

# Brief Report

## Effectiveness of acupuncture in selected mental health conditions

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### Important note:

- The purpose of this review is to summarise evidence on the effectiveness of acupuncture in selected mental health disorders specifically Major Depressive Disorder, Dysthymia, Anxiety Disorder, Borderline Personality Disorder and Post Traumatic Stress Disorder (PTSD)
- This summary is not intended to replace clinical judgement or be used as a clinical protocol. The content does not represent the official view of ACC or represent ACC policy.
- A reasonable attempt has been made to find and review papers relevant to the focus of this report; however, it does not claim to be exhaustive.
- The review has been prepared by the staff of the Knowledge Management Team, Clinical Services Directorate in consultation with the Evidence Based Healthcare Group, ACC Research.
- This review is primarily based upon information supplied up to September 2013 and subsequently updated in February 2014 incorporating the feedback from external peer reviewers.

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## **Glossary of Acupuncture terms:**

1. Manual acupuncture involves stimulation of specific acupuncture points or anatomical points on the body through penetration of the skin with thin, solid, metallic needles that are manipulated by hands (Cheuk, Yeung, Chung, & Wong, 2012; Smith, Hay, & MacPherson, 2010). This is the common method of acupuncture used in Traditional Chinese Medicine.
2. Electro-acupuncture involves stimulation of specific acupuncture points by passing a pulsed current through the body using acupuncture needles (Cheuk, et al., 2012; Smith, et al., 2010).
3. Laser acupuncture involves stimulation of specific acupuncture points by laser beam instead of an acupuncture needle (Cheuk, et al., 2012; Smith, et al., 2010).
4. Sham acupuncture involves the insertion of an acupuncture needle into a non acupuncture point (Smith, et al., 2010).
5. Minimal acupuncture involves inserting needles into non acupuncture points superficially, without stimulation or manipulation to avoid obtaining the needling sensation (Smith, et al., 2010).
6. Non penetrating acupuncture involves the use of a blunted needle (placebo needle) that appears to pierce the skin but does not (Smith, et al., 2010).
7. Mock electro-acupuncture and mock laser acupuncture involve use of a decommissioned acupuncture stimulation unit and fixing electrodes/ similar units to the skin when the device is powered off (Smith, et al., 2010).
8. Moxibustion involves stimulation of the acupoints by application of heat usually done by burning compressed powdered herbal material on the body surface (Chiu, 2013).

## **Executive Summary**

### ***Objective***

The aim of this review was to examine the evidence for the effectiveness of acupuncture for treatment of selected mental health conditions, specifically Major Depressive Disorder, Dysthymia, Anxiety Disorder, Borderline Personality Disorder and Post Traumatic Stress Disorder (PTSD).

### ***Methods***

Literature search was done on the Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials (CENTRAL), Medline, PsycINFO, National Guideline Clearinghouse and Google Scholar. Selection criteria were applied to include studies which evaluated the effectiveness of acupuncture in patients with identified mental health conditions. The literature review was limited to recent systematic reviews. Studies that met the criteria for inclusion in the evidence based review were graded using the Scottish Intercollegiate Guideline Network (SIGN) levels of evidence. Literature review was done independently by one reviewer over a short timeframe of 2 weeks. Limited critical appraisal was done for the different studies used in this summary in view of the scope and nature of the query.

### ***Results***

This review identified a total of 5 systematic reviews that met the selection criteria and evaluated the effectiveness of acupuncture as a therapy for the selected mental health conditions. 3 systematic reviews were identified for acupuncture in depression; 1 systematic review for Anxiety and 1 systematic review for PTSD. However, the trials included in the reviews were heterogeneous in terms of patient selection criteria, control treatment, outcome measures, acupuncture points, number of sessions, duration of therapy and follow up period. The quality of evidence was noted to be heterogeneous and hence it was difficult to draw reliable conclusions about the effectiveness of acupuncture therapy in the identified mental health conditions. No literature could be found for the effectiveness of acupuncture in borderline personality disorders.

### ***Conclusion***

There is limited good quality evidence to conclusively determine acupuncture's efficacy in treatment of mental health conditions such as Major Depressive Disorder, Dysthymia, Anxiety Disorder, Borderline Personality Disorder and Post Traumatic Stress Disorder.

## Introduction

Acupuncture involves the insertion of fine needles into different parts of the body to correct the energy (Qi) imbalance in the body. The principles of practice of acupuncture in Traditional Chinese Medicine (TCM) differ from the practice of acupuncture in western medicine. The location of acupuncture points and needle stimulation methods as well as the duration and frequency of acupuncture vary based on the approach adopted (Smith, et al., 2010).

TCM acupuncture is based on the theoretical concepts of yin and yang. In TCM, regardless of the condition being treated, a practitioner addresses the individual constitution of the patient and plans a series of sessions utilising unique acupuncture points for each patient. The TCM practitioner changes the acupuncture points and his/her approach based on the response of the patient. Westernised medical application of acupuncture, also known as medical acupuncture, is based on neurophysiology and anatomy for identification of the acupuncture points (Chon & Lee, 2013; Hardaker & Ayson, 2011). It is often used by practitioners trained in western medicine and involves newer modalities of application of acupuncture such as electro acupuncture (Schroer & Adamson, 2011). In TCM, acupuncture has been used as a primary therapeutic modality for a wide range of medical conditions. However, in western practice setting, acupuncture is used as an adjuvant therapy primarily for pain management (Chon & Lee, 2013).

