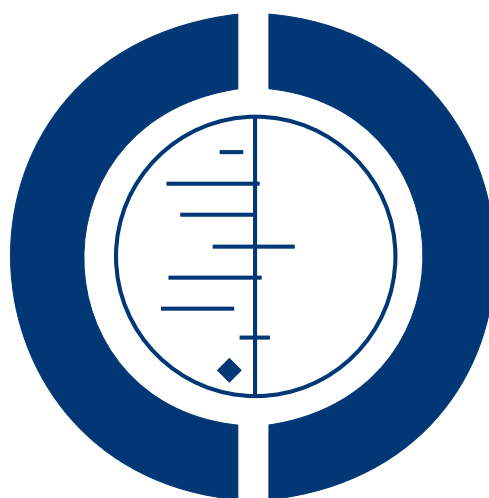


# Interventions for drug-using offenders with co-occurring mental illness (Review)

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



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[Intervention Review]

# Interventions for drug-using offenders with co-occurring mental illness

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## ABSTRACT

### Background

This is an updated version of an original Cochrane review published in Issue 3 2006 (Perry 2006). The review represents one from a family of four reviews focusing on interventions for drug-using offenders. This specific review considers interventions aimed at reducing drug use or criminal activity, or both for drug-using offenders with co-occurring mental illness.

### Objectives

To assess the effectiveness of interventions for drug-using offenders with co-occurring mental illness in reducing criminal activity or drug use, or both.

### Search methods

We searched 14 electronic bibliographic databases up to May 2014 and 5 Internet resources (searched between 2004 and 11 November 2009). We contacted experts in the field for further information.

### Selection criteria

We included randomised controlled trials designed to reduce, eliminate, or prevent relapse of drug use and criminal activity, or both in drug-using offenders with co-occurring mental illness. We also reported data on the cost and cost-effectiveness of interventions.

### Data collection and analysis

We used standard methodological procedures expected by The Cochrane Collaboration.

### Main results

Eight trials with 2058 participants met the inclusion criteria. The methodological quality of the trials was generally difficult to rate due to a lack of clear reporting. On most 'Risk of bias' items, we rated the majority of studies as unclear. Overall, we could not statistically combine the results due to the heterogenous nature of the different study interventions and comparison groups. A narrative summary of the findings identified that the interventions reported limited success with reducing self report drug use, but did have some impact on

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re-incarceration rates, but not re-arrest. In the single comparisons, we found moderate-quality evidence that therapeutic communities determine a reduction in re-incarceration but reported less success for outcomes of re-arrest, moderate quality of evidence and self report drug use. Three single studies evaluating case management via a mental health drug court (very low quality of evidence), motivational interviewing and cognitive skills (low and very low quality of evidence) and interpersonal psychotherapy (very low quality of evidence) did not report significant reductions in criminal activity and self report drug use respectively. Quality of evidence for these three types of interventions was low to very low. The trials reported some cost information, but it was not sufficient to be able to evaluate the cost-effectiveness of the interventions.

### **Authors' conclusions**

Two of the five trials showed some promising results for the use of therapeutic communities and aftercare, but only in relation to reducing subsequent re-incarceration. Overall, the studies showed a high degree of variation, warranting a degree of caution in the interpretation of the magnitude of effect and direction of benefit for treatment outcomes. More evaluations are required to assess the effectiveness of interventions for drug-using offenders with co-occurring mental health problems.

## **PLAIN LANGUAGE SUMMARY**

### **Interventions for drug-using offenders with co-occurring mental illness**

#### **Background**

A number of policy directives are aimed at enabling people with drug problems to live healthy, crime-free lives. Drug-using offenders with co-occurring mental health problems represent a group who access treatment for a variety of different reasons. The complexity of the two problems makes the treatment and rehabilitation of this group particularly challenging.

#### **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 or criminal activity of drug-using offenders with co-occurring mental illness. We included people of any gender, age, or ethnicity.

#### **Key results**

We identified eight trials evaluating treatments for drug-using offenders with co-occurring mental illness. The interventions included case management via a mental health court: a therapeutic community; an evaluation of motivational interviewing techniques and cognitive skills (a person's ability to process thoughts) in comparison to relaxation training; and an evaluation of interpersonal psychotherapy in comparison to a psycho-educational intervention. Overall, the interventions reported limited success with reducing self report drug use, but did report some success with reducing re-incarceration rates, but not re-arrest. The therapeutic community studies reported a reduction in re-incarceration but were shown to be less effective for re-arrest and self report drug use. Three single studies evaluating case management via a mental health drug court, motivational interviewing and cognitive skills, and interpersonal psychotherapy did not report significant reductions in criminal activity and self report drug use respectively. Some information is provided on the costs and cost-effectiveness of such interventions and trial evaluations focusing specifically on the needs of drug-using offenders with co-occurring mental illness are required.

#### **Quality of the evidence**

This review was limited by the lack of information reported in this group of trials. The quality of the evidence was moderate for therapeutic community and low to very low for the other types of intervention. The evidence is current to May 2014.

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

Therapeutic community for drug-using offenders with co-occurring mental illness						
<b>Patient or population:</b> drug-using offenders with co-occurring mental illness						
<b>Settings:</b>						
<b>Intervention:</b> Therapeutic community						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Therapeutic community				
<b>Criminal activity - Re-arrests</b> Follow-up: mean 12 months	117/340 (34.4%)	167/458 (36.5%)	1st study: 1.65 [0.83, 3.28] 2nd study: 0.96 [0.82, 1.13]	798 (2 studies)	⊕⊕⊕○ <b>moderate</b> <sup>1</sup>	--
<b>Criminal activity - Re-incarceration</b> Follow-up: mean 12 months	71/283 (25.1%)	47/353 (13.3%)	1st study: 0.28 [0.13, 0.63] 2nd study: 0.73 [0.45, 1.19] 3rd study: 0.49 [0.27, 0.89]	636 (3 studies)	⊕⊕⊕○ <b>moderate</b> <sup>2</sup>	--

\*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

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.

<sup>1</sup> Across the 2 studies, 13 of the 18 'Risk of bias' items in total were rated as unclear risk; 2 of the 18 were rated as high risk.

<sup>2</sup> Across all the studies, 21 of the 27 'Risk of bias' items were rated as unclear risk; 2 of the 27 were rated as high risk.

## BACKGROUND

This review is part of a family of four reviews providing a close examination of what works in reducing drug use and criminal activity in 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 a specific interest 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 not only the effectiveness of interventions based on two key outcomes but also analyse the impact of setting and intervention type. We have presented here the revised methodology for this individual review focusing on the impact of interventions for drug-using offenders with co-occurring mental illness.

### Description of the condition

Mental health issues in offenders are common, with over half (64%) of jail inmates in the US reporting a serious mental illness (Glase 2006). In the US, individuals incarcerated to jails are generally on remand awaiting trial, while those in prison have been sentenced within the criminal justice system. One study of mental illness in jails found that more women than men (31% and 14.5%, respectively) have a serious mental illness (Steadman 2009). Other studies have reported that a greater proportion of mentally ill people are arrested compared with the general population (Lamb 1998). Factors cited as causes include a lack of support in the community, problems accessing treatment, and the attitudes of police and society. A systematic review evaluating 62 surveys from 12 countries accounting for 23,000 prisoners. They found that prisoners were several times more likely to have psychosis or major depression and 10 times more likely to have an antisocial personality disorder than the general population. It is unknown how well the prison service is addressing these problems (Fazel 2002).

In the UK, renewed emphasis from Clarke's green paper, *Breaking the Cycle*, recognises that the justice system is not always the best place to manage the problems of less serious offenders, where their criminal behaviour is related to their mental health problems (Clarke 2010). As a result, several diversionary schemes have been established (Ministry of Justice 2010). The use of diversionary schemes have been supported by previous systematic reviews and meta-analytical techniques that have evaluated diversion programmes (for example mental health courts) providing a mechanism for diverting individuals with severe mental illness into treatment programmes instead of the prison system (Sarteschi 2011). Findings from such studies generally show positive improvements on a small number of clinical outcomes. However, the conclusions are often limited by the research design (that is quasi-experimental

studies), introducing potential bias about the relative effectiveness of such schemes. Evidence from one systematic review of serious mentally disordered adult offenders identified seven trials, but the evidence was insufficient to draw conclusions. The authors called for more comparative trials to increase their confidence in the findings (Fontanarosa 2013).

### Description of the intervention

Many different treatments for substance misuse (for example detoxification and therapeutic communities) have been adopted for use in the criminal justice system. This review included any intervention that was designed to reduce, eliminate, or prevent relapse to drug use or criminal activity, or both. This resulted in the inclusion of a wide range of treatments focusing on: case management via a mental health drug court, therapeutic communities, and motivational interviewing (MI) with cognitive skills in comparison to relaxation training. The evidence to support the effectiveness of these interventions differs and is dependent upon the quality of the experimental evaluations employed to assess whether they are successful in reducing drug use or criminal activity, or both.

Case management evolved traditionally to address the needs of prisoner re-entry programmes covering employment, education, health, housing, and family support via assessment and connecting clients with the appropriate services (Austin 1994). Case management in the US has been applied in Treatment Accountability for Safer Communities programmes (Marlowe 2003b), and has shown initial effectiveness but without systematic evidence in support of the process.

Previous meta-analyses and systematic reviews have shown therapeutic community interventions specifically with aftercare to have modest effects in the reduction of recidivism and drug use (Mitchell 2012a; Pearson 1999).

Cognitive behavioural approaches, including self monitoring, goal setting, self control training, interpersonal skills training, relapse prevention, group work, and lifestyle modification, have shown signs of success with offenders generally (Lipsey 2007), but the evidence is based on systematic reviews that have excluded evaluations focusing specifically on the needs of drug-using offenders. Two previous systematic reviews found that motivational interviewing can lead to improved retention in treatment, enhanced motivation to change, and reduced offending, although there are variations across studies (McMurrin 2009; Smedslund 2011).

Interpersonal psychotherapy has been used in the community with proven effectiveness in non-criminal justice settings. Such studies have not found interpersonal psychotherapy to be superior to other treatments (Johnson 2012).

Policy interests have also placed an increasing demand on knowing more about the cost and cost-effectiveness of such interventions. We can draw some evidence from systematic reviews completed in the area. However, despite growing knowledge about the

effectiveness of treatment programmes for offenders, there is no recent systematic review evidence focusing on the effectiveness of treatment for offenders with drug misuse and co-occurring mental health problems.

## How the intervention might work

Interventions delivered to drug-using offenders under the care of the criminal justice system have varied over time. Case management is a problematic term that has been used to describe what amounts to a range of diverse practices and supervision models spanning several different services, including probation. These are generally used to co-ordinate and integrate all aspects of community supervision, from the initial offender needs assessment, through to programme delivery and the intended completion of the order or sentencing requirement (Partridge 2004).

In the US since the 1960s therapeutic community interventions have been used in combination with work release programmes to rehabilitate offenders via a supportive environment over a relatively long period. This usually encompasses the transition between the prison and working within the community (Prendergast 2011). The ethos of a therapeutic community intervention is to focus on treatment on the whole self (and not on the drug abuse per se) and the underlying symptomatic problems, where the residents are instrumental in running the therapeutic community (Mitchell 2012a).

Cognitive behavioural approaches using programmes based on psychological theory have been employed to try to help people address their offending behaviour and generally have good support from the literature in their reduction of recidivism, but have previously excluded drug-using offenders (Andrews 1990; Lipsey 1998; Lipsey 2007).

Miller and Rollnick developed motivational interviewing as a process to motivate change in substance abusers (Miller 1991). The technique uses different strategies such as expressing empathy, avoiding arguing for change, and working on ambivalence to strengthen commitment to change. Meta-analyses evidence supports the use of motivational interviewing as a stand-alone treatment and in combination with more intensive programmes (Vasilaki 2006).

## Why it is important to do this review

Many people under the care of the criminal justice system have co-occurring mental illness and drug-misuse problems. While previous research has evaluated treatment programmes for offenders more broadly, we know little about the challenges, treatment, and rehabilitation opportunities for offenders with co-occurring mental health and drug-misuse problems. We therefore believe that an evaluation of existing evidence on the impact of interventions for drug-using offenders with co-occurring mental illness might be

helpful in identifying treatments for reducing drug use and criminal activity in this vulnerable population. Where possible, the review will also report descriptively on the costs of such treatment programmes.

## OBJECTIVES

To assess the effectiveness of interventions for drug-using offenders with co-occurring mental illness in reducing criminal activity or drug use, or both.

The review addressed the following questions:

1. Does any treatment for drug-using offenders with co-occurring mental illness reduce drug use?
2. Does any treatment for drug-using offenders with co-occurring mental illness reduce criminal activity?
3. Does the treatment setting (court, community, prison/secure establishment) affect the intervention outcome(s)?
4. Does the type of treatment affect the outcome(s)?

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 drug-using offenders with co-occurring mental illness regardless of gender, age, or ethnicity. Drug misuse included any study that referred to participants who used occasionally, were dependent, or were known to abuse drugs. We defined offenders as participants who were involved in the criminal justice system. We judged offenders to have co-occurring mental illness where the paper explicitly stated this. We used several different mechanisms to identify study samples with mental health problems including:

1. use of diagnostic gold-standard tests such as the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) or International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) criteria; or
2. the nature of the intervention (e.g. mental health court); or



3. where the study described the participant demographic as having a “history of psychiatric illness” or “serious mental disorder” with a co-occurring substance misuse.

### 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 participants who may have returned to an incarcerated setting or were subsequently arrested, or who 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

1. Any pharmacological intervention (e.g. buprenorphine, methadone)
2. Any psychosocial intervention (e.g. therapeutic community, case management, cognitive behavioural therapy, interpersonal psychotherapy, motivational interviewing)

### Control interventions included in the review

1. No treatment
2. Minimal treatment
3. Waiting list
4. Treatment as usual
5. Other treatment

### Types of outcome measures

#### Primary outcomes

For the purpose of this 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 reported the longest period, as we felt this measure was the most conservative estimate of effectiveness.

1. Drug use measures reported as:
  - i) self report drug use (unspecified drug, specific drug use not including alcohol, Addiction Severity Index composite scores);
  - ii) biological drug use (measured by drugs testing by either urine or hair analysis).
2. Criminal activity as measured by:
  - i) self report or official report of criminal activity (including arrest for any offence, drug offences, re-incarceration, convictions, charges, and recidivism).

