

Of the 14 studies, nine studies were rated as unclear, and two studies were rated at low risk (Dolan 2003; Howells 2002). Three studies were rated at high risk of bias (Brown 2013; Kinlock 2005; Wright 2011).

Other potential sources of bias

Threats to other bias within the study designs generally yielded mixed results. In total, seven studies were rated at high risk. Low risk was noted in four further studies (Cropsey 2011; Dolan 2003; Lobmaier 2010; Wright 2011); and three studies were rated as unclear (Cornish 1997; Dole 1969; Lobmann 2007).

See Figure 4 and Figure 5 for additional details.

Effects of interventions

See: **Summary of findings for the main comparison** Summary of findings for the main comparisons: Agonist pharmacological compared to no intervention for drug-using offenders; **Summary of findings 2** Summary of findings for the main comparisons: Antagonost (Naltrexone) compared to no pharmacological for drug-using offenders

Of the 14 studies, 11 were included in a series of meta-analyses and the main comparisons are presented in the 'Summary of findings' tables (Summary of findings for the main comparison; Summary of findings 2). Three studies were not included in the meta-analyses: Bayanzadeh 2004 because it compared methadone + CBT versus not further specified non-pharmacological treatment, so it was not possible to ascertain the effect of methadone treatment alone; Brown 2013 because it compared specialist treatment plus suboxone or methadone versus primary care plus suboxone, so it was not possible to ascertain the effect of methadone or suboxone alone; moreover it did not assess the outcomes of interest; and Howells 2002 because it did not assess the outcomes of interest and repeated attempted contact with the authors asking for more information was unsuccesful. For those studies that were included we grouped them by drug and criminal activity outcomes (re-arrest and reincarceration), setting (community and secure establishment), and intervention type (buprenorphine, methadone and naltrexone). Tests for heterogeneity at the 0.01 level revealed that across all meta-analyses, the studies were found to be homogeneous.

1. *Agonist pharmacological interventions vs no non-pharmacological treatment*

Drug use

See Summary of findings for the main comparison

For dichotomous measure, results did not show reduction in drug use for objective results (biological), two studies, 237 participants: (RR 0.72, 95% CI 0.51 to 1.00), low quality of evidence and for subjective (self-report), three studies, 317 participants: (RR 0.61 95% CI 0.31 to 1.18), low quality of evidence. Also for continuous measures, self-report drug use did not show differences, three studies, 510 participants: (SMD -0.62 95% CI -0.85 to -0.39), low quality of evidence, see Analysis 1.1; Analysis 1.2; and Analysis 1.3.

Criminal activity

See Summary of findings for the main comparison

All data come from studies assessing the efficacy of methadone treatment. Both for reincarceration three studies, 472 participants (RR 0.77, 95% CI 0.36 to 1.64) low quality of evidence; and re-

arrests, one study, 62 participants (RR 0.60, 95% CI 0.32 to 1.14), low quality of evidence, the studies did not show difference (see Analysis 1.4). The impact on criminal activities was evaluated also utilising continuous measures in one study, 51 participants: MD of -74.21 (95% CI -133.53 to -14.89), low quality of evidence, the result is in favour of pharmacological interventions, (see Analysis 1.5).

2. Antagonist (Naltrexone) pharmacological treatment vs non -pharmacological treatment?

See Summary of findings 2

Two studies, 114 participants focused on the use of naltrexone versus no pharmacological treatment and subsequent criminal activity. The results indicate that naltrexone does appear to reduce subsequent reincarceration, with an RR of 0.40 (95% CI 0.21, 0.74), moderate quality of evidence, see Analysis 2.1

One study, 63 participants (RR 0.69, 95% CI 0.28 to 1.70) did not show statistically significant difference, low quality of evidence, see Analysis 2.2,

3. Methadone versus buprenorphine

Drug use

Two studies (Magura 2009; Wright 2011), showed a reduction in self report drug use for 370 participants using a dichotomous outcome (RR 1.04. 95% CI 0.69 to 1.55) altough the result is not statistically significant. Continuous outcomes, one study with 81 participants, (MD 0.70, 95% CI -5.33 to 6.73) see Analysis 3.1 and Analysis 3.2 .

Criminal activity

Magura 2009 showed a non-statistically significant reduction in criminal activity for 116 participants (RR 1.25, 95% CI 0.83 to 1.88) see Analysis 3.3.

4. Methadone versus diamorphine

Drug use: the study did not assess this outcome

Criminal activity

Rearrest: One study, (Lobmann 2007) 825 participants shows a non-statistically significant reduction in criminal activity for re-arrests: (RR 1.25, 95% CI 1.03 to 1.51 see Analysis 4.1.

5. Methadone vs naltrexone

Drug use

Lobmaier 2010, 44 participants, showed a non-statistically significant reduction in self reported drug use continuous MD 4.60 (95% CI -3.54 to 12.74) see Analysis 5.1.

Criminal activity

Lobmaier 2010, 44 participants, showed a non-statistically significant reduction in dichotomous reincarceration, outcomes (RR 1.10, 95% CI 0.37 to 3.26) and continuous outcomes (MD -0.50, 95% CI -8.04 to 7.04) see Analysis 5.2; Analysis 5.3.

Does setting of intervention (community, prison/secure establishment) affect outcomes of pharmacological interventions?

All the studies comparing methadone versus non-pharmacological intervention were conducted in a secure setting; the only study comparing buprenorphine with non-pharmacological intervention was conducted in the community, as well as the two studies comparing naltrexone with non-pharmacological treatment. In the other comparison only one study was included for each, so it was not possible to perform a subgroup analysis for setting of the intervention.

Cost and cost-effectiveness

The Magura study noted differences in the costs of administering buprenorphine and methadone, but were not sufficient for us to conduct a full cost effectiveness appraisal (Magura 2009). The investigators estimated that about ten times as many inmates can be served with methadone as with buprenorphine with the same staff resources. This cost implication is also endorsed in the community, where physicians have difficulty in obtaining reimbursement for buprenorphine treatment for released inmates, making the continued use of buprenorphine problematic after release.

ADDITIONAL SUMMARY OF FINDINGS *[Explanation]*

Antagonost(Naltrexone) compared to no pharmacological for drug-using offenders

Patient or population: patients with drug-using offenders
Settings: criminal justice
Intervention: Antagonost(Naltrexone)
Comparison: no pharmacological

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	No pharmacological	Antagonost(Naltrexone)				
Criminal activity dichotomous - Reincarceration official records Follow-up: 6 months	**Study population**		**RR 0.4** (0.21 to 0.74)	114 (2 studies)	⊕⊕⊕◯ **moderate**[1]	
	39 per 100	**16 per 100** (8 to 29)				
	Moderate					
	44 per 100	**17 per 100** (9 to 32)				
drug use (objective) urine screen Follow-up: 30 days prior to 6 months	**Study population**		**RR 0.69** (0.28 to 1.7)	63 (1 study)	⊕⊕◯◯ **low** [2,3]	
	28 per 100	**19 per 100** (8 to 48)				
	Moderate					
	28 per 100	**19 per 100** (8 to 48)				

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).
CI: Confidence interval; **RR:** Risk ratio;

GRADE Working Group grades of evidence
High quality: Further research is very unlikely to change our confidence in the estimate of effect.
Moderate quality: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Low quality: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
Very low quality: We are very uncertain about the estimate.

[1] Across the two studies 9 of the 18 risk of bias items were rated as unclear
[2] 5 of the 9 risk of bias items was rated as unclear
[3] only 1 study with 63 participants

DISCUSSION

Summary of main results

This systematic review provides evidence from 14 trials producing several meta-analyses. Studies could not be combined all together because the comparisons were too different. Only subgroup analysis for type of pharmacological treatment was done. Findings of the effects of individual interventions on drug use and criminal activity show mixed results. When compared to non-pharmacological, we found low quality evidence that agonist treatments are not effective in reducing drug use or criminal activity. We found low quality of evidence that antagonist treatment was not effective in reducing drug use but we found moderate quality of evidence that they significantly reduced criminal activity. When comparing the drugs to one another we found no significant differences between the drug comparisons (methadone versus buprenorphine, diamorphine and naltrexone) on any of the outcome measures suggesting that no one pharmacological drug is more effective than another. Two studies provided some cost comparisons, but data were not sufficient to generate a cost-effectiveness analysis. In conclusion, we found that pharmacological interventions do reduce subsequent drug use and (to a lesser extent) criminal activity. Additionally, we found individual differences and variation on different outcome measures when pharmacological interventions were compared to a non-pharmacological treatment but no significant differences when compared to another pharmacological treatment.

Buprenorphine

The Cropsey study specifically evaluated buprenorphine for opioid-dependent women with HIV risk and found that buprenorphine given to participants in prison (followed by its use upon release into the community) was beneficial in preventing or delaying relapse to opioid use (Cropsey 2011). The findings of this study add to the growing body of evidence (which primarily includes men) suggesting that outcomes with buprenorphine are comparable with what others have found with both methadone and methadone maintenance (Lobmaier 2010). The findings however were not sustained post treatment, and most women had relapsed to active opioid treatment at the three-month follow-up point. Future studies on the use of buprenorphine in women should evaluate its impact on long-term effects with the goal of assessing its effect on opioid abstinence and prevention of associated criminal activity (Cropsey 2011). Overall, the dosage of buprenorphine varied between studies; in one study, instances of 30 mg rising to 130 mg were reported (Lobmaier 2010). A meta-analysis of buprenorphine dose and treatment outcome found that a higher dosage (16 to 32 mg per day) predicted better retention in treatment when compared with a lower dosage (Fareed 2012). Another Cochrane review (outside the prison environment) indicated that buprenorphine detoxification and maintenance studies concluded that completion of withdrawal treatment is possibly more likely when managed with buprenorphine compared to methadone although the difference was not statistically significant, leading the authors to conclude that more research is needed to evaluate the possible differences between the two medications (Gowing 2009). The Wright 2011 study in this review suggests that there is equal clinical effectiveness between buprenorphine and methadone in maintaining abstinence at eight days post detoxification in prison. As many prisoners are eventually released back into the community the authors note that GPs need to be aware of the few trials which compare two of the most common detoxification agents in the UK. The research currently supports the use of either buprenorphine or methadone within a detoxification setting (Wright 2011).

Methadone

Two studies showed a decrease in self-report methadone treatment upon release into the community (Dole 1969; Magura 2009). The Dole study, albeit small, found that 3 of 12 prisoners who started using methadone before release were convicted of new crimes during an 11.5-month follow-up compared with 15 of 16 prisoners randomly assigned to a control condition (Dole 1969); and a larger, more recent study found that Rikers Island MMT programme in New York significantly facilitated entry and retention at six months in post release programmes (Magura 2009). In contrast, another study reported on opioid agonist maintenance by examining levo-alpha-acetylmethadol (LAAM) before prison release and found no significant differences with regard to subsequent arrest of participants who received LAAM and a control group at nine months post-release (Kinlock 2005). Subsequent Kinlock studies involving evaluations of counselling only and counselling with transfer in comparison with counselling and methadone support the findings of Dole 1969 and Dolan 2003 suggesting that methadone programmes can provide effective opioid agonist therapy for prisoners with a history of heroin addiction but not arrest at 12 month post prison release (Kinlock 2007). Taken together, the findings also suggest that increased criminal activity and overdose death are disproportionately likely to occur within one month of release from incarceration. The authors conclude that making connections with drug treatment services at release from prison is likely to help sustain treatment for opiod addictions; such findings are supported by other studies which found that offering pre-release MMT and payment assistance was significantly associated with increased enrolment in post-release MMT and reduce time to enter community-based MMT (e.g. Binswanger 2007). Additionally, in support of methadone treatment, the World Health Organisation has listed methadone as an essential medication and has strongly recommended that treatment should be made available in prison and supported subsequently within the community to significantly reduce the likelihood of adverse health and criminogenic consequences (Hergert 2005).

Dosage of methadone treatment varied across studies. For example, Magura 2009 reported problems with the use of suboptimal doses of methadone when higher doses were available. Investigators argue that higher doses appear to reflect participant preference

because most did not intend to continue treatment after release. The Dolan study reported moderate doses of methadone (61 mg) and noted that outcomes might have improved if higher doses had been given (Dolan 2003). Significantly lower doses of methadone were noted in the Dole study, in which 10 mg of methadone per day was increased to a dosage of 35 mg per day (Dole 1969). Participants in the Kinlock 2005 study were medicated three times per week, starting at 10 mg and increasing by 5 mg every third medication day during incarceration to a target dose of 50 mg. Evidence from the Amato 2005 review suggests that low dosages of methadone maintenance lead to compromise in the effectiveness of treatment and that recommendations for dosage should be monitored at around 60 mg. Additional systematic review evidence considering the use of methadone and a tapered dose for the management of opioid withdrawal shows a wide range of programmes with differing outcome measures, making the application of meta-analysis difficult (Amato 2013). The authors conclude that slow tapering with temporary substitution of long-acting opioids can reduce withdrawal severity; however, most participants still relapsed to heroin use (Amato 2013).

Naltrexone

For evaluation of naltrexone, two studies (one pilot: Cornish 1997) and Coviello 2010, a subsequent larger replication trial, show that use of a larger sample size consisting of a diverse group of offenders resulted in no differences in criminal behaviour between naltrexone and treatment-as-usual groups. The authors note that one of the major differences between the two studies remains the extent and quality of supervision provided by parole officers. The authors suggest that for treatment to be successful, use of oral naltrexone by probationers and parolees requires more supervision than is typically available within the criminal justice system. Study authors reported instances of 35 mg of naltrexone rising to 300 mg (Coviello 2010). Other research evidence related to naltrexone use and mortality rates highlights possible concerns about the high risk of death after treatment. Gibson 2007 compared mortality rates associated with naltrexone and methadone by using retrospective data analysis of coronial participants between 2000 and 2003. Findings show that participants receiving naltrexone were up to 7.4 times more likely to die after receiving treatment when compared with those using methadone over the same time period. Although this study was not conducted in a population of prisoners, it is likely that such risks are comparable; therefore generalised use of naltrexone and associated subsequent supervision of those taking naltrexone in its oral form require careful consideration.

Overall completeness and applicability of evidence

Overall, the findings of this review suggest that pharmacological interventions have an impact on reducing self-report drug use. Individual pharmacological drugs had differing effects, particularly in relation to subsequent drug use. Promising results highlight the use of methadone or buprenorphine (although this was only one study) within a prison environment but may be limited to shorter-term outcomes when prisoners are released into the community. For naltrexone, the evidence is sparse and presents problems associated with different mechanisms of drug administration (e.g. oral versus implants). We can say little about the cost and cost-effectiveness of these studies. One study reported some descriptive cost information, but the information was insufficient to generate a cost analysis (Magura 2009). In conclusion, high-quality research is required to evaluate the processes involved in the engagement of offenders mandated to substance abuse programmes to enable us to understand better why one programme works and another does not.

Quality of the evidence

A number of limitations within each of the studies are highlighted by the authors. High dropout rates were noted in the methadone group after prison release in the Lobmaier study and appear to be more difficult to maintain in offender populations (Lobmaier 2010). Major limitations of the Coviello 2010 study included low treatment retention and low six-month follow-up rates. Most offenders did not return for the follow-up evaluation because they could not be located (63%). Only two-thirds of treated participants remained in treatment in the Dolan study (Dolan 2003). As a consequence, the study does not provide conclusive evidence regarding the efficacy of oral naltrexone in this offender sample. Attrition was also a problem in Kinlock 2005; this was due in part to the fact that individuals were being transferred to other prisons or were having their sentences extended because of pre-existing charges (Kinlock 2005). Similiar problems of segregation and impact of sentence releases affected the sample size in the Bayanzadeh 2004 and Wright 2011 studies whereby transfer to other prison establishments with little prior warning made follow-up data difficult to collect. Such attrition within studies threatens the comparability of experimental and control groups, thereby ensuring that any conclusions should be taken with considerable caution. In particular, the Bayanzadeh 2004 study noted some of the practical difficulties associated with contamination between experimental and control groups, given that the ideal would be to keep the groups apart. In contrast the pilot study by Brown 2013 produced a study retention rate of 80%; the authors note that this may be due to the coercive nature of participation in jail diversion programs in which successful completion may result in the dismissal or reduction of criminal charges. Although this finding is represented by only one study it suggests the possibility that completion of drug treatment programs might fare best when an incentive which effects sentence or charge outcome can be sustained.

Sample sizes were considered modest in a number of studies, with attrition presenting difficulties in interpretation of study findings. For example, 30% attrition at follow-up producing possible threats

to the internal validity of the study design in Magura 2009 and similar small sample sizes in the Lobmaier trial may have been too small to reveal any differences between the two treatment conditions (Lobmaier 2010). The Cropsey 2011 study identified a sample of 36 women and randomly allocated 15 to the intervention and 12 to the placebo group. Investigators note that although the potency of buprenorphine for control of opioid use is clearly demonstrated, a larger sample size may be needed to detect significant differences between groups on other variables of interest. Larger trials are therefore required to assess the possible advantages of one treatment over the other. Additionally, the study was limited to three months of treatment, and further studies should explore the provision of buprenorphine for longer periods of time to prolong opioid abstinence and prevent associated criminal activity. Similiar short follow-up periods were noted in other trials, including Dolan 2003.

Potential biases in the review process

Despite limitations associated with the literature, two limitations in review methodology were achieved. Specifically, the original review included an additional five fee paying databases and one search using DrugScope. In this current review resources did not allow such extensive searching. Whislt the electronic databases searches have been updated to April 2014. the web site search has been updated to November 2011. As a result some literature may have been missed from this current review

AUTHORS' CONCLUSIONS

Implications for practice

When compared to non-pharmacological treatments, agonist treatments did not seem effective in reducing drug use or criminal activity Antagonist treatment was not effective in reducing drug use but significantly reduced criminal activity. When comparing the drugs to one another we found no significant differences between the drug comparisons (methadone versus buprenorphine, diamorphine and naltrexone) on any of the outcome measures. Caution should be taken when interpreting these findings, as the conclusions are based on a small number of trials, and generalisation of these study findings should be limited mainly to male adult offenders. Additionally, many studies were rated at high risk of bias because trial information was inadequately described.

Implications for research

Several research implications can be identified from this review.

1. Generally, better quality research is required to evaluate the effectiveness of interventions with extended long-term effects of aftercare following release into the community.

2. Buprenorphine research in the prison environment requires evidence of the long-term impact and larger studies, currently an equivalence of buprenorphine and methadone exists.

3. Evidence for naltrexone is less convincing. Trials evaluating differences between oral and implantation naltrexone and associated supervision requirements under the criminal justice system are required.

4. Only one court diversion study was identified: exploration of some court diversionary schemes using different pharmacological interventions would be useful.

5. Future clinical trials should collect information from all sectors of the criminal justice system. This would enhance the heterogeneous nature of the included studies and would facilitate generalisation of study findings.

6. Evidence of comparable mortality rates in prisoners using pharmacological interventions (particularly after release) needs to be explored to assess the long-term outcomes of such treatments.

7. The link between dosage, treatment retention and subsequent criminal activity should be examined across all three pharmacological treatment options. Evidence from other trial data suggests that dose has important implications for retention in treatment; in future studies, this should be considered alongside criminal activity outcomes.

8. Cost and cost-effectiveness information should be standardized within trial evaluations; this will help policymakers to decide upon health versus criminal justice costs.

ACKNOWLEDGEMENTS

We would like to acknowledge the help of the York Health Economics Consortium and The Health Sciences Department at the University of York and the Cochrane Drugs and Alcohol Group.

REFERENCES

References to studies included in this review

Bayanzadeh 2004 *{unpublished data only}*

Bayanzadeh SA. Final report of research project: a study of the effectiveness of psychopharmacological and psychological interventions in reducing harmful/high risk behaviours among substance user prisoners. Iran University of Medical Education and Health and Treatment Services, Tehran Psychology Institute. Centre for Psychological Health Research Polarity of Science, Education and Research 2004.

Brown 2013 *{published data only}*

Brown R, Gassman M, Hetzel S, Berger L. Community-based treatment for opioid dependent offenders: A pilot study. *American Journal on Addictions* 2013;**22**(5):500–2.

Cornish 1997 *{published data only}*

* Cornish JW, Metzger D, Woody GE, Wilson D, McLellan AT, Vandergrift B, et al. Naltrexone pharmacotherapy for opioid dependent federal probationers. *Journal of Substance Abuse Treatment* 1997;**14**(6):529–34.

Coviello 2010 *{published data only}*

Coviello DM, Cornish JW, Lynch KG, Alterman AI, O'Brien CP. A randomized trial of oral naltrexone for treating opioid-dependent offenders. *American Journal of Addiction* 2010;**19**(5):422–32.

Cropsey 2011 *{published data only}*

Cropsey KL, Lane PS, Hale GJ, Jackson DO, Clark CB, Ingersoll KS, et al. Results of a pilot randomized controlled trial of buprenorphine for opioid dependent women in the criminal justice system. *Drug and Alcohol Dependence* 2011; **119**(3):172–8.

Dolan 2003 *{published data only}*

* Dolan K A, Shearer J, MacDonald M, Mattick RP, Hall W, Wodak AD. A randomised controlled trial of methadone maintenance treatment versus wait list control in an Australian prison system. *Drug and Alcohol Dependence* 2003;**72**(1):59–65.

Dolan KA, Shearer J, White B, Zhou J, Kaldor J, Wodak AD. Four-year follow-up of imprisoned male heroin users and methadone treatment: mortality, re-incarceration and hepatitis C infection. *Addiction* 2005;**100**(6):820–828. [DOI: 10.1111/j.1360-0443.2005.01050.x]

Dole 1969 *{published data only}*

Dole VP, Robinson MD, Orraca J, Towns E, Searcy P, Caine E. Methadone treatment of randomly selected criminal addicts. *New England Journal of Medicine* 1969;**280**: 1372–5.

Howells 2002 *{published data only}*

Howells C, Allen S, Gupta J, Stillwell G, Marsden J, Farrell M. Prison based detoxification for opioid dependence: a randomised double blind controlled trial of lofexidine and methadone.. *Drug & Alcohol Dependence* 2002;**67**(2): 169–76.

Kinlock 2005 *{published data only}*

Kinlock TW, Battjes RJ, Schwartz RP, MTC Project Team. A novel opioid maintenance program for prisoners: report of post-release outcomes. The American Journal of Drug and Alcohol Abuse 2005; Vol. 31, issue 3:433–54. [: CN–00590052]

Kinlock 2007 *{published data only}*

Gordon MS, Kinlock TW, Schwartz RP, O'Grady KE. A randomized clinical trial of methadone maintenance for prisoners: findings at 6 months post-release. *Addiction* 2008b;**103**(8):1333–42.

Kinlock TW, Gordon MS, Schwartz RP, Fitzgerald TT, O'Grady KE. A randomized clinical trial of methadone maintenance for prisoners: results at 12 months post release. *Journal of Substance Abuse Treatment* 2009;**37**(3):277–85.

* Kinlock TW, Gordon MS, Schwartz RP, O'Grady K, Fitzgerald TT, Wilson M. A randomized clinical trial of methadone maintenance for prisoners: results at 1-month post-release. *Drug and Alcohol Dependence* 2007;**91**(2-3): 220–7.

Kinlock TW, Gordon MS, Schwartz RP, O'Grady KE. A study of methadone maintenance for male prisoners: 3-month postrelease outcomes. *Criminal Justice Behavior* 2008;**35**(1):34–47.

Wilson ME, Kinlock TW, Gordon MS, O'Grady KE, Schwartz RP. Postprison Release HIV-Risk Behaviors in a Randomized Trial of Methadone Treatment for Prisoners. *American Journal on Addictions* 2012;**21**(5):476–87. [DOI: 10.1111/j.1521-0391.2012.00250.x]

Lobmaier 2010 *{published data only}*

Lobmaier PP, Kunoe N, Gossop M, Katevoll T, Waal H. Naltrexone implants compared to methadone: outcomes six months after prison release. *European Addiction Research* 2010;**16**(3):139–45.

Lobmann 2007 *{published data only}*

Lobmann R. Diamorphine substitution therapy and criminal activity. Sucht: Zeitschrift fur Wissenschaft und Praxis 2007; Vol. 53, issue 5:288–95. [: CN–00627424]

Magura 2009 *{published data only}*

Magura S, Lee JD, Hershberger J, Joseph H, Marsch L, Shropshire C, et al. Buprenorphine and methadone maintenance in jail and post-release: a randomized clinical trial. Drug and Alcohol Dependence 2009; Vol. 99, issue 1–3:222–30.

Wright 2011 *{published data only}*

Wright N, Sheard L. Comparison of methadone and buprenorphine for opiate detoxification (LEEDS trial): a randomised controlled trial. *British Journal of General Practice* 2011;**61**(593):772–80.

References to studies excluded from this review

Alemi 2010 *{published and unpublished data}*
Alemi F, Haack M, Nemes S, Harge A, Baghi H. Impact of online counseling on drug use: a pilot study. *Quality Management Health Care* 2010;**19**(1):62–9.

Alessi 2011 *{published data only}*
Alessi SM, Rash C, Petry NM. Contingency management is efficacious and improves outcomes in cocaine patients with pretreatment marijuana use. *Drug and Alcohol Dependence* 2011;**118**(1):62–7.

Andersson 2014 *{published data only}*
Andersson C, Vasiljevic Z, Hoglund P, Ojehagen A, Berglund M. Daily automated telephone assessment and intervention improved 1-month outcome in paroled offenders. *International Journal Offender Therapy Comparative Criminology* 2014;**online**:1–18. [DOI: 10.1177/0306624X14526800]]

Anglin 1999 *{published data only}*
Anglin MD, Longshore D, Turner S. Treatment alternatives to street crime - An evaluation of five programs. *Criminal Justice and Behavior* 1999;**26**(2):168–95.