This literature review was undertaken to address the following research question:

What is the “effectiveness of acupuncture as a treatment modality for selected mental health disorders?” This review was done in the context of Accident Compensation Act 2001 Part 2 s 21 - “Cover for mental injury caused by certain criminal acts”. The literature review was scoped to focus on the effectiveness of acupuncture in the treatment of the following conditions:

- I. Major Depressive Disorder
- II. Dysthymia
- III. Anxiety Disorder
- IV. Post Traumatic Stress Disorder (PTSD)
- V. Borderline Personality Disorder

The report also summarises the adverse reactions reported in the literature.

Evidence tables for the key studies included in the review are in Appendix A

## Methods

### Literature Search

Literature search was done on the Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effectiveness, Cochrane Central Register of Controlled Trials (CENTRAL), Medline (1994 to September 2013), PsycINFO (2002 to September 2013), National Guideline Clearinghouse and Google Scholar. Search was done for acupuncture therapy in general and included both the traditional and western acupuncture methods.

- Literature search on acupuncture therapy was restricted to the specific mental health conditions: depression, anxiety disorder, dysthymia, posttraumatic stress disorder and borderline personality disorder, however a generic search on “acupuncture in mental health” was also done.
- The literature review was focussed on secondary research: systematic reviews (SR) and where systematic reviews were unavailable, effort was made to identify best practice guidelines.
- Search was focussed on most recent publications (year 2007 onwards) and limited to English language publications.
- Information specialist was consulted during the literature search process; however the review was done by 1 reviewer over a short timeframe of 2 weeks.
- Limited critical appraisal was done for the different studies used in this summary in view of the scope and nature of the query.

### Selection criteria

Key Inclusion Criteria:

- Study Design - secondary research: systematic reviews (SRs) of relevant randomised controlled trials (RCT), guidelines
- Participants - people with identified mental health conditions ( Depression, Dysthymia, Anxiety, PTSD, Borderline Personality Disorder)
- Interventions – acupuncture therapy (such as needle acupuncture, laser acupuncture)
- Outcomes – symptom control and improvement, safety, adverse events

Key Exclusion Criteria:

- Study Design - primary studies, primary studies that were included in systematic review, older systematic reviews, trials in progress, conference proceedings, generic reviews
- Participants – healthy participants, animal studies, diagnosis not specific to the identified mental health conditions
- Interventions – primary intervention is not acupuncture

### Excluded Studies:

The following studies were considered but excluded from this review. Main characteristics of the excluded studies and reason for exclusion are listed in Appendix B.

(Hollifield, Sinclair-Lian, Warner, & Hammerschlag, 2007); (Sarris, et al., 2012) ;(Evans, 2012); (Park, et al., 2008) ; (Wu, 2012) ;(Mukaino, Park, White, & Ernst, 2005) ;(Leo & Ligot Jr, 2007).

### Grading the evidence

Studies meeting the criteria for inclusion in this evidence based review were graded using the Scottish Intercollegiate Guideline Network (SIGN) levels of evidence (Scottish Intercollegiate Guidelines Network, 2011). SIGN methodology checklist for SR and meta-analysis was applied to each included study to obtain a SIGN rating.

Scottish Intercollegiate Guidelines Network (SIGN) criteria Levels of Evidence	
Rating	Study Description
1++	High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias
1+	Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias
1-	Meta-analyses, systematic reviews, or RCTs with a high risk of bias
2++	High quality systematic reviews of case control or cohort or studies High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal
2+	Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
2-	Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal
3	Non-analytic studies, e.g. case reports, case series
4	Expert opinion

The following section groups the included studies by the type of mental health condition. The synthesis of evidence is in a narrative format, highlighting the study characteristics. Evidence tables are provided for each included study in the Appendix A.

## **Effectiveness of Acupuncture in Depression (includes Major Depressive Disorder (MDD), Depression secondary to other medical conditions, Dysthymic Disorder)**

3 systematic reviews were identified for Depression disorders to be relevant within the scope of this review.

Smith, Hay and MacPherson (2010) systematically reviewed 30 published and unpublished randomised clinical trials (RCT) with 2,812 participants. The systematic review compares acupuncture with sham acupuncture, no treatment, pharmacological treatment and other psychotherapies or standard care. Patients groups were variable in each of reviewed studies, however most of the clinical trials included males and females and were focused on hospital in-patients with clinical diagnosis of depression or depression with co-morbidity. The meta-analysis included the following conditions: depression, depressive disorder, dysthymic disorder. The acupuncture modalities included needle acupuncture, laser and electro acupuncture. The comparator arm were varied in the studies and included a range of methods such as invasive and non invasive acupuncture control, mock electro acupuncture, mock laser acupuncture, no treatment, pharmacological treatment and structured psychotherapies. Majority of the trials compared manual and electro acupuncture with medication. Primary outcomes were reduction in severity of depression as measured by self rating scales (Beck Depression Inventory) or by a clinician rated scales (Hamilton Rating Scale for Depression) and an improvement in depression defined as remission versus no remission. Secondary outcomes that were assessed variably in the different trials were quality of life indices such as sleep, emotional outcomes, adverse events and change in use of medications. In general, there was variation in the frequency of measurement. Outcomes were assessed at end of intervention but were also assessed weekly in some trials. Frequency of treatment was daily in most of the longer duration trials.