#### Secondary outcomes

Our secondary outcome reported on cost or cost-effectiveness information. We used a descriptive narrative to describe these findings. We undertook a full critical appraisal based on the [Drummond 1997](#) checklist for studies presenting sufficient information.

### Search methods for identification of studies

#### Electronic searches

The update searches identified records from 2004 to May 2014.

- CENTRAL (issue 5, 2014) ([Appendix 1](#))
- MEDLINE (1966 to May 2014) ([Appendix 2](#))
- EMBASE (1980 to May 2014) ([Appendix 3](#))
- PsycINFO (1978 to April 2014) ([Appendix 4](#))
- PASCAL (1973 to November 2004)<sup>a</sup> ([Appendix 5](#))
- SciSearch (Science Citation Index) (1974 to April 2014) ([Appendix 5](#))
  - Social SciSearch (Social Science Citation Index) (1972 to April 2014) ([Appendix 5](#))
  - ASSIA (1987 to April 2014) ([Appendix 6](#))
  - Wilson Applied Science and Technology Abstracts (1983 to October 2004)<sup>a</sup>
    - Inside Conferences (1993 to November 2004)<sup>a</sup>
    - Dissertation Abstracts (1961 to October 2004)<sup>a</sup>
    - NTIS (1964 to April 2014)
    - Sociological Abstracts (1963 to April 2014) ([Appendix 7](#))
    - HMIC (2004 to April 2014) ([Appendix 8](#))
    - PAIS (1972 to April 2014) ([Appendix 9](#))
    - SIGLE (1980 to June 2004)<sup>b</sup> ([Appendix 10](#))
    - Criminal Justice Abstracts (1968 to April 2014) ([Appendix 11](#))
      - LILACS (2004 to April 2014)
      - National Research Register (March 2004)<sup>c</sup> ([Appendix 12](#))
      - Current Controlled Trials (December 2009)
      - DrugScope (February 2004) - unable to access
      - SPECTRA (March 2004)<sup>d</sup> ([Appendix 13](#))

<sup>a</sup>Unable to access further to 2004 search.

<sup>b</sup>Database not updated since original 2004 search.

<sup>c</sup>No longer exists.

<sup>d</sup>Now Campbell Collaboration searched online.

In our update of the original review we restricted the search strategy to studies that were published or unpublished from 2004 onwards ([Perry 2006](#)). We did not search several of the original databases for this update (indicated by the key at the end of the database list). We did not search PASCAL, ASSIA, Wilson Applied Science and Technology Abstracts, Inside Conferences, and Dissertation Abstracts, as these databases were available only via the fee-charging Dialog online host service, and we did not have the required

resources. 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 employees.

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

In addition to the electronic databases, we searched relevant websites (Home Office, National Institute of Drug Abuse, and European Association of Libraries and Information Services on Alcohol and Other Drugs). We searched directory websites up to November 2011. We placed no language restrictions on identification and inclusion of studies in the review.

We have listed details of the update search strategies and results and websites searched 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 additional references and searched the catalogues of relevant organisations.

### Personal communication

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

## Data collection and analysis

### Selection of studies

Two review authors independently inspected titles and abstracts identified by the search strategy. We obtained each potentially relevant study as a full article, and two review authors independently assessed these for inclusion. In the case of discordance, a third review author arbitrated. One review author undertook translation of articles not written in the English language.

We divided the screening process into two key phases. Phase one used the initial eight key questions reported in the original review ([Perry 2006](#)).

### Phase one pre-screening criteria:

1. Is the document an empirical study? [If no, exclude document]
2. Does the study evaluate an intervention, a component of which is designed to reduce, eliminate, or prevent relapse in drug-using offenders?
3. Are the participants referred by the criminal justice system at baseline?
4. Does the study report pre- and post-programme measures of drug use?
5. Does the study report pre- and post-programme measures of criminal behaviour?
6. Is the study an RCT?
7. Do the outcome measures refer to the same length of follow-up for two groups?

Following identification of relevant papers from phase one, we sought in phase two screening to identify those papers describing offenders with a mental illness. This information was primarily obtained from the participant description and the type of intervention (for example mental health drug court).

### Phase two pre-screening:

1. Is the study population comprised wholly of participants with diagnosed mental illness using DSM-IV or ICD-10 diagnostic criteria? [if yes, include document]
2. Is the study population comprised wholly of participants identified on screening to have a mental health problem(s) based on intervention eligibility (e.g. mental health court)? [if yes, include document]
3. Where the full study population is not comprised of offenders with diagnosed or presumed mental illness, are separate results given for those participants with mental illness? [if no, exclude document]

Drug-using interventions were implied if the programme was targeted at reducing drug use in a group of individuals or could be ascertained from the background characteristics of the group. Offenders were individuals residing in special hospitals, prisons, the community, or who were diverted from court or placed on arrest referral schemes for treatment. We did accept papers in the review where the entire sample were not using drugs, but reported pre and post measures needed to be the same at both time points. The study setting could change throughout the process of the study. For example, 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 were 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 review

authors independently extracted data and subsequently checked them for agreement.

### Assessment of risk of bias in included studies

Three review authors (AEP, MMSJ, RW) independently assessed risk of bias of all included studies using the 'Risk of bias' assessment criteria recommended in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011).

The recommended approach for assessing risk of bias in studies included in Cochrane reviews is a two-part tool, addressing seven 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 source 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 relating 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* adapted to the addiction field. See [Appendix 14](#) for details.

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) were considered separately for objective outcomes (for example drop-out, use of substance of abuse measured by urine analysis, participants relapsed at the end of follow-up, participants engaged in further treatments) and subjective outcomes (for example 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 relationship).

Incomplete outcome data (avoidance of attrition bias) was considered for all outcomes except for drop-out from the treatment, which is very often the primary outcome measure in trials on addiction.

For studies identified in the 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) was used for outcomes measured on different scales. Higher scores for continuous measures are representative of greater harm. We presented dichotomous outcomes as risk ratios (RR), with 95% confidence intervals (CIs).

### Unit of analysis issues

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

### Dealing with missing data

We attempted to contact study authors via email where missing data occurred in the original publication.

### Assessment of heterogeneity

We assessed heterogeneity using the  $I^2$  statistic and  $\text{Chi}^2$  statistic (Higgins 2011).

### Data synthesis

We planned to use the RevMan software package to perform a series of meta-analyses for continuous and dichotomous outcome measures (RevMan 2012). We planned to use a random-effects model to account for the fact that participants did not come from a single underlying population. Because of the high heterogeneity of included studies for types of intervention compared, no meta-analysis were performed. The narrative tables included a presentation of the study details (for example author, year of publication, and country of study origin), study methods (for example random assignment), participants (for example number in sample, age, gender, ethnicity, age, mental health status), interventions (for example description, duration, intensity, and setting), outcomes (for example description, follow-up period, and reporting mechanism), resource and cost information and resource savings (for example number of staff, intervention delivery, estimated costs, and estimated savings) and notes (for example methodological and quality assessment information).

### Subgroup analysis and investigation of heterogeneity

We had planned to conduct sensitivity analyses to assess the impact of studies at high risk of bias compared with those at low or unclear risk of bias. Because of the overall high risk of bias of the included studies, this analysis was not possible.

## RESULTS

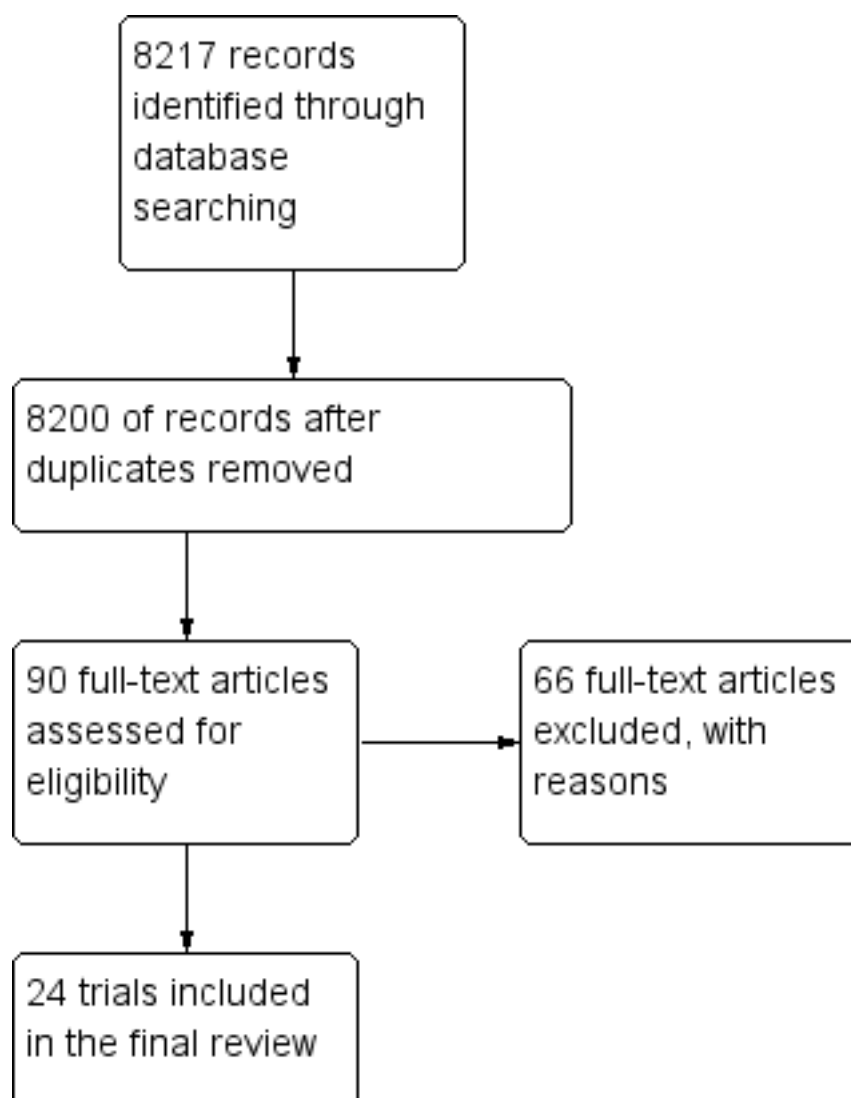
## Description of studies

### Results of the search

#### Original review

The original searches spanned from database inception to October 2004. They identified a total of 8217 records after duplication. We acquired a total of 90 full-text papers for assessment and excluded 36 papers, bringing 24 trials to the review (see [Figure 1](#)).

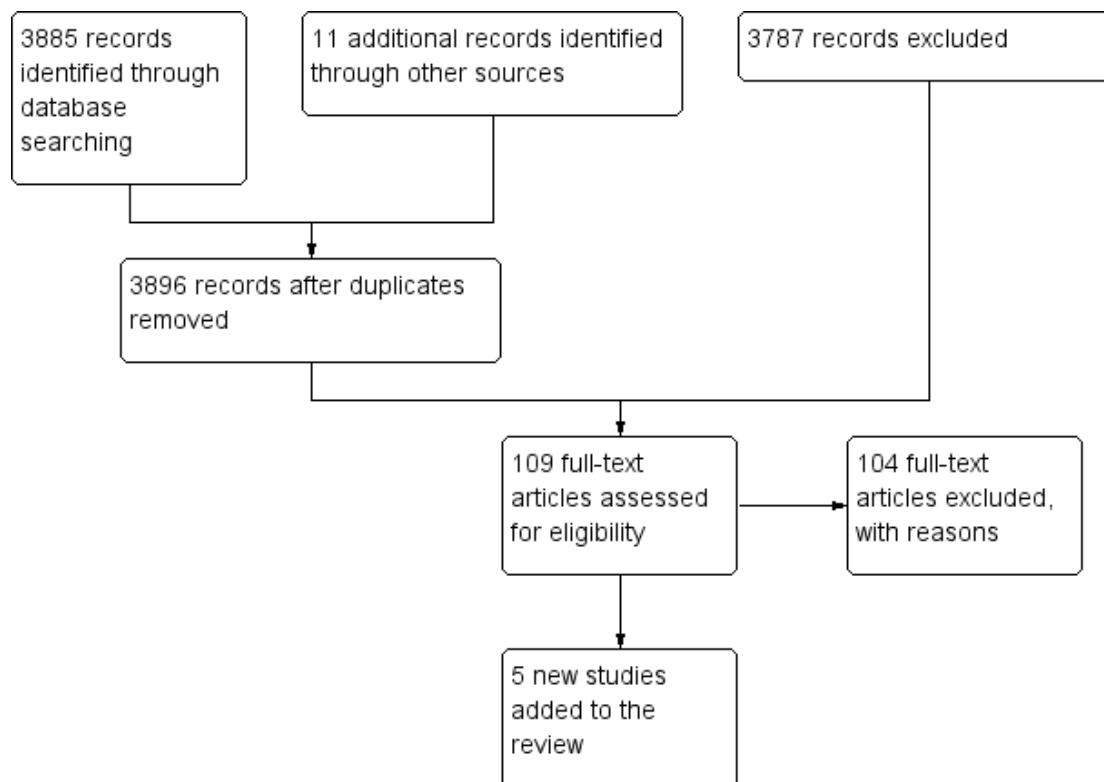
**Figure 1. Study flow diagram of paper selection process: Original Review**



### First update

The updated searches spanned from October 2004 until March 2013. These identified a total of 3896 records after duplication. We acquired a total of 109 full-text papers for assessment and excluded 104 papers, bringing 5 new trials to the review (see [Figure 2](#)).