Awgu 2010 *{published data only}*
Awgu E, Magura S, Rosenblum A. Heroin-dependent inmates' experiences with buprenorphine or methadone maintenance. *Journal of Psychoactive Drugs* 2010;**42**(3): 339–46.

Azbel 2013 *{published data only}*
Azbel L, Wickersham JA, Grishaev Y, Dvoryak S, Altice FL. Burden of infectious diseases, substance use disorders, and mental illness among Ukrainian prisoners transitioning to the community. *PLoS ONE* 2013;**8**(3):e59643.

Baldus 2011 *{published data only}*
Baldus C, Miranda A, Weymann N, Reis O, More K, Thomasius R. "CAN Stop"- implementation and evaluation of a secondary group prevention for adolescent and young adult cannabis users in various contexts- study protocol. *BMC Health Services Research* 2011;**11**:80.

Baltieri 2014 *{published data only}*
Baltieri D. A. Order of onset of drug use and criminal activities in a sample of drug-abusing women convicted of violent crimes.. *Drug & Alcohol Review* 2014;**33**(2):202–10.

Barnes 2012 *{published data only}*
Barnes GC, Hyatt JM, Ahlman LC, Kent DTL. The effects of low intensity supervision for lower risk probationers: updated results from a RCT. *Journal of Crime and Justice* 2012;**35**(2):200–20.

Berman 2004 *{published data only}*
Berman AH, Lundberg U, Krook AL, Gyllenhammar C. Treating drug using prison inmates with auricular acupuncture: a randomized controlled trial. *Journal of Substance Abuse Treatment* 2004;**26**(2):95–102. [0740–5472: (Print)]

Black 2011 *{published data only}*
Black S, Carey E, Webber A, Neish N, Gilbert R. Determining the efficacy of auricular acupuncture for reducing anxiety in patients withdrawing from psychoactive drugs. *Journal of Substance Abuse Treatment* 2011;**41**(3): 279–87.

Brady 2010 *{published data only}*
Brady LLC, Najavits LM, Toussaint D, Bonavota D, Veysey B. Does recent criminal involvement matter? A study of women with co-occurring disorders in a multisite national trial. *Mental Health and Substance Use: Dual Diagnosis* 2010;**3 (3)**:193–202.

Braithwaite 2005 *{published data only}*
Braithwaite RL, Stephens TT, Treadwell HM, Braithwaite K, Conerly R. Short-term impact of an HIV risk reduction intervention for soon-to-be released inmates in Georgia. *Journal of Health Care for the Poor and Underserved* 2005;**16** (4Suppl B):130–9. [: CN–00532300]

Breckenridge 2000 *{published data only}*
Breckenridge JF, Winfree LT, Maupin JR, Clason DL. Drunk drivers, DWI 'drug court' treatment and recidivism: Who fails?. *Justice Research and Policy* 2000;**2**:87–105.

Britt 1992 a-d *{published data only}*
* Britt IC, Gottfredson MR, Goldkamp JS. Drug testing and pretrial misconduct: an experiment on the specific deterrent effects of drug monitoring defendants on pretrial release. *Journal of Research in Crime and Delinquency* 1992; **29**(1):62–78.

Brown 2001 *{published data only}*
Brown BS, O'Grady KE, Battjes RJ, Farrell EE, Smith NP, Nurco DN. Effectiveness of a stand-alone aftercare program for drug-involved offenders. *Journal of Substance Abuse Treatment* 2001;**21**(4):185–92.

Burdon 2013 *{published data only}*
Burdon WM, St De Lore J, Dang J, Warda US, Prendergast ML. Psychosocial Functioning Among Inmates in Prison-Based Drug Treatment: Results from Project BRITE. *Journal of Experimental Criminology* 2013;**9**(1):45-64. [DOI: 10.1007/s11292-012-9169-5]

Carr 2008 *{published data only}*
Carr CJ, Xu J, Redko C, Lane D, Rapp RC, Goris J, et al. Individual and system influences on waiting time for substance abuse treatment. *Journal of Substance Abuse Treatment* 2008;**34**(2):192–201. [: 0740–5472]

Carroll 2006 *{published data only}*
Carroll KM, Easton CJ, Nich C, Hunkele KA, Neavins TM, Sinha R, et al. The use of contingency management and motivational/skills-building therapy to treat young adults with marijuana dependence. *Journal of Consulting and Clinical Psychology* 2006;**74**(5):955–66. [: 0022–006X]

Carroll 2011 *{published data only}*
Carroll KM, Kiluk BD, Nich C, Babuscio TA, Brewer JA, Potenza MN, et al. Cognitive function and treatment response in a randomized clinical trial of computer-based training in cognitive-behavioral therapy. *Substance Use and Misuse* 2011;**46**(1):23–34.

Carroll 2012 *{published data only}*
Carroll KM, Nich C, Lapaglia DM, Peters EN, Easton CJ, Petry NM. Combining cognitive behavioral therapy

and contingency management to enhance their effects in treating cannabis dependence: less can be more, more or less.. *Addiction* 2012;**107**(9):1650–9.

Chandler 2006 ***{published data only}***
Chandler DW, Spicer G. Integrated treatment for jail recidivists with co-occurring psychiatric and substance use disorders. *Community Mental Health Journal* 2006;**42**(4): 405–25. [0010–3853: (Print)]

Chaple 2014 ***{published data only}***
Chaple M, Sacks S, McKendrick K, Marsch LA, Belenko S, Leukefeld C, et al. Feasibility of a computerized intervention for offenders with substance use disorders: a research note. *Journal of Experimental Criminology* 2014;**10**: 105–27.

Clair 2013 ***{published data only}***
Clair M, Stein LA, Soenksen S, Martin RA, Lebeau R, Golembeske C. Ethnicity as a moderator of motivational interviewing for incarcerated adolescents after release.. *Journal of Substance Abuse Treatment* 2013;**45**(4):370–5.

Cogswell 2011 ***{published data only}***
Cogswell J, Negley SK. The effect of autonomy- supportive therapeutic recreation programming on integrated motivation for treatment among persons who abuse substances. *Therapeutic Recreation Journal* 2011;**45**(1):1st Quarter:47-61.

Cosden 2003 ***{published data only}***
* Cosden M, Ellens JK, Schnell JL, Yamini-Diouf Y, Wolfe MM. Evaluation of a mental health treatment court with assertive community treatment. *Behavioral Sciences & the Law* 2003;**21**(4):415–27.

Cosden 2005 ***{published data only}***
Cosden M, Ellens J, Schnell J, Yamini-Diouf Y. Efficacy of a mental health treatment court with assertive community treatment. *Behavioral Sciences & the Law* 2005;**23**(2): 199–214. [0735–3936: (Print)]

Coviello 2012 ***{published data only}***
Coviello DM, Cornish JW, Lynch KG, Boney TY, Clark C, Lee JD, et al. A multisite pilot study of extended release injectable naltrexone treatment for previously opioid dependent parolees and probationers. *Substance Abuse* 2012;**33**(1):48–59.

Cox 2013 ***{published data only}***
Cox BR, Olney JJ, Lowery-Gionta EG, Sprow GM, Rinker JA, Navarro M, et al. Repeated cycles of binge-like ethanol (EtOH)-drinking in male C57BL/6J mice augments subsequent voluntary EtOH intake but not other dependence-like phenotypes.. *Alcoholism, Clinical and Experimental Research* 2013;**37**(10):1688–95..

Cropsey 2013 ***{published data only}***
Cropsey KL, Lane PS, Perkins AC, Clark B, Hardy S, McCullumsmith C, et al. Buprenorphine and Medication management in a community corrections population: A pilot study. *Journal of Addict Med* 2013;**7**:210–5.

Cullen 2011 ***{published data only}***
Cullen AE, Soria C, Clarke AY, Dean K, Fahy T. Factors Predicting Dropout from the Reasoning and Rehabilitation Program with Mentally Disordered Offenders.. *Criminal Justice and Behavior* 2011;**38**(3):217–30. [DOI: 10.1177/0093854810393659]

Cusack 2010 ***{published data only}***
Cusack KJ, Morrissey JP, Cuddeback GS, Prins A, Williams DM. Criminal justice involvement, behavioral health service use, and costs of forensic assertive community treatment: a randomized trial. *Community Mental Health Journal* 2010; **46**(4):356–63.

D'Amico 2013 ***{published data only}***
D'Amico EJ, Hunter SB, Miles JN, Ewing BA, Osilla KC. A randomized controlled trial of a group motivational interviewing intervention for adolescents with a first time alcohol or drug offense.. *Journal of Substance Abuse Treatment* 2013;**45**(5):400–8.

Dakof 2010 ***{published data only}***
Dakof GA, Cohen JB, Henderson CE, Duarte E, Boustani M, Blackburn A, et al. A randomized pilot study of the Engaging Moms Program for family drug court. *Journal of Substance Abuse Treatment* 2010;**38**(3):263–74.

Dana 2013 ***{published data only}***
Dana D, Zary N, Peyman A, Behrooz A. Risk prison and hepatitis B virus infection among inmates with history of drug injection in Isfahan, Iran.. *Scientific World Journal* 2013;**735761**:1–4.

DeFulio 2013 ***{published data only}***
DeFulio A, Stitzer M, Roll J, Petry N, Nuzzo P, Schwartz RP, et al. Criminal justice referral and incentives in outpatient substance abuse treatment.. *Journal of Substance Abuse Treatment* 2013;**45**(1):70–5. [DOI: http://dx.doi.org/10.1016/j.jsat.2012.12.012]

Dembo 2000 ***{published data only}***
Dembo R, Ramirez GG, Rollie M, Schmeidler J, Livingston S, Hartsfield A. Youth recidivism twelve months after a family empowerment intervention: final report. *Journal of Offender Rehabilitation* 2000;**31**(3/4):29–65.

Deschenes 1994 ***{published data only}***
* Deschenes EP, Greenwood PW. Maricopa-County Drug Court - an innovative program for 1st-time drug offenders on probation. *Justice System Journal* 1994;**17**(1):99–115.

Diamond 2006 ***{published data only}***
Diamond G, Panichelli-Mindel SM, Shrea D, Dennis M, Tims F, Ungemack J. Psychiatric syndromes in adolescents with marijuana abuse and dependency in outpatient treatment. Journal of Child & Adolescent Substance Abuse 2006; Vol. 15, issue 4:37–54.

Di Nitto 2002 ***{published data only}***
Di Nitto DM, Webb DK, Rubin A. The effectiveness of an integrated treatment approach for clients with dual diagnoses. *Research on Social Work Practice* 2002;**12**(5): 621–41.

Dugan 1998 *{published data only}*
Dugan JR, Everett RS. An experimental test of chemical dependency therapy for jail inmates. *International Journal of Offender Therapy & Comparative Criminology* 1998;**42**(4): 360–8.

Evans 2012 *{published data only}*
Evans E, Jaffe A, Urada D, Anglin MD. Differential outcomes of court-supervised substance abuse treatment among California parolees and probationers.. *International Journal of Offender Therapy and Comparative Criminology* 2012;**56**(4):539–56.

Forsberg 2011 *{published data only}*
Forsberg LG, Ernst D, Sundqvist K, Farbring CA. Motivational Interviewing delivered by existing prison staff: a randomized controlled study of effectiveness on substance use after release. *Substance Use and Misuse* 2011;**46**(12): 1477–85.

Freudenberg 2010 *{published data only}*
Freudenberg N, Ramaswamy M, Daniels J, Crum M, Ompad DC, Vlahov D. Reducing drug use, human immunodeficiency virus risk, and recidivism among young men leaving jail: evaluation of the REAL MEN re-entry program. *Journal of Adolescent Health* 2010;**47**(5):448–55.

Friedman 2012 *{published data only}*
Friedman SR, West BS, Pouget ER, Hall HI, Cantrell J, Tempalski B, et al. Metropolitan Social Environments and Pre-HAART/HAART Era Changes in Mortality Rates (per 10,000 Adult Residents) among Injection Drug Users Living with AIDS.. *PLoS ONE* 2013;**8**(2):12. [DOI: e5720110.1371/journal.pone.0057201]

Frost 2013 *{published data only}*
Frost M, Iacobacci B. Utilization of buprenorphine assisted opioid dependence treatment in a county drug court program.. *Journal of Addiction Medicine* 2013;**7**(4):E10.

Gagnon 2010 *{published data only}*
Gagnon H, Godin G, Alary M, Bruneau J, Otis J. A randomized trial to evaluate the efficacy of a computer-tailored intervention to promote safer injection practices among drug users. *AIDS & Behavior* 2010;**14**(3):538–48.

Gil 2004 *{published data only}*
Gil AG, Wagner EF, Tubman JG. Culturally sensitive substance abuse intervention for Hispanic and African American adolescents: empirical examples from the Alcohol Treatment Targeting Adolescents in Need (ATTAIN) Project. *Addiction* 2004;**99**(Suppl 2):140–50. [: 0965–2140]

Gordon 2012 *{published data only}*
Gordon M, Kinlock TW, Couvillion KA, Schwartz RP, O'Grady K. A Randomized Clinical Trial of Methadone Maintenance for Prisoners: Prediction of Treatment Entry and Completion in Prison. *Journal of Offender Rehabilitation* 2012;**51**(4):222–38.

Gordon 2013 *{published data only}*
Gordon MS, Kinlock TW, Couvillion KA, Wilson ME, Schwartz RP, O'Grady KE. Gender Differences Among Prisoners With Pre-Incarceration Heroin Dependence Participating in a Randomized Clinical Trial of Buprenorphine Treatment. *Journal of Offender Rehabilitation* 2013;**52**(5):376–91.

Gottfredson 2002 *{published data only}*
* Gottfredson DC, Exum ML. The Baltimore City drug treatment court: one-year results from a randomized study. *Journal of Research in Crime and Delinquency* 2002;**39**(3): 337–56.

Grohman 2002 *{published data only}*
Grohman K, Fals-Stewart W, Bates ME. Cognitive rehabilitation for neuropsychologically impaired substance-abusing patients: posttreatment outcomes [web page]. http: //addictionandfamily.org [2004, 29 Oct] 2002.

Grommon 2013a *{published data only}*
Grommon E, Cox SM, Davidson WS, Bynum TS. Alternative models of instant drug testing: Evidence from an experimental trial. *Journal of Experimental Criminology* 2013;**9**(2):145–68. [DOI: http://dx.doi.org/10.1007/s11292-012-9168-6]

Grommon 2013b *{published data only}*
Grommon E, Davidson WS, Bynum TS. A randomized trial of a multimodal community-based prisoner reentry program emphasizing substance abuse treatment. *Journal of Offender Rehabilitation* 2013;**52**(4):287–309. [DOI: http://dx.doi.org/10.1080/10509674.2013.782775]

Guydish 2011 *{published data only}*
Guydish J, Chan M, Bostrom A, Jessup M, Davis T, Marsh C. A randomized trial of probation case management for drug-involved women offenders. *Crime and Delinquency* 2011;**57**(2):167–98.

Guydish 2014 *{published data only}*
Guydish J, Campbell BK, Manuel JK, Delucchi KL, Le T, Peavy KM, et al. Does treatment fidelity predict client outcomes in 12-Step Facilitation for stimulant abuse?. *Drug & Alcohol Dependence* 2014;**134**:330–36.

Haapanen 2002 *{published data only}*
* Haapanen R, Britton L. Drug testing for youthful offenders on parole: an experimental evaluation. *Criminology and Public Policy* 2002;**1**(2):217–44.

Haasen 2010 *{published data only}*
Haasen C, Verthein U, Eiroa-Orosa FJ, Schäfer I, Reimer J. Is heroin-assisted treatment effective for patients with no previous maintenance treatment? Results from a German randomised controlled trial. *European Addiction Research* 2010;**16**(3):124–30.

Hanlon 1999 *{published data only}*
* Hanlon TE, Bateman RW, O'Grady KE. The relative effects of three approaches to the parole supervision of narcotic addicts and cocaine abusers. *Prison Journal* 1999; **79**(2):163–81.

Harada 2012 *{published data only}*
Harada T. The randomized controlled trial of the prison-based Japanese Matrix Program (J-MAT) for

methamphetamine abusers. *Japanese Journal of Alcohol Studies and Drug Dependence* 2012;**47**(6):298–307.

Harrell 2001 ***{published data only}***
Harrell A, Roman J. Reducing drug use and crime among offenders: the impact of graduated sanctions. *Journal of Drug Issues* 2001;**31**(1):207–32.

Henderson 2010 ***{published data only}***
Henderson CE, Dakof GA, Greenbaum PE, Liddle HA. Effectiveness of multidimensional family therapy with higher severity substance-abusing adolescents: report from two randomized controlled trials. *Journal of Consulting in Clinical Psychology* 2010;**78**(6):885–97.

Henggeler 1991 ***{published data only}***
Henggeler SW, Borduin CM, Melton GB, Mann BJ. Effects of multisystemic therapy on drug use and abuse in serious juvenile offenders: a progress report from two outcome studies. *Family Dynamics of Addiction Quarterly* 1991;**1**(3): 40–51.

Henggeler 1999 ***{published data only}***
* Henggeler SW, Pickrel SG, Brondino MJ. Multisystemic treatment of substance-abusing and dependent delinquents: outcomes, treatment fidelity, and transportability. *Mental Health Services Research* 1999;**1**(3):171–84.

Henggeler 2002 ***{published data only}***
Henggeler SW, Clingempeel WG, Brondino MJ, Pickrel SG. Four-year follow-up of multisystemic therapy with substance-abusing and substance-dependent juvenile offenders. *Journal of the American Academy of Child & Adolescent Psychiatry* 41;**7**:868–74.

Henggeler 2006 ***{published data only}***
Henggeler SW, Halliday-Boykins CA, Cunningham PB, Randall J, Shapiro SB, Chapman JE. Juvenile drug court: enhancing outcomes by integrating evidence-based treatments. *Journal of Consulting in Clinical Psychology* 2006;**74**(1):42–54. [0022–006X: (Print)]

Henggeler 2012 ***{published data only}***
Henggeler SW, McCart MR, Cunningham PB, Chapman JE. Enhancing the effectiveness of juvenile drug courts by integrating evidence-based practices. *Journal of Consulting & Clinical Psychology* 2012;**80**(2):264–75. [DOI: 10.1037/a0027147]

Hser 2011 ***{published data only}***
Hser Y-I, Li J, Jiang H, Zhang R, Du J, Zhang C, et al. Effects of a randomized contingency management intervention on opiate abstinence and retention in methadone maintenance treatment in China. *Addiction* 2011;**106**(10):1801–9.

Hser 2013 ***{published data only}***
Hser Y-I, Fu L, Wu F, Du J, Zhao M. Pilot trial of a recovery management intervention for heroin addicts released from compulsory rehabilitation in China. *Journal of Substance Abuse Treatment* 2013;**44**(1):78–83. [DOI: http://dx.doi.org/10.1016/j.jsat.2012.03.009]

Inciardi 2004 ***{published data only}***
Inciardi JA, Martin SS, Butzin CA. Five-year outcomes of therapeutic community treatment of drug-involved offenders after release from prison. *Crime & Delinquency* 2004;**50**(1):88–107. [: 0011–1287]

Jain 2011 ***{published data only}***
Jain K, Jain R, Dhawan A. A double-blind, double-dummy, randomized controlled study of memantine versus buprenorphine in naloxone-precipitated acute withdrawal in heroin addicts. *J Opioid Manag* 2011;**7**(1):11–20.

Johnson 2011 ***{published data only}***
Johnson JE, Friedmann PD, Green TC, Harrington M, Taxman FS. Gender and treatment response in substance use treatment-mandated parolees. *Journal of Substance Abuse Treatment* 2011;**40**(3):313–21.

Johnson 2012 ***{published data only}***
Johnson JE, Zlotnick C. Pilot study of treatment for major depression among women prisoners with substance use disorder. *Journal of Psychiatric Research* 2012;**46**(9): 1174–83.

Jones, 2011 ***{published data only}***
Jones RK. Evaluation of the DUI court program in Maricopa County, Arizona.. Washington, DC: U.S. Department of Transportation. 2011; Vol. Report.

Jones 2013 ***{published data only}***
Jones CG. Early-phase outcomes from a randomized trial of intensive judicial supervision in an Australian Drug Court. *Criminal Justice and Behavior* 2013;**40**(4):453–68. [DOI: http://dx.doi.org/10.1177/0093854812449215]

Katz 2007 ***{published data only}***
Katz EC, Brown BS, Schwartz RP, King SD, Weintraub E, Barksdale W. Impact of role induction on long-term drug treatment outcomes. *Journal of Addictive Diseases* 2007;**26** (2):81–90. [: CN–00590052]

Kelly 2013 ***{published data only}***
Kelly SM, O'Grady KE, Jaffe JH, Gandhi D, Schwartz RP. Improvements in outcomes in methadone patients on probation/parole regardless of counseling early in treatment. *Journal of Addiction Medicine* 2013;**7**(2):133–8. [DOI: http://dx.doi.org/10.1097/ADM.0b013e318284a0c1]

Kidorf 2013 ***{published data only}***
Kidorf M, Brooner RK, Gandotra N, Antoine D, King VL, Peirce J, et al. Reinforcing integrated psychiatric service attendance in an opioid-agonist program: a randomized and controlled trial. *Drug and Alcohol Dependence* 2013; **133**(1):30–6.

King 2014 ***{published data only}***
King VL, Brooner RK, Peirce JM, Kolodner K, Kidorf MS. A randomized trial of Web-based videoconferencing for substance abuse counseling.. *Journal of Substance Abuse Treatment* 2014;**46**(1):36–42.

Kinlock 2008 ***{published data only}***
Kinlock TW, Gordon MS, Schwartz RP, O'Grady KE. A study of methadone maintenance for male prisoners: 3-month postrelease outcomes. Criminal Justice and Behavior 2008; Vol. 35, issue 1:34–47. [0093–8548: (Print)]

Kinlock 2009a ***{published data only}***
Kinlock T, Gordon M, Schwartz R. Buprenorphine for prisoners: preliminary findings at one-month post release.

Conference Papers -- American Society of Criminology. 2009:1.

Kinlock 2009b *{published data only}*
Kinlock TW, Gordon MS, Schwartz RP, Fitzgerald TT, O'Grady KE. A randomized clinical trial of methadone maintenance for prisoners: Results at 12 months postrelease. Journal of Substance Abuse Treatment 2009; Vol. 37, issue 3:277–85. [: 0740–5472]

Kok 2013 *{published data only}*
Kok T, de Haan HA, van der Meer M, Najavits LM, DeJong CAJ. Efficacy of "seeking safety" in a Dutch population of traumatized substance-use disorder outpatients: study protocol of a randomized controlled trial. *BMC Psychiatry* 2013;**13**(8):162–70. [DOI: 16210.1186/1471-244x-13-162]

Law 2012 *{published data only}*
Law FM, Guo GJ. Hope and recovery from substance abuse for female drug offenders in Taiwan. *International journal of offender therapy and comparative criminology* 2012;**56**(8):1258–82.

Lee 2012 *{published data only}*
Lee JD, Grossman E, Truncali A, Rotrosen J, Rosenblum A, Magura S, et al. Buprenorphine-naloxone maintenance following release from jail. *Subst Abus* 2012;**33**(1):40–7. [DOI: 10.1080/08897077.2011.620475]

Liddle 2011 *{published data only}*
Liddle HA, Dakof GA, Henderson C, Rowe C. Implementation outcomes of multidimensional family therapy-detention to community: a reintegration program for drug-using juvenile detainees. *International Journal of Offender Therapy and Comparative Criminology* 2011;**55**(4):587–604.

Ling 2013 *{published data only}*
Ling Murtaugh K, Krishnamurti T, Davis AL, Reback CJ, Shoptaw S. Spend today, clean tomorrow: predicting methamphetamine abstinence in a randomized controlled trial. *Health Psychology* 2013;**32**(9):958–66.

Lobmann 2009 *{published data only}*
Lobmann R, Verthein U. Explaining the effectiveness of heroin-assisted treatment on crime reductions. *Law and Human Behavior* 2009;**33**(1):83–95. [DOI: 10.1007/s10979-008-9138-8]

MacDonald 2007 *{published data only}*
MacDonald JM, Morral AR, Raymond B, Eibner C. The efficacy of the Rio Hondo DUI court: A 2-year field experiment. *Evaluation Review* 2007;**31**(4):4–23.

Marlowe 2003 *{published data only}*
Marlowe DB, Festinger DS, Lee PA, Schepise MM, Hazzard JER, Merrill JC, et al. Are judicial status hearings a key component of drug court? During treatment data from a randomized trial. *Criminal Justice and Behavior* 2008;**30**(2):141–62.

Marlowe 2005 *{published data only}*
Marlowe DB, Festinger DS, Dugosh KL, Lee PA. Are judicial status hearings a "key component" of drug court? Six and twelve month outcomes. *Drug and Alcohol Dependence* 2005;**79**(2):145–55.

Marlowe 2007 *{published data only}*
Marlowe DB, Festinger DS, Dugosh KL, Lee PA, Benasutti KM. Adapting judicial supervision to the risk level of drug offenders: discharge and 6-month outcomes from a prospective matching study. *Drug and Alcohol Dependence* 2007;**88**(Suppl 2):S4–S13.