Acupuncture versus waitlist control (2 RCT) as well as acupuncture versus sham acupuncture (1 RCT) showed promising results in terms of reduction of severity of depression however the number of trials was very few. The bias for the 2 trials in the acupuncture and the waitlist control was low. The trials in this review that compared manual and electro acupuncture with medications found no difference between groups. Two trials found that acupuncture combined with medications is more beneficial than medication alone. The findings of this review were overall similar to findings from previous systematic reviews done by Mukaino et al.(2005) and Leo et al.(2007). The authors concluded that the evidence was inconsistent and insufficient to recommend the use of acupuncture for management of depression. They report that this could be due to the high risk of bias in the RCT in majority of trials that met the inclusion criteria. **This systematic review is rated 1+ (Scottish**



**Intercollegiate Guidelines Network, 2011). However, many of the primary RCTs that met the inclusion criteria for this review are heterogeneous and hence the overall strength of evidence is weak.**

Schroer and Adamson (2011) reviewed 9 clinical trials of acupuncture in depression (n=744) but were unable to demonstrate convincing evidence of effectiveness. Eight of the nine trials in this review were included in the systematic review done by Smith et al (2010) discussed earlier. The study that was not in the Smith et al review was focussed on pregnant women only (Manber et al, 2004). Majority of the trials in this review used the Hamilton Rating Scale for Depression (HRSD) for inclusion of patients; however the cut off points varied between studies ranging from 14 + to 25 +. There was variability noted in the types of depression included in the reviews ranging from maniac and involuntional depression to MDD. Electro acupuncture was used in a majority of the trials, either alone or in combination with medications such as Amitriptyline or Mianserin for durations ranging from 4 - 8 weeks. Dosage of the medications used in the comparator arm varied. The number of acupuncture sessions per week varied from 2 -7 in the various studies. There was variability noted in how acupuncture was administered in terms of the acupuncture points and treatment protocol. The authors note that the western acupuncture approach usually provided weekly / biweekly therapy initially, with sessions tapering off after a few weeks, while the traditional acupuncture approach was to have brief intensive daily therapy. Therapeutic effectiveness was assessed in terms of rapid or improved remission from a specific depression episode. HRSD was used in 8 of 9 trials to assess the outcome measures in addition to other assessment tools, such as Clinical Global Impression Chart, rating scales for side – effects and the outcomes were assessed periodically usually weekly during the trial period only. No follow up was done in any of the studies beyond a few days / weeks after treatment ceased. No meta- analysis was done in this systematic review (Schroer & Adamson, 2011).

Schoer et al (2011) point out the methodological differences that exist in approach of modern acupuncture and TCM acupuncture. For some RCTs in this review the practitioners were advised to minimise verbal communications which is unlike the actual practice scenario. The authors state that the potential value of TCM acupuncture will remain unknown if evaluations do not allow a practitioner to implement their therapy as they would in everyday clinical practice. The major critique of a RCT for effectiveness of acupuncture is that rigid protocols (as in a RCT) do not allow for acupuncture therapy to be administered in a holistic manner and hence do not measure the effectiveness accurately. This has implications in generalising the findings of these studies to other clinical situations such as primary care (Schroer & Adamson, 2011). **This systematic review is rated 1- (Scottish Intercollegiate Guidelines Network, 2011).**

Zhang, Chen, Yip, Ng and Wong (2010) conducted a systematic review and meta-analysis of 20 RCTs of acupuncture treatment in MDD patients (n=1,998) and 15 RCTs of acupuncture treatment in post stroke depression (n=1,680) to assess its effectiveness as monotherapy as well as adjunct therapy. Pooled risk ratios and 95% Confidence intervals were calculated. From meta analysis of the results i.e. clinical response in MDD patients and improvement on depressive symptoms of MDD, it is noted that the overall treatment effects of acupuncture monotherapy were similar to that of antidepressant therapy. There was no statistically significant difference in pooling treatment effect between acupuncture and antidepressant treatment group but high heterogeneity was noted.

Furthermore in RCTs that compared acupuncture with sham acupuncture, no significant difference was noted in the clinical response rate of MDD as well as in improvement of depressive symptoms of MDD. Only one trial compared the clinical response rate of MDD between active acupuncture group and waitlist controls and showed no significant difference in response rates between the two conditions.

Further subgroup analysis for the trials did not show any statistically significant difference between acupuncture and antidepressants, sham acupuncture and wait list controls.

The authors reported that acupuncture therapy appeared safe and effective for MDD and could be considered as an alternative option. However they did recognise the methodological heterogeneity in the selected RCTs of this review could have contributed to bias in their analysis and results. **This systematic review is rated 1+ (Scottish Intercollegiate Guidelines Network, 2011). However, due to the heterogeneity of the included primary RCTs in this review, the strength of evidence is weak.**

## **Effectiveness of Acupuncture in Anxiety Disorders**

Only one systematic review was identified for Anxiety disorders to be relevant within the scope of this review.