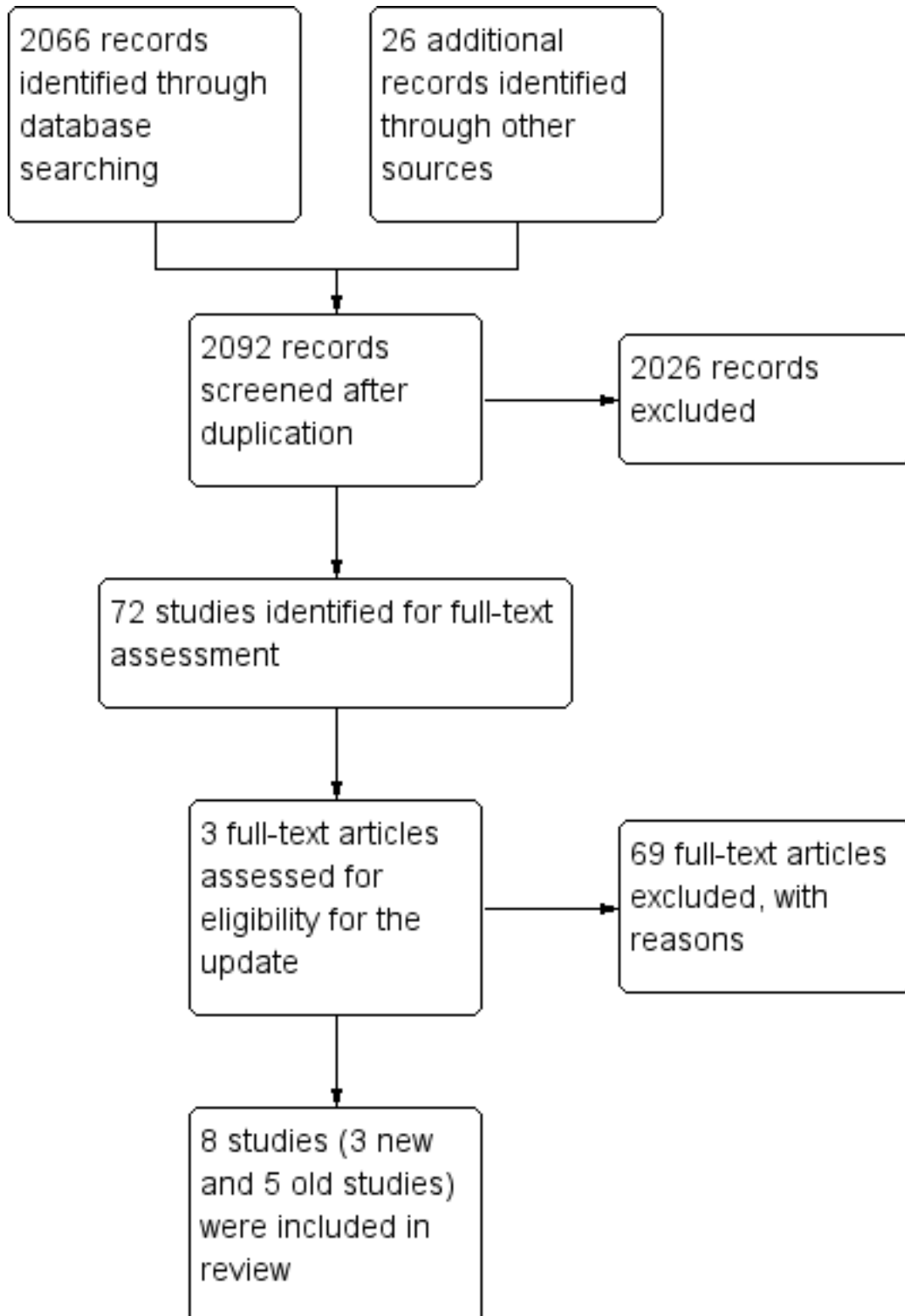
**Figure 2. Study flow diagram of paper selection process: First update**



### Second update

The updated searches spanned from March 2013 until April 2014. These identified a total of 2092 records after duplication. We acquired a total of 72 full-text papers for assessment and excluded 69 papers, bringing 3 new trials to the review, making a total of 14 publications represented by 8 trials (see [Figure 3](#)).

Figure 3. Study flow diagram of paper selection process: Second update



### Included studies

Fourteen publications represented eight trials published between 1999 and 2014. The eight trials consisted of three singular trial publications on different interventions, [Cosden 2003](#), [Sacks 2011](#), and [Stein 2011](#), and two trials represented by five publications. The first trial represented an evaluation of one intervention to two comparison groups, using different outcome measures (drug use at 12 months reported by [Sacks 2004](#)). The second trial represented three publications and four comparisons presenting follow-up data successively between 12 and 60 months ([Wexler 1999](#)).

### Treatment regimens and settings

Six studies were conducted in a secure setting. The evaluations considered a therapeutic community intervention and aftercare in comparison to some alternative-sentencing option ([Johnson 2012](#); [Lanza 2013](#); [Sacks 2004](#); [Sacks 2008](#); [Sacks 2011](#); [Wexler 1999](#)). Two studies were conducted in a court setting. The evaluations compared assertive case management versus treatment as usual in a mental health drug court ([Cosden 2003](#)), and motivational interviewing with relaxation training in a group of adolescents with significant depression ([Stein 2011](#)).

No studies assessed the efficacy of pharmacological treatments. No studies were identified in the community.

### Countries in which the studies were conducted

All the studies were published in the US.

### Duration of trials

The trial duration varied between 3 months' follow-up, in [Johnson 2012](#), [Lanza 2013](#), and [Stein 2011](#), to a 5-year follow-up ([Wexler 1999](#)). The remaining studies reported on outcomes at 12, 24, and 36 months ([Cosden 2003](#); [Sacks 2011](#); [Sacks 2008](#); [Sacks 2004](#)).

### Participants

Seven of the eight comparisons included adult drug-using offenders. One study investigated the impact of motivational interviewing in adolescents aged 14 to 19 years ([Stein 2011](#)).

Three studies included female offenders ([Cosden 2003](#); [Johnson 2012](#); [Stein 2011](#)). Adult male offenders were the focus of the study populations in the majority of studies, with a mean age of 30 years.

In all study populations, the majority of participants were of white ethnic origin.

Mental health diagnoses varied across the studies (see [Table 1](#) for more information).

### Excluded studies

We excluded 172 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; and allocation of participants to study groups that were not strictly randomised or did not contain original trial data. We excluded the majority of studies because the study population were not offenders. We excluded one study because follow-up periods were not equivalent across study groups ([Di Nitto 2002](#)), and another because the study intervention (acupuncture) did not measure our specified outcomes of drug use or criminal activity ([Berman 2004](#)). One study reported the protocol of a trial only ([Baldus 2011](#)), while another only contained conference proceedings ([Kinlock 2009](#)). For one trial, we were unable to obtain the data ([Cogswell 2011](#)), and for another we were unable to obtain the full-text version ([Rowan-Szal 2005](#)).

### Risk of bias in included studies

#### Allocation

#### Randomisation

All of the nine included comparisons were described as randomised. Five of the included studies reported on how the randomisation sequence was generated and were judged as at low risk of bias ([Cosden 2003](#); [Johnson 2012](#); [Lanza 2013](#); [Sacks 2011](#); [Stein 2011](#)). The remaining three studies did not report how the randomisation sequence of participants was generated ([Sacks 2004](#); [Sacks 2008](#); [Wexler 1999](#)).

#### Characteristics at baseline

Five of the eight studies were similar on drug use at baseline ([Johnson 2012](#); [Sacks 2004](#); [Sacks 2008](#); [Sacks 2011](#); [Stein 2011](#)), two studies were rated unclear ([Cosden 2003](#); [Lanza 2013](#)), and one study showed comparable baseline differences ([Sacks 2004](#)). For similarity on criminal justice measures, six studies were rated as similar ([Cosden 2003](#); [Johnson 2012](#); [Sacks 2008](#); [Sacks 2011](#); [Sacks 2004](#); [Stein 2011](#); [Wexler 1999](#)), and two were rated as unclear ([Lanza 2013](#); [Stein 2011](#)).

#### Allocation concealment

Of the eight studies, only one adequately reported that the allocation process was concealed ([Johnson 2012](#)).

## Blinding

We assessed blinding across four dimensions considering performance and detection bias across subjective and objective measures (see Appendix 14). For five of the eight studies, we considered blinding unclear on all four measures of blinding (Sacks 2004; Sacks 2008; Stein 2011; Wexler 1999). We rated one study as at high risk of bias on two of the four measures (Cosden 2003), and we rated another study as at low risk of bias across three of the four domains (Lanza 2013).

## Incomplete outcome data

Loss to follow-up was reported to differing extents in the included studies. We rated two studies as at low risk of bias (Cosden 2003; Sacks 2008), and we rated four as at low risk with limited attrition

noted (Johnson 2012; Lanza 2013; Sacks 2004; Wexler 1999). We rated two studies as unclear (Sacks 2011; Stein 2011).

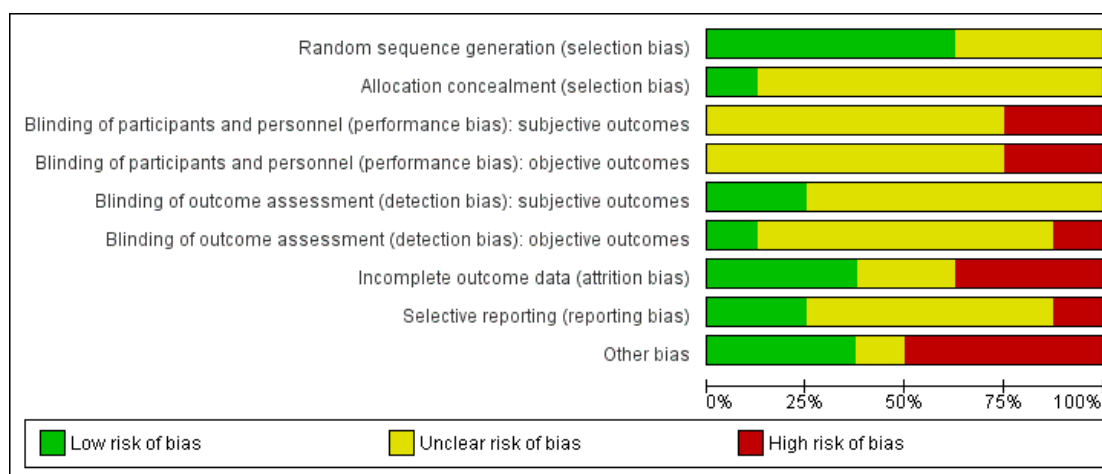
## Selective reporting

We rated five of the eight trials as unclear (Cosden 2003; Sacks 2004; Sacks 2011; Stein 2011; Wexler 1999). We rated two studies as at low risk (Lanza 2013; Sacks 2008), and we rated one study as at high risk (Johnson 2012).

## Other potential sources of bias

Of the eight studies, we rated four as at high risk of other bias (Cosden 2003; Johnson 2012; Stein 2011; Wexler 1999), three as at low risk with no further concerns (Lanza 2013; Sacks 2008; Sacks 2011), and the final study as unclear (Sacks 2004). See Figure 4 and Figure 5 for more details.

**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.**

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias): subjective outcomes	Blinding of participants and personnel (performance bias): objective outcomes	Blinding of outcome assessment (detection bias): subjective outcomes	Blinding of outcome assessment (detection bias): objective outcomes	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Cosden 2003	+	?	-	-	?	?	-	?	-
Johnson 2012	+	+	?	?	+	+	+	-	-
Lanza 2013	+	?	-	-	+	-	+	+	+
Sacks 2004	?	?	?	?	?	?	-	?	?
Sacks 2008	?	?	?	?	?	?	-	+	+
Sacks 2011	+	?	?	?	?	?	?	?	+
Stein 2011	+	?	?	?	?	?	?	?	-
Wexler 1999	?	?	?	?	?	?	+	?	-

## Effects of interventions

See: [Summary of findings for the main comparison](#) Therapeutic community for drug-using offenders with co-occurring mental illness; [Summary of findings 2](#) Mental health court for drug-using offenders with co-occurring mental illness; [Summary of findings 3](#) Motivational interviewing and cognitive skills for drug-using offenders with co-occurring mental illness; [Summary of findings 4](#) Interpersonal psychotherapy for drug-using offenders with co-occurring mental illness

We considered each of our studies in relation to the key objectives of the review and grouped them together by outcome measures and individual intervention type (see [Table 2](#) for more details). We have summarised the main comparisons in [Summary of findings for the main comparison](#); [Summary of findings 2](#).

Due to high heterogeneity of the interventions compared in the included studies, it was not possible to combine study results, and we performed no meta-analyses for drug use measures and criminal activities. Furthermore as all the included studies were conducted in a secure or court setting, it was not possible to combine study results, and we performed no meta-analyses.

### 1. Therapeutic community and aftercare versus treatment as usual

See [Summary of findings for the main comparison](#)

#### Impact on self report drug use

Three studies reported results about self report drug use. One study found statistically significant reduction: [Sacks 2004](#) (RR 0.58, 95% CI 0.36 to 0.93, 139 participants); the second study found nearly statistically significant reduction: [Sacks 2008](#) (RR 0.73, 95% CI 0.53 to 1.01, 370 participants); while the third study found no statistically significant reduction: [Wexler 1999](#) (RR 1.11, 95% CI 0.82 to 1.49, 576 participants).

#### Impact on criminal activity

Two studies reported no statistically significant reduction in re-arrest following treatment: [Sacks 2008](#) (RR 1.65, 95% CI 0.83 to 3.28, 370 participants); and [Wexler 1999](#) comparing a secure establishment-based therapeutic community program versus no treatment (RR 0.96, 95% CI 0.82 to 1.13, 428 participants), moderate quality of evidence; see [Analysis 1.1](#)

Three studies evaluated the impact of therapeutic community treatment using re-incarceration measures. Two studies reported statistically significant reduction: [Sacks 2004](#) comparing Personal Reflections therapeutic community and voluntary residential aftercare versus mental health programme (RR 0.28, 95% CI 0.13 to

0.63, 139 participants); and [Sacks 2011](#) comparing re-entry modified therapeutic community treatment versus parole supervision case management (RR 0.49, 95% CI 0.27 to 0.89, 127 participants). One study did not find statistically significant results: [Sacks 2008](#) comparing a therapeutic community program versus cognitive behavioural intervention (RR 0.73, 95% CI 0.45 to 1.19, 370 participants), moderate quality of evidence, see [Analysis 1.1](#)

### 2. Mental health court and case management versus treatment as usual (standard court proceedings)

See [Summary of findings 2](#)

#### Impact on self report drug use

The study did not assess this outcome.

#### Impact on self report criminal activity

One study reported no statistically significant reduction in criminal activity: RR 1.05, 95% CI 0.90 to 1.22, 235 participants ([Cosden 2003](#)), very low quality of evidence, see [Analysis 2.1](#)

### 3. Motivational interviewing and cognitive skills versus relaxation therapy

See [Summary of findings 3](#)

#### Impact on self report drug use--continuous

One study reported no statistically significant reduction in self report drug use: MD -7.42, 95% CI -20.12 to 5.28, 162 participants ([Stein 2011](#)), low quality of evidence, see [Analysis 3.1](#)

#### Impact on self report drug use--dichotomous

One study reported no statistically significant reduction in self report drug use: RR 0.92, 95% CI 0.36 to 2.33, 41 participants ([Lanza 2013](#)), very low quality of evidence, see [Analysis 3.2](#)

#### Impact on self report criminal activity

The studies did not assess this outcome.