Marlowe 2008 *{published data only}*
Marlowe DB, Festinger DS, Dugosh KL, Arabia PL, Kirby KC. An effectiveness trial of contingency management in a felony preadjudication drug court. *Journal of Applied Behavior Analysis* 2008;**41**(4):565–77. [0021–8855: (Print)]

Marsch 2014 *{published data only}*
Marsch LA, Guarino H, Acosta M, Aponte-Melendez Y, Cleland C, Grabinski M, et al. Web-based behavioral treatment for substance use disorders as a partial replacement of standard methadone maintenance treatment. *Journal of Substance Abuse Treatment* 2014;**46**(1):43–51.

Martin 1993 *{published data only}*
* Martin SS, Scarpitti SR. An intensive case management approach for paroled IV drug users. *Journal of Drug Issues* 1993;**23**(1):43–59.

Mbilinyi 2011 *{published data only}*
Mbilinyi LF, Neighbors C, Walker DD, Roffman RA, Zegree J, Edleson J, et al. A telephone intervention for substance-using adult male perpetrators of intimate partner violence. *Research on Social Work Practice* 2011;**21**(1):43–56.

McKendrick 2007 *{published data only}*
McKendrick K, Sullivan C, Banks S, Sacks S. Modified therapeutic community treatment for offenders with MICA disorders: antisocial personality disorder and treatment outcomes. Journal of Offender Rehabilitation 2006; Vol. 44, issue 2–3:133–59. [: 1050–9674]

McKenzie 2012 *{published data only}*
McKenzie M, Zaller N, Dickman SL, Green TC, Parihk A, Friedmann PD, et al. A randomized trial of methadone initiation prior to release from incarceration. *Substance Abuse* 2012;**33**(1):19–29. [DOI: 10.1080/08897077.2011.609446]

Messina 2000 *{published data only}*
Messina N, Wish E, Nemes S. Predictors of treatment outcomes in men and women admitted to a therapeutic community. *American Journal of Drug & Alcohol Abuse* 2000;**26**(2):207–27.

Messina 2010 *{published data only}*
Messina N, Grella CE, Cartier J, Torres S. A randomized experimental study of gender-responsive substance abuse treatment for women in prison.. *Journal of Substance Abuse Treatment* 2010;**38**(2):97–107.

Milloy 2011 *{published data only}*
Milloy MJS, Kerr T, Zhang R, Tyndall M, Montaner J. *Randomised Trial of the Effectiveness of Naloxone*. London: Department of Health, 2011.

Needels 2005 *{published data only}*
Needels K, James-Burdumy S, Burghardt J. Community case management for former jail inmates: its impacts on rearrest, drug use, and HIV risk. *Journal of Urban Health* 2005;**82**(3):420–33. [1099–3460: (Print)]

Nemes 1998 *{published data only}*
Nemes S, Wish E, Messina N. *The District of Columbia Treatment Initiative (DCI) final report*. College Park, MD: University of Maryland, National Evaluation Data and Technical Assistance Center (NEDTAC), 1998.

Nemes 1999 *{published data only}*
Nemes S, Wish ED, Messina N. Comparing the impact of standard and abbreviated treatment in a therapeutic community: findings from the District of Columbia treatment initiative experiment. *Journal of Substance Abuse Treatment* 1999;**17**(4):339–47.

Nielsen 1996 *{published data only}*
Farrell A. Women, crime and drugs: testing the effect of therapeutic communities. *Women and Criminal Justice* 2000;**11**(1):21–48.
* Nielsen AL, Scarpitti FR, Inciardi JA. Integrating the therapeutic community and work release for drug-involved offenders: the CREST program. *Journal of Substance Abuse Treatment* 1996;**13**(4):349–58.

Nosyk 2010 *{published data only}*
Nosyk B, Geller J, Guh DP, Oviedo-Joekes E, Brissette S, Marsh DC, et al. The effect of motivational status on treatment outcome in the North American Opiate Medication Initiative (NAOMI) study. *Drug and Alcohol Dependence* 2010;**111**(1-2):161–5.

Petersilia 1992 *{published data only}*
* Petersilia J, Turner S, Deschenes EP. Intensive supervision programs for drug offenders. In: Byrne JM, Lurigio AJ editor(s). *Smart Sentencing: The Emergence of Intermediate Sanctions*. Thousand Oaks, CA: Sage Publications Inc, 1992:18–37.

Petry 2005 *{published data only}*
Petry NM, Peirce JM, Stitzer ML, Blaine J, Roll JM, Cohen A, et al. Effect of prize-based incentives on outcomes in stimulant abusers in outpatient psychosocial treatment programs: a national drug abuse treatment clinical trials network study. *Archives of General Psychiatry* 2005;**62**(10): 1148–56. [DOI: 10.1001/archpsyc.62.10.1148]

Petry 2011 *{published data only}*
Petry NM, Ford J D, Barry D. Contingency management is especially efficacious in engendering long durations of abstinence in patients with sexual abuse histories. *Psychology of Addictive Behaviors* 2011;**25**(2):293–300.

Polsky 2010 *{published data only}*
Polsky D, Glick HA, Yang J, Subramaniam GA, Poole SA, Woody GE. Cost-effectiveness of extended buprenorphine-naloxone treatment for opioid-dependent youth: data from a randomized trial. *Addiction* 2010;**105**(9):1616–24.

Prendergast 2003 *{published data only}*
Prendergast ML, Hall EA, Wexler HK. Multiple measures of outcome in assessing a prison-based drug treatment program. *Journal of Offender Rehabilitation* 2003;**37**:65–94.

Prendergast 2008 *{published data only}*
Prendergast ML, Hall EA, Roll J, Warda U. Use of vouchers to reinforce abstinence and positive behaviors among clients in a drug court treatment program. *Journal of Substance Abuse Treatment* 2008;**35**(2):125–36. [1873–6483: (Electronic)]

Prendergast 2009 *{published data only}*
Prendergast M, Greenwell L, Cartier J, Sacks J, Frisman L, Rodis E, et al. Adherence to scheduled sessions in a randomized field trial of case management: the Criminal Justice-Drug Abuse Treatment Studies Transitional Case Management Study. *Journal of Experimental Criminology* 2009;**5**(3):273–97.

Prendergast 2011 *{published data only}*
Prendergast M, Frisman L, Sacks JY, Staton-Tindall M, Greenwell L, Lin HJ, et al. A multi-site, randomized study of strengths-based case management with substance-abusing parolees. *Journal of Experimental Criminology* 2011;**7**(3): 225–53.

Proctor 2012 *{published data only}*
Proctor SL, Hoffmann NG, Allison S. The effectiveness of interactive journaling in reducing recidivism among substance-dependent jail inmates. *International Journal of Offender Therapy and Comparative Criminology* 2012;**56**(2): 317–32.

Reimer 2011 *{published data only}*
Reimer J, Verthein U, Karow A, Schäfer I, Naber D, Haasen C. Physical and mental health in severe opioid-dependent patients within a randomized controlled maintenance treatment trial. *Addiction* 2011;**106**(9):1647–55.

Robertson 2006 *{published data only}*
Robertson JR, Raab GM, Bruce M, McKenzie JS, Storkey HR, Salter A. Addressing the efficacy of dihydrocodeine versus methadone as an alternative maintenance treatment for opiate dependence: a randomized controlled trial. *Addiction* 2006;**101**(12):1752–9. [: CN–00577209]

Rosengard 2008 *{published data only}*
Rosengard C, Stein LAR, Barnett NP, Monti PM, Golembeske C, Lebeau-Craven R, et al. Randomized clinical trial of motivational enhancement of substance use treatment among incarcerated adolescents. *Journal of HIV/AIDS Prevention in Children and Youth* 2008;**8**(2):45–64.

Rossman 1999 *{published data only}*
Rossman S, Sridharan S, Gouvis C, Buck J, Morley E. *Impact of the Opportunity to Succeed (OPTS) Aftercare Program for Substance-Abusing Felons: comprehensive Final Report*. Washington DC: Urban Institute, 1999.

Rounsaville 2001 *{published data only}*
Rounsaville BJ, Carroll KM, Onken LS. A Stage Model of Behavioral Therapies research: Getting started and moving on from stage I. *Clinical Psychology-Science and Practice* 2001;**8**(2):133–42. [DOI: 10.1093/clipsy/8.2.133]

Rowan-Szal 2005 *{published data only}*
Rowan-Szal GA, Bartholomew NG, Chatham LR, Simpson DD. A combined cognitive and behavioral intervention for cocaine-using methadone clients. *Journal of Psychoactive Drugs* 2005;**37**(1):75–84.

Rowan-Szal 2009 *{published data only}*
Rowan-Szal GA, Joe GW, Simpson D, Greener JM, Vance J. During-treatment outcomes among female methamphetamine-using offenders in prison-based treatments. *Journal of Offender Rehabilitation* 2009;**48**(5): 388–401.

Rowe 2007 *{published data only}*
Rowe M, Bellamy C, Baranoski M, Wieland M, Connell MJO, Benedict P, et al. A peer-support, group intervention to reduce substance use and criminality among persons with severe mental illness. *Psychiatric Services* 2007;**58**(7): 955–61. [: 1075–2730]

Sacks 2004 *{published data only}*
Sacks S, Sacks JY, McKendrick K, Banks S, Stommel J. Modified TC for MICA inmates in correctional settings: crime outcomes. *Behavioural Sciences and the Law* 2004;**22** (4):477–501.

Sacks 2008 *{published data only}*
Sacks JY, Sacks S, McKendrick K, Banks S, Schoeneberger M, Hamilton Z, et al. Prison therapeutic community treatment for female offenders: profiles and preliminary findings for mental health and other variables (crime, substance use and HIV risk). *Journal of Offender Rehabilitation* 2008;**46**(3-4):233–61. [: 1050–9674]

Sacks 2011 *{published data only}*
Sacks S, Chaple M, Sacks JY, McKendrick K, Cleland CM. Randomized trial of a reentry modified therapeutic community for offenders with co-occurring disorders: crime outcomes. *Journal of Substance Abuse Treatment* 2012;**42**(3): 247–59.

Sanchez-Hervas 2010 *{published data only}*
Sanchez-Hervas E, Secades-Villa R, Romaguera FZ, Fernandez GG, Gomez FJS, Garcia-Rodriguez O. Behavioral therapy for cocaine addicts: outcomes of a follow-up six month study. *Revista Mexicana De Psicologia* 2010;**27**(2):159–67.

Schaeffer 2014 *{published data only}*
Schaeffer CM, Henggeler SW, Ford JD, Mann M, Chang R, Chapman JE. RCT of a promising vocational/employment program for high-risk juvenile offenders. *Journal of Substance Abuse Treatment* 2014;**46**(2):134–43. [DOI: http: //dx.doi.org/10.1016/j.jsat.2013.06.012]

Schmiege 2009 *{published data only}*
Schmiege SJ, Broaddus MR, Levin M, Bryan AD. Randomized Trial of Group Interventions to Reduce HIV/ STD Risk and Change Theoretical Mediators Among Detained Adolescents. *Journal of Consulting and Clinical Psychology* 2009;**77**(1):38–50. [DOI: 10.1037/A0014513]

Schwartz 2006 *{published data only}*
Schwartz RP, Highfield DA, Jaffe JH, Brady JV, Butler CB, Rouse CO, et al. A randomized controlled trial of interim methadone maintenance. *Archives of General Psychiatry* 2006;**63**(1):102–9.

Shanahan 2004 *{published data only}*
Shanahan M, Lancsar E, Haas M, Lind B, Weatherburn D, Chen S. Cost-effectiveness analysis of the New South Wales adult drug court program. *Evaluation Review* 2004;**28**(1): 3–27.

Sheard 2009 *{published data only}*
Sheard L, Wright NM, El-Sayeh CE, Adams C, Li R, Tompkins CN. The Leeds evaluation of efficacy of detoxification study (LEEDS) prisons project: a randomised controlled trial comparing dihydrocodeine and buprenorphine for opiate detoxification. *Substance Abuse Treatment Prevention and Policy* 2009;**4**:1.

Siegal 1999 *{published data only}*
Siegal HA, Jichuan W, Carlson RG, Falck RS, Rahman AM, Fine RL. Ohio's prison-based therapeutic community treatment programs for substance abusers: preliminary analysis of re-arrest data. *Journal of Offender Rehabilitation* 1999;**28**(3/4):33–48.

Sinha 2003 *{published data only}*
Sinha R, Easton C, Renee-Aubin L, Carroll KM. Engaging young probation-referred marijuana-abusing individuals in treatment: a pilot trial. *American Journal on Addictions* 2003;**12**(4):314–23.

Smith 2010 *{published data only}*
Smith DK, Chamberlain P, Eddy JM. Preliminary support for multidimensional treatment foster care in reducing substance use in delinquent boys. *Journal of Child & Adolescent Substance Abuse* 2010;**19**:343–58.

Solomon 1995 *{published data only}*
Solomon P, Draine J. One-Year Outcomes of a Randomized Trial of Case-Management with Seriously Mentally-Ill Clients Leaving Jail.. *Evaluation Review* 1995;**19**(3): 256–73. [DOI: 10.1177/0193841x9501900302]

Specka 2013 *{published data only}*
Specka M, Boning A, Kluwig J, Schifano F, Banger M, Lange W, et al. Can reinforcement-based interventions to reduce drug use successfully be adapted to routine opioid maintenance treatment?. *Annali dell Istituto Superiore di Sanita* 2013;**49**(4):358–64.

Stanger 2009 *{published data only}*
Stanger C, Budney AJ, Kamon JL, Thostensen J. A randomized trial of contingency management for adolescent marijuana abuse and dependence. *Drug and Alcohol Dependence* 2009;**105**(3):240–7. [: 0376–8716]

Staton-Tindall 2009 *{published data only}*
Staton-Tindall M, McNees E, Leukefeld CG, Walker R, Thompson L, Pangburn K, et al. Systematic outcomes research for corrections-based treatment: implications from the criminal justice Kentucky treatment outcome study. *Journal of Offender Rehabilitation* 2009;**48**(8):710–24.

Stein 2006 *{published data only}*
Stein LA, Monti PM, Colby SM, Barnett NP, Golembeske C, Lebeau-Craven R, et al. Enhancing Substance Abuse

Treatment Engagement in Incarcerated Adolescents. *Psychol Serv* 2006;**3**(1):25–34.

Stein 2010 ***{published data only}***
Stein MD, Herman DS, Kettavong M, Cioe PA, Friedmann PD, Tellioglu T, et al. Antidepressant treatment does not improve buprenorphine retention among opioid-dependent persons. *Journal of Substance Abuse Treatment* 2010;**39**(2): 157–66.

Stein 2011 ***{published data only}***
Stein LA, Clair M, Lebeau R, Colby SM, Barnett NP, Golembeske CM, et al. Motivational interviewing to reduce substance-related consequences: effects for incarcerated adolescents with depressed mood. *Drug and Alcohol Dependence* 2011;**118**(2-3):475–8.

Stevens 1998 ***{published data only}***
Stevens SJ, Patton T. Residential treatment for drug addicted women and their children: Effective treatment strategies. *Drugs & Society* 1998;**13**(1-2):235–49.

Svikis 2011 ***{published data only}***
Svikis DS, Keyser-Marcus L, Stitzer M, Rieckmann T, Safford L, Loeb P, et al. Randomized multi-site trial of the Job Seekers' Workshop in patients with substance use disorders. *Drug and Alcohol Dependence* 2012;**1**(1,20):1–3.

Taxman 2006 ***{published data only}***
Taxman FS, Meridith T. Risk, need, and responsivity (RNR): it all depends. *Crime & Delinquency* 2006;**52**(1): 28–51. [0095–2990: (Print)]

Vagenas 2014 ***{published data only}***
Vagenas P, Di Paola A, Herme M, Lincoln T, Skiest DJ, Altice FL, et al. An evaluation of hepatic enzyme elevations among HIV-infected released prisoners enrolled in two randomized placebo-controlled trials of extended release naltrexone. *Journal of Substance Abuse Treatment* 2014;**47** (1):35–40.

Vanderberg 2002 ***{published data only}***
Vanderberg SA. Motivational interviewing as a precursor to a substance abuse program for offenders. Doctoral thesis, Department of Psychology, Carlton University, Ottawa, Ontario 2002.

Villagrá Lanza 2013 ***{published data only}***
Villagrá Lanza P, González Menéndez A. Acceptance and Commitment Therapy for drug abuse in incarcerated women. *Psicothema* 2013;**25**(3):307–12.

Walters 2014 ***{published data only}***
Walters ST, Ondersma SJ, Ingersoll KS, Rodriguez M, Lerch J, Rossheim ME, et al. MAPIT: development of a web-based intervention targeting substance abuse treatment in the criminal justice system. *Journal of Substance Abuse Treatment* 2014;**46**(1):60–5.

Wang 2010 ***{published data only}***
Wang EA, Moore BA, Sullivan LE, Fiellin DA. Effect of incarceration history on outcomes of primary care office-based buprenorphine/naloxone. *Journal of General Internal Medicine* 2010;**25**(7):670–4.

Webster 2014 ***{published data only}***
Webster JM, Staton-Tindall M, Dickson MF, Wilson JF, Leukefeld CG. Twelve-month employment intervention outcomes for drug-involved offenders.. *American Journal of Drug and Alcohol Abuse* 2014;**40**(3):200–5. [DOI: 10.3109/00952990.2013.858722]

White 2006 ***{published data only}***
White MD, Goldkamp JS, Robinson JB. Acupuncture in drug treatment: exploring its role and impact on participant behavior in the drug court setting. *Journal of Experimental Criminology* 2006;**2**(1):45–65. [: 1573–3750]

Williams 2011 ***{published data only}***
Williams K, Martin M, Martin D. Examining a drug court treatment program in New Jersey: a perspective from the field. *Alcoholism Treatment Quarterly* 2011;**29**(1):85–90.

Winstanley 2011 ***{published data only}***
Winstanley EL, Bigelow GE, Silverman K, Johnson RE, Strain EC. A randomized controlled trial of fluoxetine in the treatment of cocaine dependence among methadone-maintained patients. *Journal of Substance Abuse Treatment* 2011;**40**(3):255–64.

Witkiewitz 2010 ***{published data only}***
Witkiewitz K, Bowen S. Depression, craving, and substance use following a randomized trial of mindfulness-based relapse prevention. *Journal of Consulting in Clinical Psychology* 2010;**78**(3):362–74.

Wolff 2012 ***{published data only}***
Wolff N, Frueh BC, Shi J, Schumann BE. Effectiveness of cognitive-behavioral trauma treatment for incarcerated women with mental illnesses and substance abuse disorders. *Journal of Anxiety Disorders* 2012;**26**(7):703–10. [DOI: 10.1016/j.janxdis.2012.06.001]

Zlotnick 2009 ***{published data only}***
Zlotnick C, Johnson J, Najavits LM. Randomized controlled pilot study of cognitive-behavioral therapy in a sample of incarcerated women with substance use disorder and PTSD. *Behavior Therapy* 2009;**40**(4):325–36. [: 0005–7894]

References to ongoing studies

Springer 2015 ***{unpublished data only}***
Springer SA. Naltrexone for opioid dependent released HIV+ Criminal Justice Populations.. (ongoing-2015) to be confirmed.

Additional references

Amato 2005
Amato L, Davoli M, Perucci CA, Ferri M, Faggiano F, Mattick RP. An overview of systematic reviews of effectiveness of opiate maintenance therapies: available evidence to information clinical practice and research. *Journal of Substance Abuse Treatment* 2005;**28**:321–9.

Amato 2013
Amato L, Davoli M, Minozzi S, Ferroni E, Ali R, Ferri M. Methadone at tapered doses for the management of opioid

withdrawal. *Cochrane Database of Systematic Reviews* 2013, Issue 2. [DOI: 10.1002/14651858.CD003409.pub3]

Binswanger 2007
Binswanger IA, Stern MF, Deyo RA, Heagerty PJ, Cheadle A, Elmore JG, et al. Release from prison- a high risk of death for former inmates. *New England Journal of Medicine* 2007;**356**:157–65.

Bird 2003
Bird SM, Hutchinson SJ. Male drugs related deaths in the fortnight after release from prison: Scotland 1996-99. *Addiction* 2003;**98**:185–90.

Brooke 1996
Brooke D, Taylor C, Gunn J, Maden A. Point prevalence of mental disorder in unconvicted male prisoners in England and Wales. *British Medical Journal* 1996;**313**:1524–7.

Catania 2003
Catania H. Prison health needed in prisons. Harm reduction news: Newsletter of the International Harm Reduction Development Program of the Open Society Institute. Open Society Institute 2003; Vol. 4, issue 11:13.

Chanhatasilpa 2000
Chanhatasilpa C, Mackenzie DL, Hickman LJ. The effectiveness of community-based programs for chemically dependent offenders: a review and assessment of the research. *Journal of Substance Abuse Treatment* 2000;**19**: 383–93.

Drummond 1997
Drummond M, O'Brien B, Stoddart G, Torrance G. *Methods for the Economic Evaluation of Health Care Programmes*. 2nd Edition. Oxford, UK: Oxford University Press, 1997.

Egg 2000
Egg R, Pearson FS, Cleland CM, Lipton DS. Evaluations of correctional treatment programs in Germany: a review and meta-analysis. *Substance Use and Misuse* 2000;**35**(12-14): 1967–2009.

Faggiano 2003
Faggiano F, Vigna-Taglianti F, Versino E, Lemma P. Methadone maintenance at different dosages for opioid dependence. *Cochrane Database of Systematic Reviews* 2003, Issue 1. [DOI: 10.1002/14651858.CD002208]

Fareed 2012
Fareed A, Vayalapalli S, Casarella J, Drexler K. Effect of buprenorphine dose on treatment outcome. *Journal of Addiction Disorders* 2012;**31**(1):8–18.

Fiscella 2004
Fiscella K, Moore A, Engerman J, Meldrum S. Jail management of arrestees/inmates enrolled in community methadone maintenance programs. *Journal of Urban Health: Bulletin of the New York Academy of Medicine.* 2004; **81**:645–54.

Garcia 2007
Garcia CA, Correa GC, Viver AD, Hernandez BS, Kinlock TW, Gordon MS, et al. Buprenorphine-naloxone treatment for pre-release opiod dependent inmates in Puerto Rico. *Journal of Addiction Medicine* 2007;**1**:126–32.

Gibson 2007
Gibson A, Degenhardt LJ. Mortality related to pharmacotherapies for opioid dependence: a comparative analysis of coronial records. *Drug and Alcohol Review* 2007; **26**:405–10.

Gowing 2009
Gowing L, Ali R, White J. Buprenorphine for the management of opioid withdrawal. *Cochrane Database of Systematic Reviews* 2009, Issue 3. [DOI: 10.1002/ 14651858.CD002025.pub4]

Gunn 1991
Gunn J, Maden A, Swinton M. Treatment needs of prisoners with psychiatric disorders. *British Medical Journal* 1991;**303**:338–41.

Hedrich 2011
Hedrich D, Alves P, Farrell M, Stover H, Moller L, Mayet S. The effectiveness of opioid maintenance treatment in prison settings: a systematic review. *Addiction* 2011;**107**:501–17.

Hergert 2005
Hergert G. Methadone and buprenorphine added to the WHO list of essential medicines. *HIV, AIDS Policy Law Review* 2005;**10**:23–4.

Higgins 2011
Higgins JPT, Green S (editors). *Cochrane Handbook for Systematic Reviews of Interventions* 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org.

Lo 2000
Lo CC, Stephens RC. Drugs and prisoners: treatment needs on entering prison. *American Journal of Drug and Alcohol Abuse* 2000;**26**:229–45.

Lobmaier 2008
Lobmaier P, Kornor H, Kunoe N, Bjorndal A. Sustained-release naltrexone for opioid dependence. *Cochrane Database of Systematic Reviews* 2008, Issue 2. [DOI: 10.1002/14651858.CD006140.pub2]

Magura 1995
Magura S, Kang SY, Shapiro JL. Measuring cocaine use by hair analysis among criminally involved youth. *Journal of Drug Issues* 1995;**25**:683–701.

Marsch 1998
Marsch LA. The efficacy of methadone maintenance interventions in reducing illicit opiate use, HIV risk behaviours and criminality: a meta-analysis. *Addiction* 1998;**93**(4):515–32.

Mason 1997
Mason D, Birmingham L, Grubin D. Substance use in remand prisoners: a consecutive case study. *British Medical Journal* 1997;**315**:18–21.

Mattick 2009
Mattick RP, Breen C, Kimber J, Davoli M. Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database*

of Systematic Reviews 2009, Issue 3. [DOI: 10.1002/14651858.CD002209.pub2]

Michel 2005
Michel L, Maguet O. Guidelines for substitution treatments in prison populations. *Encephale* 2005;**31**(1):92–7.

Minozzi 2011
Minozzi S, Amato L, Vecchi S, Davoli M, Kirchmayer U, Verster A. Oral naltrexone maintenance treatment for opioid dependence. *Cochrane Database of Systematic Reviews* 2011, Issue 2. [DOI: 10.1002/14651858.CD001333.pub3]

Mitchell 2006
Mitchell O, Wilson D, MacKenzie D. The effectiveness of incarceration-based drug treatment on criminal behaviour. Campbell Systematic Reviews 2006, issue 11. [DOI: 10.4073/csr.2006.11]

Mitchell, 2012a
Mitchell O, Mackenzie LD, Wilson D. The effectiveness of incarcerated based drug treatment on criminal behaviour: A systematic review. Campbell Systematic Reviews 2012; Vol. 18. [DOI: 10.4073/csr.2012.18]

Mitchell, 2012b
Mitchell O, Wilson D, Eggers A, Mackenzie LD. Drug Courts effects on criminal offending for juveniles and adults: A systematic review. Campbell Systematic Reviews 2012; Vol. 4. [DOI: 10.4073/csr.2012.4]

Moller 2007
Moller L, Gathere A, Juergens R, Stover H, Nikogosian H. Health in Prisons. A WHO Guide to the Essentials in Prison Health. Copenhagen: World Health Organization Regional Office for Europe, 2007.