Pilkington et al (2007) conducted a systematic review of the effectiveness of acupuncture for anxiety and anxiety disorders in 12 controlled trials (n=1,134). Studies included 10 RCT (n=1,010) and 2 non randomised clinical trials (n=124). Four RCTs were done in patients with generalised anxiety disorders (GAD) and anxiety neurosis and 6 RCTs were done in patients with situational anxiety. Majority of these trials were of short duration (4 - 6 weeks). Comparator arms were variable in the different studies. Studies included TCM, western acupuncture and acupressure and evaluated acupuncture in combination with other treatments such as medications, behavioural desensitisation, biofeedback and relaxation etc. Patients included adults as well as children with anxiety or anxiety disorders from both hospital inpatient and outpatient facilities. The results in patients with generalised anxiety show that effectiveness of acupuncture is comparable to drug therapy. This could be an amplified response due to small sample sizes and limited ability to detect a difference in treatment effect.

The quality of reporting in studies for situational anxiety was overall noted to be better than the RCT for GAD. The authors conclude that although positive outcomes were reported when using acupuncture in patients with anxiety, there was insufficient evidence to draw firm conclusions and further research is required (Pilkington, et al., 2007). **This systematic review is rated 1- (Scottish Intercollegiate Guidelines Network, 2011)**

Independent critical review of this study (Centre for Reviews and Dissemination, 2013) suggests that the conclusions made by the authors reflect the limitation of the evidence and are likely to be reliable. These are promising results but still inconclusive.

Overall, the quality of evidence pertaining to use of acupuncture in treatment of anxiety varies greatly in terms of methodological rigour and comparability and the published literature is limited to very few good quality RCTs that met the inclusion criteria for this review. Preliminary review of evidence suggests that acupuncture is beneficial but the results must be interpreted with caution due to the diversity in the methodology used in the study designs and evaluation of results.

### **Effectiveness of Acupuncture in Post Traumatic Stress Disorder (PTSD)**

Only one systematic review was identified for PTSD to be relevant within the scope of this review.

Kim et al (2013) conducted a systematic review and meta-analysis of effectiveness of acupuncture for PTSD with 4 RCT (n= 543) and 2 uncontrolled clinical trials (n= 103). The review included patients with PTSD regardless of gender, age, nationality or outpatient therapy or inpatient therapy. Interventions assessed were classical acupuncture, electro acupuncture and auricular acupuncture as well as acupuncture combined with moxibustion. Comparison was done for acupuncture and its variants with control groups with no treatment, sham acupuncture and conventional treatments for PTSD patients. Outcomes were assessed using the relevant PTSD scales, such as clinician administered PTSD scale, depression scale and anxiety scale. The outcome end points are not clearly defined. Duration of treatment varied in the trials from 1-12 weeks. The major findings of this review were: no statistical difference was found between acupuncture and cognitive behavioural therapy (CBT) but acupuncture was statistically superior to waitlist control. No difference was noted between acupuncture group and oral selective serotonin reuptake inhibitors (SSRI). For Acupuncture with CBT versus CBT alone – acupoint stimulation plus CBT showed better efficacy on the PTSD rating scales. Meta-analysis of 2 RCTs that compared electro acupuncture and moxibustion versus oral SSRI showed acupuncture + moxibustion had favourable outcomes. The authors concluded that though the results were encouraging, the study size was too small to verify the efficacy of acupuncture. Their findings were based on one high quality RCT (Hollifield, et al., 2007) and a meta-analysis of one medium quality RCT and low quality RCT. **This systematic review is rated 1+ (Scottish Intercollegiate Guidelines Network, 2011).**

**No relevant literature was found for the effectiveness of acupuncture in management of borderline personality disorders.**

## Limitations of this review

There were a relatively small number of systematic reviews on each condition and the quality of evidence was heterogeneous. Hence it is difficult to draw reliable conclusions about the effectiveness of acupuncture therapy in identified mental health conditions.

Acupuncture therapy in selected mental health conditions described in the reviewed papers varies considerably with respect to patient selection criteria, control treatment, outcome measures, acupuncture points, number of sessions, duration of acupuncture therapy and follow up period.

The review has been limited to the published academic literature, and it has not appraised unpublished work. Only English language papers were included in the review and hence there is a possibility of language bias due to exclusion of all non English language research.

In view of the timeframes and scope of the research, only one reviewer conducted the review; however the brief report was peer reviewed internally as well as externally.

The studies included in the review were conducted outside of New Zealand and therefore their generalisability to the New Zealand population and context of applicability to ACC clients may be limited.

## Additional information: Current guideline recommendations on acupuncture therapy in mental health

Guideline	Recommendation	Strength of evidence
<b>Depression</b>		
Non pharmacological management of depression in adults. A National Guideline (Scottish Intercollegiate Guidelines Network, 2010)	<b>No recommendation</b>	Recommendations could not be made due to insufficient evidence

## Conclusion

There is limited good quality evidence to conclusively determine acupuncture's efficacy in treatment of mental health conditions such as Major Depressive Disorder, Dysthymia, Anxiety Disorder, Borderline Personality Disorder and Post Traumatic Stress Disorder.