### 4. Interpersonal psychotherapy versus a psycho-educational intervention

See [Summary of findings 4](#)

**Impact on self report drug use**

One study reported no statistically significant reduction in self report drug use: RR 0.67, 95% CI 0.30 to 1.50, 38 participants (Johnson 2012), very low quality of evidence, see Analysis 4.1

**Impact on self report criminal activity**

The studies did not assess this outcome.

**Cost and cost-effectiveness**

Four papers referred to the costs or cost-effectiveness of the therapeutic community programmes. The Sacks 2011 paper suggested that cost-beneficial analyses associated with each intervention in

achieving the desired outcome would greatly assist how best to allocate scarce resources. The Prendergast five-year evaluation presents economic differences when compared to the one-year Amity outcome study. The Prendergast research suggests that optimal cost savings appear to require prison treatment plus aftercare rather than prison treatment alone (McCollister 2013). One study contained some information about cost, but not sufficient to conduct a cost-effectiveness appraisal (Sacks 2004). The authors of this study noted that the additional marginal costs on top of the specific incarceration costs were USD7.37 per day, compared with the USD148.19 cost of a prison day. This suggests a substantial cost saving of using therapeutic community programmes as opposed to prison.

## ADDITIONAL SUMMARY OF FINDINGS *[Explanation]*

Mental health court for drug-using offenders with co-occurring mental illness						
<b>Patient or population:</b> drug-using offenders with co-occurring mental illness <b>Settings:</b> <b>Intervention:</b> Mental health court						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Mental health court				
<b>Self report dichotomous criminal activity</b> Follow-up: mean 12 months	Study population		<b>RR 1.05</b> (0.9 to 1.22)	208 (1 study)	⊕○○○ <b>very low</b> <sup>1,2</sup>	--
	724 per 1000	761 per 1000 (652 to 884)				
	Moderate					
	725 per 1000	761 per 1000 (652 to 885)				

\*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.

<sup>1</sup> 4 of the 9 items were rated as high risk; 4 of the 9 items were rated as unclear risk.

<sup>2</sup> Only 1 study with 208 participants

Motivational interviewing and cognitive skills for drug-using offenders with co-occurring mental illness						
<b>Patient or population:</b> drug-using offenders with co-occurring mental illness <b>Settings:</b> <b>Intervention:</b> Motivational interviewing and cognitive skills						
Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Motivational interviewing and cognitive skills				
<b>Self report drug use continuous</b> Follow-up: mean 3 months	--	The mean self report drug use continuous in the intervention groups was <b>7.42 lower</b> (20.12 lower to 5.28 higher)	--	162 (1 study)	⊕⊕○○ <b>low</b> <sup>1,2</sup>	--
<b>Self report drug use dichotomous</b> Follow-up: mean 3 months	<b>Study population</b> <b>364 per 1000</b>	<b>335 per 1000</b> (131 to 847)	<b>RR 0.92</b> (0.36 to 2.33)	41 (1 study)	⊕○○○ <b>very low</b> <sup>3,4</sup>	--
	<b>Moderate</b> <b>364 per 1000</b>	<b>335 per 1000</b> (131 to 848)				

\*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.

<sup>1</sup> 1 of 9 items judged as high risk; 7 of 9 items judged as unclear risk.

<sup>2</sup> Only 1 study with 162 participants.

<sup>3</sup> 3 of 9 items rated as high risk; 1 of 9 rated as unclear risk.

<sup>4</sup> Only 1 study with 41 participants.

**Interpersonal psychotherapy for drug-using offenders with co-occurring mental illness**

**Patient or population:** drug-using offenders with co-occurring mental illness  
**Settings:**  
**Intervention:** Interpersonal psychotherapy

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Control	Interpersonal psychotherapy				
Self report drug use dichotomous Follow-up: mean 3 months	Study population		RR 0.67 (0.3 to 1.5)	38 (1 study)	⊕○○○ very low <sup>1,2</sup>	
	474 per 1000	317 per 1000 (142 to 711)				
	Moderate					
	474 per 1000	318 per 1000 (142 to 711)				

\*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.

<sup>1</sup> 2 of 9 items rated as high risk; 2 of 9 items rated as unclear risk.  
<sup>2</sup> Only 1 study with 38 participants.

## DISCUSSION

### Summary of main results

This systematic review provided evidence from eight trials. The trials were conducted in secure settings and the court judicial system. We did not identify any studies that evaluated interventions for drug-using offenders with co-occurring mental illness in the community who were on parole or under the care of the probation service. We therefore do not know whether such interventions work better in one setting as opposed to another. Four different types of treatment interventions were classified across the studies. These were divided into: case management via a mental health drug court, therapeutic community treatment, motivational interviewing with cognitive skills in comparison to relaxation training, and interpersonal psychotherapy in comparison to a psycho-educational intervention. The therapeutic community studies reported statistically significant reductions in subsequent re-incarceration, but not for re-arrest. This finding supports previous research that demonstrates that the combination of therapeutic community treatment and aftercare release seem to produce the most consistent and successful results [Mitchell 2012a](#). Though not addressed within this review, those clients also remained in treatment for the longest period appeared to benefit the most ([Sacks 2004](#)). One of the included studies was specifically adapted therapeutic community treatment for women offenders. This study compared women assigned to therapeutic community treatment or standard treatment, a cognitive behavioural recovery and relapse prevention curriculum referred to in the system as the Intensive Outpatient Program ([Sacks 2008](#)). At six months the study found that both groups improved significantly on variables of mental health, substance use, criminal behaviour, and HIV risk. The authors note that further exploration of each model for different offender groups is required to permit a more precise utility of each model. The authors conclude that these preliminary findings suggest the importance of providing gender-specific sensitive and comprehensive approaches within the correctional system to respond to the complex substance abuse needs of female offenders ([Sacks 2008](#)). The more recent follow-up study investigated outcomes at 6 and 12 months. The outcomes followed a similar pattern, with both groups of women benefiting from treatment. Therapeutic community treatment was found to be more beneficial than cognitive behavioural therapy at improving re-incarceration rates and lengthening the amount of time spent in the community before subsequent re-incarceration ([Sacks 2008](#)).

We noted no statistically significant reductions for criminal activity or self report drug use with the use of case management via a mental health court; motivational interviewing with cognitive skills over relaxation training; and acceptance and commitment therapy (ACT) or interpersonal psychotherapy ([Cosden 2003](#); [Johnson 2012](#); [Lanza 2013](#); [Stein 2011](#)). The interpersonal psychotherapy was evaluated using a pilot study of women suffering from ma-

ior depression and substance use disorder ([Johnson 2012](#)). This study is primarily a feasibility study to assess the applicability of using interpersonal psychotherapy in a prison environment. While small, it is in fact one of the largest trials including women with co-occurring substance misuse and mental health problems. The findings showed that participants undergoing interpersonal psychotherapy had significantly reduced levels of depression and substance misuse over the attention-matched control. The study evaluating ACT in comparison to traditional cognitive behavioural therapy found higher levels of abstinence in the ACT (43.8%) when compared to the control (18.2%). These findings are similar to other studies that have used ACT albeit in non-incarcerated populations ([Hayes 2004](#)). The authors attribute the success of ACT to the nature of the 'co-joint' work between the therapist and client, the aim of which is to increase the flexibility and structure of the therapy allowing the client to have greater autonomy over decision-making. They argue that cognitive behavioural therapy is in contrast more systematically directed by the therapist, leaving little scope for responsive change ([Lanza 2013](#)). In summary, the studies varied greatly in nature, and given that they represent a series of singular trials, caution is called for in interpreting their results.

The impact on criminal-activity outcome measures varied, and the differences noted between the reductions in re-incarceration but not re-arrest could be a reflection of the measurement processes. For example, incarceration to prison is a longer process involving a court case, and as a numerical outcome measure is less likely to be recorded within the time frame of an experimental evaluation. In comparison, 'arrest' as a measurement outcome is more frequent and is recorded in the criminal justice system within a shorter time frame. [Sacks 2011](#) also argues that participation in different treatment options does not necessarily lead to less involvement with the criminal justice system, but that the severity of the offences are reduced such that re-incarceration is less likely. The follow-up studies to the Wexler trial also commented on differential effectiveness of treatment outcomes ([Prendergast 2003](#); [Prendergast 2004](#)). The authors argue that focusing on only one or two outcomes may mask the impact of treatment on other outcome domains that are of interest to various stakeholders. For example, measuring re-arrest or re-incarceration does not reveal the reason for why an individual has returned to correctional supervision. Questions that remain unanswered through such measurement include (i) the length of time an offender remains in the community until re-arrest, (ii) knowledge about what crimes are committed, and (iii) the reasons for return.

In terms of addressing some of the complex issues of individuals with mental illness and co-occurring substance abuse, the evidence from this systematic review provides little information. Only three studies discussed the differential treatment effects on the severity of depression ([Cosden 2003](#); [Johnson 2012](#); [Stein 2011](#)). The [Cosden 2003](#) study noted that further understanding of how to help clients with serious mental illness with different levels of



treatment is needed. The [Johnson 2012](#) study noted that participants undergoing interpersonal psychotherapy had significantly reduced levels of depression and substance misuse over the attention-matched control. The authors noted that the intensity of treatment delivered once the individual is released into the community is key to maintaining good outcomes. However, they go on to state that women often experience delays in treatment and service provision on release, and they suggest that alternative service provision such as phone treatment might be helpful in providing a more intensive post-release treatment and useful in times of crisis.

Several successful treatment elements were reported throughout the five trials with a number of key themes identified. First, we noted the issue of treatment engagement as important. In the mental health court trial, the informal support from family and friends encouraged the engagement of clients within the community to longer term gain ([Cosden 2003](#)). Second, programmes that were specifically adapted to the needs of mental health clients tended to include a cognitive behavioural curriculum that emphasised criminal thinking and behaviour alongside psycho-educational classes. The focus of combining these two types of mechanisms is to enhance an individual's ability to recognise and understand their substance misuse and mental health problems in more detail ([Sacks 2004](#)). Third, the longer an individual is engaged in treatment the better the outcome(s) ([Wexler 1999](#)).

## Overall completeness and applicability of evidence

### General applicability

The applicability of the evidence is hindered in general by the lack of trials covering a range of different treatment options for drug-using offenders with co-occurring mental illness. As the trials were conducted in the US judicial system, they are, therefore, limited in their generalisation to other criminal justice systems outside of the US. The current evidence suggests that therapeutic community treatment may have some effect in reducing re-incarceration rates, but we do not know how such treatment facilitates the specific rehabilitation requirements of drug-using offenders with co-occurring mental illness, and the studies represent singular outcomes. For drug use measures, the review only reports on self report drug use, as not enough information using biological outcome measures of drug use (for example hair and urine analysis) was available. As a result, the self report information must be interpreted with caution. In addition, we can say nothing about whether the treatments are effective in reducing drug use and subsequent criminal behaviour while offenders are on parole or on probation in the community.

### Mental health information

Although the review specifically sought to identify studies including participants with co-occurring mental illness, the study descriptions of mental ill health varied (see [Table 1](#)). The [Cosden 2003](#) study used a psychiatrist or psychologist to conduct a clinical interview to make a mental health diagnosis alongside substance misuse. This resulted in a mental health court sample of individuals diagnosed with a range of mental health problems including mood disorder, schizophrenia, bipolar disorder, and dual diagnosis. Other papers referred to use of the DSM-IV diagnostic criteria ([Sacks 2011](#)), but subsequently provided little information with regards to individual mental illness needs. Demographic information in the Sacks study reported on other aspects of mental health prognosis, including lifetime mental health treatment, lifetime in patient care, and prescribed medication ([Sacks 2004](#)). The [Wexler 1999](#) series of studies reported a range of diagnoses, including antisocial personality disorder, phobias, post-traumatic stress disorder, depression, dysthymia, and attention deficit disorder, but did not describe how these diagnoses were confirmed or assessed within the population.

Six of the eight trials reported on change in mental health well-being. Three trials reported on use of the Beck Depression Inventory, Global Severity Index, and the Posttraumatic Diagnostic Scale ([Sacks 2004](#); [Sacks 2008](#); [Sacks 2011](#)). Another study reported on depression but used the Hamilton Rating Scale for Depression ([Johnson 2012](#)). Two studies reported presence of mood disorder alongside schizophrenia, general anxiety disorder, and antisocial personality disorder ([Cosden 2003](#); [Lanza 2013](#)). Future updates of this review will include mental health outcomes in order to assess the impact of treatment on mental health well-being alongside criminality and drug use.

### Cost information

Cost information within the studies was lacking, allowing for little comparison of cost-effectiveness between different types of drug treatment programmes. Regular report of effect sizes would aid calculations for power analysis and provide estimates of the magnitude of treatment effect needed for cost-benefit and cost-effectiveness analysis.

### Quality of the evidence

Overall, the 'Risk of bias' assessment was limited due to lack of information reported in the trials. We therefore rated most of the studies on the majority of 'Risk of bias' measures as unclear. The main limiting factor was the lack of reporting evidence, which prevented the reviewer authors from making a clear judgement of bias. Since the imprecision of reporting lowers the quality of evidence, this means that 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. In addition, a number of specific

limitations were described relating to the study design (and leading to problems of selection bias), and sample sizes were small. The [Stein 2011](#) study was noted as being relatively underpowered. Replication of the study is required to enhance the generalisation and external validity of the study findings. Similar modest sample sizes were reported by [Sacks 2011](#) and [Cosden 2003](#), who suggested that larger samples should be used to provide a more precise estimate of effect. The [Cosden 2003](#) study also reported on the possibility of outcome bias, as the interviewer was not blind to the outcome condition of the participant, and loss to follow-up (25% of the study sample were lost to follow-up) at 12 months. Another possible selection bias concern in the series of Wexler studies was that participants were randomly assigned to the prison therapeutic community treatment and regular prison conditions but not to aftercare ([Wexler 1999](#); [Prendergast 2003](#); [Prendergast 2004](#)). The authors noted that possible differences in personal motivation may account for some of the positive outcomes associated with participants' continued support for aftercare services. Subsequently these participants were noted as having the highest 'readiness scores', which suggests that motivation creates an important consideration on client selection ([Wexler 1999](#)). Overall the quality of evidence was judged as moderate for therapeutic community and low to very low for mental health court, motivational interviewing, and interpersonal psychotherapy.