NICE 2007a
National Institute for Health and Clinical Excellence. NICE technology appraisal guidance 114 Methadone and buprenorphine for the management of opioid dependence. www.nice.org.uk/TA114. Accessed 20 July 2013. 2007. [: ISBN 1–84629–338–3]

NICE 2007b
National Institute for Health and Clinical Excellence. NICE technology appraisal guidance 115 Naltrexone for the management of opioid dependence. www.nice.org.uk/TA115. Accessed 20 July 2013. 2007.

Perry 2006
Perry A, Coulton S, Glanville J, Godfrey C, Lunn J, McDougall C, et al. Interventions for drug-using offenders in the courts, secure establishments and the community. *Cochrane Database of Systematic Reviews* 2006, Issue 3. [DOI: 10.1002/14651858.CD005193.pub2]

Perry 2013a
Perry AE, Neilson M, Martyn-St James M, Hewitt C, Glanville J, McCool R, et al. Non-pharmacologic interventions for drug-using offenders. Cochrane Database of Systematic Reviews.

Perry 2013b
Perry AE, Neilson M, Martyn-St James M, Hewitt C, Glanville J, McCool R, et al. Interventions for drug using offenders with co-occurring mental illness. Cochrane Database of Systematic Reviews 2013.

Perry 2013c
Perry AE, Neilson M, Martyn-St James M, Hewitt C, Glanville J, McCool R, et al. Interventions for female drug using offenders. Cochrane Database of Systematic Reviews 2013.

Review Manager 2014
The Nordic Cochrane Centre, The Cochrane Collaboration. Review Manager (RevMan). 5.3. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014.

Reynaud-Maurupt 2005
Reynaud-Maurupt C, Caer Y, Escaffre N, Gagneau M, Galinier A, Marzo NJ, et al. High-dose buprenorphine substitution during incarceration. *La Presse Médicale* 2005; **34**:487–90.

Stallwitz 2007
Stallwitz A, Stover H. The impact of substitution treatment in prisons- a literature review. *International Journal Drug Policy* 2007;**18**:464–74.

* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Bayanzadeh 2004

Methods	Allocation: random assignment Randomisation method: high risk based on even and odd rows Similar on drug use: yes Similar on criminal activity: unknown Blinding methodology: high-risk participants not blind Loss to follow-up: inadequate information with some attrition in the control group/high risk
Participants	120 male participants 100% male Age range: 20 to 70 years Mean age: 35.7 years (SD 8.86) Participants had to have a history of opioid use for longer than one year, had to be dependent upon drugs and had to have a sentence length greater than 6 months. In addition, non-death penalty inmates were excluded, and individuals had to be willing to engage in services
Interventions	Intervention group: The intervention group received methadone treatment in combination with CBT and widely focused on coping and problem-solving skills. n = 60. The CBT training offered analysis on the role and thoughts on drug abuse, identification of high-risk situations, relapse prevention resilience skills, family participation in treatment and motivational interviewing. Family education was arranged to coincide with weekly visiting hours and the harm reduction education was delivered once a week Comparison group: The comparison group received non-methadone drugs plus standard psychiatric services and therapeutic medications. An option for treatment using clonidine and psychoactive drugs was provided as part of this treatment alternative n = 60
Outcomes	Drug use: yes/no Frequency of drug injections (percentage) Syringe sharing Morphine urine analysis All outcomes at six months
Notes	After random allocation, 20 participants who were allocated to the control group opted out of the research. This group of inmates were subsequently replaced by individuals from the general inmate population No conflict of interest was reported.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**

Random sequence generation (selection bias)	High risk	Participants were categorised into one of four lists based on their previous history of drug abuse. The random allocation was then chosen, using even and odd row numbers from each list
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No information reported
Incomplete outcome data (attrition bias) All outcomes	High risk	After random allocation, 20 participants from the control group opted out of the research. At the end of the study attrition was high in both groups: for the intervention group n = 38 out of the original 60 allocated and for the control group n = 31 out of the original 60 allocated
Selective reporting (reporting bias)	Unclear risk	Not clearly reported but problems with the research design are highlighted
Other bias	High risk	The authors note a number of operational difficulties, especially in relation to contamination across prison wings and the two intervention groups

Brown 2013

Methods	Allocation: random assignment Randomisation method: not reported Similar on drug use: reported that there was no significant between-group difference in any demographic variable. Variable and data not presented Similar on criminal activity: as above Blinding methodology: unclear risk, not reported Loss to follow-up: high risk, study retention rate reported as 80%, but figure indicates 80% at week 24, 33% at week 52 and 26% at follow-up
Participants	15 adults enrolled in either a drug treatment court (DTC) or Treatment Alternative Program (TAP). Participants were referred by the Clinical Assessment Unit at the Mental Health Centre of Dane County, where all potential jail diversion program participants receive initial clinical evaluation Average age: 27.5 years 53.3 % male 80.0 % white % drug users, not reported % alcohol, not reported % psychiatric history, not reported Eligibility criteria: inclusion criteria were diagnosis of opioid dependence (via Mini International Neuropsychiatric Interview (MINI)), opioid positive urine drug screen, negative screening urine pregnancy test, and willingness to use appropriate birth control methods throughout the study. Exclusion criteria (via MINI and initial medical history and physical exam) were current alcohol or sedative dependence, pregnancy, women who were breastfeeding, complex psychiatric comorbidity, complex medical comorbidity, or pharmacotherapy with an agent contraindicated in combination with suboxone or methadone, according to drug labelling
Interventions	Interventions: (I) specialist treatment facility plus suboxone (buprenorphine and naloxone) or (ii) specialist treatment facility plus methadone, n = 9 Control: (C) primary care plus suboxone (buprenorphine and naloxone), n = 6 Participation lasted 13.5 months, including a 12-month treatment period and a one-time follow-up 6 weeks post-treatment
Outcomes	Primary outcomes included on-going drug use measured by timeline follow-back method (TLFB is a reliable, calendar-based technique for retrospectively assessing the frequency and patterns of daily drug use) and use of the Addiction Severity Index (self report) Lite, HIV risk behaviours (RAB - Risk Assessment Battery short version), and health services utilization. TLFB was administered at baseline, bi-weekly for the first 6 months, and monthly thereafter. All other measures were assessed at baseline, month 6, month 12, and follow-up Urine drug screens were collected as a part of routine management in DTC and TAP
Notes	The project described was supported by the Clinical and Translational Science Award (CTSA) program, previously through the National Center for Research Resources (NCRR - now the National Centre for Advancing Translational Sciences, NCATS) grant

	1UL1RR025011, and grant 9U54TR000021. Funding was also provided by the Vilas Foundation The authors report no conflicts of interest.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Random allocation noted no further information.
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information provided
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information provided
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information provided
Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No information provided
Incomplete outcome data (attrition bias) All outcomes	High risk	Small sample size (reported as a "pilot study") with 80% completing the 24-week assessment, 33% completing week 52 and 26% at follow-up
Selective reporting (reporting bias)	High risk	Protocol reported as being available. However, on-going drug use (frequency and patterns of daily drug use), health services utilization and urine tests are reported as being assessed, but no outcome data are reported
Other bias	High risk	The authors report: "The higher baseline HIV risk in the specialist study condition, and, hence, greater potential for risk reduction, may have affected this result. In other words, the relatively low prevalence of global HIV risk behaviours in the primary care group may have contributed to a 'floor effect' or greater difficulty achieving

		improvement on this factor." "Additionally, urine drug testing was not collected randomly DTC and TAP where severity of use affects frequency of testing. Hence, urine drug test results are likely to present a biased picture and be difficult to interpret in aggregate in this community-based setting."

Cornish 1997

Methods	Allocation: random assignment, 2:1 ratio (naltrexone:control) Randomisation method: unclear Similar on drug use: yes Similar on criminal activity: unknown Blinding methodology: high risk Loss to follow-up: unclear risk; some loss to follow-up; volunteer participants
Participants	51 adults randomized, 68 indicated initial interest, of these 2 failed the naltrexone challenge and 15 did not return for completion of screening and enrollment Average age: 39 years 90% male 24% white 62% African American 14% Latino
Interventions	Community-based naltrexone programme and routine parole/probation (n = 34) vs routine parole/probation (n = 17) (I) Nalrexone programe: When a 0.8 naltrexone challenge was negative, the participant received 25 mg oral dose of naltrexone, if no signs of opioid withdrawal after 1 hour, this was followed by 25 mg daily for two days and 50 mg daily for the following three days. Aproximately 1 week after initiation participants were stabilized on naltrexone regimen of 100 mg on Tuesdays and 150 mg on Fridays. In addition, research staff obtained observed urine specimens and breathalyzer readings weekly (results of these were not shared with probation staff) (C) Routine parole/probation: Participants were required to attend three orientation and counseling sessions per week for the first 2 weeks of the study Both groups received weekly parole/probation officer contact for the first 6 months and medication visits occured twice weekly. At 6-month follow up participants were give a $25 incentive payment and at 9, 12, 15 and 18 month follow up participants were given $25 for keeping scheduled appointments
Outcomes	Reincarceration for technical violation (official records) during the past 6 months at 6 months' follow-up Mean percentage for opioid positive urine specimens per group
Notes	Work supported by NIDA Grant DA05186. No declarations of interest are noted by the authors

Cornish 1997 (*Continued*)

Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Individuals were assigned at a ratio of 2:1 to naltrexone vs control
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) subjective outcomes	High risk	Study description suggests that participants were not blind: see p.531
Blinding of participants and personnel (performance bias) objective outcomes	High risk	Study description suggests that participants were not blind: see p.531
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	Blinding of urine samples were not shared with probation staff
Incomplete outcome data (attrition bias) All outcomes	Low risk	All allocated participants were reported in the analysis. Retention rates appeared to be similar; appears to be an ITT analysis
Selective reporting (reporting bias)	Unclear risk	Not reported
Other bias	Unclear risk	Groups similar at baseline, but potential for volunteer bias

Coviello 2010

Methods	Allocation: random Randomisation method: unknown/unclear Similar on drug use: significant difference in heroin use. Otherwise similar Similar on criminal activity: yes Blinding methodology: high risk Loss to follow-up: inadequate/high risk
Participants	111 adults Age range: 18 to 55 years; average age: 34 years 82% male 47% Caucasian

	100% drug users Alcohol use not reported but participants excluded if severe alcohol dependence Psychiatric history not reported Eligibility criteria: consented, age 18 to 55 years, opioid dependence, otherwise good health, probation or parole for 6 months, 3 days opioid free
Interventions	Community pharmacological intervention vs treatment as usual (I) Oral naltrexone plus psychosocial treatment (n = 56) vs (C) psychosocial treatment only (n = 55) The (I) group was started on directly observed administration of naltrexone, increasing in dose from 25 mg to 300 mg and was also given psychosocial treatment. The (C) group was given a treatment regimen consisting of group therapy, individual therapy and case management, all of which the (I) group also received
Outcomes	Criminal activity (self-reported) and criminal record data at 6 months Illicit drug use (self-reported) during the 30 days before the interview at 6 months % positive urine drug screen for opioids % positive urine drug screen for cocaine
Notes	The study was supported by grant R01-DA-012268 from the National Institute on Drug Abuse, Bethesda, MD (Dr. Cornish) Declaration of Interest In the past 3 years, Dr. O'Brien has served as a consultant on one occasion to Alkermes, a company that makes a version of depot naltrexone. He is also conducting an NIH-funded study of this medication in opioid addiction. The authors report no conflicts of interest

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Randomisation method unclear. Note that randomisation was balanced by using six variables
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding of participants and personnel (performance bias) subjective outcomes	High risk	page 4 'we did not use a placebo for participants'. The treatment as usual group were not blinded
Blinding of participants and personnel (performance bias) objective outcomes	High risk	page 4 'we did not use a placebo for participants'. The treatment as usual group were not blinded
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information provided

Coviello 2010 (*Continued*)

Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No information provided
Incomplete outcome data (attrition bias) All outcomes	High risk	A large amount of attrition was noted in the first week, and only one-third of participants remained at 6-month follow-up
Selective reporting (reporting bias)	Unclear risk	No information provided
Other bias	High risk	Blinding and attrition concerns throughout the study

Cropsey 2011

Methods	Allocation: random assignment, random number table- first 9 people put on intervention Randomisation method: sealed envelopes opened at the end of treatment Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: double-blinded. Placebo was used and was not known to evaluators or dispensers during treatment Loss to follow-up: partial- a few individuals not included in the final analysis
Participants	36 adults Mean age: 31.8 years (SD 8.4) 100% female 89% white 100 drug users Alcohol use: yes- percentage not available 54.3% prescribed medication for mental illness Eligibility criteria: adult women, opioid dependent, interest in treatment for opioid dependence, no contraindications for buprenorphine, due for release from residential treatment within the month, returning to the community, release to correct area
Interventions	Community-based pharmacological intervention vs placebo (I) buprenorphine (n = 24) vs (C) placebo (n = 12) (I) group was started on 2 mg of buprenorphine, increased to target dose of 8 mg at discharge. Only 37.2% reached target dose at discharge. (Doses were lower than standard induction, as participants had been in a controlled environment for some time without access to opiates.) Doses were titrated up to a maximum of 32 mg per day in the community, as clinically indicated. Participants were assessed weekly for side effects, were given drug testing and were counselled by the study physician if using drugs. The treatment course was 12 weeks The (C) group was given a placebo on the same regimen as the (I) group
Outcomes	% injection drug use and % urine opiates at end of treatment and at 3 months' follow-up

Notes	This project was supported by funding from NIDA R21DA019838 and product support from Reckitt Benckiser Pharmaceuticals Inc The authors have no declarations of interest

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	High risk	First 9 participants deliberately allocated to intervention for practical reasons; use of a random number table
Allocation concealment (selection bias)	Low risk	Use of sealed envelopes
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	This trial began as an open label trial then became a double blind trial of participants and providers on all outcomes. Some concerns about contamination issues with the placebo group but difficult to assess to what extent the blinding might have been affected
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	This trial began as an open label trial then became a double blind trial of participants and providers on all outcomes. Some concerns about contamination issues with the placebo group but difficult to assess to what extent the blinding might have been affected
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No evidence to provide information about whether the assessors were blind
Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No evidence to provide information about whether the assessors were blind
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	A total of 8 individuals were not included in the final analysis after randomisation
Selective reporting (reporting bias)	Unclear risk	No information reported
Other bias	Low risk	No other concerns within the methodology

Dolan 2003

Methods	Allocation: random allocation Randomisation method: low risk, cards drawn from sealed envelope Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: high risk, treatment and comparator (methadone or wait list) would not permit blinding. No statement that the outcome assessment was blind (unclear risk) Loss to follow-up: high risk, > 30% in both groups excluded from 4-month follow-up
Participants	382 adults and young offenders Mean age: 27 years (SD 6) 100% male Ethnicity: not reported 100% drug-using Alcohol use: not reported Psychiatric history: not reported Eligibility criteria: prisoners with a heroin problem, as confirmed by a detailed interview, who have at least 4 months remaining on their prison sentence at time of interview
Interventions	Secure establishment-based pharmacological intervention versus waiting-list control (I) methadone maintenance (n = 191) vs waiting-list control (n = 191) (I) Participants were given 30 mg of methadone each day, increasing by 5 mg every 3 days until 60 mg was achieved; duration in treatment varied. Duration of waiting-list was 4 months At 5 months, all participants were offered methadone through the prison-based methadone treatment programme. Released subjects who had been treated through the prison methadone programme were offered the opportunity to transfer to local community methadone programmes
Outcomes	**Dolan 2003: primary study** Heroin use (hair analysis) and self-reported heroin use during the past 2 months at 2 months' follow-up Drug injecting during the past 3 months at 3 months' follow-up. Syringe sharing and HIV/HCV seroconversion during the past 4 months at 4 months' follow-up **Dolan 2005: 4-year follow up** Long-term outcomes at four years including mortality, reincarceration, hepatitis C seroconversion and HIV seroconversion
Notes	Funding was provided by the Commonwealth Department of Health and Family Services, Glaxo Wellcome, the NSW Department of Health and the National Drug and Alcohol Research Centre, UNSW The authors have no declarations of interest

Risk of bias

Bias	Authors' judgement	Support for judgement

Dolan 2003 (*Continued*)

Random sequence generation (selection bias)	Low risk	Central randomisation by phone
Allocation concealment (selection bias)	Low risk	Allocation held by researcher not involved in recruiting or interviewing participants. Trial nurses had no access to lists
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	Treatment and comparator (methadone or wait list) would not permit blinding
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	Treatment and comparator (methadone or wait list) would not permit blinding
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information provided
Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No information provided
Incomplete outcome data (attrition bias) All outcomes	High risk	Attrition > 30% in both groups and ITT not undertaken. At follow-up, 129 (68%) treated and 124 (65%) control subjects who had been in continuous custody were reinterviewed. 29 treated and 33 control subjects had been released from prison and were excluded. No data on other participants not accounted for at follow-up
Selective reporting (reporting bias)	Low risk	All outcomes in objectives were reported in results
Other bias	Low risk	Baseline characteristics largely similar (p 61) Some control participants received Tx, some Tx not given; methadone tested by subgroup analysis

Dole 1969

Methods	Allocation: random assignment Randomisation method: lottery method Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: unclear and not reported Loss to follow-up: adequate/low risk
Participants	32 males Heroin addicts 5 years or longer 5 or more previous convictions 15 European, 10 negro, 7 Puerto Rican With a population of heroin-dependent prerelease prisoners
Interventions	Methadone (n = 12) vs waiting-list control (n = 16). Methadone was prescribed on admission to a hospital unit where individuals were given 10 mg per day, gradually increasing to a dose of 35 mg
Outcomes	Heroin use Reincarceration Treatment retention Employment At 7 to 10 months, 50 weeks
Notes	Participants were chosen by a lottery based on release dates between January 1 and April 30 1968 Supported by grants from the Health Research Council and the New York State Narcotics Addiction Control Commission No declarations of interest by the authors

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Allocation by lottery, no further details of the study method provided
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information provided
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information provided
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information provided

Dole 1969 (*Continued*)

Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No information provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	No missing data on key outcomes
Selective reporting (reporting bias)	Unclear risk	Intention-to-treat analysis not reported
Other bias	Unclear risk	Representativeness of the small sample with no urine analysis in follow-up of controls

Howells 2002

Methods	Allocation: random assignment Randomisation method: method not reported Similar on drug use: yes Similar on criminal activity: not reported Blinding methodology: low risk, double-blind with blinded outcome assessment Loss to follow-up: high risk, 21 participants (27.63%) (13/32 lofexidine, 8/36 methadone) were withdrawn from the trial prematurely
Participants	80 adult participants was planned, in the time available for the trial, 76 patients met eligibility criteria and gave their consent to participate. Of these, two patients immediately elected to withdraw from the trial. In error, six patients were entered into the trial for a second detoxification after completing the trial on the first occasion and then receiving a separate prison sentence following release. Four of these patients were randomised to the other drug on second entry Average age: The ages of the lofexidine and methadone groups were similar (29.8 years [range 22 to 43] and 30.5 years [range 22 to 49] respectively, P = 0.65) 100% male % white not reported Use of heroin was reported by 97.1% (n = 66) of the participants during the previous month and 89.7% reported heroin to be their main problem substance % alcohol not reported % psychiatric history not reported. Major psychiatric illness was an exclusion criterion Eligibility criteria: Consenting patients were required to be under 55 years old and to meet DSM-IV criteria for opioid dependence and induced withdrawal (American Psychiatric Association, 1994). Participant exclusion criteria were concurrent serious major psychiatric illness (schizophrenia, psychotic depression) or serious physical illness that would prevent participation in the trial. Opioid use was confirmed by urine screening for the presence of urinary opioid metabolites
Interventions	Intervention: (I) Placebo syrup as a green aqueous solution and lofexidine peach-coloured tablets twice daily for 10 days (n = 32) Control: (C) Methadone as a green liquid (1 mg/ml), and placebo peach-coloured tablets, twice

	daily for 10 days Following the manufacturer's datasheet the Lofexidine (Britlofex) regimen consisted of an initial daily dose of 0.6 mg (with 0.2 mg administered in the morning and 0.4 mg at night) increasing by 0.4 mg daily (two tablets) until day 4. At this point the dose was maintained at 2 mg daily (five tablets twice a day) for 3 days. Over the next 3 days the dose was tapered by 0.4 mg per day. The gradual dose reduction was designed to prevent any possible rebound hypertension (n = 36)
Outcomes	The primary outcome measure was withdrawal symptom severity measured using two withdrawal scales: the 20-item Withdrawal Problems Scale (WPS), and the eight item Short Opiate Withdrawal Scale (SOWS). The participants self-completed the withdrawal scales each morning. Given limited item overlap between the two scales, a composite 28-item total withdrawal symptoms scale was computed to facilitate presentation of results. To analyse the total daily scores for each scale, the following global indices were derived: the highest daily score observed and the time of the occurrence, the lowest daily score observed and the time of the occurrence, the total score summed over all 10 days of the trial Secondary outcome measures were rates and timing of withdrawal from the detoxification programme so that the relationship between failure to complete detoxification and severity of withdrawal symptoms could be measured The Severity of Dependency Scale (SDS) was also used to assess the severity of psychological aspects of drug dependence
Notes	Britannia Pharmaceuticals provided the medication. No declarations of interest statement included in the trial report

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	The authors report "The pharmacist who made up the medication used a simple randomisation procedure to allocate each participant to one arm of the trial" but no further description is reported
Allocation concealment (selection bias)	Unclear risk	The authors report "The independent pharmacy team at the prison oversaw the randomisation and blinding procedure…", but no statement that allocation was concealed
Blinding of participants and personnel (performance bias) subjective outcomes	Low risk	"…both the patient and health centre clinicians were blind to the assigned treatment group"
Blinding of participants and personnel (performance bias) objective outcomes	Low risk	The authors report "The independent pharmacy team at the prison oversaw the randomisation and blinding procedure…",

Howells 2002 (*Continued*)

		but no statement that allocation was concealed
Blinding of outcome assessment (detection bias) subjective outcomes	Low risk	"…blinding was maintained during treatment of the patients and during data entry and analysis"
Blinding of outcome assessment (detection bias) Objective outcomes	Low risk	"…blinding was maintained during treatment of the patients and during data entry and analysis"
Incomplete outcome data (attrition bias) All outcomes	High risk	Twenty-one participants (27.63%) (13/32 lofexidine, 8/36 methadone) were withdrawn from the trial prematurely. ITT not used, data analysed per-protocol
Selective reporting (reporting bias)	Low risk	The authors indicate that there was a protocol for the study ("Patient safety elements in the protocol were as follows:") and primary and secondary outcomes are clearly defined. Outcome data for the primary and secondary outcomes are reported
Other bias	High risk	The authors report "Four of these patients were randomised to the other drug on second entry. As a check on results, we repeated the analyses with the exclusion of these six cases. Whilst both the direction and magnitude of the results were unaltered we removed these cases from the dataset and the remaining results relate to the reduced sample of 68 patients."