## **Adverse effects of Acupuncture**

The therapeutic effectiveness of complementary and alternative medicine methods should be considered in the context of their benefits and risks (Melzer, Deter, & Uehleke, 2013; Xu, et al., 2013). The benefits of acupuncture are extensively researched, promising yet largely ill defined. The harms of acupuncture are not extensively reported in the studies included within the scope of this review. Hence, literature search was also done to study the adverse effects of acupuncture in mental health conditions as well as in general terms.

The **side effects** of acupuncture therapy commonly reported in literature are fear of needles, soreness and pain, bruising, bleeding at needle site, haematoma, transient dizziness and nausea (Kim, et al., 2013; Schroer & Adamson, 2011; Smith, et al., 2010; Wu, 2012). Rate of adverse events for acupuncture (active and sham) in the pooled data from 21 trials was 10.2 % (n=179 /1756) as compared to 40.4% (554/1372) in antidepressant treated patients (Zhang, 2010). Systematic review by Smith et al (2010) report that risk associated with acupuncture is low, especially if performed by a competent therapist. There is some evidence of serious adverse events related to acupuncture though these are rare.

In general, Ernst et al (2011) conducted a review of **life threatening / serious adverse reactions after acupuncture reported in literature** and identified two main serious adverse events – infection and trauma. A more recent systematic review of frequency and severity of adverse events of acupuncture by Xu et al (2013) reported similar findings. Infections were the main complications of acupuncture. Infection risk linked to acupuncture was mainly due to improper handling of needles or reuse of needles without adequate sterilisation. The infections reported in literature as being associated with acupuncture were Hepatitis B, Hepatitis C, HIV, sub acute bacterial endocarditis and staphylococcal septicaemia. Of these, bacterial infections were the most commonly encountered complication. Risk of trauma depends on the site of needling. In a few instances life threatening complications were reported. Besides infections, pneumothorax was recorded as the second most frequent serious complication of acupuncture. Most patients recovered fully. Other traumatic events include cardiac tamponade and spinal cord injury. There was also a report of electromagnetic interference of an electro acupuncture device that suppressed a demand cardiac pacemaker (Ernst & White, 1997).

Witt et al (2009) conducted a prospective observational study in Germany with 229,230 patients who received 2.2 million acupuncture sessions and reported on the safety of acupuncture. Overall, 19,726 (8.6%) reported experiencing at least one adverse event. These were mostly minor self limiting event such as minor bleeding or haematoma and pain. Adverse events requiring treatment occurred in 4,963 (2.2%) patients. Two patients had a pneumothorax (none of them were life

threatening). In summary, major adverse effects of acupuncture appear to be rare and when done by a competent therapist acupuncture is safe.

### **Challenges encountered in the interpretation of the acupuncture literature**

In general the current evidence about effectiveness of acupuncture in the specific mental health conditions included in this review is heterogeneous in terms of:

- whether mental disorder under investigation was a primary diagnosis or whether it was present / associated with other co-morbid condition(s)
- whether acupuncture was used as an adjunct to drug therapy or as the sole therapy
- methods of selection of the study participants for inclusion in the study (for example diagnostic criteria and set thresholds for inclusion / exclusion)
- sample size (smaller sample size reduces the sensitivity and accuracy of analysis)
- variety of control interventions (sham acupuncture, drug therapy, biofeedback etc)
- types of comparable outcome measures / prognostic indicators
- study period (short term focus or long term)
- types of acupuncture used for therapy (needle acupuncture, electro acupuncture etc)
- types of “acupuncture protocols” such as number and sites of acupuncture points and number of treatment sessions and whether the protocols were rigid or flexible
- varying sources of bias (therapist, publication, language bias etc).

Hence there are concerns about comparability and integration of the available evidence. Caution needs to be exercised in generalising results of the acupuncture therapy based on the available evidence and adopting it in routine clinical practice.

Randomised clinical trials have the methodological rigor of standardised protocols and robust study design but they may adversely affect the therapeutic effectiveness of TCM acupuncture which adopts a holistic approach of ongoing therapist-patient interaction and relies on “flexible” treatment protocols based on patient’s responsiveness.

To be able to elucidate the effectiveness of acupuncture in mental health disorders with further clarity there is the need for well designed studies and use of robust treatment evaluation methods. The key challenge is that the research methods adopted should preserve the therapeutic integrity of acupuncture while studying its effectiveness.

None of the reviews provide conclusive treatment recommendations in terms of an “optimal treatment protocol” with regards to sites of acupuncture, number of therapy sessions, frequency of sessions per week and duration of each session.