### Potential biases in the review process

Besides the limitations associated with the literature, there are also two limitations of the review methodology. 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. While the electronic database searches were updated to April 2014, the website information has only been updated to November 2011. As a result, the literature will require further extensive searching when the review is next updated.

## AUTHORS' CONCLUSIONS

### Implications for practice

This review highlights the paucity of evidence for drug-using offenders with co-occurring mental illness. Two of the five trials showed some promising results for the use of therapeutic community and aftercare, but only in relation to reducing subsequent re-incarceration. Overall, the studies showed a high degree of variation, warranting a degree of caution in the interpretation of the magnitude of effect and direction of benefit for treatment outcomes. More evaluations are required to assess the effectiveness of

interventions for drug-using offenders with co-occurring mental illness.

### Implications for research

We have identified several research implications:

1. Good-quality research is required to evaluate the effectiveness of interventions in offenders with substance misuse problems and co-occurring mental illness. Of particular interest is the extended long-term effects of aftercare and the level of contact required with services in the community. Further research to enhance to explore the intensity of different community treatment alternatives following release may help to unravel this process.
2. Better descriptions of participants' mental health problems and more detailed information about mental health diagnoses are required to enable the transferability of information to clinical practice. Such information could also facilitate the use of mental health diagnoses as a moderator within the analysis of the outcomes.
3. Trial interventions specifically focusing on females and adolescents are required. In the current review, only one study contained females, and one study reported on adolescents with depression.
4. Little is known about the interaction between mental illness, individual personal characteristics and positive outcomes relating to treatment success. In terms of depression, [Stein 2011](#) attempted to explore some of the differences between participants with few and with many depressive symptoms. Future studies should consider an analysis of existing datasets which might reveal which individuals with which mental health diagnosis fair better than others. This would reveal who might potentially benefit most from treatment and enable the appropriate targeting of resources.
5. Standardising cost and cost-effectiveness information within trial evaluations would help policymakers make decisions about health versus criminal justice costs. New outcome evaluations should consider the length of time to a parolee's re-arrest or re-incarceration, as this has cost implications. For example, the [Prendergast 2003/4](#) study found that community residential treatment kept parolees from relapse or recidivism so long as they remained in treatment topping treatment (prior to the intended dose) tended to lead to relapse or recidivism rates equivalent to participants who received prison treatment only ([Prendergast 2003](#); [Prendergast 2004](#)). Such evaluations provide potential important information for stakeholders and funding bodies involved in distributing budgets to fund such enterprises.

## ACKNOWLEDGEMENTS

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## REFERENCES

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\* Indicates the major publication for the study

## CHARACTERISTICS OF STUDIES

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

#### Cosden 2003

Methods	Allocation: random assignment Randomisation method: adequate/low risk Similar on drug use: unknown/unclear risk Similar on criminal activity: yes Blinding methodology: high risk Loss to follow-up: partial/high risk
Participants	235 adults Age not reported 50.2% male 70.6% European American Drug use not reported Alcohol use not reported 100% psychiatric history Eligibility criteria: adults charged with a crime or misdemeanour who were booked into county jail, had at least 1 prior booking and were diagnosed with a serious and pervasive mental illness and were residents of the county involved. Pre-plea participants were required to have no previous offences involving violence; post-adjudication participants with prior violence were eligible if they were considered to no longer pose a threat
Interventions	Court-based sentencing and case management intervention vs. treatment as usual (I) MHTC and ACT case management (n = 137) vs. (C) treatment as usual (n = 98) (I) received weekly or bi-weekly court supervision and frequent contact with case managers, duration 18 months, followed by treatment as usual if required (C) received traditional court proceedings and county mental health services as usual for at least 18 months, which was less intensive than (I)
Outcomes	Drug use (Addiction Severity Index, self report) during the last month at 12 months' follow-up Re-arrests dichotomous outcomes.
Notes	This research was sponsored by a grant from the California State Board of Corrections, the Mentally Ill Offender Crime Reduction Grant Program. Contract/grant sponsor: California State Board of Corrections No declaration of interest reported by the authors

#### *Risk of bias*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random number table
Allocation concealment (selection bias)	Unclear risk	Not reported

**Cosden 2003** (Continued)

Blinding of participants and personnel (performance bias) subjective outcomes	High risk	The interviewer was not blind to the condition of the client
Blinding of participants and personnel (performance bias) objective outcomes	High risk	The interviewer was not blind to the condition of the client
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information available
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information available
Incomplete outcome data (attrition bias) All outcomes	High risk	25% of the initial population could not be located at the end of 12 months
Selective reporting (reporting bias)	Unclear risk	Not reported
Other bias	High risk	The relatively small number of clients in each group resulted in chance variation on some of the intake measures. Generalisability issues and concerns about self report measures and validity

**Johnson 2012**

Methods	Allocation: random - wave randomisation Randomisation method: independently generated randomisation sequence. Exact methodology unclear Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: Principal investigator blinded to initial allocation, data collectors blinded throughout study period. Loss to follow-up: none reported
Participants	38 adults Average age: 35 years (SD 9.2) 100% female 18% Hispanic, 18% African American 58% cocaine dependence, 24% opiate dependence, 21% marijuana dependence, 21% sedative/hypnotic dependence 58% alcohol dependence 100% psychiatric history Criteria used for mental health diagnoses: "MDD as determined by the Structured

	<p>Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First et al., 1996a) after at least 4 weeks of abstinence and prison substance use treatment”</p> <p>Description of mental health problem: major depressive disorder</p> <p>Eligibility criteria: primary major depressive disorder as determined by the Structured Clinical Interview for DSM-IV Axis I Disorders after at least 4 weeks of abstinence and prison substance use treatment, minimum 17-item Hamilton Depression Scale score of 18, substance use disorder 1 month prior to incarceration as determined by the SCID, 10-24 weeks away from prison release. Women with bipolar disorder and psychotic disorder were excluded</p>
<p>Interventions</p>	<p>Prison-based, non-pharmacological intervention vs attention-matched control condition (I) Interpersonal psychotherapy (n = 19) vs (C) psycho-education (n = 19)</p> <p>Intervention group</p> <p>Intervention participants received manualised 60-75 min group sessions 3 times per week for 8 weeks plus pre-group, mid-group, and post-group individual sessions in prison for the treatment of substance misuse and mental health problems. Participants in both conditions also received 6 weekly post-release individual sessions to help maintain gains and address crises as they transitioned to the community. Session lengths varied between 60 and 75 min because of time taken to assemble women within the facilities, occasional early prison counts, and other facility logistics. In-prison treatment was condensed into 2 months because many incarcerated women serve short sentences (30, 60, 90, 180 days) . Group sessions were kept short (60 to 75 min) because prison providers advised us that incarcerated women would have difficulty tolerating treatment sessions longer than this length</p> <p>Control group</p> <p>Control condition participants received attention-matched manualised in-prison and post-release psycho-education, which is described as co-occurring mental health and substance use disorders (PSYCHOED). The psycho-education condition was adapted from a class on co-occurring disorders for prisoners that had been used at the women’s facilities in the past, but was not being used at the time of the study. It was designed to be credible and engaging without focusing on the theorised active ingredients of interpersonal psychotherapy (e.g., focus on social support, relationships, life changes, analysis of communication, and exploration of emotions). The stated purpose of PSYCHOED was to help women become informed and empowered consumers of mental health treatment services. The 24 in-prison sessions focused on the meaning of dual diagnosis, women’s experience with dual diagnosis, major depression, bipolar disorder, each of the anxiety disorders, post-traumatic stress disorder, personality disorders, psychotic disorders, eating disorders, and self care. Sessions for each disorder described symptoms (including relevant self report tests), interactions between the disorder and substance use, effects of the disorder on women in prison (including film clips and written stories), and disorder-specific medication and psychosocial treatment options. When a woman in group had symptoms of a disorder, the group discussed her treatment options and preferences. The 6 post-release sessions focused on women’s symptoms and connection with various mental health and substance use treatment options in the community. Study treatments took place in addition to prison treatment as usual. Treatment as usual consisted of prison residential or day treatment for substance use disorder (typically 16 to 30 hours per week) for all participants and prison mental health treatment as usual for most participants</p>



Outcomes	Relapse within 3-month follow-up period, defined as using drugs on at least 10% of non-incarcerated days or any positive breath test/urine drug screen. Hamilton Depression Scale scores	
Notes	Work supported by US National Institute of Drug Abuse. No declarations of interest were noted by the authors.	
<b>Risk of bias</b>		
<b>Bias</b>	<b>Authors' judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Low risk	Random sequence generated by person independent of rest of study. Wave randomisation used with at least 8 weeks between allocation to avoid contamination across prison wings
Allocation concealment (selection bias)	Low risk	Allocation adequately concealed from principal investigator and research assistants. An independent individual concealed the assignment of each wave before the study started. After the intake assessment was complete, the principal investigator unsealed the waves treatment assignment
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	Not reported
Blinding of outcome assessment (detection bias) subjective outcomes	Low risk	Adequate blinding throughout study. Research assistants who conducted the follow-up assessment at 3 months after prison release were kept blind to the condition
Blinding of outcome assessment (detection bias) objective outcomes	Low risk	Adequate blinding throughout study. Research assistants who conducted the follow-up assessment at 3 months after prison release were kept blind to the condition
Incomplete outcome data (attrition bias) All outcomes	Low risk	No loss to follow-up, intention-to-treat analysis

Selective reporting (reporting bias)	High risk	Did not report on SCID-I/SCID-II, Trauma History Questionnaire, or Timeline Followback
Other bias	High risk	Authors noted that the short timeline and limited outcomes made it difficult to assess relapse rates, as 26% of the sample remained in residential treatment at the end of the study

**Lanza 2013**

Methods	<p>Allocation: Allocation did not seem to be concealed</p> <p>Randomisation method: randomisation table</p> <p>Similar on drug use: No differences between the groups for “demographic characteristics” but not sure if this includes drug use. unclear</p> <p>Similar on criminal activity: No differences between the groups for “demographic characteristics” but not sure if this includes criminal activity. unclear</p> <p>Blinding methodology: Participants, investigators, and assessors were not blinded</p> <p>Loss to follow-up: All participants lost to follow-up were reported in study flow diagram, but the authors did not report if there were between-group differences</p>
Participants	<p>50 adults</p> <p>Average age: overall mean 33.2 (SD 7.2) (range 21-49) (cognitive behavioural therapy 35.2 (mean); acceptance and commitment therapy 31.1 (mean); control 33.1 (mean))</p> <p>100% female</p> <p>% white, not reported</p> <p>% drug users: CBT 100%, ACT 83.3%, control 100%</p> <p>% alcohol users: CBT 0%, ACT 16.7%, control 100%</p> <p>% psychiatric history: 86% had at least 1 mental disorder</p> <p>Eligibility criteria:</p> <ul style="list-style-type: none"> <li>• met diagnostic criteria for current substance use disorder</li> <li>• serving sentence of more than 6 months</li> </ul>
Interventions	<p>Intervention 1: cognitive behavioural therapy (CBT: n = 13) vs Intervention 2: acceptance and commitment therapy (ACT: n = 18) vs Control group (n = 13)</p> <p>Intervention 1</p> <p>16 weekly CBT group sessions lasting 90 minutes led by a trained therapist. CBT was used to change behaviour through cognitive restructuring, where therapist works with offender to identify thoughts that cause distress and uses CBT to alter resulting behaviour. Treatment offenders were assessed by the therapist afterwards, and follow-up was conducted at six months. The main outcome of the CBT intervention was to increase abstinence from drug use; this was measured and corroborated by urine analysis testing</p> <p>Intervention 2</p> <p>16 weekly ACT group sessions lasting 90 minutes led by a trained therapist. ACT seeks to undermine the grip of the literal verbal content of cognition that provokes avoidance</p>

	<p>behaviour and constructs an alternative context in which behaviour aligned with one's values is more likely to occur. Sessions involve both experiential and didactic learning to enable clients to experience and understand the key ACT processes. ACT helps offenders to respond to previously avoided events in new ways and uses validation and empowerment. The ACT therapy was aimed at increasing substance use abstinence within the prison population. Treatment offenders were assessed by the therapist afterwards, and follow-up was conducted at six months</p> <p>Control group Control group received a mental health assessment and then after 6 months received treatment. The offenders received a re-educational programme for inmates during the 6 months</p>
Outcomes	<p>Abstinence: 3 months without drug use, self report, corroborated by urinalysis Anxiety sensitivity measured by Anxiety Sensitivity Index Mental disorders measured on Mini International Neuropsychiatric Interview</p>
Notes	<p>Work supported by Trust for the Promotion of Scientific Applied Research and Technology in Asturias, Spain A second publication reporting on the same trial comparing 2 arms of the 3-armed trial can be found at: Lanza, P., Menedez, G.A. (2013). Acceptance and commitment therapy for drug abuse in incarcerated women. <i>Psicothema</i>, 25,3,307-312 No conflict of interest reported by authors.</p>

***Risk of bias***

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Use of random number table noted.
Allocation concealment (selection bias)	Unclear risk	No information reported.
Blinding of participants and personnel (performance bias) subjective outcomes	High risk	Participants, investigators, and assessors were not blinded to treatment allocation
Blinding of participants and personnel (performance bias) objective outcomes	High risk	Participants and personnel were not blinded to treatments.
Blinding of outcome assessment (detection bias) subjective outcomes	Low risk	Urinalysis was used to corroborate self reported abstinence
Blinding of outcome assessment (detection bias) objective outcomes	High risk	Therapists assessed the participants in their group.

**Lanza 2013** (Continued)

Incomplete outcome data (attrition bias) All outcomes	Low risk	Similar loss to follow-up across all 3 groups. A total of 9/50 lost (n = 4 for ACT, n = 3 for CBT, n = 2 for control)
Selective reporting (reporting bias)	Low risk	All outcome measures were reported as expected
Other bias	Low risk	No other concerns.