Kinlock 2005

Methods	Allocation: random assignment Randomisation method: unclear Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: unknown Loss to follow-up: inadequate/high risk
Participants	126 adult males Age: 35.7 years (SD 6.8) 100% male 14% white 100% drug users Alcohol use: not reported

	Eligibility criteria: 3 months before anticipated release from prison, history of heroin dependence meeting DSM-IV criteria
Interventions	(I) Prison/secure establishment-based levo-alpha-acetyl methanol + transfer to methadone maintenance after release (n = 20) vs (C) untreated controls (31) and withdrew before treatment (N = 13) (I) Participants medicated 3 times per week starting at 10 mg and increasing by 5 mg every third medication day during incarceration to a target dose of 50 mg. At release participants were advised to report to the program's communirty ased maintenance facility for continuing care (C) Received community treatment referral information only.
Outcomes	Heroin use during 9-month follow-up (self-report), arrests during 9-month follow-up (official records) and reincarceration during 9-month follow-up (official records), frequency of illegal activity, admission to drug use and average weekly income obtained from illegal activities, mean number of crime days
Notes	No funding information provided No declaration of interest by the authors

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	No information reported other than stated 'random'
Allocation concealment (selection bias)	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No information reported
Incomplete outcome data (attrition bias) All outcomes	High risk	A considerable number of experimental participants declined medication after initial consent and randomisation to the ex-

Kinlock 2005 (*Continued*)

		perimental condition (see pp. 437 and 499). High attrition from the experimental group after random assignment and before treatment initiation required revision of the original two-group study design for purposes of data analyses
Selective reporting (reporting bias)	High risk	Table 4, p. 446, indicates only selected outcomes. No ITT conducted
Other bias	High risk	Experimental and control groups could not be considered comparable (p. 449); therefore, the number of variables was restricted. Study groups were revised after attrition in treatment group. Groups were considered not to be comparable, and the number of variables assessed was restricted. Urine samples and treatment records available on experimental group only

Kinlock 2007

Methods	Allocation: random assignment Randomisation method: block randomised Similar on drug use: unknown Similar on criminal activity: unknown Blinding methodology: high risk Loss to follow-up: adequate
Participants	211 adult males Age: group (a) 40.9 years (SD 7.6), (b) 40.3 years (7.0), (c) 39.8 years (7.0) 100% male % white: group (a) 31.3%, (b) 19.7%, (c) 20% 100% drug users Alcohol use not reported Psychiatric history not reported Eligibility criteria: (1) 3 to 6 months before release from prison; (2) meeting Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria of heroin dependence at time of incarceration and being physiologically dependent during the year prior to incarceration; (3) no pending parole hearings and/or unadjudicated charges; (4) having a Baltimore city address post-release; and (5) suitability for methadone maintenance as determined by medical evaluation. Inmates were excluded from study participation if they had any unadjudicated charges and/or pending parole hearings
Interventions	(C) Counselling Only: counselling in prison and passive referral to community-based drug treatment (n = 70) (I) Counselling + Transfer: counselling in prison and transfer to methadone maintenance in the community upon release beginning with 5 mg of methadone and increasing by 5

	mg every eighth day to a target minimum dose of 60 mg (n = 70) (I) Counselling + Methadone: counselling and methadone in prison with transfer to methadone treatment in the community upon release, begininning with 5 mg dose of methadone and increasing by 5 mg every eighth day during incarceration to a target dose of 60 mg. Advised to report to the program's community-based methadone program within 10 days of release for continuing care (n = 71)
Outcomes	**Kinlock 2007: primary study** Urine test for opioids 1 month post-release, urine test for cocaine 1 month post-release, self-report heroin use 1 month post-release, self-report cocaine use 1 month post-release **Gordon 2008: 6 month follow up study** Urine testing for opioids, cocaine and other illicit drugs 6 months post-release, treatment record review, Addiction Severity Index (ASI) from baseline and follow up **Wilson 2012: follow up study** Post-release changes over time in the specific HIV risk behaviours in which the participants had a prior history of engaging. Participants were assessed at baseline (study entry in prison), and at 1-, 3-, 6-, and 12-month post-release. The primary outcome measures at each time period were self-reported participation in risky drug- and sex-risk behaviours obtained from the Texas Christian University AIDS Risk Assessment (ARA)
Notes	Funding for this study was provided by Grant R01 DA 16237 from the National Institute on Drug Abuse (NIDA) No declarations of interest reported by the authors.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Block randomisation
Allocation concealment (selection bias)	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information reported
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information reported
Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No information reported

Incomplete outcome data (attrition bias) All outcomes	High risk	Individuals in the counselling only group did not receive treatment
Selective reporting (reporting bias)	Unclear risk	No information reported
Other bias	High risk	Contamination of treatment groups

Lobmaier 2010

Methods	Allocation: random Randomisation method: permuted block protocol Groups similar on drug use at baseline: yes Groups similar on criminal activity at baseline: yes Blinding methodology: not blinded- open label Loss to follow-up: unknown
Participants	46 adults Mean age: 35.1 years (SD 7) 93% male Ethnicity: unknown 100% drug users. 86.4% polydrug use Alcohol use: not reported Psychiatric history: not reported Eligibility criteria: inclusion: pre-incarceration heroin dependence, at least 2 months sentence time remaining. Exclusion: untreated major depression or psychosis, severe hepatic impairment, already in agonist maintenance treatment, pregnant
Interventions	Secure establishment naltrexone intervention vs methadone treatment (I) Received 20-pellet naltrexone implants around one month before release. Implants give sustained-release naltrexone over 5 to 6 months (n = 23) vs (C) Initiated on 30 mg methadone per day at around one month pre-release. Increased over typical period of three weeks to recommended dose of 80 to 130 mg (n = 21)
Outcomes	Mean days per month of criminal activity (self-reported) at 6 months No. of days in prison (from official records of Norwegian prison) at 6 months Mean days per month using heroin, benzodiazepines and amphetamines (self-reported) at 6 months
Notes	Funding was provided by the Research Council of Norway No declarations of interest by the authors

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Treatment allocation sequence performed at an independent centre using a permuted block protocol

Lobmaier 2010 (*Continued*)

Allocation concealment (selection bias)	Low risk	Sequentially numbered, sealed, opaque envelopes
Blinding of participants and personnel (performance bias) subjective outcomes	High risk	p143 "the treatment conditions were not blind and may have increased risk if performance bias"
Blinding of participants and personnel (performance bias) objective outcomes	High risk	p143 "the treatment conditions were not blind and may have increased risk if performance bias"
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information provided
Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No information provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intention-to-treat analysis conducted
Selective reporting (reporting bias)	Unclear risk	No evidence
Other bias	Low risk	No other concerns

Lobmann 2007

Methods	Allocation: random assignment Randomisation method: block randomised Similar on drug use: unknown Similar on criminal activity: unknown Blinding methodology: unknown Loss to follow-up: adequate
Participants	1015 drug-using offenders Age: 36 years (SD 6.7) % male not reported % white not reported 100% drug users Alcohol use not reported Eligibility criteria: min age 23 years, ICD-10 opiate addiction, opiate addiction min 5 years, current daily heroin consumption, OTI scale health problems, not received therapy for addiction during past 6 months
Interventions	Community-based: diamorphine treatment (n = 500) vs methadone treatment (n = 515)

Outcomes	12 months follow up and outcomes. Drug use and criminal activity (self-report and official records)	
Notes	Article in German, single reviewer translation completed	
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Block randomisation used
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information provided
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information provided
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information provided
Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No information provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	Data on all outcomes presented, limited attrition noted
Selective reporting (reporting bias)	Unclear risk	No information provided
Other bias	Unclear risk	No information provided

Magura 2009

Methods	Random allocation: to methadone or buprenorphine allocation initially on a 1:1 ratio and subsequently periodically based on 7:3 Randomisation method: inadequate, personnel aware of allocation Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: unknown Loss to follow-up: inadequate, up to 30% lost
Participants	133 male inmates Age: group (a) 38.4 years (SD 7.9), (b) 40.7 years (9.1) 100% male 25% black, 64% Hispanic 100% drug users Alcohol use: not reported Eligibility criteria: inmates who were eligible for the Key Extended Entry Program (KEEP), 18 to 65 years old, sentenced to 10 to 90 days' jail time, and expected to reside locally post-release
Interventions	Prison/secure establishment based methadone (n = 56) vs buprenorphine (n = 77) (C) Methadone: Participants were given liquid methadone dispensed once daily usual maintenance dose was 30 mg which could be stepped up to a maximum of 70 mg if clinically indicated and participant agreed (I) Buprenorphine: The sublingual combination burprenorphine/naloxone tablet was used for both induction and maintenance, initial dose of 4 mg which could be stepped up to 8 mg on the first day and could be stepped up to 32 mg on subsequent days. Participants observed until the tablet had dissolved
Outcomes	Arrest (self-report) during the past 12 months at 3-month follow-up for property crime, drug posession and % reincarcerated. Drug use past 30 days (self-report), mean number of days heroin use post-release at 3-month follow-up
Notes	No funding information provided by the authors No declarations of interest reported by the authors

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Random number generator used. Allocation was originally 1:1, but loss in one group meant that treatment-adaptive randomisation was used at a ratio of 7:3
Allocation concealment (selection bias)	High risk	Project director was naive to allocation, but research assistant was not
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information provided

Magura 2009 (*Continued*)

Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information provided
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information provided
Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No information provided
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Some attrition occurred before medication was received by buprenorphine-assigned participants. 30% of participants could not be interviewed at follow-up
Selective reporting (reporting bias)	Unclear risk	No information reported
Other bias	High risk	Participants at one site received methadone suboptimal doses (30 mg). The study contained a modest sample size

Wright 2011

Methods	Allocation: random allocation Randomisation method: low risk, generated using Microsoft Excel Similar on drug use: yes Similar on criminal activity: not reported Blinding methodology: high risk, open-label Loss to follow-up: high risk
Participants	439 eligible adults of whom 133 declined leaving 306 available for randomisation. Seventeen excluded at randomisation 289 adults randomised and allocated The median age was 30.8 years (interquartile range (IQR), 26.9 to 34.9) % male, not reported - mixed sample (1 all-female and 2 all-male prisons) Methadone, 89.9 % white; buprenorphine, 93.6% white % drug users not reported % alcohol, not reported % Psychiatric history, not reported Eligibility criteria: Inclusion criteria: 21 to 65 years old; using illicit opiates as confirmed by urine test; expressing a wish to detoxify and remain abstinent; willing to give informed consent; and remaining in custody for at least 28 days. Exclusion criteria: contraindications to methadone or buprenorphine; medical conditions requiring emergency admission to hospital, thus precluding detoxification; currently undergoing detoxification

	from other addictive drugs whereby concurrent opiate detoxification would not be clinically indicated; and previously randomised into the trial
Interventions	Sublingual buprenorphine (n = 141) vs Oral methadone (n = 148) (I) Sublingual buprenorphine: prescribed daily within set dose limits of 8 mg for days 1 to 5, 6 mg for days 6 to 7, 4 mg for days 8 to 10 and subsequently descreasing to a limit of 0.4 on day 20 (C) Oral methadone (1mg/1ml mixture): prescribed daily within set dose limits of 30 mg for days 1 to 5, 25 mg for days 6 to 7, 22 mg for days 8 to 9, 20 mg for days 10 to 11 and subsequently descreasing to a limit of 2 mg on day 20
Outcomes	The primary outcome was abstinence from illicit opiates at 8 days post detoxification, as indicated by a urine test Secondary outcomes included abstinence status at 1, 3, and 6 months post detoxification, ascertained via urine test if the participant was still in prison. If the participant had been released, local community drugs service records were accessed to verify abstinence. Adverse events were recorded and a researcher was informed immediately of any serious adverse events, which were then reported to the regulatory authorities. These included overdose, self-harm, or suicide attempt; inappropriate use of prescribed medication; or admission as a prison healthcare inpatient
Notes	Funded by Department of Health, National Research and Development Programme on Forensic Mental Health Research Funding Scheme 2004 The authors state that they have no competing interests.

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Randomisation sequence (with random block size) was generated using Microsoft Excel RAND function
Allocation concealment (selection bias)	Low risk	Sealed, opaque, consecutively numbered envelopes concealing the name of the allocated intervention were prepared by a researcher who had no contact with participants
Blinding of participants and personnel (performance bias) subjective outcomes	High risk	Open label "The prescribing doctor randomised by opening the next envelope and prescribing the intervention named inside. Both prisoner and doctor were blind to the intervention until this point."
Blinding of participants and personnel (performance bias) objective outcomes	High risk	Open label "The prescribing doctor randomised by opening the next envelope and prescribing the intervention named inside. Both prisoner and doctor were blind to the

		intervention until this point."
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No statement regarding blinding of individual who undertook the biochemical urine tests
Blinding of outcome assessment (detection bias) Objective outcomes	Unclear risk	No statement regarding blinding of individual who recorded self-report or clinical notes
Incomplete outcome data (attrition bias) All outcomes	High risk	High levels of attrition. 50% buprenorphine and 45% methadone did not provide urine sample at day 8, 65% and 62% at 1 month, 80% and 85% at 3 months and 86% and 91% at 6 months. ITT undertaken assuming if no objective or subjective data available, participants were not abstinent
Selective reporting (reporting bias)	High risk	Adverse events and reasons for withdrawal stated as being recorded but no outcome data reported
Other bias	Low risk	No other concerns

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Alemi 2010	Does not concern pharmacological intervention
Alessi 2011	Not original RCT. Data is from previous, older studies.
Andersson 2014	Intervention not aimed at reducing drug use or criminal activity, or both
Anglin 1999	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Awgu 2010	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Azbel 2013	Intervention not aimed at reducing drug use or criminal activity, or both
Baldus 2011	Study protocol only, author has since died.

(*Continued*)

Baltieri 2014	Intervention not aimed at reducing drug use or criminal activity, or both
Barnes 2012	Not using a population of drug-using offenders
Berman 2004	The intervention was not aimed at reducing drug use or criminal activity or both in drug-using offenders
Black 2011	Not offender population
Brady 2010	Not RCT
Braithwaite 2005	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Breckenridge 2000	Evaluated a DWI Court for alcoholic offenders, not illicit drug use, not a pharmacological intervention
Britt 1992 a-d	Does not concern pharmacological intervention.
Brown 2001	3-arm study in which only 2 arms were randomised - 1 treatment arm and control arm. Results presented as both treatment arms combined vs control
Burdon 2013	Not a trial.
Carr 2008	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention
Carroll 2006	Does not concern pharmacological intervention
Carroll 2011	Not offender population
Carroll 2012	Not a pharmacological intervention.
Chandler 2006	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Chaple 2014	No pre- and post-test measures of drug or crime, or both.
Clair 2013	No data presented at pre- and post-test outcomes for crime and drug
Cogswell 2011	Population not offenders.
Cosden 2003	Does not concern pharmacological intervention
Cosden 2005	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Coviello 2012	Not a Randomised Controlled Trial

(*Continued*)

Cox 2013	Not an offender population
Cropsey 2013	Not a Randomised Controlled Trial
Cullen 2011	Not a drug program aimed at reducing drug use/criminal activity in drug using offenders
Cusack 2010	Not a drug program aimed at reducing drug use/criminal activity in drug using offenders
D'Amico 2013	Does not present data for pre- and post-test information on drug or crime measures, or both
Dakof 2010	Study population is mothers of offenders, not offenders themselves
Dana 2013	Not an RCT
DeFulio 2013	Not an RCT
Dembo 2000	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods. The follow-up periods reported for the different groups were not equivalent
Deschenes 1994	Does not concern pharmacological intervention
Di Nitto 2002	The follow-up periods reported for the different groups were not equivalent
Diamond 2006	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Dugan 1998	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Evans 2012	Not an RCT
Forsberg 2011	Does not concern pharmacological intervention
Freudenberg 2010	Does not concern pharmacological intervention
Friedman 2012	Not an RCT
Frost 2013	Not an RCT
Gagnon 2010	Not offender population
Gil 2004	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Gordon 2012	No relevant data; all analysis at baseline; no pre- and post-test information on drug use or criminal activity, or both

(*Continued*)

Gordon 2013	No relevant data; all analysis secondary, not a primary RCT.
Gottfredson 2002	Does not concern pharmacological intervention
Grohman 2002	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Grommon 2013a	Not a pharmacological intervention.
Grommon 2013b	Not a pharmacological intervention.
Guydish 2011	Does not concern pharmacological intervention
Guydish 2014	Not criminal justice population
Haapanen 2002	Does not concern pharmacological intervention
Haasen 2010	Not offender population
Hanlon 1999	Does not concern pharmacological intervention
Harada 2012	No data on pre- and post-test outcomes for drug or criminal justice, or both
Harrell 2001	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Henderson 2010	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Henggeler 1991	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Henggeler 1999	Does not concern pharmacological intervention
Henggeler 2002	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Henggeler 2006	Does not concern pharmacological intervention
Henggeler 2012	Not a pharmacological intervention.
Hser 2011	Unclear if study looks at offender population
Hser 2013	Not a pharmacological intervention
Inciardi 2004	Some participants were not randomly selected into the treatment groups

(*Continued*)

Jain 2011	Paper not available and not clear from abstract if looks at offender population
Johnson 2011	Does not concern pharmacological intervention
Johnson 2012	Does not concern pharmacological intervention
Jones 2013	Not a pharmacological intervention
Jones, 2011	Evaluated a DWI Court for alcoholic offenders, not illicit drug use
Katz 2007	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention
Kelly 2013	Not a pharmacological intervention.
Kidorf 2013	Not offender population
King 2014	Not offender population
Kinlock 2008	Not a pharmacological intervention.
Kinlock 2009a	Conference proceedings only
Kinlock 2009b	Not a pharmacological intervention
Kok 2013	Not offender population
Law 2012	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Lee 2012	No pre- and post-test data for outcomes of drug or criminal justice measures, or both
Liddle 2011	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Ling 2013	Not offender population
Lobmann 2009	No pre- and post-outcome measures for drug or crime outcomes, or both
MacDonald 2007	Evaluated a DWI Court for alcoholic offenders, not illicit drug use
Marlowe 2003	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Marlowe 2005	Not a pharmacological intervention

(*Continued*)

Marlowe 2007	Participants randomised to receive treatment were not randomised into the different treatment groups but were identified by level of risk. Not an RCT
Marlowe 2008	Does not concern pharmacological intervention
Marsch 2014	Not offender population
Martin 1993	Does not concern pharmacological intervention
Mbilinyi 2011	Participants not recruited through criminal justice system
McKendrick 2007	The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
McKenzie 2012	Does not concern pharmacological intervention
Messina 2000	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention. The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Messina 2010	No pharmacological interventions
Milloy 2011	No pre- and post-data for outcomes of crime or drug use, or both
Needels 2005	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention
Nemes 1998	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention. The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Nemes 1999	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention. The study did not report relevant drug or crime outcome measures, or both, at both the pre- and post-intervention periods
Nielsen 1996	Does not concern pharmacological intervention
Nosyk 2010	Not offender population
Petersilia 1992	Does not concern pharmacological intervention
Petry 2005	Not 100% criminal justice population.
Petry 2011	Not offender population

(*Continued*)

Polsky 2010	Not offender population
Prendergast 2003	Does not concern pharmacological intervention
Prendergast 2008	Does not concern pharmacological intervention
Prendergast 2009	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Prendergast 2011	Does not concern pharmacological intervention
Proctor 2012	No pharmacological interventions
Reimer 2011	Not offender population
Robertson 2006	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention
Rosengard 2008	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Rossman 1999	Does not concern pharmacological intervention
Rounsaville 2001	No pre- and post-test data presented on drug use or crime outcomes, or both
Rowan-Szal 2005	Population not offenders.
Rowan-Szal 2009	Not RCT
Rowe 2007	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention
Sacks 2004	Does not concern pharmacological intervention
Sacks 2008	Does not concern pharmacological intervention
Sacks 2011	Does not concern pharmacological intervention
Sanchez-Hervas 2010	Population not offenders.
Schaeffer 2014	Does not contain a pharmacological intervention
Schmiege 2009	No data for pre- and post-test outcome measures of drug or crime outcomes, or both
Schwartz 2006	Not offender population
Shanahan 2004	This is not a pharmacological intervention

(*Continued*)

Sheard 2009	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Siegal 1999	Not RCT
Sinha 2003	Not a pharmacological intervention.
Smith 2010	Does not concern pharmacological intervention
Solomon 1995	Not an offender population.
Specka 2013	Not an offender population.
Stanger 2009	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention
Staton-Tindall 2009	No control group; not an RCT.
Stein 2006	No pre- and post-test data for drug or crime outcome measures, or both
Stein 2010	Not offender population
Stein 2011	Does not concern pharmacological intervention
Stevens 1998	The population of the study was not 100% drug-using offenders that were specifically referred by the criminal justice system to the intervention
Svikis 2011	Not clear if offender population
Taxman 2006	Does not concern pharmacological intervention
Vagenas 2014	No pre- and post-test data on drug or crime outcome measures, or both
Vanderberg 2002	No pre- and post-test outcome data on crime or drug measures, or both
Villagrá Lanza 2013	Does not concern pharmacological intervention
Walters 2014	No data on pre- and post-test information for drug or crime outcome measures, or both
Wang 2010	Participants not in criminal justice system
Webster 2014	No data on pre- and post-test information for drug or crime outcome measures, or both
White 2006	Randomisation broken as 40% of control arm were allowed to receive treatment (acupuncture) outside of the intervention
Williams 2011	Not RCT

(*Continued*)

Winstanley 2011	Not clear if offender population
Witkiewitz 2010	Not clear if offender population
Wolff 2012	No data for pre- and post-test outcomes of drug or crime measures, or both
Zlotnick 2009	Does not concern pharmacological intervention

Characteristics of ongoing studies *[ordered by study ID]*

Springer 2015

Trial name or title	Naltrexone for opioid dependent released HIV+ criminal justice populations Referred to as NEWHOPE.
Methods	Our specific aim is to conduct a placebo-controlled RCT of depot NTX (d-NTX) for HIV+ prisoners with OD who are transitioning to the community 150 subjects within CJS in New Haven, Hartford and Springfield. Subjects will be randomized 2:1 to d-NTX or d-placebo for 6 months and observed for 12 months
Participants	HIV-infected prisoners with opioid dependence who are treated with depot naltrexone as they are transitioning from the correctional to the community setting 150 participants.
Interventions	Depot naltrexone versus placebo
Outcomes	6 and 12 months HIV treatment (HIV-1 RNA levels, CD4 count, ART adherence, retention in care), substance abuse (time to relapse to opioid use, % opioid negative urines, opioid craving), adverse side effects and HIV risk behavior (sexual and drug-related risks) The public health relevance is that outcomes from this study will establish the efficacy, safety and tolerability of pharmacological therapy using naltrexone treatment among HIV+s and establish depot-naltrexone treatment as an effective, evidence-based treatment for opioid dependence for released HIV+ prisoners
Starting date	2012
Contact information	Yale University
Notes	

DATA AND ANALYSES

Comparison 1. Agonist pharmacological vs no intervention

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Drug use (objective)	2	237	Risk Ratio (M-H, Random, 95% CI)	0.72 [0.51, 1.00]
2 Drug use self reported dichotomous	3	317	Risk Ratio (M-H, Random, 95% CI)	0.61 [0.31, 1.18]
3 Drug use self reported continuous	3	510	Std. Mean Difference (IV, Fixed, 95% CI)	-0.62 [-0.85, -0.39]
4 Criminal activity dichotomous	3		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
4.1 Arrests	1	62	Risk Ratio (M-H, Random, 95% CI)	0.60 [0.32, 1.14]
4.2 Re-incarceration	3	472	Risk Ratio (M-H, Random, 95% CI)	0.77 [0.36, 1.64]
5 Criminal activity continuous	1	51	Mean Difference (IV, Fixed, 95% CI)	-74.21 [-133.53, -14.89]

Comparison 2. Antagonist (Naltrexone) vs no pharmacological

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Criminal activity dichotomous	2		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.1 Reincarceration	2	114	Risk Ratio (M-H, Random, 95% CI)	0.40 [0.21, 0.74]
2 drug use (objective)	1	63	Risk Ratio (M-H, Fixed, 95% CI)	0.69 [0.28, 1.70]

Comparison 3. Methadone vs buprenorphine

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Self reported drug use dichotomous	2	370	Risk Ratio (M-H, Random, 95% CI)	1.04 [0.69, 1.55]
2 Self reported drug use continuous	1	81	Mean Difference (IV, Fixed, 95% CI)	0.70 [-5.33, 6.73]
3 Criminal activity dichotomous	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
3.1 re incarceration	1	116	Risk Ratio (M-H, Fixed, 95% CI)	1.25 [0.83, 1.88]

Comparison 4. Methadone vs diamorphine

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 criminal activity dichotomous	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
1.1 arrest	1	825	Risk Ratio (M-H, Fixed, 95% CI)	1.25 [1.03, 1.51]

Comparison 5. Methadone vs naltrexone

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 self reported drug use continuous	1	44	Mean Difference (IV, Fixed, 95% CI)	4.60 [-3.54, 12.74]
2 criminal activity dichotomous	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
2.1 re incarceration	1	44	Risk Ratio (M-H, Fixed, 95% CI)	1.10 [0.37, 3.26]
3 criminal activity continuous	1	44	Mean Difference (IV, Fixed, 95% CI)	-0.5 [-8.04, 7.04]

Analysis 1.1. Comparison 1 Agonist pharmacological vs no intervention, Outcome 1 Drug use (objective).