## Appendix A: Evidence tables for included studies

Table 1: Acupuncture for Depression (Review)				
Study	Inclusions	Interventions	Outcomes & results	Comments & level of evidence
<p>(Smith, et al., 2010)</p> <p>Systematic review of RCTs to examine the effectiveness and adverse effects of acupuncture in the treatment of depression disorder and dysthymic disorder</p> <p>Cochrane collaboration Review</p>	<p>30 RCTs with 2,812 participants were included in this meta - analysis</p> <p>Studies were from: China (24), US (2), Germany (2), Australia (1), United Kingdom (1). 24 of the 30 trials were from China</p> <p>16 RCTs recruited participants from inpatient hospital setting, 10 RCTs recruited both inpatient and outpatient, 3 RCTs recruited from community and 1 from primary care</p> <p>Patient selection criteria in each study are variable.</p> <p>Sample sizes ranged from 19 – 460 in the trials</p>	<p>Acupuncture treatment was variable (manual, electro and laser acupuncture).</p> <p>19 of the 30 RCT used standardised treatment protocol with fixed selection of points. 20 RCT reported needling duration between 20 - 30 minutes.</p> <p>In 17 RCTs the number of treatment sessions was more than 30</p> <p>Variable control treatment in different studies and included waitlist control, sham acupuncture, non specific acupuncture, medications such as Amitriptyline, SSRI, Seratalin</p>	<p><b>Outcome measures:</b></p> <ul style="list-style-type: none"> <li>Reduction in severity of depression measured by tools such as Hamilton Rating scale for Depression, Beck Depression Inventory, Clinical Global Impression Scale, Ashberg scale and</li> <li>improvement in depression defined as remission or no remission</li> </ul> <p>Adverse events reported in 4 RCTs and Quality of life outcomes reported in 3 RCTs</p> <p>Outcome measures assessed at variable frequency and varied between 2 – 4 months. In 20 RCTs the outcome were assessed at the end of intervention.</p> <p><b>Key results:</b></p> <p>Insufficient evidence of consistent beneficial effect from acupuncture as compared with sham acupuncture or wait list control.</p> <ul style="list-style-type: none"> <li>Acupuncture versus waitlist control (2 RCT) – reduced severity of depression but no evidence of improvement in depression (improvement in depression is defined as remission versus no remission)</li> <li>Acupuncture versus Sham acupuncture (1 RCT) - no evidence in reduction of severity of depression but there was improvement in depression</li> <li>Manual and electro acupuncture versus medications – no difference was noted between groups in reducing the severity of depression or in improvement of depression.</li> <li>Acupuncture + antidepressant medication versus antidepressant medication alone – (2 RCT) acupuncture</li> </ul>	<p>Heterogeneity noted in the studies in terms of acupuncture intervention –mode of acupuncture and treatment protocols, comparator arms, clinical setting as well as assessment of outcomes.</p> <p>There is a high risk of methodological bias due to lack of blinding, lack of consistent protocols etc</p> <p><b>The systematic review is rated SIGN Evidence Level 1+. However, many of the primary RCTs that met the inclusion criteria for this review have methodological limitations and are prone to bias and hence the overall strength of evidence is weak.</b></p>



			<p>combined with medications is more beneficial than medication alone in reduction of symptoms of depression.</p> <ul style="list-style-type: none"> <li>• Subgroup of participants (3 RCT , n=94) with depression as a co morbidity experienced a reduction in depression with manual acupuncture compared with SSRI (RR 1.66 , 95% CI 1.03-2.68)</li> </ul> <p>No serious adverse effects were found in the review of 4 RCTs.</p> <p><b>Recommendations for practice could not be made</b></p>	
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Table 2: Acupuncture for Depression: A critique of the evidence base

Study	Inclusions	Interventions	Outcomes & results	Comments & level of evidence
<p>(Schroer &amp; Adamson, 2011)</p> <p>Systematic review of RCTs for effectiveness of acupuncture as a depression intervention</p>	<p>9 RCTs were included to review the scope of the existing evidence base.</p> <p>Review was structured around PICO format (patients, intervention, comparison and outcome). It included studies done in China, USA and Germany</p> <p>Study selection in this review was based inclusion criteria for Cochrane review.</p> <p>No further details are provided on the inclusion and exclusion criteria</p> <p>Patient selection criteria in each study is variable</p>	<p>Variable intervention modes and duration in different studies and include the following: Electro-acupuncture / combined electro-acupuncture and manualised specific acupuncture (SPEC)</p> <p>Variable control treatment in different studies and include the following: amitriptyline / mianserin / placebo acupuncture / non specific active acupuncture comparison (NSPEC)/ waitlist control</p>	<p>Duration of therapy varies 4 to 8 weeks</p> <p><b>Outcome measures:</b> variable and include Hamilton Rating scale for Depression/ Clinical Global impression Scale/ Antidepressant side effect rating scale / Asberg rating scale for side effects</p> <p><b>Results</b> are in a narrative format with regards to the limitations of the clinical trials of acupuncture only.</p> <p>No meta analysis is done or the outcomes evaluated</p> <p>The study highlights the differences in principles of practice and approach to acupuncture from the traditional chinese medicine versus western modern acupuncture perspective.</p>	<p>The reviewers appear to have synthesised the results of the evidence from the RCT's in a narrative format.</p> <p><b>The systematic review SIGN evidence level 1-</b></p>

Table 3: The effectiveness and safety of acupuncture therapy in depressive disorders: Systematic review and meta-analysis