**Sacks 2004**

Methods	Allocation: random assignment Randomisation method: unclear Similar on drug use: no Similar on criminal activity: yes Blinding methodology: unknown/unclear risk Loss to follow-up: adequate/low risk
Participants	236 adults Mean age 34.3 years (SD 8.8) 100% male 49% white 100% drug-using 32% alcohol-using 100% psychiatric history Eligibility criteria: prisoners who had both a serious mental disorder and a substance use disorder
Interventions	Secure establishment-based therapeutic community vs. treatment as usual (I) Personal reflections TC and voluntary residential aftercare (n = 142) vs. (C) mental health programme combined with a substance use education course (n = 94) Intervention group Therapeutic communities have long been recognized as a major drug abuse treatment approach, particularly for the socially disaffiliated. TC has an established record of effectiveness in reducing drug use and criminality. The Personal Reflections initiative is a modified TC residential treatment programme that uses a cognitive behavioral curriculum within a foundation of TC principles to change attitudes and lifestyles in 3 critical areas: substance abuse, mental illness, and criminal thinking and behavior. The intervention group received a mixture of psycho-educational classes, cognitive behavioural methods, medication, and group therapy. Activities were attended 5 days per week for 4-5 hours per day with the rest of the day spent working in the prison; duration 12 months. Aftercare included mental health counselling, medication and psychiatric services, and basic skills. Activities were attended 3-7 days per week for 3-5 hours per day; duration 6 months Control group The control group received intensive psychiatric services with medication, weekly individual therapy and counselling, and specialised groups of cognitive behavioural work, anger management, therapy and education, domestic violence, parenting, and weekly

**Sacks 2004** (Continued)

	drug/alcohol therapy with a 72-hour course on substance abuse education and relapse prevention over a duration of 12 months	
Outcomes	<p><b>Sacks 2004 - Primary study</b>            Criminal activity regarding a new offence (official records) during the last 12 months at 12-months follow-up            Incarceration for a new offence (official records) during the last 12 months at 12-months follow-up</p> <p><b>Sullivan 2007 - Follow-up study</b>            Drug use (self report) at 12 months</p>	
Notes	Contract/grant sponsor: National Institute on Drug Abuse (NIDA); contract/grant number: P50 DA 7700.0003. No declaration of interest reported by the authors.	
<b>Risk of bias</b>		
<b>Bias</b>	<b>Authors' judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Unclear risk	Participants were randomly assigned p. 824
Allocation concealment (selection bias)	Unclear risk	Method of concealment not reported
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information on blinding reported
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information on blinding reported
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information on blinding reported
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information on blinding reported
Incomplete outcome data (attrition bias) All outcomes	High risk	Some difference between the groups. At follow-up, 82% for the (I) group and 69% for the (C) group. ITT was performed and missing data was added to the data set
Selective reporting (reporting bias)	Unclear risk	Limited information

Sacks 2004 (Continued)

Other bias	Unclear risk	No other obvious concerns with the study but difficult to assess
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**Sacks 2008**

Methods	<p>Allocation: random assignment          Randomisation method: unclear          Similar on drug use: yes          Similar on criminal activity: yes          Blinding methodology: unknown          Loss to follow-up: high risk--intention to treat noted</p>
Participants	<p><b>Sacks 2008 - primary study</b>          573 adult women          Mean age 35.6 (SD 7.5)          100% female          47.8% white          99% drug-using          Eligibility criteria: female inmates with at least 6 months remaining until parole with serious substance abuse problems requiring treatment and presenting a minimum/medium security risk</p> <p><b>Sacks 2012 - follow-up study at 6 and 12 months</b>          468 adult females          Average age: 35.1 years (SD 7.9)          100% female          47% white          26% Hispanic          100% drug users (as measured by Standardized Offender Assessment score)          Alcohol use: not reported          58% lifetime mental health treatment          Eligibility criteria: female offenders at Denver Women's Correctional Facility; at least 6 months, but no greater than 24 months remaining before parole eligibility; Colorado Department of Corrections Standardized Offender Assessments score of 4 or higher (indicating substance use disorder severe enough to require treatment); security risk level allowing participation in programme; consented</p>
Interventions	<p>(I) Therapeutic community programme (n = 257) vs (C) cognitive behavioural intervention (n = 211)          Intervention group          Therapeutic communities were initially designed for use in community-based residential settings, and the model has been successfully adapted for inmate populations. The model has been further modified for male inmates with co-occurring serious mental and substance use disorders, with previous evidence showing positive outcomes for reincarceration, substance use, and mental health symptoms. The intervention involved a 6-month tenure in a separate residential building with programme activities 4 hours per day, 5 days per week, supplemented by peer-led activities on weekends, and a further 4 hours per day, 5 days per week working within the prison complex. The programme followed therapeutic community principles, with additional gender-specific aspects</p>

	<p>Control group</p> <p>The control programme, known as the Intensive Outpatient Program, is the standard treatment that the Colorado Department of Corrections offers to all female offenders who have been classified as substance abusers. The intervention is designed to address substance abuse and criminality, with a focus on prevention of relapse and recidivism. The Intensive Outpatient Program substance abuse treatment curriculum consists of a 90-hour course, presented in an educational format (Strategies for Self-Improvement and Change, Wanburg &amp; Milkman, 1998), utilising a cognitive behavioural format to address underlying issues of substance use/abuse and criminal behavior. The course is completed within 15 weeks. Women in the programme can participate in multiple other services facility-wide including mental health assessments</p>	
Outcomes	<p>Criminal activity, arrest, and drug-related activity (self reported) at 6 and 12 months, and criminal record data (% incarcerated, mean days to incarceration) at 12 months post-prison release</p> <p>Self reported illegal drug use at 6 and 12 months</p>	
Notes	<p>Work supported by US Department of Health and Human Services, National Institutes of Health, National Institute on Drug Abuse</p> <p>No declarations of interest are noted by the authors</p>	
<b><i>Risk of bias</i></b>		
<b>Bias</b>	<b>Authors' judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Unclear risk	No information other than "were randomly assigned"
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No evidence to suggest blinding was done but lack of information makes it difficult to make an assessment
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No evidence to suggest blinding was done but lack of information makes it difficult to make an assessment
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No evidence about whether the assessors were blind
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No evidence about whether the assessors were blind
Incomplete outcome data (attrition bias) All outcomes	High risk	No loss to follow-up for re-incarceration outcome but loss to follow-up for other

**Sacks 2008** (Continued)

		outcomes unclear. ITT reported. Differences also noted between data collected using self report and official records. Intention-to-treat analysis used to analyse the outcome measures
Selective reporting (reporting bias)	Low risk	No evidence of selective reporting
Other bias	Low risk	Protocol noted

**Sacks 2011**

Methods	Allocation: random assignment Randomisation method: random number list Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: open label - no blinding Loss to follow-up: unclear risk
Participants	127 adults Mean age 38.2 years (SD 9.9) 100% male 56% white 100% co-occurring substance use and mental illness Alcohol use: unknown 61.8% with clinical level of psychological distress as measured by Global Severity Index Eligibility criteria: male, diagnosed with co-occurring mental and substance use disorders, had participated in 1 of 2 prison substance abuse treatment programmes, were approved for placement in a community corrections facility and were accepted by the provider agency for placement in a community corrections facility
Interventions	Secure establishment-based therapeutic community vs. parole supervision case management (I) re-entry modified TC (n = 71) vs. (C) parole supervision case management (n = 56) Intervention group The intervention consisted of a residential programme of 6 months' duration. Formal programme activities 3-7 days per week, 3-5 hours each day. Participants had progressively increasing independence, eventually being responsible for providing counsel, guidance, and coaching for new members. Participants also worked in the community and saved money for independent living. There were weekly group psycho-educational classes to address the interrelationship between mental disorders and substance abuse, as well as various other group and individual counselling sessions. Medication monitoring and psychiatric services were on site. Participants were given assistance with housing and encouragement for employment Control group The control participants were released to a community corrections facility, and left the facility during the day to go to work, have treatment, and report to parole officers. The control consisted of outreach and engagement activities, brokering community-based



	services, and direct provision of support and counselling services. There was a weekly relapse prevention group and daily medication monitoring. Psychiatric and substance abuse services were provided by outside agencies (community parole officers helped client choose). Unlike in the intervention, criminal thinking and behaviour were not specifically addressed. The average participant attended 1 group per week and had monthly psychiatric assessments
Outcomes	Rate of re-incarceration, number of days until re-incarceration, involvement in self reported criminal activity, number of days until self reported criminal activity. Alcohol and drug offences (self reported) %. Other offences (self reported) %. All at 12 months post-prison release
Notes	This project received support from the Department of Health and Human Services, National Institutes of Health, NIDA (Grant 5R01DA019982-[01-05]). 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 list
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	"Open-label trial", no blinding possible
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	"Open label trial", no blinding possible
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information about blinding presented
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information about blinding presented
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Some partial loss to follow-up
Selective reporting (reporting bias)	Unclear risk	Not reported
Other bias	Low risk	No other obvious concerns with the study

## Stein 2011

Methods	<p>Allocation: random assignment</p> <p>Randomisation method: random numbers table</p> <p>Similar on drug use: yes</p> <p>Similar on criminal activity: unknown/unclear risk</p> <p>Blinding methodology: unclear/unknown</p> <p>Loss to follow-up: partial/unclear risk</p>
Participants	<p>189 adolescents</p> <p>Mean age 17.12 years (SD 1.10). Range 14-19 years</p> <p>85.7% male</p> <p>32.8% white</p> <p>88.9% marijuana use</p> <p>63% alcohol use</p> <p>68.5% had significant depressive symptomatology during past week at baseline (CES-D)</p> <p>Eligibility criteria: 14-19 years old, sentenced to juvenile correctional facility for 4-12 months, engaged in at least monthly marijuana use or binge-drinking in the year before incarceration, used any alcohol or marijuana in the month prior to incarceration (or prior to the offence leading to incarceration)</p>
Interventions	<p>Secure establishment-based motivational interviewing vs. relaxation treatment (I) MI (n = 96) vs. (C) relaxation training (n = 85)</p> <p>Intervention group</p> <p>The intervention was designed specifically to reduce substance use and its associated risks and consequences. Consisted of 90-minute baseline intervention and 60-minute booster intervention within 2 weeks of release</p> <p>Comparison group</p> <p>The comparison group consisted of 90-minute baseline intervention and 60-minute booster intervention, and involved relaxation techniques as well as advice on risky behaviours associated with substance use</p>
Outcomes	Mean number of joints per day and mean percentage of days used marijuana at 3 months
Notes	<p>Results presented for both high and low depressive symptom scores. Results used in this review were for those identified as having high depressive symptomatology</p> <p>This research was supported by National Institute on Drug Abuse Grant R01 #13375 (to L.A.R. Stein, principal investigator).</p> <p>No declaration of interest reported by the authors.</p>

### *Risk of bias*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"Random assignment using a random number table"
Allocation concealment (selection bias)	Unclear risk	"Random number was placed in an envelope and opened by research staff after the baseline assessment"

**Stein 2011** (Continued)

Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	Researchers were blind until after the baseline assessment. Participants were not blinded
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	Researchers were blind until after the baseline assessment. Participants were not blinded
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	Follow-up assessments at 3 months were completed blind by the researchers but not at any other time point
Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	Follow-up assessments at 3 months were completed blind by the researchers but not at any other time point
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Some attrition, particularly for those individuals with more severe depression
Selective reporting (reporting bias)	Unclear risk	Limited information
Other bias	High risk	Short follow-up period and concerns about self report measures

**Wexler 1999**

Methods	Allocation: random assignment Randomisation method: unclear/unknown Similar on drug use: yes Similar on criminal activity: yes Blinding methodology: unknown/unclear risk Loss to follow-up: adequate/low risk
Participants	715 adults Mean age 30.9 years (SD 7.4) 100% male 37.8% white 100% drug-using Alcohol use not reported 100% psychiatric history Eligibility criteria: offenders with a drug problem who were 9-14 months from parole. Offenders convicted of arson or sexual crimes to minors were not eligible
Interventions	Secure establishment-based therapeutic community vs. no treatment (I) Amity TC and (I1) voluntary residential aftercare (n = 247) vs. (C) waiting-list control (n = 290) (I) TC included a 2- to 3-month orientation phase, a 5- to 6-month treatment stage, and

**Wexler 1999** (Continued)

	<p>a 1- to 3-month re-entry phase; total duration 12 months. The intervention elements included a needs assessment, education, group work, counselling, and prison industry jobs</p> <p>(I1) voluntary residential aftercare in the community for up to 12 months</p> <p>(C) waiting-list control</p>
Outcomes	<p><b>Wexler 1999a:</b>            Incarceration (official records) during the last 12 months at 12 months' follow-up            Incarceration (official records) during the last 24 months at 24 months' follow-up</p> <p><b>Wexler 1999b:</b>            Incarceration (official records) during the last 36 months at 36 months' follow-up</p> <p><b>Prendergast 2003:</b>            Arrest for any offence (self report), arrest for a drug offence (self report), incarceration for any offence (official records) 12-months post-release</p> <p><b>Prendergast 2004:</b>            Incarceration (official records) during the last 60 months at 60 months' follow-up            Drug use (self report) during the last 60 months at 60 months' follow-up</p>
Notes	<p>This study was a cooperative effort by the Center for Therapeutic Community Research at National Development and Research Institutes, Inc. and the California Department of Corrections and Rehabilitation Office of Substance Abuse Programs. The evaluation was funded by the National Institute of Drug Abuse, Grant #PAODA07700-01</p>

**Risk of bias**

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	It was noted that the participants were "randomly" assigned and stratified by ethnic makeup. Randomisation only applied to the TC and not to aftercare
Allocation concealment (selection bias)	Unclear risk	No information provided
Blinding of participants and personnel (performance bias) subjective outcomes	Unclear risk	No information on blinding was provided
Blinding of participants and personnel (performance bias) objective outcomes	Unclear risk	No information on blinding was provided
Blinding of outcome assessment (detection bias) subjective outcomes	Unclear risk	No information on blinding was provided

**Wexler 1999** (Continued)

Blinding of outcome assessment (detection bias) objective outcomes	Unclear risk	No information on blinding was provided
Incomplete outcome data (attrition bias) All outcomes	Low risk	Outcomes for the first 12 months post-release were obtained for all 715 participants
Selective reporting (reporting bias)	Unclear risk	Information not reported
Other bias	High risk	Only the prison phase was randomised. Aftercare was voluntary and participants self selected. Concerns about bias in self selection processes p.164-165

ACT: acceptance and commitment therapy; CBT: cognitive behavioural therapy; CES-D: Center for Epidemiologic Studies Depression Scale; (C): control; DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; (I): intervention; ITT: intention to treat; MDD: major depressive disorder; MHTC: mental health treatment court; MI: motivational interviewing; SCID: Structured Clinical Interview for DSM Disorders; SD: standard deviation; TC: therapeutic community.