Review: Pharmacological interventions for drug-using offenders

Comparison: 1 Agonist pharmacological vs no intervention

Outcome: 1 Drug use (objective)

Study or subgroup	Pharmacological n/N	No pharmacological n/N	Risk Ratio M-H,Random,95% CI	Weight	Risk Ratio M-H,Random,95% CI
Cropsey 2011	8/24	7/12		20.1 %	0.57 [0.27, 1.20]
Dolan 2003	33/106	39/95		79.9 %	0.76 [0.52, 1.10]
Total (95% CI)	**130**	**107**		**100.0 %**	**0.72 [0.51, 1.00]**

Total events: 41 (Pharmacological), 46 (No pharmacological)

Heterogeneity: $Tau^2 = 0.0$; $Chi^2 = 0.45$, df = 1 (P = 0.50); $I^2 = 0.0\%$

Test for overall effect: Z = 1.97 (P = 0.049)

Test for subgroup differences: Not applicable

Analysis 1.2. Comparison 1 Agonist pharmacological vs no intervention, Outcome 2 Drug use self reported dichotomous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 1 Agonist pharmacological vs no intervention

Outcome: 2 Drug use self reported dichotomous

Study or subgroup	Pharmacological n/N	No pharmacological n/N	Risk Ratio M-H,Random,95% CI	Weight	Risk Ratio M-H,Random,95% CI
Cropsey 2011	7/24	6/12		24.4 %	0.58 [0.25, 1.35]
Dolan 2003	41/129	92/124		37.9 %	0.43 [0.33, 0.56]
Dole 1969	10/12	15/16		37.7 %	0.89 [0.67, 1.18]
Total (95% CI)	**165**	**152**		**100.0 %**	**0.61 [0.31, 1.18]**

Total events: 58 (Pharmacological), 113 (No pharmacological)

Heterogeneity: $Tau^2 = 0.28$; $Chi^2 = 18.04$, df = 2 (P = 0.00012); $I^2 = 89\%$

Test for overall effect: Z = 1.48 (P = 0.14)

Test for subgroup differences: Not applicable

Analysis 1.3. Comparison 1 Agonist pharmacological vs no intervention, Outcome 3 Drug use self reported continuous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 1 Agonist pharmacological vs no intervention

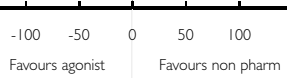
Outcome: 3 Drug use self reported continuous

Study or subgroup	Pharmacological N	Mean(SD)	No pharmacological N	Mean(SD)	Std. Mean Difference IV,Fixed,95% CI	Weight	Std. Mean Difference IV,Fixed,95% CI
Dolan 2003	129	1 (5)	124	9 (19)		83.7 %	-0.58 [-0.83, -0.33]
Kinlock 2005	141	14.3 (27.19)	65	2801 (27.41)		0.1 %	-101.85 [-111.79, -91.92]
Kinlock 2007	20	65.63 (99.89)	31	125.29 (120.42)		16.2 %	-0.52 [-1.09, 0.05]
Total (95% CI)	**290**		**220**			**100.0 %**	**-0.62 [-0.85, -0.39]**

Heterogeneity: Chi² = 399.08, df = 2 (P<0.00001); I² =99%

Test for overall effect: Z = 5.31 (P < 0.00001)

Test for subgroup differences: Not applicable

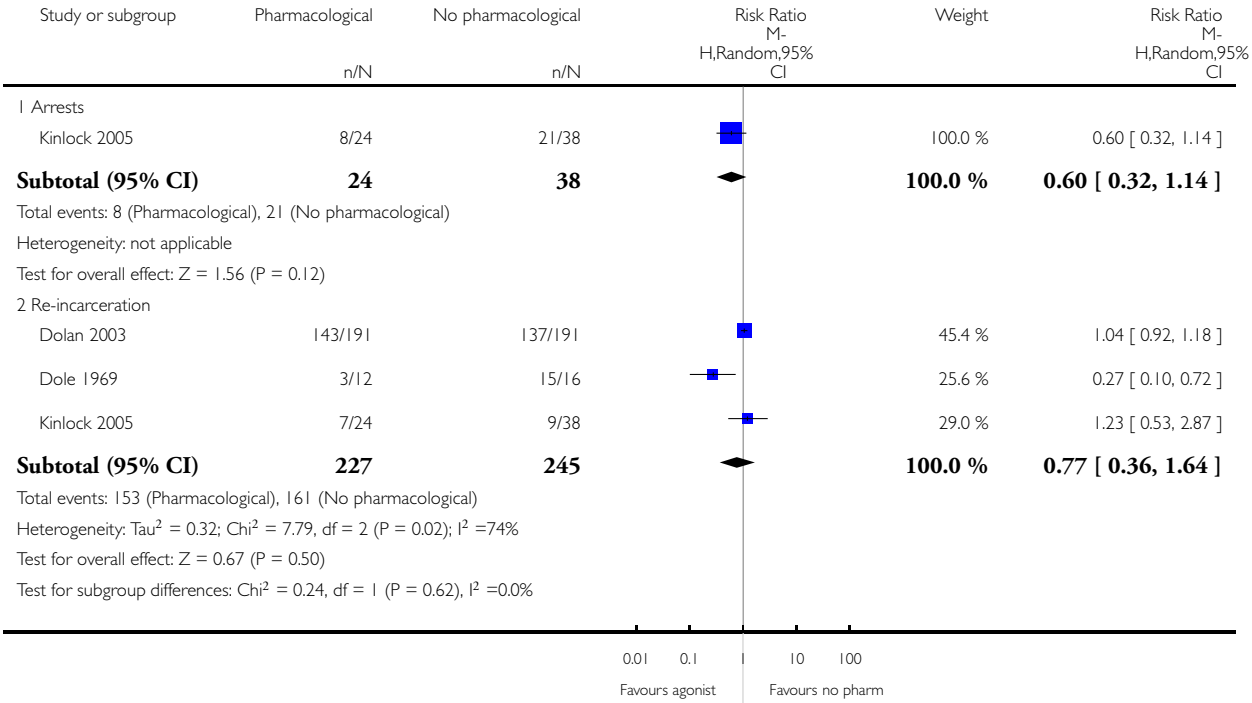


Analysis 1.4. Comparison 1 Agonist pharmacological vs no intervention, Outcome 4 Criminal activity dichotomous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 1 Agonist pharmacological vs no intervention

Outcome: 4 Criminal activity dichotomous

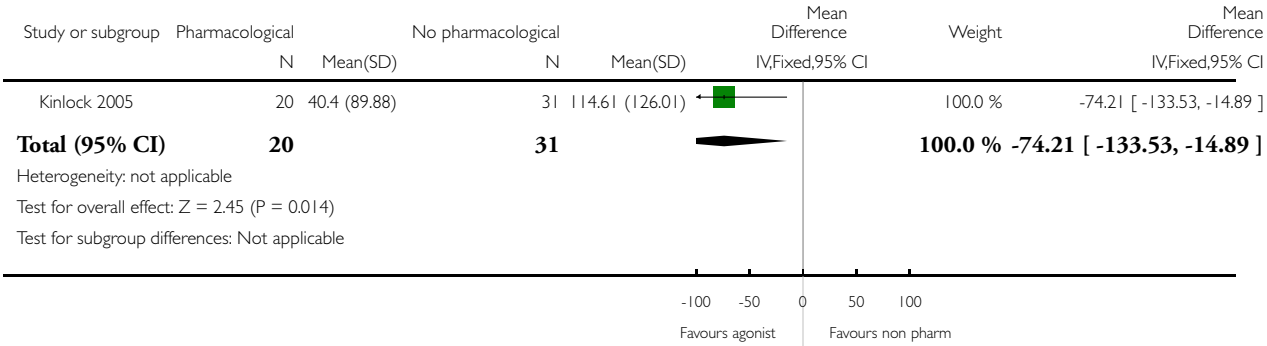


Analysis 1.5. Comparison 1 Agonist pharmacological vs no intervention, Outcome 5 Criminal activity continuous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 1 Agonist pharmacological vs no intervention

Outcome: 5 Criminal activity continuous

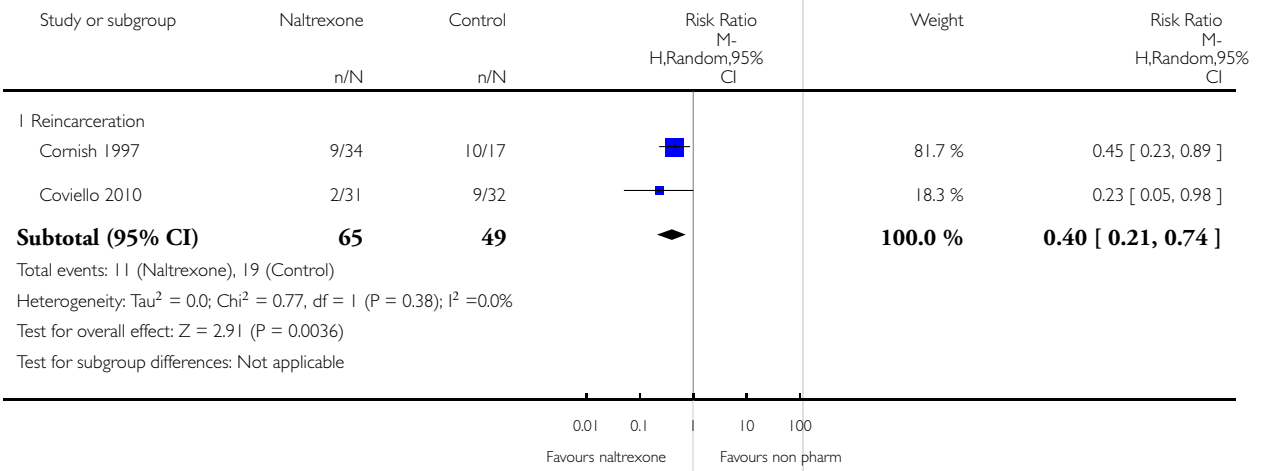


Analysis 2.1. Comparison 2 Antagonist (Naltrexone) vs no pharmacological, Outcome 1 Criminal activity dichotomous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 2 Antagonist (Naltrexone) vs no pharmacological

Outcome: 1 Criminal activity dichotomous



Analysis 2.2. Comparison 2 Antagonist (Naltrexone) vs no pharmacological, Outcome 2 drug use (objective).

Review: Pharmacological interventions for drug-using offenders

Comparison: 2 Antagonist (Naltrexone) vs no pharmacological

Outcome: 2 drug use (objective)

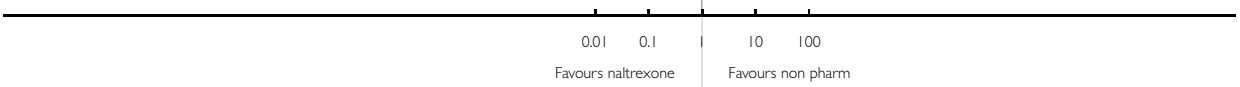
Study or subgroup	Naltrexone n/N	no pharm treat n/N	Risk Ratio M-H,Fixed,95% CI	Weight	Risk Ratio M-H,Fixed,95% CI
Coviello 2010	6/31	9/32		100.0 %	0.69 [0.28, 1.70]
Total (95% CI)	**31**	**32**		**100.0 %**	**0.69 [0.28, 1.70]**

Total events: 6 (Naltrexone), 9 (no pharm treat)

Heterogeneity: not applicable

Test for overall effect: Z = 0.81 (P = 0.42)

Test for subgroup differences: Not applicable



Analysis 3.1. Comparison 3 Methadone vs buprenorphine, Outcome 1 Self reported drug use dichotomous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 3 Methadone vs buprenorphine

Outcome: 1 Self reported drug use dichotomous

Study or subgroup	methadone n/N	buprenorphine n/N	Risk Ratio M-H,Random,95% CI	Weight	Risk Ratio M-H,Random,95% CI
Magura 2009	25/38	23/43		56.2 %	1.23 [0.86, 1.76]
Wright 2011	27/148	31/141		43.8 %	0.83 [0.52, 1.32]
Total (95% CI)	**186**	**184**		**100.0 %**	**1.04 [0.69, 1.55]**

Total events: 52 (methadone), 54 (buprenorphine)

Heterogeneity: $Tau^2 = 0.04$; $Chi^2 = 1.94$, df = 1 (P = 0.16); $I^2 = 48\%$

Test for overall effect: Z = 0.17 (P = 0.87)

Test for subgroup differences: Not applicable

Analysis 3.2. Comparison 3 Methadone vs buprenorphine, Outcome 2 Self reported drug use continuous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 3 Methadone vs buprenorphine

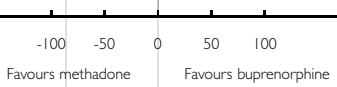
Outcome: 2 Self reported drug use continuous

Study or subgroup	methadone N	Mean(SD)	buprenorphine N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Weight	Mean Difference IV,Fixed,95% CI
Magura 2009	38	14.4 (13.4)	43	13.7 (14.3)		100.0 %	0.70 [-5.33, 6.73]
Total (95% CI)	**38**		**43**			**100.0 %**	**0.70 [-5.33, 6.73]**

Heterogeneity: not applicable

Test for overall effect: Z = 0.23 (P = 0.82)

Test for subgroup differences: Not applicable

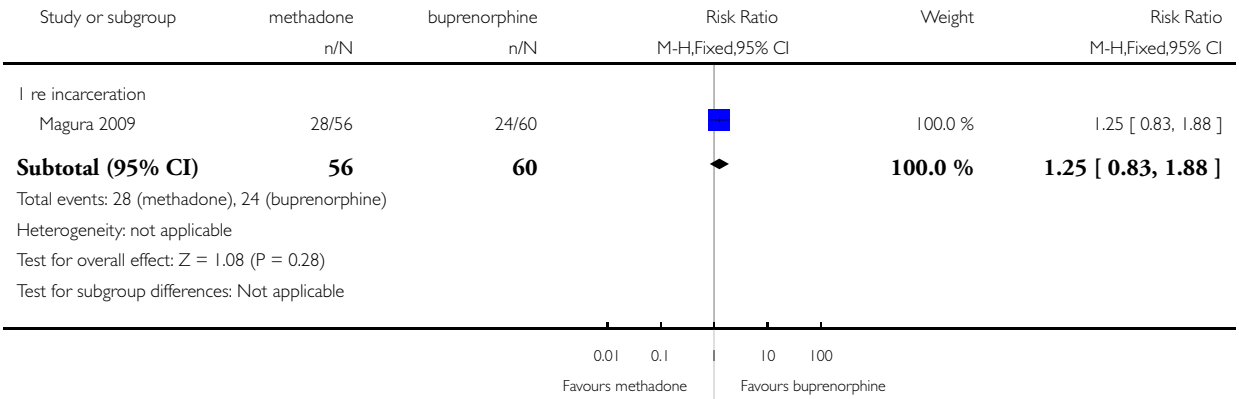


Analysis 3.3. Comparison 3 Methadone vs buprenorphine, Outcome 3 Criminal activity dichotomous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 3 Methadone vs buprenorphine

Outcome: 3 Criminal activity dichotomous

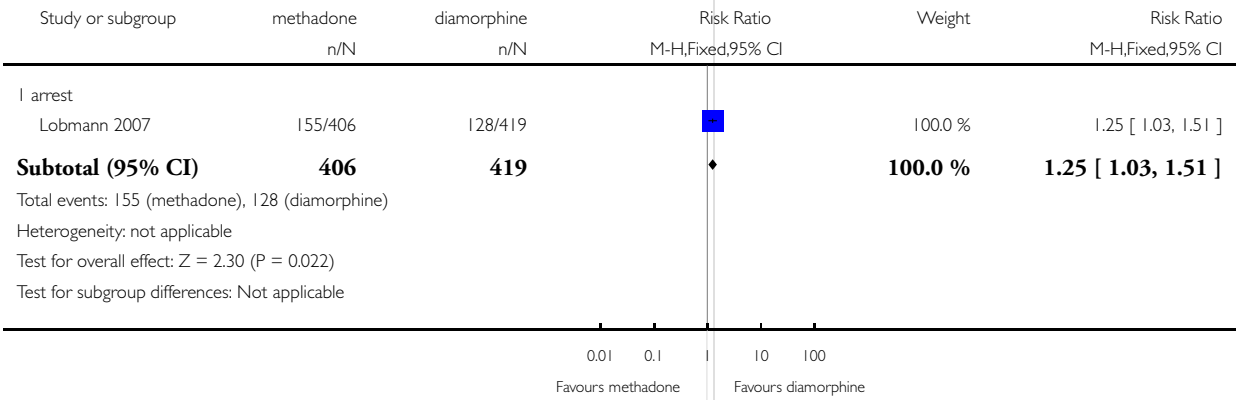


Analysis 4.1. Comparison 4 Methadone vs diamorphine, Outcome 1 criminal activity dichotomous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 4 Methadone vs diamorphine

Outcome: 1 criminal activity dichotomous

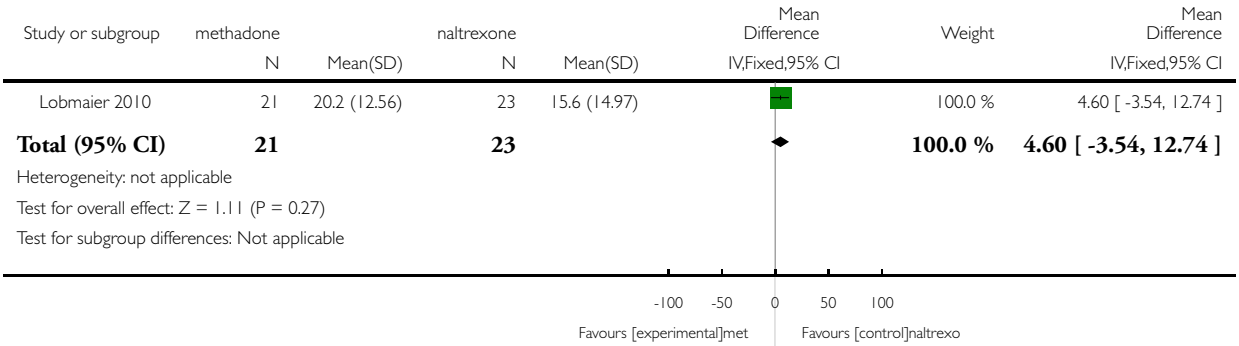


Analysis 5.1. Comparison 5 Methadone vs naltrexone, Outcome 1 self reported drug use continuous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 5 Methadone vs naltrexone

Outcome: 1 self reported drug use continuous

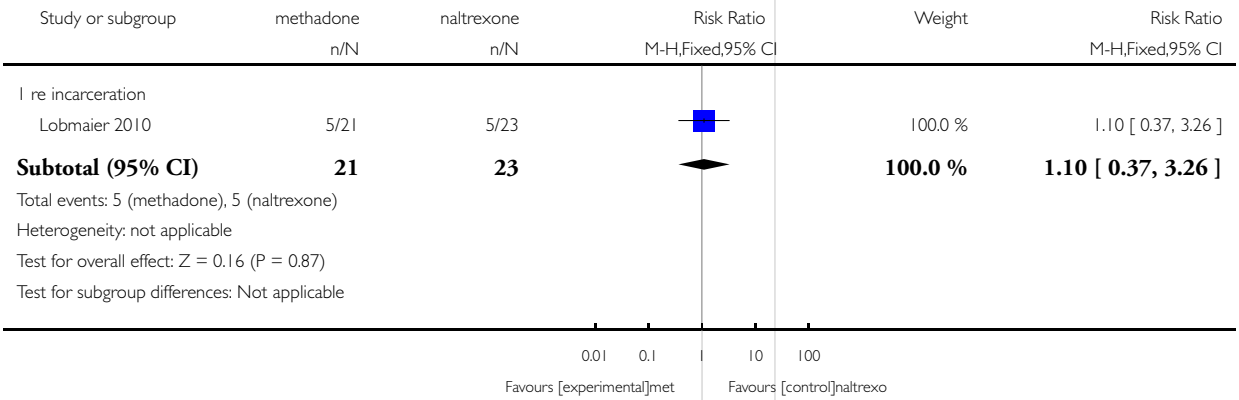


Analysis 5.2. Comparison 5 Methadone vs naltrexone, Outcome 2 criminal activity dichotomous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 5 Methadone vs naltrexone

Outcome: 2 criminal activity dichotomous

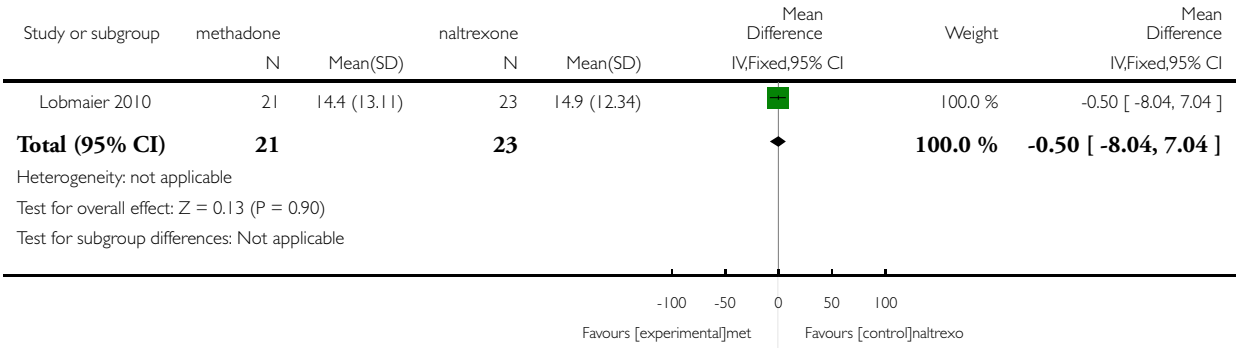


Analysis 5.3. Comparison 5 Methadone vs naltrexone, Outcome 3 criminal activity continuous.

Review: Pharmacological interventions for drug-using offenders

Comparison: 5 Methadone vs naltrexone

Outcome: 3 criminal activity continuous



ADDITIONAL TABLES

Table 1. Table 1 summary of outcomes and comparisons

Study	Setting	Intervention	Comparison group	Follow-up period	Outcome type	Outcome description
Bayanzadeh 2004	Prison	Methadone treatment in combination with CBT and widely focused on coping and problem-solving skills	Non-methadone drugs plus standard psychiatric services and therapeutic medications	6 months	Biological drug use Self-report drug use	Drug use yes/no Frequency of drug injections (percentage) Syringe sharing Morphine urine analysis
Brown 2013	Community	Methadone	Primary care plus suboxone (buprenorphine and naloxone)	6 months 12 months	Biological drug use Self report drug use	Frequency and pattern of daily drug use Addiction Severity Index (self report). Lite, HIV risk behaviours (RAB - Risk Assessment Battery short ver-

Table 1. Table 1 summary of outcomes and comparisons (*Continued*)

						sion), and health services utilization Urine drug screens were collected as a part of routine management
Cornish 1997	Community	Naltrexone	Routine parole/ probation	6 months and during 6 months of treatment	Criminal activity dichotomous	% reincarcerated during 6 months of follow-up
Coviello 2010	Community	Naltrexone	Psychosocial treatment only	6 months	Biological drug use dichotomous Criminal activity dichotomous	% positive urine drug screen opioids % positive urine drug screen cocaine % violating parole/probation
Cropsey 2011	Community	Buprenorphine	Placebo	End of treatment 3 months	Biological drug use dichotomous Self-report drug use dichotomous	% positive urine opiates % self-report injection drug use
Dolan 2003	Prison	Pharmacological (methadone)	Waiting list control	4 months 2 months 3 months	Biological drug use continuous Biological drug use dichotomous Self-report drug use dichotomous	% hair positive for morphine % self-reported any injection % self-reported heroin injection
Dole 1969	Prison	Methadone	Waiting list control.	At between 7 and 10 months At 50 weeks	Biological drug use continuous Biological drug use dichotomous Self-report drug use dichotomous	Heroin use Reincarceration Treatment retention Employment
Howells 2002	Prison	Methadone and placebo	Lofexidine and placebo	Post treatment	Self report data on withdrawl Severity of psychological dependence	Withdrawal symptom severity measured using two withdrawal scales: the 20-item Withdrawal Problems

Table 1. Table 1 summary of outcomes and comparisons (*Continued*)

						Scale (WPS), and the eight item Short Opiate Withdrawal Scale (SOWS) Secondary outcome measures were rates and timing of withdrawal from the detoxification programme so that the relationship between failure to complete detoxification and severity of withdrawal symptoms could be measured The Severity of Dependency Scale (SDS) was also used to assess the severity of psychological aspects of drug dependence
Kinlock 2007	Prison	Counselling + methadone initiation pre-release (a) and post-release (b)	Counselling only	1 month 3 months 6 months 12 months	Biological drug use dichotomous Self-report drug use dichotomous Criminal activity dichotomous	% positive for urine opioids % positive for urine cocaine % self-reported 1 or more days heroin n used heroin for entire 180-day follow-up period Re-incarcerated Self-reported criminal activity
Kinlock 2005	Prison	Prison based levo alpha acetyl methanol and transfer to methadone after release	untreated controls	During 9 months	Biological drug use dichotomous Self-report drug use dichotomous Criminal activity dichotomous	Heroin use Arrest Re incarceration Frequency of illegal activity Admission drug

Table 1. Table 1 summary of outcomes and comparisons (*Continued*)

						use Average weekly income
Lobmaier 2010	Prison	Naltrexone	Methadone	6 months	Criminal activity continuous Criminal activity dichotomous Self-report drug use continuous	Mean days of criminal activity % re-incarcerated Mean days of heroin use Mean days of benzodiazepine use Mean days of amphetamine use
Lobmann 2007	Community	Pharmacological (diamorphine)	Methadone	12 months	Criminal activity dichotomous	% self-reported criminal activity % police-recorded offences
Magura 2009	Prison	Buprenorphine	Methadone	3 months	Criminal activity dichotomous Self-report drug use continuous Self-report drug use dichotomous	% re-incarcerated % arrested for property crime % arrested for drug possession Mean days of heroin use % any heroin/opioid use
Wright 2011	Prison	Buprenorphine	Methadone	1 month 3 months 6 months post detoxification	Biological drug test Self report official drug records	Abstinence from illicit opiates at 8 days post detoxification, as indicated by a urine test If the participant had been released, local community drugs service records were accessed to verify abstinence

APPENDICES

Appendix 1. MEDLINE search strategy

MEDLINE search
1. exp "Substance-Related-Disorders"/
2. ((drug or substance) adj (abuse* or addict* or dependen* or misuse*)).ti,ab
3. (drug* adj (treat* or intervention* or program*)
4. substance near (treat* or intervention* or program*)
5.(detox* or methadone) in ti,ab
6. narcotic* near (treat* or intervention* or program*)
7. 1 or 2 or 3 or 4 or 5 or 6
8. prison*. ti,ab
9. exp "Prisoners"/
10. offender* or criminal* or inmate* or convict* or probation* or remand or felon*).ti,ab
11. exp "Prisons"/
12. 8 or 9 or 10 or 11
13. 7 and 12

Appendix 2. EMBASE search strategy

Embase search
1. (detox$ or methadone or antagonist prescri$).ti,ab.
2. detoxification/ or drug detoxification/ or drug withdrawal/ or drug dependence treatment/ or methadone/ or methadone treatment/ or diamorphine/ or naltrexone/
3. (diamorphine or naltrexone or therapeutic communit$).ti,ab
4. morality/

(*Continued*)

5. (motivational interview$ or motivational enhancement).ti,ab
6. (counselling or counseling).ti,ab.
7. exp counseling/
8. (psychotherap$ or cognitive behavioral or cognitive behavioural).ti,ab
9. exp psychotherapy/
10. (moral adj3 training).ti,ab.
11. (cognitive restructuring or assertiveness training).ti,ab
12. reinforcement/ or self monitoring/ or self control/
13. (relaxation training or rational emotive or family relationship therap$).ti,ab
14. social learning/ or withdrawal syndrome/ or coping behavior/
15. (community reinforcement or self monitoring or self control or self management or interpersonal skills).ti,ab
16. (goal$ adj3 setting).ti,ab.
17. (social skills adj3 training).ti,ab.
18. anger/ or lifestyle/
19. (basic skills adj3 training).ti,ab.
20. (relapse adj3 prevent$).ti,ab.
21. (craving adj3 (minimi$ or reduc$)).ti,ab.
22. (trigger or triggers or coping skills or anger management or group work).ti,ab
23. (lifestyle adj3 modifi$).ti,ab.
24. (high intensity training or resettlement or throughcare or aftercare or after care).ti,ab
25. aftercare/ or halfway house/
26. (brief solution or brief intervention$ or minnesota program$ or 12 step$ or twelve step$).ti,ab
27. (needle exchange or nes or syringe exchange or dual diagnosis or narcotics anonymous).ti,ab