Study	Inclusions	Interventions	Outcomes & results	Comments & level of evidence
<p>(Zhang, 2010) Systematic review of RCTs for effectiveness of acupuncture as a mono therapy and as an adjunct in treating major depressive disorder (MDD) and post stroke depression (PSD)</p>	<p>20 RCTs for MDD and 15 of PSD were included in the review. Diagnosis of depression by International Classification of Diseases (ICD); Chinese Classification of Mental Disorders (CCMD); Chinese classification of cerebrovascular disease (CCCD)</p>	<p>Intervention: Manual Acupuncture / Electro-acupuncture  Acupoints used : body/scalp /ear points  Control treatment included the following: antidepressant medications such as fluoxetine (20 mg/day), amitriptyline (25-300 mg/day), paroxetine (20-40 mg/day) / sham acupuncture / waitlist control</p>	<p><b>Outcome measures:</b> Hamilton Rating scale (HAMD) for severity of depression. Additionally – response rates, depressive symptoms and adverse events were assessed. For MDD – 10 RCTs applied electro-acupuncture and 10 RCTs used manual acupuncture. Number of treatment session varied between 15 -60 and duration of treatment varied between 4- 12 weeks. <b>Results:</b> Overall treatment effects of acupuncture (ACU) monotherapy as compared with antidepressant (ADD) treatment</p> <ol style="list-style-type: none"> <li>on clinical response rate in MDD patients no significant difference was noted ( RR 1.09, 95%CI, 0.92-1.30) ; heterogeneity 71% ACU vs. ADD – RR 1.06 95%CI 0.97-1.17 ; heterogeneity 9% ACU vs. Sham ACU – RR 1.30 95%CI 0.26 -6.37 ; heterogeneity 94 % ACU vs. waitlist control – RR 1.27 95%CI 0.58 -2.80 ; heterogeneity NA ( 1 trial only)</li> <li>on reducing the severity of symptoms no significant difference was noted (WMD 0.31, 95%CI -0.94-1.56) ; heterogeneity 80% ACU vs. ADD – MD -0.23 95%CI -1.40- -0.94) ; heterogeneity 69% ACU vs. Sham ACU – MD 2.39 95%CI -2.78 -7.56 ; heterogeneity 90%</li> </ol> <p>For acupuncture as an additional therapy with antidepressants i.e. ACU + ADD vs. ADD – pooled treatment effects showed no significant differences in clinical response rate but improvement</p>	<p>Robust methodology for the meta analysis. However included studies have small sample size and quite heterogeneous in their study criteria.  <b>The systematic review is rated SIGN Evidence Level 1+. However due to variability of interventions, comparators and outcome end points in RCTs, the overall strength of evidence is weak.</b></p>

			<p>in symptom severity reached significant level.</p> <p>The authors reported that acupuncture therapy appeared safe and effective for MDD.</p> <p>Incidence of adverse events was lower with acupuncture and sham acupuncture than with antidepressants (10.2% versus 40.4%).</p>	
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Table 4: Acupuncture for anxiety and anxiety disorders – a systematic literature review

Study	Inclusions	Interventions	Outcomes & results	Comments & level of evidence
<p>(Pilkington, et al., 2007)</p> <p>Systematic review of RCTs for effectiveness of acupuncture in the treatment of anxiety and anxiety disorders</p>	<p>12 controlled trials, of which 10 were RCT</p> <p>4 RCT were on generalised anxiety disorder (GAD) or anxiety neurosis ; 6 RCT were on situational anxiety (anxiety in perioperative period)</p> <p>Subjects included adults or children with anxiety, including patients attending psychiatric clinics and in and out patient facilities.</p>	<p>Intervention: Variable and included – Manual Acupuncture, Western acupuncture, ear acupuncture, electro acupuncture and acupressure</p> <p>Acupuncture alone and in combination with other treatments such as electromyographic biofeedback ( EMG BFB) and medication</p> <p>Control treatment include the following: sham acupuncture / behavioural desensitisation , drug treatment, relaxation, EMG BFB</p>	<p><b>Outcome measures:</b> Variable in different studies and included measures of anxiety</p> <p><b>Results:</b></p> <p>In patients with generalised anxiety, the effectiveness of acupuncture is comparable to drug therapy (no difference between drug therapy and acupuncture intervention in terms of effective rate / response)</p> <p>In the patients with situational anxiety (in perioperative period), auricular acupuncture was found to be beneficial in controlling anxiety than sham acupuncture.</p> <p>The authors conclude that although positive outcomes were reported when using acupuncture in patients with anxiety, there was insufficient evidence to draw firm conclusions and further research is required.</p>	<p>No meta analysis was done</p> <p>Study results combined as narrative</p> <p>Heterogeneous studies.</p> <p>Methodological details are not reported in all studies</p> <p><b>The systematic review is rated SIGN Evidence Level 1- . However, strength of evidence is weak due to heterogeneity of included trials.</b></p>

Table 5: Acupuncture for Posttraumatic Stress Disorder: A systematic review of randomised controlled trials and prospective clinical trials.