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

Study	Reason for exclusion
Alemi 2010	Study population did not have co-occurring mental illness
Alessi 2011	Not original RCT. Data are 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 (or both) measures at both the pre- and post-intervention periods
Awgu 2010	The study did not report relevant drug or crime outcome (or both) measures 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
Baltieri 2014	Intervention not aimed at reducing drug use or criminal activity, or both
Barnes 2012	Intervention not aimed at reducing drug use or criminal activity, or both

(Continued)

Bayanzadeh 2004	Did not provide mental health information
Berman 2004	Intervention not aimed at reducing drug use or criminal activity, or both
Black 2011	Not an offender population
Brady 2010	Not RCT
Braithwaite 2005	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Breckenridge 2000	Evaluated a DWI Court for alcoholic offenders, not illicit drug use
Britt 1992	Did not provide mental health information
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
Brown 2013	Did not provide mental health information
Burdon 2013	Did not provide mental health information
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	Study population did not have co-occurring mental illness
Carroll 2011	Not offender population
Carroll 2012	Did not provide mental health information
Chandler 2006	The study did not report relevant drug or crime outcome (or both) measures 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 pre- and post-test data on either drug or crime outcomes
Cogswell 2011	Did not present mental health information
Cornish 1997	Study population did not have co-occurring mental illness
Cosden 2003a	Did not present mental health information
Cosden 2005	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods

(Continued)

Coviello 2010	Study population did not have co-occurring mental illness
Coviello 2012	Did not present mental health information
Cox 2013	Not an offender population
Cropsey 2011	Study population did not have co-occurring mental illness
Cropsey 2013	Did not present mental health information
Cullen 2011	Not an intervention aimed at reducing drug use or criminal activity, or both
Cusack 2010	Not an intervention aimed at reducing drug use or criminal activity, or both
D'Amico 2013	Did not present mental health information
Dakof 2010	Study population was 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 (or both) measures at both the pre- and post-intervention periods The follow-up periods reported for the different groups were not equivalent
Deschenes 1994	Study population did not have co-occurring mental illness
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 (or both) measures at both the pre- and post-intervention periods
Dolan 2003	Study population did not have co-occurring mental illness
Dole 1969	No outcome based on mental health problems
Dugan 1998	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Evans 2012	Not an RCT
Forsberg 2011	Study population did not have co-occurring mental illness
Freudenberg 2010	Study population did not have co-occurring mental illness
Friedman 2012	Not an RCT

(Continued)

Frost 2013	Not an RCT
Gagnon 2010	Not offender population
Gil 2004	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Gordon 2012	No pre- and post-test outcomes of drug or criminal activity, or both
Gordon 2013	No relevant primary data, all data presented considered a secondary post hoc analysis
Gottfredson 2002	Study population did not have co-occurring mental illness
Grohman 2004	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Grommon 2013a	Did not contain any mental health information
Grommon 2013b	Did not contain any mental health information
Guydish 2011	Study population did not have co-occurring mental illness
Guydish 2014	Not criminal justice population
Haapanen 2002	Study population did not have co-occurring mental illness
Haasen 2010	Not offender population
Hanlon 1999	Study population did not have co-occurring mental illness
Harada 2012	No data at pre- and post-test on outcomes of drug or criminal activity, or both
Harrell 2001	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Henderson 2010	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Henggeler 1991	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Henggeler 1999	Study population did not have co-occurring mental illness
Henggeler 2002	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Henggeler 2006	Study population did not have co-occurring mental illness



(Continued)

Henggeler 2012	Study population did not have co-occurring mental illness
Howells 2002	Study population did not have co-occurring mental illness
Hser 2011	Unclear if study looked at offender population
Hser 2013	Study population did not have co-occurring mental illness
Inciardi 2004	Some participants were not randomly selected into the treatment groups
Jain 2011	Not an offender population
Johnson 2011	Study population did not have co-occurring mental illness
Jones 2011	Evaluated a DWI Court for alcoholic offenders, not illicit drug use
Jones 2013	Study population did not have co-occurring mental illness
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	Study population did not have co-occurring mental illness
Kidorf 2013	Not an offender population
King 2014	Not an offender population
Kinlock 2005	Study population did not have co-occurring mental illness
Kinlock 2007	Study population did not have co-occurring mental illness
Kinlock 2008	Study population did not have co-occurring mental illness
Kinlock 2009	Conference proceedings only
Kinlock 2009b	Study population did not have co-occurring mental illness
Kok 2013	Not offender population
Law 2012	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Lee 2012	Study population did not have co-occurring mental illness
Liddle 2011	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods

(Continued)

Ling 2013	Not offender population
Lobmaier 2010	Study population did not have co-occurring mental illness
Lobmann 2007	Study population did not have co-occurring mental illness
Lobmann 2009	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
MacDonald 2007	Evaluated a DWI Court for alcoholic offenders, not illicit drug use
Magura 2009	Study population did not have co-occurring mental illness
Marlowe 2003	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Marlowe 2005	Study population did not have co-occurring mental illness
Marlowe 2007	Participants were not randomised to treatment group but once in a group were randomised by level of risk Not an RCT
Marlowe 2008	Study population did not have co-occurring mental illness
Marsch 2014	Not offender population
Martin 1993	Study population did not have co-occurring mental illness
Mbilinyi 2011	Participants not recruited through criminal justice system
McKendrick 2007	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
McKenzie 2012	Did not present mental health information
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 (or both) measures at both the pre- and post-intervention periods
Milloy 2011	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
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

(Continued)

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 (or both) measures 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 (or both) measures at both the pre- and post-intervention periods
Nielsen 1996	Study population did not have co-occurring mental illness
Nosyk 2010	Not offender population
Petersilia 1992	Did not present mental health information
Petry 2005	Partial criminal justice population
Petry 2011	Not offender population
Polsky 2010	Not offender population
Prendergast 2008	Did not present mental health information
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	Study population did not have co-occurring mental illness
Proctor 2012	Study population did not have co-occurring mental illness
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
Rossmann 1999	Study population did not have co-occurring mental illness
Rounsaville 2001	The study did not report relevant drug or crime outcome (or both) measures at both the pre- and post-intervention periods
Rowan-Szal 2005	Not offender population
Rowan-Szal 2009	Not RCT

(Continued)

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
Sanchez-Hervas 2010	Not offender population
Schaeffer 2014	No mental health information
Schmiege 2009	No pre- and post-test data on drug or crime outcome measures, or both
Schwartz 2006	Not offender population
Shanahan 2004	Did not contain a population with mental illness
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	Did not contain a population with mental illness
Smith 2010	Study population did not have co-occurring mental illness
Solomon 1995	Not offender population
Specka 2013	Not 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 data pre- and post-test for drug or crime measures, or both
Stein 2010	Not offender population
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/Thanner 2003	Study population did not have co-occurring mental illness
Vagenas 2014	No pre- and post-test data on either drug or crime measures, or both
Vanderberg 2002	No pre- and post-test outcome data on crime or drug measures, or both
Walters 2014	No data on pre- or post-test outcome data on crime or drug measures, or both

(Continued)

Wang 2010	Participants not in criminal justice system
Webster 2014	No data on pre- and/or post-test crime and/or drug measures
White 2006	Randomisation broken as 40% of control arm were allowed to receive treatment (acupuncture) outside of the intervention
Williams 2011	Not RCT
Winstanley 2011	Not clear if offender population
Witkiewitz 2010	Not clear if offender population
Wolff 2012	No data at pre- and/or post-test measures of drug and/or crime measures
Wright 2011	No separate mental health data
Zlotnick 2009	Study population did not have co-occurring mental illness

RCT: randomised controlled trial

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

#### Springer ongoing

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 randomised controlled trial of depot NTX (d-NTX) for HIV+ prisoners with opioid dependence who are transitioning to the community 150 participants within the criminal justice system in New Haven, Hartford, and Springfield. Subjects will be randomised 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-NTX as they are transitioning from the correctional to the community setting 150 participants
Interventions	Depot-NTX versus placebo
Outcomes	6 and 12 months HIV treatment (HIV-1 RNA levels, CD4 count, antiretroviral adherence, retention in care), substance abuse (time to relapse to opioid use, % opioid negative urine results, 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 NTX treatment among HIV+s and establish depot-NTX treatment as an

**Springer ongoing** (Continued)

	effective, evidence-based treatment for opioid dependence for released HIV+ prisoners
Starting date	2012
Contact information	Yale University
Notes	

NTX: naltrexone

## DATA AND ANALYSES

### Comparison 1. Therapeutic community

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Criminal activity	4		Risk Ratio (M-H, Random, 95% CI)	Totals not selected
1.1 Re-arrests	2		Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]
1.2 Re-incarceration	3		Risk Ratio (M-H, Random, 95% CI)	0.0 [0.0, 0.0]

### Comparison 2. Mental health court

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Self report dichotomous criminal activity	1		Risk Ratio (M-H, Random, 95% CI)	Totals not selected

### Comparison 3. Motivational interviewing and cognitive skills

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Self report drug use continuous	1		Mean Difference (IV, Random, 95% CI)	Totals not selected
2 Self report drug use dichotomous	1		Risk Ratio (M-H, Random, 95% CI)	Totals not selected

### Comparison 4. Interpersonal psychotherapy

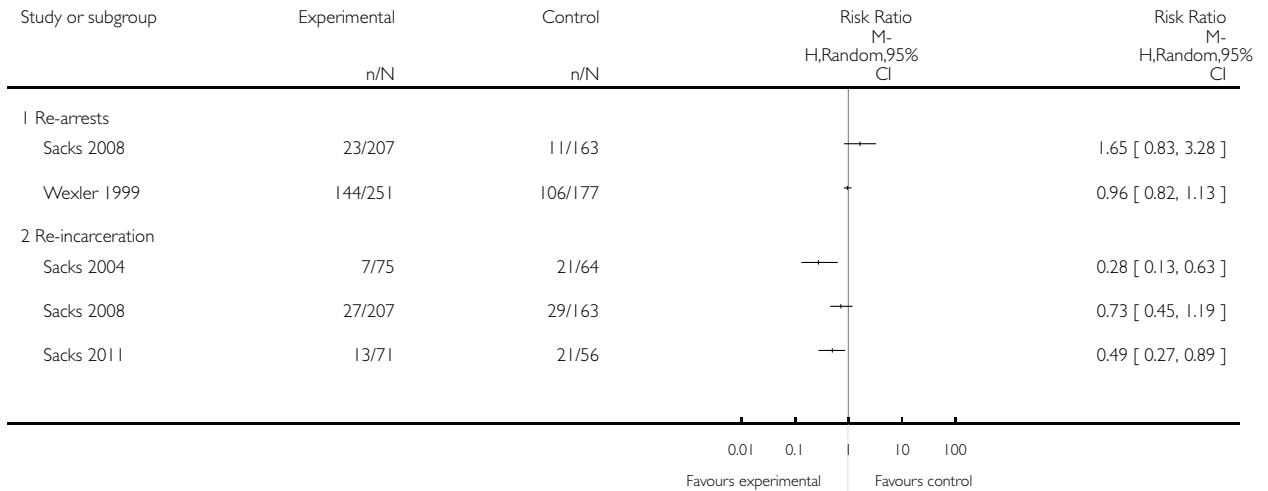
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Self report drug use dichotomous	1		Risk Ratio (M-H, Random, 95% CI)	Totals not selected

### Analysis 1.1. Comparison 1 Therapeutic community, Outcome 1 Criminal activity.

Review: Interventions for drug-using offenders with co-occurring mental illness

Comparison: 1 Therapeutic community

Outcome: 1 Criminal activity

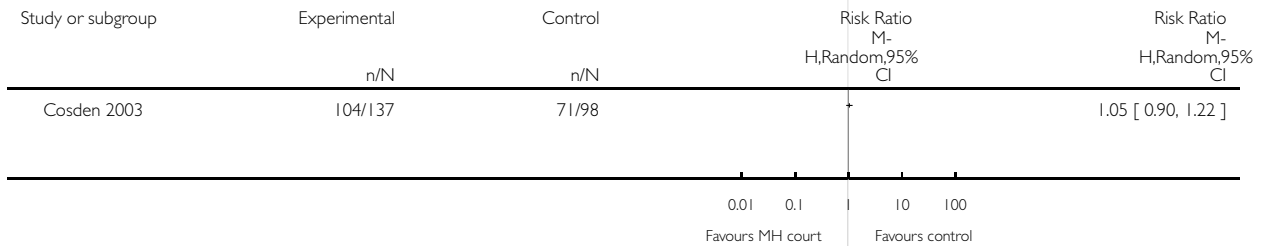


### Analysis 2.1. Comparison 2 Mental health court, Outcome 1 Self report dichotomous criminal activity.

Review: Interventions for drug-using offenders with co-occurring mental illness

Comparison: 2 Mental health court

Outcome: 1 Self report dichotomous criminal activity



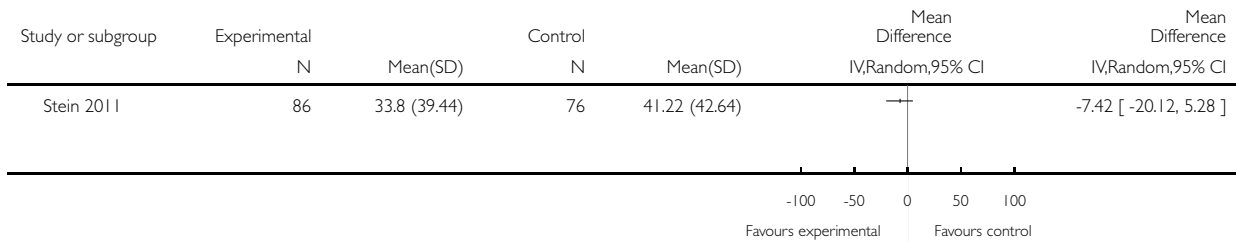


**Analysis 3.1. Comparison 3 Motivational interviewing and cognitive skills, Outcome 1 Self report drug use continuous.**