(*Continued*)

28. self help/ or support group/
29. (self-help or selfhelp or self help or outreach or bail support or arrest referral$).ti,ab
30. exp urinalysis/ or rehabilitation/ or rehabilitation center/
31. (diversion or dtto or dttos or drug treatment or testing order$ or carat or carats).ti,ab
32. (combined orders or drug-free or drug free).ti,ab.
33. (peer support or evaluation$ or urinalysis or drug testing or drug test or drug tests).ti,ab
34. ((rehab or rehabilitation or residential or discrete) adj2 (service$ or program$)).ti,ab
35. (asro or addressing substance$ or pasro or prisons addressing or acupuncture or shock or boot camp or boot camps).ti,ab
36. (work ethic camp$ or drug education or tasc or treatment accountability).ti,ab
37. exp acupuncture/
38. or/1-36
39. (remand or prison or prisoner or prisoners or offender$ or criminal$ or probation or court or courts).ti,ab
40. (secure establishment$ or secure facilit$).ti,ab.
41. (reoffend$ or reincarcerat$ or recidivi$ or ex-offender$ or jail or jails or goal or goals).ti,ab
42. (incarcerat$ or convict or convicts or convicted or felon or felons or conviction$ or revocation or inmate$ or high security).ti,ab
43. criminal justice/ or custody/ or detention/ or prison/ or prisoner/ or offender/ or probation/ or court/ or recidivism/ or crime/ or criminal behavior/ or punishment/
44. or/39-43
45. 38 and 44
46. (substance abuse$ or substance misuse$ or substance use$).ti,ab
47. (drug dependanc$ or drug abuse$ or drug use$ or drug misuse$ or drug addict$).ti,ab
48. (narcotics adj3 (addict$ or use$ or misuse$ or abuse$)).ti,ab
49. (chemical dependanc$ or opiates or heroin or crack or cocaine or amphetamines or addiction or dependance disorder or drug involved).ti,ab

(*Continued*)

50. substance abuse/ or drug abuse/ or analgesic agent abuse/ or drug abuse pattern/ or drug misuse/ or intravenous drug abuse/ or multiple drug abuse/
51. addiction/ or drug dependence/ or narcotic dependence/ or exp narcotic agent/ or narcotic analgesic agent/
52. opiate addiction/ or heroin dependence/ or morphine addiction/
53. cocaine/ or amphetamine derivative/ or psychotropic agent/
54. or/46-53
55. 45 and 54

Appendix 3. PsycInfo search strategy

PsycInfo
1. (detoxification in de) or (drug withdrawal in de)
2. (drug usage screening in de) or (methadone maintenance) in de
3. explode "Narcotic-Antagonists" in DE
4. 1 or 2 or 3
5. (counseling in de) or (explode "psychotherapeutic-counseling" in de)
6. (explode "cognitive-therapy" in de) or (explode "psychotherapeutic-techniques" in de)
7. (cognitive restructuring in de) or (assertiveness training in de)
8. explode "relaxation-therapy" in de
9. (rational emotive therapy in de) or (rational-emotive therapy in de)
10. (explode "self monitoring" in de) or (explode self-monitoring) in de
11. (goal setting in de) or (self control in de) or (explode "self-management" in de)
12. (social skills in de) or (relapse prevention in de) or (craving in de) or (coping behavior in de)
13. (anger control in de) or (explode "group-psychotherapy" in de) or (brief psychotherapy in de)
14. (explode "behavior-modification" in de) or (posttreatment followup in de) or (aftercare in de)

(*Continued*)

15. (halfway houses in de) or (twelve step programs in de)
16. (dual diagnoses in de) or (explode "self help techniques" in de) or (outreach programs in de) or (court referrals in de)
17. (peer pressure in de) or (urinalysis in de)
18. (drug rehabilitation in de) or (residential care institutions in de) or (acupuncture in de) or (drug education in de)
19. (detox* or methadone or antagonist prescri* or diamorphine or naltrexone or therapeutic communit*) in ti,ab
20. (motivational interview* or motivational enhancemen* or counseling or psychotherapy or psychotherapies) in ti,ab
21. (cognitive behav* or cognitive therapy or cognitive therapies or moral training or cognitive restructuring) in ti,ab
22. (assertiveness training or relaxation training or relaxation therapy or relaxation therapies) in ti,ab
23. (rational emotive therap* or rational emotive behav* therap* or family relationship therap* or community reinforcement) in ti,ab
24. (self-monitor* or self monitor* or goal setting or self control or self-control or self management or self-management) in ti,ab
25. (interpersonal skills training or social skills training or basic skills training) in ti,ab
26. (relapse with prevent*) in ti,ab
27. (craving near reduc*) in ti,ab
28. craving with (reduc* in ti,ab)
29. (trigger* or coping skills or anger management or group work or lifestyle modif* or high intensity training or resettlement) in ti, ab
30. (throughcare or aftercare or after care or brief solution* or brief intervention*) in ti,ab
31. (minnesota or 12 step* or twelve step* or needle exchange or nes or syringe exchange or dual diagnosis) in ti,ab
32. (narcotics anonymous or self-help or self help or outreach or bail support or arrest referral*) in ti,ab
33. (diversion or dtto* or testing order* or carat* or counseling assessment referral or combined order or combined orders or drug free wing* or drug free environment*) in ti,ab
34. (peer support or user evaluations or urinalysis or urinalyses or mandatory drug test* or rehabilitation or discrete service* or discrete program*) in ti,ab
35. (residential program* or residential scheme* or asro or addressing substance* or pasro or prisons addressing substance) in ti,ab
36. (acupuncture or shock or boot camp* or work ethic or drug education or tasc or treatment accountability) in ti,ab

(*Continued*)

37. or/4-36
38. (secure facilities or convict* or revocation or inmate* or high security) in ti,ab
39. (prisoners in de) or (explode "correctional-institutions" in de)
40. (perpetrators in de) or (explode criminals in de)
41. (probation in de) or (parole in de) or (incarceration in de) or (recidivism in de) or (criminal conviction in de) or (crime in de)
42. (remand or prison* or offender* or criminal* or probation or court or courts or secure establishment* or reoffend* or reincarcerat* or recidivi* or ex-offender* or jail or jails or incarcerat*) in ti,ab
43. (drug abuse in de) or (explode "inhalant-abuse" in de) or (explode "drug-dependency" in de)
44. (polydrug abuse in de) or (drug abuse in de) or (intravenous drug usage in de)
45. (narcotic drugs in de) or (heroin in de) or (cocaine in de) or (explode amphetamine in de)
46. (substance abuse* or substance misuse* or substance user*) in ti,ab
47. (drug dependen* or drug abuse* or drug misuse* or drug addict* or drug use) in ti,ab
48. (narcotic abuse* or narcotic misuse* or chemical dependen* or opiate misuse* or opiate abuse*) in ti,ab
49. (heroin use* or heroin addict* or heroin misuse* or heroin abuse*) in ti,ab
50. (crack use* or crack addict* or crack misuse* or crack abuse*) in ti,ab
51. (cocaine use* or cocaine addict* or cocaine misuse* or cocaine abuse*) in ti,ab
52. (amphetamine* use* or amphetamine* addict* or amphetamine* misuse* or amphetamine* abuse*) in ti,ab
53. (dependence disorder or drug involved or dug-involved) in ti,ab
54. #38 or #39 or #40 or #41 or #42
55. #4 or #43 or #44 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52 or #53
56. #37 and #54 and #55

Appendix 4. SPECTRA search strategy

SPECTRA search
1. {remand} or {prison} or {offender} or {criminal} or {probation} or {court} or {tribunal} or {secure establishment} or {secure facilit} or {reoffend} or {reincarcerat} or {recidivi} or {ex-offender} or {jail} or {incarcerat} or {convict} or {felon} or {reconvict} or {high security} or {law enforcement} {remand} or {prison} or {offender} or {criminal} or {probation} or {court} or {tribunal} or {secure establishment} or {secure facilit} or {reoffend} or {reincarcerat} or {recidivi} or {ex-offender} or {jail} or {incarcerat} or {convict} or {felon} or {reconvict} or {high security} or {law enforcement}
2. {substance} or {dependenc} or {drug abuse} or {drug use} or {drug misuse} or {addict} All indexed fields: {remand} or {prison} or {offender} or {criminal} or {probation} or {court} or {tribunal} or {secure establishment} or {secure facilit} or {reoffend} or {reincarcerat} or {recidivi} or {ex-offender} or {jail} or {incarcerat} or {convict} or {felon} or {reconvict} or {high security} or {law enforcement} OR All unindexed fields: {remand} or {prison} or {offender} or {criminal} or {probation} or {court} or {tribunal} or {secure establishment} or {secure facilit} or {reoffend} or {reincarcerat} or {recidivi} or {ex-offender} or {jail} or {incarcerat} or {convict} or {felon} or {reconvict} or {high security} or {law enforcement} AND All unindexed fields: {substance} or {dependenc} or {drug abuse} or {drug use} or {drug misuse} or {addict} or {narcotics} or {opiates} or {heroin} or {crack} or {cocaine} or {amphetamines} or {drug involved} or {substance-related} or {amphetamine-related} or {cocaine-related} or {marijuana} or {opioid} or {street drug} or {designer drug}
3. narcotics
4. opiates
5. heroin
6. {crack}
7. cocaine
8. amphetamines
9. drug involved
10. substance-related
11. amphetamine-related
12. cocaine-related
13. marijuana
14. opioid

(*Continued*)

15. street drug
16. designer drug
17. 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16
18. 1 AND 17

Appendix 5. PASCAL. SciSearch, Social SciSSciSearch, Wilson Applied Science and Technology Abstracts search strategy

PASCAL search
1. (DETOX? OR METHADONE OR ANTAGONIST()PRESCRI?)/TI,AB
2. METHADONE/DE OR NALTREXONE/DE
3. (DIAMORPHINE OR NALTREXONE)/TI,AB
4. THERAPEUTIC()COMMUNITY/DE OR THERAPEUTIC()COMMUNIT?)/TI,AB
5. (MOTIVATIONAL()INTERVIEW? OR MOTIVATIONAL()ENHANCEMENT)/TI,AB
6. (COUNSELLING OR COUNSELING)/TI,AB
7. COUNSELING/DE
8. (PSYCHOTHERAP? OR COGNITIVE()BEHAVIORAL OR COGNITIVE()BEHAVIOURAL)/TI,AB
9. PSYCHOTHERAPY!/DE
10. (MORAL(3W)TRAINING)/TI,AB
11. (COGNITIVE()RESTRUCTURING OR ASSERTIVENESS()TRAINING)/TI,AB
12. ASSERTIVENESS/DE OR RELAXATION()TECHNIQUES/DE
13. (RELAXATION()TRAINING OR RATIONAL()EMOTIVE OR FAMILY()RELATIONSHIP()THERAP?)/TI,AB
14. FAMILY()RELATIONS/DE
15. (COMMUNITY()REINFORCEMENT OR SELF()MONITORING OR SELF()CONTROL OR SELF()MANAGEMENT OR INTERPERSONAL()SKILLS)/TI,AB
16. (GOAL?(3W)SETTING)/TI,AB

(*Continued*)

17. (SOCIAL(3W)TRAINING)/TI,AB
18. SOCIAL RESPONSIBILITY/DE
19. (BASIC()SKILLS(3W)TRAINING)/TI,AB
20. (RELAPSE(3W)PREVENT?)/TI,AB
21. (CRAVING(3W)(MINIMI? OR REDUC?))/TI,AB
22. (TRIGGER OR TRIGGERS OR COPING()SKILLS OR ANGER()MANAGEMENT OR GROUP()WORK)/TI,AB
23. (LIFESTYLE(3W)MODIFI?)/TI,AB
24. (HIGH()INTENSITY()TRAINING OR RESETTLEMENT OR THROUGHCARE OR AFTERCARE OR AFTER()CARE) /TI,AB
25. ADAPTATION,-PSYCHOLOGICAL!/DE OR ANGER/DE OR LIFE()STYLE/DE OR AFTER()CARE/DE OR HALFWAY ()HOUSES/DE
26. (BRIEF()SOLUTION OR BRIEF()INTERVENTION? OR MINNESOTA()PROGRAM? OR 12()STEP? OR TWELVE() STEP?)/TI,AB
27. (NEEDLE()EXCHANGE OR NES OR SYRINGE()EXCHANGE OR DUAL()DIAGNOSIS OR NARCOTICS()ANONY-MOUS)/TI,AB
28. NEEDLE-EXCHANGE()PROGRAMS/DE
29. (SELF-HELP OR SELFHELP OR SELF()HELP OR OUTREACH OR BAIL()SUPPORT OR ARREST()REFERRAL?)/TI, AB
30. SELF-HELP()GROUPS/DE OR URINALYSIS/DE OR SUBSTANCE()ABUSE()DETECTION/DE
31. (DIVERSION OR DTTO OR DTTOS OR DRUG()TREATMENT OR TESTING()ORDER? ? OR CARAT OR CARATS) /TI,AB
32. (COMBINED()ORDERS OR DRUG-FREE OR DRUG()FREE)/TI,AB
33. (PEER()SUPPORT OR EVALUATION? ? OR URINALYSIS OR DRUG()TESTING OR DRUG()TEST? ?)/TI,AB
34. ((REHAB OR REHABILITATION OR RESIDENTIAL OR DISCRETE)(2W)(SERVICE? ? OR PROGRAM?))/TI,AB
35. (ASRO OR ADDRESSING()SUBSTANCE? OR PASRO OR PRISONS()ADDRESSING OR ACUPUNCTURE OR SHOCK OR BOOT()CAMP OR BOOT()CAMPS)/TI,AB
36. (WORK()ETHIC()CAMP? ? OR DRUG()EDUCATION OR TASC OR TREATMENT()ACCOUNTABILITY)/TI,AB
37. ACUPUNCTURE-THERAPY!/DE OR ACUPUNCTURE/DE OR HEALTH()EDUCATION/DE OR SUBSTANCE() ABUSE()TREATMENT()CENTERS/DE

(*Continued*)

38. S1:S3
39. S4:S37
40. S38 AND S39
40. (REMAND OR PRISON OR PRISONER OR PRISONERS OR OFFENDER? ? OR CRIMINAL? ? OR PROBATION OR COURT OR COURTS)/TI,AB
41. (SECURE()ESTABLISHMENT? ? OR SECURE()FACILIT?)/TI,AB
42. (REOFFEND? OR REINCARCERAT? OR RECIDIVI? OR EX()OFFENDER? ? OR JAIL OR JAILS)/TI,AB
43. (INCARCERAT? OR CONVICT OR CONVICTS OR CONVICTED OR FELON? ? OR CONVICTION? ? OR REVOCATION OR INMATE? ? OR HIGH()SECURITY)/TI,AB
44. PRISONERS/DE OR LAW()ENFORCEMENT/DE OR JURISPRUDENCE/DE
45. S40:S44
46. S40 AND S45
47. (SUBSTANCE()ABUSE? OR SUBSTANCE()MISUSE? OR SUBSTANCE()USE?)/TI,AB
48. (DRUG()DEPENDANC? OR DRUG()ABUSE? OR DRUG()USE? OR DRUG()MISUSE? OR DRUG()ADDICT?)/TI,AB
49. (NARCOTICS(3W)(ADDICT? OR USE? OR MISUSE? OR ABUSE?))/TI,AB
50. (CHEMICAL()DEPENDANC? OR OPIATES OR HEROIN OR CRACK OR COCAINE OR AMPHETAMINES OR ADDICTION OR DEPENDENCE()DISORDER OR DRUG()INVOLVED)/TI,AB
51. SUBSTANCE-RELATED()DISORDERS/DE OR AMPHETAMINE-RELATED()DISORDERS/DE OR COCAINE-RELATED()DISORDERS/DE OR MARIJUANA ()ABUSE/DE
52. OPIOID-RELATED-DISORDERS!/DE OR PHENCYCLIDINE()ABUSE/DE OR SUBSTANCE()ABUSE()INTRAVENOUS/DE
53. STREET()DRUGS/DE OR DESIGNER()DRUGS/DE OR NARCOTICS/DE
54. COCAINE!/DE OR AMPHETAMINES!/DE OR ANALGESICS()OPIOID/DE
55. S47:S54
56. S46 AND S55
57. (DETOXIFICATION OR METHADONE OR ANTAGONIST-PRESCRIBING)/DE FROM 144,34,434,7,99,65,35,6
58. (DIAMORPHINE OR NALTREXONE)/DE FROM 144,34,434,7,99,65,35,6

(*Continued*)

59. THERAPEUTIC-COMMUNITY)/DE FROM 144,34,434,7,99,65,35,6
60. (MOTIVATIONAL-INTERVIEW OR MOTIVATIONAL-ENHANCEMENT)/DE FROM 144,34,434,7,99,65,35,6
61. (COUNSELLING OR COUNSELING)/DE FROM 144,34,434,7,99,65,35,6
62. (PSYCHOTHERAPY! OR COGNITIVE-BEHAVIORAL OR COGNITIVE-BEHAVIOURAL)/DE FROM 144,34,434,7,99,65,35,6
63. (MORAL-TRAINING)/DE FROM 144,34,434,7,99,65,35,6
64. (COGNITIVE-RESTRUCTURING OR ASSERTIVENESS-TRAINING)/DE FROM 144,34,434,7,99,65,35,6
65. (RELAXATION-TRAINING OR RATIONAL-EMOTIVE OR FAMILY-RELATIONSHIP-THERAPY)/DE FROM 144,34,434,7,99,65,35,6
66. FAMILY-RELATIONS/DE
67. (COMMUNITY-REINFORCEMENT OR SELF-MONITORING OR SELF-CONTROL OR SELF-MANAGEMENT OR INTERPERSONAL-SKILLS)/DE FROM 44,34,434,7,99,65,35,6
68. (GOAL-SETTING)/DE FROM 144,34,434,7,99,65,35,6
69. (SOCIAL-SKILLS-TRAINING)/DE FROM 144,34,434,7,99,65,35,6
70. SOCIAL-RESPONSIBILITY/DE
71. (BASIC-SKILLS-TRAINING)/DE FROM 144,34,434,7,99,65,35,6
72. (RELAPSE-PREVENTION)/DE FROM 144,34,434,7,99,65,35,6
73. CRAVING/DE FROM 144,34,434,7,99,65,35,6
74. (TRIGGER OR COPING-SKILLS OR ANGER-MANAGEMENT OR GROUP-WORK)/DE FROM 144,34,434,7,99,65,35,6
75. (LIFESTYLE-MODIFICATION)/DE FROM 144,34,434,7,99,65,35,6
76. (HIGH-INTENSITY-TRAINING OR RESETTLEMENT OR THROUGHCARE OR AFTERCARE OR AFTER-CARE)/DE FROM 144,34,434,7,99,65,35,6
77. (BRIEF-SOLUTION OR BRIEF-INTERVENTIONS OR MINNESOTA-PROGRAM OR 12-STEP-PROGRAM OR TWELVE-STEP-PROGRAM)/DE FROM 144,34,434,7,99,65,35,6
77. (NEEDLE-EXCHANGE OR SYRINGE-EXCHANGE OR DUAL-DIAGNOSIS OR NARCOTICS-ANONYMOUS)/DE FROM 144,34,434,7,99,65,35,6
79. (SELF-HELP OR OUTREACH OR BAIL-SUPPORT OR ARREST-REFERRAL)/DE FROM 144,34,434,7,99,65,35,6

(*Continued*)

80. (DRUG-TREATMENT OR TESTING-ORDERS OR CARAT)/DE FROM 144,34,434,7,99,65,35,6
81. (COMBINED-ORDERS OR DRUG-FREE)/DE FROM 144,34,434,7,99,65,35,6
82. (PEER-SUPPORT OR EVALUATION OR URINALYSIS OR DRUG-TESTING OR DRUG-TESTS)/DE FROM 144,34,434,7,99,65,35,6
83. (REHABILITATION OR RESIDENTIAL OR DISCRETE-SERVICES)/DE FROM 144,34,434,7,99,65,35,6
84. (ASRO OR PASRO ACUPUNCTURE OR BOOT-CAMP)/DE FROM 144,34,434,7,99,65,35,6
85. (WORK-ETHIC-CAMP OR DRUG-EDUCATION OR TASC OR TREATMENT-ACCOUNTABILITY)/DE FROM 144,34,434,7,99,65,35,6
86. (REMAND OR PRISON OR PRISONER OR PRISONERS OR OFFENDER OR OFFENDERS OR CRIMINAL OR CRIMINALS OR PROBATION OR COURT OR COURTS)/DE FROM 144,34,434,7,99,65,35,6
87. (SECURE-ESTABLISHMENTS OR SECURE-FACILITY)/DE FROM 144,34,434,7,99,65,35,6
88. (REOFFENDERS OR REINCARCERATION OR RECIDIVISM OR EX-OFFENDERS OR JAILS)/DE FROM 144,34,434,7,99,65,35,6
89. (INCARCERATION OR CONVICT OR CONVICTS OR FELON OR FELONS OR CONVICTIONS OR REVOCATION OR INMATE OR INMATES OR HIGH-SECURITY)/DE FROM 144,34,434,7,99,65,35,6
90. (SUBSTANCE-ABUSE OR SUBSTANCE-MISUSE OR SUBSTANCE-USE)/DE FROM 144,34,434,7,99,65,35,6
91. (DRUG-DEPENDANCE OR DRUG-DEPENDENCY OR DRUG-ABUSE OR DRUG-MISUSE OR DRUG-ADDICT OR DRUG-ADDICTION)/DE FROM 144,34,434,7,99,65,35,6
92. (CHEMICAL-DEPENDANCY OR OPIATE-DEPENDENCY OR HEROIN-DEPENDENCY OR CRACK-DEPENDENCY OR COCAINE-DEPENDENCY OR AMPHETAMINES OR ADDICTION OR DEPENDENCE-DISORDER OR DRUG-INVOLVED)/DE FROM 144,34,434,7,99,65,35,6
93. S40 OR S57:S85
94. S45 OR S86:S89
95. S55 OR S90:S92
96. S93 AND S94 AND S95
97. S96/1980-2004

Appendix 6. The CENTRAL Register of Controlled trials search strategy

CENTRAL search
1. prison*
2. offender*
3. (criminal* or probation or court*)
4. (secure next establishment*)
5. reoffend*
6. reincarcerat*
7. recidiv*
8. exoffend*
9. (jail or jails or incarcerat*)
10. (secure next facilit*)
10(secure next facilit*)
11. (convict* or revocation or inmate* or (high next security))
12. PRISONERS
13. LAW ENFORCEMENT
14. JURISPRUDENCE
15. CRIME
16. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15
17. SUBSTANCE-RELATED DISORDERS
18. ((substance or drug*) next (abuse* or misuse* or dependen*or use* or addict*))
19. (narcotics or chemical or opiate) next (dependen* or addict* or abuse* or misuse*))
20. ((heroin) next (addict* or dependen* or misuse* or abuse*))
21. ((crack) next (addict* or dependen* or misuse* or abuse* or use*))
22. ((cocaine next addict*) or (cocaine next dependenc*) or (cocaine next misuse*) or (cocaine next abuse*) or (cocaine next use*))

(*Continued*)

23. ((amphetamine*) next (addict* or dependen* or misuse* or abuse* or use*))
24. (addicts or (dependence next disorder) or (drug next involved))
25. (street next drugs)
26. STREET DRUGS
27. DESIGNER DRUGS
28. NARCOTICS
29. COCAINE
30. AMPHETAMINES
31. ANALGESICS ADDICTIVE
32. ANALGESICS OPIOID
33. PSYCHOTROPIC DRUGS
34. opioid* or opiat*
35. #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34
35. (#16 and #35)

Appendix 7. SIGLE search strategy

SIGLE
1. ((reoffend* or reincarcerat* or recidivi* or ex-offend* or jail or jails or incarcerat* or secure facilit* or convict* or revocation or inmate*) in ti,ab)
2. ((remand or prison* or offender* or criminal* or probation or court or courts or secure establishment*) in ti,ab
3. ((drug dependenc* or drug addict* or narcotics abuse* or narcotics use* or narcotics misuse* or narcotics addict*) in ti,ab
4. ((drug abuse* or drug misuse* or drug use*) in ti,ab
5. ((substance abuse* or substance misuse* or substance use*) in ti,ab
6. ((detox* or methadone maintenance or methadone prescri* or antagonist prescri* or dimorphine or naltrexone) in ti,ab

(*Continued*)

7. ((dependence disorder or drug involved) in ti,ab
8. ((amphetamine* abuse* or amphetamine* misuse* or amphetamine* use* or amphetamine* addict*) in ti,ab
9. ((cocaine abuse* or cocaine misuse* or cocaine use* or cocaine addict*) in ti,ab
10. ((crack abuse* or crack misuse* or crack use* or crack addict*) in ti,ab
11. ((heroin abuse* or heroin misuse* or heroin use* or heroin addict*) in ti,ab
12. ((chemical dependenc* or opiate abuse* or opiate misuse* or opiate use* or opiate addict*) in ti,ab
13. #1 or #2
14. #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12
15. #13 and #14