Study	Inclusions	Interventions	Outcomes & results	Comments & level of evidence
<p>(Kim, et al., 2013)</p> <p>Systematic review of RCTs for effectiveness of acupuncture in the treatment of Posttraumatic Stress Disorder (PTSD)</p>	<p>4 RCT (n=543) and 2 uncontrolled trials (n=103) were included in this review</p> <p>1 RCT from USA and rest from China</p> <p>Subjects included patients with PTSD regardless of gender, age, nationality or outpatient or inpatient therapy</p> <p>3 RCT and 2 uncontrolled trials were related to earthquake PTSD</p>	<p>Intervention: Variable and included needle acupuncture such as Manual Acupuncture, ear acupuncture, electro acupuncture</p> <p>Trials that considered Acupuncture in combination with other interventions such as moxibustion were included in this review</p> <p>Control treatment include the following: sham acupuncture / no treatment / conventional treatment for PTSD such as cognitive behavioural therapy (CBT), oral selective serotonin reuptake inhibitors (SSRI)</p>	<p>Duration of treatment varied between 1-12 weeks.</p> <p>Number of treatment sessions varied from 3 – 36 sessions</p> <p><b>Outcome measures:</b> Variable and included Relevant PTSD scales as clinician administered PTSD scale (CAPS), Hamilton depression rating scale (HAMD) and Hamilton anxiety rating scale</p> <p><b>Results:</b></p> <p>Acupuncture versus CBT – no statistical difference was found between acupuncture and cognitive behavioural therapy but acupuncture was statistically superior to waitlist control</p> <p>Acupuncture versus oral SSRI – no statistical difference was noted between acupuncture group and oral selective serotonin reuptake inhibitors (SSRI)</p> <p>Acupuncture plus CBT versus CBT alone- Acupoint stimulation plus CBT showed better efficacy than CBT alone</p> <p>The authors conclude that acupuncture is effective for PTSD based on 1 high quality RCT and a meta analysis.</p>	<p>Heterogeneous studies in terms of population characteristics, interventions and comparator arms</p> <p>Sample sizes in included studies were small.</p> <p>2 RCTs were included in the meta analysis</p> <p>Methodological details are not reported in all studies and hence there is a high risk of bias</p> <p><b>This systematic review is rated SIGN Evidence Level 1+. However, strength of evidence is weak due to the limitations outlined above.</b></p>

## Appendix B Characteristics of excluded studies

Study	Reason for exclusion
Hollifield (2007)	This is a primary RCT for evaluating the efficacy and acceptability of acupuncture in the treatment of post traumatic stress disorder. This study was included in the systematic review by Kim et al. (2013)
Sarris (2012)	This is a generic review paper that summarises the complementary and alternative medicine therapies (including acupuncture) for anxiety disorders. The analysis is done in a narrative format (non-systematic approach to data inclusion) and includes a range of evidence sources such as epidemiological and clinical studies as well as systematic reviews. The main systematic review by Pilkington et al. (2007), referred to in this paper is already considered in the included studies.
Evans (2011)	This paper examines the evidence on the use of acupuncture in the treatment of anxiety disorders. The review of literature included both human studies as well as animal studies. And for the human studies –participants included health volunteers as well as patients; hence this study was not included in the review. The analysis is performed in a narrative format (for all included studies human as well as animal) with the intent to provide some treatment recommendations.
Park (2008)	This is a generic review paper providing a summary of the status and future of acupuncture in clinical research. There is a section on Acupuncture in mental health.
Wu (2011)	This is a generic review paper providing a summary of effectiveness of Acupuncture for depression as monotherapy as well as additional therapy, adverse events associated with acupuncture and evidence for using acupuncture as a means to reduce the side effects of antidepressant drugs.
Mukaino (2005)	This systematic review aimed to evaluate the available evidence on acupuncture as a therapy for depression. 7 RCT with 509 patients were included. Older review done 2005. Five of the seven RCT's in this study were covered in the more recent 2010 systematic review by Smith et al. Smith et al's findings were similar to the findings from Mukaino review regarding the effectiveness of acupuncture as compared to sham control (variable evidence of effectiveness) and wait list control ( no significant difference between acupuncture and wait list control).
Leo (2007)	This systematic review studies the effectiveness of acupuncture in treatment of depression. Nine RCT were included in this review. Seven of the nine RCT were considered in Mukaino (2005) systematic review. Five of the trials in this review were also covered in the more recent 2010 systematic review by Smith et al. Metaanalysis could not be performed due to the heterogeneity of participants , controls, outcome measures and methods of acupuncture applied, however odds ratio was calculated. There was inconsistent effectiveness of acupuncture as compared to sham control and no significant difference was noted between the acupuncture and antidepressant treated group.

Lee (2012)	This is a review of systematic reviews (SR) that studies the effectiveness of acupuncture for the various components of trauma spectrum response (TSR). SR of Depression, Anxiety and PTSD were considered under the category of the psychological and emotional components of TSR. While this is very good review of SRs, its focus is on the broad categories of TSR rather than on individual mental health conditions: there is no SR on PTSD that met the inclusion criteria for this review. For the subcomponent on depression (6 high quality SR) and anxiety (1 high quality SR): evidence suggests acupuncture is promising. The authors suggest that in the absence of conclusive evidence of benefit and safety issues – a weak recommendation can be made in favour of acupuncture for depression and anxiety. The papers in the individual systematic review have already been considered in the report.
Pilkington (2010)	This is a generic review paper providing an update of clinical trials of acupuncture in depression and in anxiety.



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