Review: Interventions for drug-using offenders with co-occurring mental illness

Comparison: 3 Motivational interviewing and cognitive skills

Outcome: 1 Self report drug use continuous

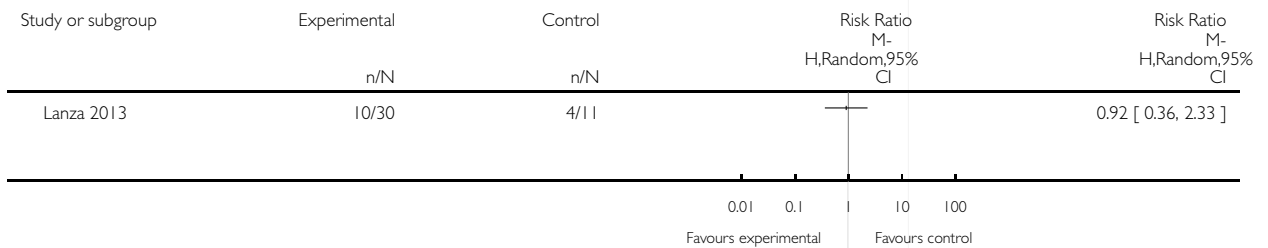


**Analysis 3.2. Comparison 3 Motivational interviewing and cognitive skills, Outcome 2 Self report drug use dichotomous.**

Review: Interventions for drug-using offenders with co-occurring mental illness

Comparison: 3 Motivational interviewing and cognitive skills

Outcome: 2 Self report drug use dichotomous

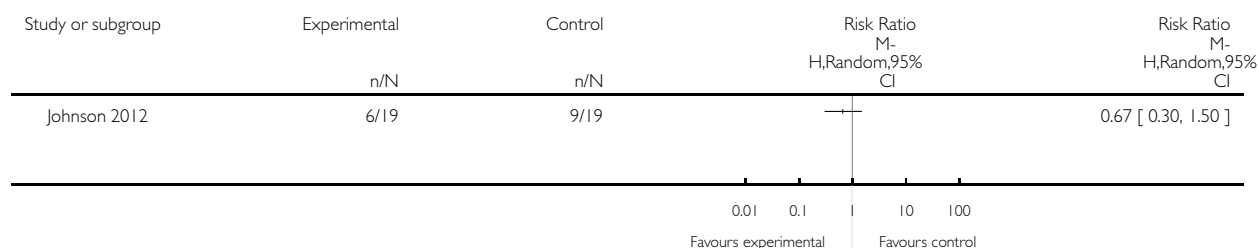


### Analysis 4.1. Comparison 4 Interpersonal psychotherapy, Outcome 1 Self report drug use dichotomous.

Review: Interventions for drug-using offenders with co-occurring mental illness

Comparison: 4 Interpersonal psychotherapy

Outcome: 1 Self report drug use dichotomous



## ADDITIONAL TABLES

Table 1. Mental health diagnoses

Study, year	Criteria used for diagnoses	Description of mental health problem
<a href="#">Cosden 2003</a>	Determined by a psychiatrist/psychologist on the basis of a clinical interview and observations	Mood disorder Schizophrenia Bipolar disorder Other Dual diagnosis
<a href="#">Johnson 2012</a>	Hamilton Rating Scale for Depression Median duration of index episode in months Number of depressive episodes Number of previous suicide attempts DSM-IV Axis I disorders using the SCID-I/II.	Criteria for a major depressive disorder at least 4 weeks after substance abuse treatment Minimum score of 18 on the Hamilton Rating Scale for Depression
<a href="#">Lanza 2013</a>	DSM-IV Mini International Neuropsychiatric Interview Anxiety Sensitivity Index	Anxiety Mental health disorders Antisocial personality disorder Major depressive disorder Generalised anxiety disorder
<a href="#">Sacks 2004</a>	DIS	Diagnoses of lifetime Axis I or Axis II mental disorder Antisocial personality disorder

**Table 1. Mental health diagnoses** (Continued)

Sacks 2008	Global Severity Index Beck Depression Inventory Lifetime of mental health PTSD Symptom Scale - Interview Post-traumatic Stress Diagnostic Scale	Depression PTSD Lifetime of mental health
Sacks 2011	DSM-IV diagnostic criteria Beck Depression Inventory Post Traumatic Stress Disorder Symptom Scale Brief Symptom Inventory Global Severity Index	Depression PTSD Psychological distress
Stein 2011	CES-D Scale	Scores > 16 indicate presence of significant depression. 69.8% had significant depressive symptoms
Wexler 1999; Prendergast 2003; Prendergast 2004	Not specified	Antisocial personality disorder Phobias PTSD Depression Dysthymia Attention deficit hyperactivity disorder

CES-D: Center for Epidemiological Studies - Depression; DIS: Diagnostic Interview Schedule; DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; PTSD: post-traumatic stress disorder; SCID: Structured Clinical Interview for DSM Disorders.

**Table 2. Summary research evidence for the narrative synthesis**

Paper, year	Intervention	Comparison	Follow-up	Outcome type	Measurement	Actual outcome
Cosden 2003	Sentencing and case management (mental health treatment court and assertive community treatment case management)	Treatment as usual	6 and 12 months	Criminal activity dichotomous Self report drug use continuous	% and total mean and SD	% arrested and spent some time in jail % convicted of a new crime Mean Addiction Severity Index (drug) composite score
Wexler 1999; Prendergast 2003; Prendergast 2004	Therapeutic community, counselling and aftercare	Treatment as usual and waiting-list control	12, 24, 36 months up to 5 years	Biological drug use dichotomous Criminal activity continuous Criminal activity	% and total mean and SD	% testing positive for illicit drugs at 12 months' follow-up

**Table 2. Summary research evidence for the narrative synthesis** (Continued)

				dichotomous Self report drug use dichotomous		Mean months incarcerated in the year following release % any arrest % arrested for drug crime % arrested for property crime % arrested for vi- olent crime % arrested for other crime % used drugs heavily in past year at 5 years Mean days until re-incarceration % re- incarcerated Mean days on parole to first re- turn to custody % returned to prison within 3 years post- parole
Sacks 2004	Modified therapeutic community (Personal Reflections therapeutic community and voluntary residential aftercare)	Intensive psychiatric services	12 months	Criminal activity continuous Criminal activity dichotomous Self report drug use dichotomous	Mean and SD % and total	Mean number of days until incarceration Mean number of days until first crime % re-incarceration % criminal activity % alcohol/drug offence % other (non-alcohol/drug) offence % illegal drug use
Sacks 2011	Therapeutic community (re-entry modified)	Parole supervision case management	12 months	Criminal activity dichotomous	% with total	% re-incarcerated % self reported criminal activity

**Table 2. Summary research evidence for the narrative synthesis** (Continued)

Sacks 2008	Therapeutic community	Cognitive behavioural therapy	6 and 12 months	Criminal activity dichotomous Criminal activity self report and official Self report drug use	% with total	Criminal activity, arrest, and drug-related activity (self-reported) Criminal record data (% incarcerated, mean days to incarceration) % self-reported illegal drug use
Johnson 2012	Interpersonal psychotherapy	psycho-educational	3 months	biological drug use	% with total	Relapse within 3-month follow-up period, defined as using drugs on at least 10% of non-incarcerated days or any positive breath test/urine drug screen
Lanza 2013	Cognitive behavioural therapy and acceptance and commitment therapy	control group	3 months	Self report drug use dichotomous	% and total	Self report, corroborated by urinalysis
Stein 2011 (high depression score)	Motivational interviewing	Relaxation training	3 months	Self report drug use continuous	Mean and SD	Mean joints per day Mean % days used marijuana

SD: standard deviation

## APPENDICES

### Appendix I. Cochrane Central Register of Controlled Trials (CENTRAL) 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*)
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 2. MEDLINE search strategy

<b>MEDLINE search</b>
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

(Continued)

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 3. 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/
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/



(Continued)

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
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/

(Continued)

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
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 4. 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)
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

(Continued)

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
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)

(Continued)

- |                                                                                                             |
|-------------------------------------------------------------------------------------------------------------|
| 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 5. PASCAL, SciSearch, Social SciSearch, 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 |

(Continued)

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
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 THROUGH-CARE OR AFTER-CARE 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()ANONYMOUS)/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

(Continued)

31. (DIVERSION OR DTTO OR DTOS 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
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

(Continued)

- |                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 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()INTRA-<br>VENOUS/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                                                                               |
| 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,<br>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,<br>434,7,99,65,35,6                              |
| 66. FAMILY-RELATIONS/DE                                                                                                                       |
| 67. (COMMUNITY-REINFORCEMENT OR SELF-MONITORING OR SELF-CONTROL OR SELF-MANAGEMENT OR<br>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                                                                                      |



(Continued)

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 THROUGH-CARE OR AFTER-CARE 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

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

(Continued)

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

## Appendix 6. 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\*

13. ex-offender\*

14. jail or jails

15. incarcerat\*

(Continued)

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
38. amphetamine-related disorders
39. cocaine-related disorders
40. marijuana abuse

(Continued)

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 7. Sociological Abstracts search strategy

Sociological Abstracts
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
13. recidivism in de
14. jail in de

(Continued)

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
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

(Continued)

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
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

(Continued)

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 8. 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

13. recidivism in de

14. jail in de

(Continued)

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
37. #19 and #36



## Appendix 9. 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)
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)

(Continued)

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 10. 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)

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)

(Continued)

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 II. 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

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

(Continued)

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
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 urinalys* 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

(Continued)

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

## Appendix 12. 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

(Continued)

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))
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)

(Continued)

42. ANALGESICS-ADDICTIVE:ME
43. ANALGESICS-OPIOID:ME
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 13. 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 {reincarcat} or {recidivi} or {ex-offender} or {jail} or {incarcat} 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 {reincarcat} or {recidivi} or {ex-offender} or {jail} or {incarcat} 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 {reincarcat} or {recidivi} or {ex-offender} or {jail} or {incarcat} 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 {reincarcat} or {recidivi} or {ex-offender} or {jail} or {incarcat} 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

(Continued)

9. drug involved
10. substance-related
11. amphetamine-related
12. cocaine-related
13. marijuana
14. opioid
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 14. Criteria for assessing risk of bias

Item	Judgement	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; minimisation
	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 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 1 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



(Continued)

	High risk	Investigators enrolling participants could possibly foresee assignments because 1 of the following methods 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
	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

(Continued)

7. Incomplete outcome data (attrition bias) For all outcomes except retention in treatment or drop-out	Low risk	<p>No missing outcome data</p> <p>Reasons for missing outcome data unlikely to be related to true outcome (for survival data, censoring unlikely to be introducing bias)</p> <p>Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups</p> <p>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</p> <p>For continuous outcome data, plausible effect size (difference in means or standardised difference in means) among missing outcomes not enough to have a clinically relevant impact on observed effect size</p> <p>Missing data have been imputed using appropriate methods</p> <p>All randomised participants are reported/analysed in the group they were allocated to by randomisation irrespective of non-compliance and co-interventions (intention to treat)</p>
	High risk	<p>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</p> <p>For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk enough to induce clinically relevant bias in intervention effect estimate</p> <p>For continuous outcome data, plausible effect size (difference in means or standardised difference in means) among missing outcomes enough to induce clinically relevant bias in observed effect size</p> <p>'As-treated' analysis done with substantial departure of the intervention received from that assigned at randomisation</p>
	Unclear risk	<p>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)</p>
8. Selective reporting (reporting bias)	Low risk	<p>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</p> <p>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)</p>
	High risk	<p>Not all of the study's pre-specified primary outcomes have been reported</p> <p>1 or more primary outcomes is reported using measurements, analysis methods, or subsets of the data (e.g. subscales) that were not pre-specified</p> <p>1 or more reported primary outcomes were not pre-specified (unless clear justification for their reporting is provided, such as an unexpected adverse effect)</p> <p>1 or more outcomes of interest in the review are reported incompletely so that they cannot be entered in a meta-analysis</p> <p>The study report fails to include results for a key outcome that would be expected to have been reported for such a study</p>

(Continued)

	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 that 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 intention-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 June 2015	Amended	Amended byline
18 May 2015	New citation required but conclusions have not changed	conclusions not changed
11 July 2014	New search has been performed	This review has been update to May 2014. The process has added an additional 3 trials bringing the total number of trials for this review to 8 represented by 14 publications

## HISTORY

Review first published: Issue 1, 2014

Date	Event	Description
28 May 2012	New search has been performed	This review has been updated using searches to 21st March 2013. The review represents one in a family of four reviews. The reviews cover pharmacological, non pharmacological and drug using female offenders. This review of interventions with drug-using offenders with co-occurring mental illness contains five randomised controlled trials. The trials represent a total of 1,502 participants

(Continued)

2 October 2011	New search has been performed	The updated edit of this review produced a new document with additional findings with searches up to 11th November 2011. Five new authors have been added to this version of the review. These include Steven Duffy, Rachael McCool, Matthew Neilson, Catherine Hewitt and Marrison Martyn-St James
1 July 2011	Amended	Converted to new review format.
8 June 2011	New search has been performed	Review has been substantially updated
19 May 2006	New citation required and conclusions have changed	Substantive amendment

## CONTRIBUTIONS OF AUTHORS

One review author (DF) constructed and conducted the searches. Three review authors (AEP, MN, RW) independently inspected titles and abstracts identified by the search strategy. We obtained each potentially relevant study as a full article, and two review authors independently assessed these for inclusion. In the case of discordance, a third review author arbitrated. Where it was not possible to evaluate the study because of language problems or missing information, we classified the study as 'translation/information required to determine decision' until we could obtain a translation or further details. Five review authors (AEP, MM-SJ, JMG, RW, MN) conducted data extraction for the papers, and one review author (CG) conducted data extraction and a narrative summary of the cost-effectiveness studies. Five review authors (MM-ST, MN, CH, RW, AEP) compiled and organised the results, and all eight review authors contributed to 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

Marrison 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**

None.

## **INDEX TERMS**

### **Medical Subject Headings (MeSH)**

Case Management; Crime [prevention & control; statistics & numerical data]; Diagnosis, Dual (Psychiatry); Law Enforcement; Mental Disorders [\*therapy]; Motivational Interviewing; Randomized Controlled Trials as Topic; Substance-Related Disorders [\*therapy]; Therapeutic Community

### **MeSH check words**

Adolescent; Adult; Female; Humans; Male; Young Adult