Appendix 8. Sociological Abstracts search strategy

Sociological Abstrac
1. remand in de
2. detention in de
3. prisoners in de
4. prisons in de
5. offenders in de
6. parole in de
7. probation in de
8. correctional system in de
9. courts in de
10. imprisonment in de
11. criminal justice in de

(*Continued*)

12. criminal proceedings in de
13. recidivism in de
14. jail in de
15. institutionalization (persons) in de
16. conviction/convictions in de
17. (remand or prison* or offender* or criminal* or probation or court or courts or secure establishment*) in ti,ab
18. (reoffend* or reincarcerat* or recidivi* or ex-offend* or jail or jails or incarcerat* or secure facilit* or convict* or revocation or inmate*) in ti,ab
19. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19
20. substance abuse in de
21. explode "Drug-Abuse" in DE
22. "Drug-Injection" in DE
23. explode "Narcotic-Drugs" in DE
24. "Cocaine-" in DE
25. "Addiction-" in DE
26. explode "Psychedelic-Drugs" in DE
27. (substance abuse* or substance misuse* or substance use*) in ti,ab
28. (drug abuse* or drug misuse* or drug use*) in ti,ab
29. (drug dependenc* or drug addict* or narcotics abuse* or narcotics use* or narcotics misuse* or narcotics addict*) in ti,ab
30. (chemical dependenc* or opiate abuse* or opiate misuse* or opiate use* or opiate addict*) in ti,ab
31. (heroin abuse* or heroin misuse* or heroin use* or heroin addict*) in ti,ab
32. (crack abuse* or crack misuse* or crack use* or crack addict*) in ti,ab
33. (cocaine abuse* or cocaine misuse* or cocaine use* or cocaine addict*) in ti,ab
34. (amphetamine* abuse* or amphetamine* misuse* or amphetamine* use* or amphetamine* addict*) in ti,ab
35. (dependence disorder or drug involved) in ti,ab

(*Continued*)

36. #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35
37. #19 and #36
38. "Detoxification-" in DE
39. "Methadone-Maintenance" in DE
40. "Counseling-" in DE
41. "Psychotherapy-" in DE
42. "Assertiveness-" in DE
43. (detoxification in de) or (methadone maintenance in de) or (treatment programs in de)
44. (counseling in de) or (psychotherapy in de) or (assertiveness in de) or (group therapy in de) or (goals in de) or (self control in de)
45. (interpersonal communication in de) or (social interaction in de) or (social competence in de) or (coping in de)
46. (social behavior in de) or (group work in de) or (lifestyle in de)
47. (after care in de) or (support networks in de) or (self help in de) or (self help groups in de) or (outreach programmes in de)
48. (outreach programs in de) or (referral in de) or (delinquency prevention in de) or (diversion/diversions in de)
49. (peer groups in de) or (peer influence in de) or (drug use screening in de) or (rehabilitation in de) or (work experience in de)
50. (detox* or methadone maintenance or methadone prescri* or antagonist prescri* or dimorphine or naltrexone) in ti,ab
51. (therapeutic communit* or motivational interview* or motivational enhance* or counseling or counselling or psychotherapy or cognitive behavi*) in ti,ab
52. (moral training or cognitive restructuring or assertiveness training or relaxation training) in ti,ab
53. (rational-emotive or rational emotive or family relationship therap* or community reinforcement or self monitoring or goal setting or self control training) in ti,ab
54. (self management or interpersonal skills or social skills or basic skills or relapse prevent* or prevent* relapse or craving reduc* or reduc* craving) in ti,ab
55. (trigger* or coping skills or anger management or group work or lifestyle modif* or high intensity training or resettlement or throughcare) in ti,ab
56. (aftercare or after care or brief solution or brief intervention* or 12 step* or twelve step* or minnesota program* or needle exchange or nes) in ti,ab

(*Continued*)

57. (syringe exchange or dual diagnosis or narcotics anonymous or self help or selfhelp or outreach or bail support) in ti,ab
58. (arrest referral* or diversion or dtto or dttos or drug treatment or carat or carats or counseling assessment or combined orders) in ti,ab
59. (drug-free or drug free or peer support or evaluation* or urinalysis or drug testing or drug use screen* or rehabilitation or discrete service* or discrete program*) in ti,ab
60. (residential program* or residential scheme* or residential service*) in ti,ab
61. (asro or addressing substance or pasro or prisons addressing or acupuncture or shock or boot camp*) in ti,ab
62. (work ethic or drug education or tasc or treatment accountability) in ti,ab
63. #38 or #39 #or #40 or #41 or #42 or #43 or #44 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52 or #53 or #54 or # 55 or #56 or #57 or #58 or #59 or #60 or #61 or #62
64. #37 and #63

Appendix 9. ASSIA search strategy

ASSIA search
1. remand
2. prison or prisoner or prisoners
3. offender*
4. criminal*
5. probation
6. court or courts
7. tribunal or tribunals
8. secure establishment*
9. secure facilit*
10. reoffend*
11. reincarcerat*
12. recidivi*

(*Continued*)

13. ex-offender*
14. jail or jails
15. incarcerat*
16. convict or convicts
17. convicted
18. felon or felons
19. conviction*
20. reconviction*
21. high security
22. law enforcement
23. Substance abuse* or substance misuse* or substance use*
24. drug dependanc* or drug abuse* or drug use*
25. drug misuse* or drug addict*
26. narcotics addict* narcotics use* narcotics misuse* narcotics abuse*
27. chemical dependanc*
28. opiates
29. heroin
30. crack
31. cocaine
32. amphetamines
33. cocaine
34. addiction
35. dependence disorder*
36. drug involved
37. Substance-related disorders

(*Continued*)

38. amphetamine-related disorders
39. cocaine-related disorders
40. marijuana abuse
41. opioid-related disorders
42. street drugs
43. designer drugs
44. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22
45. 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41 or 42 or 43
46. 44 and 45

Appendix 10. HMIC search strategy

HMIC
1. remand in de
2. detention in de
3. prisoners in de
4. prisons in de
5. offenders in de
6. parole in de
7. probation in de
8. correctional system in de
9. courts in de
10. imprisonment in de
11. criminal justice in de
12. criminal proceedings in de

(*Continued*)

13. recidivism in de
14. jail in de
15. institutionalization (persons) in de
16. conviction/convictions in de
17. (remand or prison* or offender* or criminal* or probation or court or courts or secure establishment*) in ti,ab
18. (reoffend* or reincarcerat* or recidivi* or ex-offend* or jail or jails or incarcerat* or secure facilit* or convict* or revocation or inmate*) in ti,ab
19. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18
20. substance abuse in de
21. explode "Drug-Abuse" in DE
22. "Drug-Injection" in DE
23. explode "Narcotic-Drugs" in DE
24. "Cocaine-" in DE
25. "Addiction-" in DE
26. explode "Psychedelic-Drugs" in DE
27. (substance abuse* or substance misuse* or substance use*) in ti,ab
28. (drug abuse* or drug misuse* or drug use*) in ti,ab
29. (drug dependenc* or drug addict* or narcotics abuse* or narcotics use* or narcotics misuse* or narcotics addict*) in ti,ab
30. (chemical dependenc* or opiate abuse* or opiate misuse* or opiate use* or opiate addict*) in ti,ab
31. (heroin abuse* or heroin misuse* or heroin use* or heroin addict*) in ti,ab
32. (crack abuse* or crack misuse* or crack use* or crack addict*) in ti,ab
33. (cocaine abuse* or cocaine misuse* or cocaine use* or cocaine addict*) in ti,ab
34. (amphetamine* abuse* or amphetamine* misuse* or amphetamine* use* or amphetamine* addict*) in ti,ab
35. (dependence disorder or drug involved) in ti,ab
36. #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35

(*Continued*)

37. #19 and #36

Appendix 11. National Research Register search strategy

NRR search
1. REMAND
2. PRISON*
3. OFFENDER*
4. ((CRIMINAL* or PROBATION) or COURT) or COURTS)
5. (SECURE next ESTABLISHMENT*)
6. REOFFEND*
7. REINCARCERAT*
8. RECIDIV*
9. EXOFFEND*
10. ((JAIL or JAILS) or INCARCERAT*)
11. (SECURE next FACILIT*)
12. (((CONVICT* or REVOCATION) or INMATE*) OR (HIGH next SECURITY))
13. PRISONERS:ME
14. LAW-ENFORCEMENT:ME
15. JURISPRUDENCE:ME
16. CRIME:ME
17. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10
18. #11 or #12 or #13 or #14 or #15 or #16
19. #17 or #18
20. ((SUBSTANCE next ABUSE*) or (SUBSTANCE next MISUSE*)) OR (DRUG NEXT DEPENDENC*)) OR (DRUG NEXT ABUSE*)) OR (DRUG NEXT MISUSE*)) OR (DRUG NEXT USE*)) OR (DRUG NEXT ADDICTION))

(*Continued*)

21. ((NARCOTICS or (CHEMICAL next DEPENDENC*)) OR (OPIATE NEXT ADDICT*)) OR (OPIATE NEXT DEPENDENC*)) OR (OPIATE NEXT ABUSE*)) OR (OPIATE NEXT MISUSE*))
22. ((HEROIN next ADDICT*) or (HEROIN next DEPENDENC*)) OR (HEROIN NEXT MISUSE*)) OR (HEROIN NEXT ABUSE*))
23. ((CRACK next ADDICT*) or (CRACK next DEPENDENC*)) OR (CRACK NEXT MISUSE*)) OR (CRACK NEXT ABUSE*)) OR (CRACK NEXT USE*))
24. ((COCAINE next ADDICT*) or (COCAINE next DEPENDENC*)) OR (COCAINE NEXT MISUSE*)) OR (COCAINE NEXT ABUSE*)) OR (COCAINE NEXT USE*))
25. ((AMPHETAMINE* next ADDICT*) or (AMPHETAMINE* next DEPENDENC*)) OR (AMPHETAMINE* NEXT MISUSE*)) OR (AMPHETAMINE* NEXT ABUSE*)) OR (AMPHETAMINE* NEXT USE*))
26. ((ADDICTS or (DEPENDENCE next DISORDER)) OR (DRUG NEXT INVOLVED))
27. (SUBSTANCE-RELATED and DISORDERS:ME)
28. SUBSTANCE-RELATED-DISORDERS:ME
29. AMPHETAMINE-ABUSE:ME
30. COCAINE-ABUSE:ME
31. MARIJUANA-ABUSE:ME
32. OPIOID-RELATED-DISORDERS:ME
33. PHENCYCLIDINE-ABUSE:ME
34. SUBSTANCE-ABUSE-INTRAVENOUS:ME
35. SUBSTANCE-WITHDRAWAL-SYNDROME:ME
36. (STREET next DRUGS)
38. STREET-DRUGS:ME
39. DESIGNER-DRUGS:ME
40. NARCOTICS:ME
41. (COCAINE:ME or AMPHETAMINES:ME)
42. ANALGESICS-ADDICTIVE:ME
43. ANALGESICS-OPIOID:ME

(*Continued*)

44. PSYCHOTROPIC-DRUGS:ME
45. #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40 or #41 or #42 or #43 or #44
46. 19 and 45

Appendix 12. PAIS search strategy

PAIS
1. ((reoffend* or reincarcerat* or recidivi* or ex-offend* or jail or jails or incarcerat* or secure facilit* or convict* or revocation or inmate*) in ti,ab)
2. ((remand or prison* or offender* or criminal* or probation or court or courts or secure establishment*) in ti,ab)
3. ((drug dependenc* or drug addict* or narcotics abuse* or narcotics use* or narcotics misuse* or narcotics addict*) in ti,ab)
4. ((drug abuse* or drug misuse* or drug use*) in ti,ab) or ((substance abuse* or substance misuse* or substance use*) in ti,ab)
5. ((detox* or methadone maintenance or methadone prescri* or antagonist prescri* or dimorphine or naltrexone) in ti,ab)
6. ((dependence disorder or drug involved) in ti,ab)
7. ((amphetamine* abuse* or amphetamine* misuse* or amphetamine* use* or amphetamine* addict*) in ti,ab)
8. ((cocaine abuse* or cocaine misuse* or cocaine use* or cocaine addict*) in ti,ab)
9. ((crack abuse* or crack misuse* or crack use* or crack addict*) in ti,ab)
10. ((heroin abuse* or heroin misuse* or heroin use* or heroin addict*) in ti,ab)
11. ((chemical dependenc* or opiate abuse* or opiate misuse* or opiate use* or opiate addict*) in ti,ab)
12. ((moral training or cognitive restructuring or assertiveness training or relaxation training) in ti,ab)
13. ((therapeutic communit* or motivational interview* or motivational enhance* or counseling or counselling or psychotherapy or cognitive behavi*) in ti,ab)
14. ((work ethic or drug education or tasc or treatment accountability) in ti,ab)
15. ((asro or addressing substance or pasro or prisons addressing or acupuncture or shock or boot camp*) in ti,ab)

(*Continued*)

16. ((arrest referral* or diversion or dtto or dttos or drug treatment or carat or carats or counseling assessment or combined orders) in ti,ab)
17. ((residential program* or residential scheme* or residential service*) in ti,ab)
18. ((syringe exchange or dual diagnosis or narcotics anonymous or self help or selfhelp or outreach or bail support) in ti,ab)
19. ((drug-free or drug free or peer support or evaluation* or urinalysis or drug testing or drug use screen* or rehabilitation or discrete service* or discrete program*) in ti,ab)
20. ((aftercare or after care or brief solution or brief intervention* or 12 step* or twelve step* or minnesota program* or needle exchange or nes) in ti,ab)
21. ((trigger* or coping skills or anger management or group work or lifestyle modif* or high intensity training or resettlement or throughcare) in ti,ab)
22. ((self management or interpersonal skills or social skills or basic skills or relapse prevent* or prevent* relapse or craving reduc* or reduc* craving) in ti,ab)
24. ((rational-emotive or rational emotive or family relationship therap* or community reinforcement or self monitoring or goal setting or self control training) in ti,ab)
25. #1 or #2
26. #3 or #4 or #5 or #6 or #7 or #8 or 9 or #10 or #11
27. #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24
28. 25 and #26 and #27

Appendix 13. Criminal Justice Abstracts search strategy

CJA search
1. (substance abuse* or substance misuse* or substance use or substance users) in ti,ab,de
2. substance related in ti,ab,de
3. drug related in ti,ab,de
4. (drug dependenc* or drug abuse* or drug misuse* or drug use or drug users or drug addiction) in ti,ab,de
5. (narcotics use or narcotics users or narcotics abuse* or narcotics misuse* or chemical dependenc*) in ti,ab,de

(*Continued*)

6. (opiates or heroin or crack or cocaine or amphetamines or addict or addicts or addicted or dependence disorder* or drug involved) in ti,ab,de
7. (designer drugs or street drugs or polydrug misuse* or polydrug abuse*) in ti,ab,de
8. #1 or #2 or #3 or #4 or #5 or #6 or #7
9. ((antagonist near prescri*) or diamorphine or naltrexone) in ti,ab,de
10(therapeutic communit* or (motivational near interview*)) in ti,ab,de
11. (motivational near enhancement) in ti,ab,de
12. (counselling or counseling) in ti,ab,de
13. (psychotherap* or cognitive behav* or behav* therap* or (moral near training)) in ti,ab,de
14. (cognitive restructuring or (assertiveness near train*) or relaxation training) in ti,ab,de
15. (rational emotive or family relationship therap*) in ti,ab,de
16. (community reinforcement or self monitoring or goal setting or goalsetting) in ti,ab,de
17. (self control near training) in ti,ab,de
18. (self management) in ti,ab,de
19. (interpersonal skills near training) in ti,ab,de
20. ((social skills or basic skills) near training) in ti,ab,de
21. ((relapse near prevent*) or (craving near reduc*)) in ti,ab,de
22. (trigger* or coping skills or anger management or group work or (lifestyle near modif*)) in ti,ab,de
23. (high intensity training or resettlement or throughcare or aftercare or after care) in ti,ab,de
24. (brief solution* or brief intervention*) in ti,ab,de
25. (minnesota in ti,ab) in ti,ab,de
26. (12 step* or twelve step*) in ti,ab,de
27. (needle exchange or nes or syringe exchange) in ti,ab,de
28. (dual diagnosis or narcotics anonymous or self help or selfhelp or outreach) in ti,ab,de

(*Continued*)

29. (bail support or bail program* or arrest referral* or diversion or dtto* or drug treatment) in ti,ab,de
30. (carat or counselling assessment or counseling assessment) in ti,ab,de
31. (combined order* or drug free wing* or drug free environment* or peer support) in ti,ab,de
32. (user evaluations or urinalys* or urinanalys* or drug test* or rehab* or discrete service*) in ti,ab,de
33. (discrete program* or residential program* or residential scheme*) in ti,ab,de
34. (asro or addressing substance*) in ti,ab,de
35. (pasro or prisons addressing) in ti,ab,de
36. (acupuncture or shock or boot camp or boot camps or work ethic camp*) in ti,ab,de
37. (drug education or tasc or treatment accountability) in ti,ab,de
38. (detoxification or detox or methadone maintenance or (methadone near prescri*)) in ti,ab,de
39. #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29
40. #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39
41. #39 or #40
42. #8 and #41
9. #42 and (PY > "1979")

Appendix 14. Criteria for assessing risk of bias

Item	Judgment	Description
1. Random sequence generation (selection bias)	Low risk	The investigators describe a random component in the sequence generation process such as: random number table; computer random number generator; coin tossing; shuffling cards or envelopes; throwing dice; drawing of lots; minimization
	High risk	The investigators describe a non-random component in the sequence generation process such as: odd or even date of birth; date (or day) of admission; hospital or clinic record number; alternation; judgement of the clinician; results of a laboratory test or a series of tests; availability of

(*Continued*)

		the intervention
	Unclear risk	Insufficient information about the sequence generation process to permit judgement of low or high risk
2. Allocation concealment (selection bias)	Low risk	Investigators enrolling participants could not foresee assignment because one of the following, or an equivalent method, was used to conceal allocation: central allocation (including telephone, web-based, and pharmacy-controlled, randomisation); sequentially numbered drug containers of identical appearance; sequentially numbered, opaque, sealed envelopes
	High risk	Investigators enrolling participants could possibly foresee assignments because one of the following method was used: open random allocation schedule (e.g. a list of random numbers); assignment envelopes without appropriate safeguards (e.g. if envelopes were unsealed or nonopaque or not sequentially numbered); alternation or rotation; date of birth; case record number; any other explicitly unconcealed procedure
	Unclear risk	Insufficient information to permit judgement of low or high risk This is usually the case if the method of concealment is not described or not described in sufficient detail to allow a definite judgement
3. Blinding of participants and providers (performance bias) Objective outcomes	Low risk	No blinding or incomplete blinding, but the review authors judge that the outcome is not likely to be influenced by lack of blinding; Blinding of participants and key study personnel ensured, and unlikely that the blinding could have been broken
4. Blinding of participants and providers (performance bias) Subjective outcomes	Low risk	Blinding of participants and providers and unlikely that the blinding could have been broken;
	High risk	No blinding or incomplete blinding, and the outcome is likely to be influenced by lack of blinding; Blinding of key study participants and personnel attempted, but likely that the blinding could have been broken, and the outcome is likely to be influenced by lack of blinding
	Unclear risk	Insufficient information to permit judgement of low or high risk;
5. Blinding of outcome assessor (detection bias) Objective outcomes	Low risk	No blinding of outcome assessment, but the review authors judge that the outcome measurement is not likely to be influenced by lack of blinding; Blinding of outcome assessment ensured, and unlikely that the blinding could have been broken
6.Blinding of outcome assessor (detection bias) Subjective outcomes	Low risk	No blinding of outcome assessment, but the review authors judge that the outcome measurement is not likely to be influenced by lack of blinding; Blinding of outcome assessment ensured, and unlikely that the blinding could have been broken

(*Continued*)

	High risk	No blinding of outcome assessment, and the outcome measurement is likely to be influenced by lack of blinding; Blinding of outcome assessment, but likely that the blinding could have been broken, and the outcome measurement is likely to be influenced by lack of blinding
	Unclear risk	Insufficient information to permit judgement of low or high risk;
7. Incomplete outcome data (attrition bias) For all outcomes except retention in treatment or drop out	Low risk	No missing outcome data; Reasons for missing outcome data unlikely to be related to true outcome (for survival data, censoring unlikely to be introducing bias); Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups; For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk not enough to have a clinically relevant impact on the intervention effect estimate; For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes not enough to have a clinically relevant impact on observed effect size; Missing data have been imputed using appropriate methods All randomised patients are reported/analysed in the group they were allocated to by randomisation irrespective of non-compliance and co-interventions (intention to treat)
	High risk	Reason for missing outcome data likely to be related to true outcome, with either imbalance in numbers or reasons for missing data across intervention groups; For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk enough to induce clinically relevant bias in intervention effect estimate; For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes enough to induce clinically relevant bias in observed effect size; 'As-treated' analysis done with substantial departure of the intervention received from that assigned at randomisation;
	Unclear risk	Insufficient information to permit judgement of low or high risk (e.g. number randomised not stated, no reasons for missing data provided; number of drop out not reported for each group);
8 Selective reporting (reporting bias)	Low risk	The study protocol is available and all of the study's pre-specified (primary and secondary) outcomes that are of interest in the review have been reported in the pre-specified way; The study protocol is not available but it is clear that the published reports include all expected outcomes, including those that were pre-specified (convincing text of this nature may be uncommon)

(*Continued*)

	High risk	Not all of the study's pre-specified primary outcomes have been reported; One or more primary outcomes is reported using measurements, analysis methods or subsets of the data (e.g. sub scales) that were not pre-specified; One or more reported primary outcomes were not pre-specified (unless clear justification for their reporting is provided, such as an unexpected adverse effect); One or more outcomes of interest in the review are reported incompletely so that they cannot be entered in a meta-analysis; The study report fails to include results for a key outcome that would be expected to have been reported for such a study
	Unclear risk	Insufficient information to permit judgement of low or high risk
9. Other bias *	Low risk	Evidence to suggest other problems identified with the study which might threaten the validity of the random allocation, attrition or data integrity and results of the trial
	High risk	Evidence to suggest that the trial might be underpowered/problems with the random allocation process leading to potential self selection bias/ issues of analysis not conducted using intent to treat analysis or evidence of missing data. Concerns of attrition and measurement error including reliance on self report measures
	Unclear risk	insufficient information to permit judgement of low or high risk

WHAT'S NEW

Last assessed as up-to-date: 31 May 2014.

Date	Event	Description
2 March 2015	New citation required and conclusions have changed	In the previous version pharmacological interventions for drug-using offenders appeared to reduce overall subsequent drug use and criminal activity (but to a lesser extent), while with the introduction of new studies agonist treatments did not seem effective in reducing drug use or criminal activity
29 July 2014	New search has been performed	This latest update reflects an additional four new trials (and one ongoing trial) with new follow-up data on two existing trials with searches conducted up until May 2014

HISTORY

Review first published: Issue 12, 2013

Date	Event	Description
27 January 2014	Amended	Plain language summary title correction
16 July 2012	New search has been performed	This review has been updated using searches to 21 March 2013. The review represents one in a family of four reviews. The other reviews cover non- pharmacological interventions for drug-using offenders and interventions for drug-using female offenders and offenders with co-occurring mental illness. This new review of pharmacological interventions with drug-using offenders contains 17 randomised controlled trials. Six of the 17 trials are awaiting classification for the review; the remaining 11 trials represent a total of 2,678 participants
2 March 2012	New search has been performed	The updated edit of this review produced a new document with additional findings reflecting searches up to 11 November 2011. Five new review authors have been added to this version of the review, including Steven Duffy, Rachael McCool, Matthew Neilson, Catherine Hewitt and Marrissa Martyn-St James
19 May 2006	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

Searches were constructed and conducted by DF. Three independent review authors inspected the search hits by reading the titles and abstracts (AEP, MN, RW). Each potentially relevant study located in the search was obtained as a full article and was independently assessed for inclusion by two review authors. In the case of discordance, a third independent review author arbitrated. Where it was not possible to evaluate the study because of language problems or missing information, the studies were classified as 'translation/ information required to determine decision' until a translation or further details were provided. Four review authors conducted data extraction for the papers (MM-SJ, JMG, RW, and MN), and review author CG conducted data extraction and a narrative summary of the cost-effectiveness studies. The results were compiled and organised by MM-ST, MN, CH, RW and AEP, and all eight authors contributed towards the final draft text.

DECLARATIONS OF INTEREST

Amanda E Perry have no interests to declare relating to this work

Matthew Neilson have no interests to declare relating to this work

Marrissa Martyn-St James have no interests to declare relating to this work

Julie M Glanville have no interests to declare relating to this work

Dave Fox have no interests to declare relating to this work

Rebecca Woodhouse have no interests to declare relating to this work

Catherine Hewitt have no interests to declare relating to this work

SOURCES OF SUPPORT

Internal sources

- Reviewer from Cochrane Drugs and Alcohol Group, Other.

A reviewer from the Drugs and Alcohol Group provided the researchers with the results of a search strategy for three databases

External sources

- The Department of Health funded the original review, UK.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

The original review Perry 2006 has been split up into different reviews and so there is no dedicated protocol for this particular review

INDEX TERMS

Medical Subject Headings (MeSH)

*Criminals; Buprenorphine [therapeutic use]; Heroin [therapeutic use]; Methadone [therapeutic use]; Naltrexone [analogs & derivatives; therapeutic use]; Narcotics [therapeutic use]; Randomized Controlled Trials as Topic; Substance-Related Disorders [*drug therapy]

MeSH check words

Adult; Female; Humans; Male