

ACUPUNCTURE

A therapeutic outline

This therapeutic outline provides an introduction to what acupuncture is and what it might be used for. This outline has been drafted by experts in the field. However, it is not meant to be an exhaustive review of scientific evidence, such as a systematic review or meta-analysis, which is not its purpose. This therapeutic outline provides a description of the therapy and a brief narrative review of the emerging evidence considered by the researchers at NICM Health Research Institute to be important science being undertaken in acupuncture.

What is acupuncture?

Acupuncture originated as a therapeutic modality of traditional Chinese medicine⁽¹⁾ and is a practise in which specific points on the body are stimulated, usually with fine needles. Acupuncture has multiple neurological and physiological effects on the body.⁽²⁻⁴⁾

Why people use acupuncture

Acupuncture is used worldwide. It is practised in 93 per cent of the United Nations member states and where substantive evidence is emerging, is recommended in clinical guidelines.⁽⁵⁾ Reports from 129 of the World Health Organization (WHO) member states show 80 per cent have approved the use of acupuncture and 29 have regulated its use.⁽⁵⁾ Acupuncture treatments are a publicly funded medical expense in many countries, including Australia (under the Medical Benefit Schedule).⁽⁵⁾

Australian studies indicate utilisation rates of 4.2-9.2 per cent in any given year.⁽⁶⁻⁸⁾ A nationally representative survey completed in 2005 found that 9.2 per cent of people surveyed had received acupuncture within the previous year, and the authors estimated that over 10 million acupuncture consults are made each year.⁽⁶⁾ A more recent survey carried out in general practice in Australia in 2015 had a similar finding: 1 in 10 respondents had consulted an acupuncturist in the previous 12-months.⁽⁹⁾

In Europe, acupuncture is the most readily available complementary medicine service, with over 96,000 health professionals using acupuncture.⁽¹⁰⁾ Most European countries provide cover for acupuncture under their national health insurance schemes. In Germany, the use of acupuncture by medical doctors for osteoarthritis and back pain is approved in the national health system.⁽¹¹⁾ Acupuncture is also covered by public health insurance schemes in many non-European countries, including the United Kingdom, China, Japan, Korea, Vietnam, the United States of America and Australia. In many instances, this includes delivery in outpatient and inpatient hospital contexts. In the United States of America alone acupuncture is offered in 42 hospitals, including the Boston

Children's Hospital, which provides the most active paediatric medical acupuncture service in the country.(12)

Is acupuncture a regulated healthcare practice?

Acupuncturists are professionally regulated throughout Australia. There are currently approximately 4800 acupuncture practitioners registered with the Chinese Medicine Board of Australia,(13) which is under the governance of the Australian Health Practitioner Regulation Agency (AHPRA). AHPRA is the umbrella government agency that provides oversight of registration of all health practitioners in the country (AHPRA - www.ahpra.gov.au/).

In Australia, the government health insurance system, Medicare, covers medical acupuncture performed by suitably qualified medical practitioners. Over 500,000 acupuncture item claims are made each year through Medicare.(14) A self-administered postal survey sent to a random sample of Australian general practitioners (GPs) in 2004 found 76 per cent of GPs have referred a patient to acupuncture or suggested the patient use acupuncture—from at least a few times to at least monthly over the preceding 12-month period.(15) Further, a 2010 survey of all GPs practising in rural and regional Divisions of General Practice in NSW found that two-thirds of respondents referred patients to an acupuncturist at least a few times a year.(16) However, there is evidence of a decline in the number of acupuncture claims per 100,000 population made under Medicare by GPs in the period from 1995 to 2011.(14). All private health funds offer a level of cover that provides rebates to patients receiving acupuncture treatments from AHPRA registered acupuncturists. Third-party payments from organisations such as WorkCover are also provided in most states and territories in Australia.(14)

Evidence of effectiveness

The following evidence summary provides an overview of potential clinical areas of benefit from the use of acupuncture. An overview of reviews was undertaken, including a systematic search of Pubmed/Medline and Cochrane Collaboration publications to end 2020 limited to English language papers. However, this summary is not designed to serve as an exhaustive systematic review of all scientific evidence in the field, but rather provides a brief narrative review of the emerging evidence in key clinical areas as understood by expert researchers in the field.

Acupuncture has traditionally been used for a wide range of conditions including the treatment of chronic pain, digestive problems and in women's health. Some people choose to use acupuncture for its beneficial relaxing effects.

Key areas of application and current research are reviewed below.

Pain management

(chronic low back pain; chronic knee pain and osteoarthritis; headaches; fibromyalgia; temporomandibular joint disorders; cancer pain; and acute pain and post-operative pain)

Acupuncture is often recommended for the treatment of chronic low back pain(17-21) and osteoarthritis of the knee(22). Clinical guidelines from the United States of America,(17, 18) Canada,(20, 23) Australia,(24, 25) the United Kingdom(26) and Germany(11) recommended acupuncture as a non-pharmacological approach in the management of various types of pain.

There is good quality evidence showing acupuncture is effective in the management of various pain disorders, including neck(27) and chronic back pain,(28, 29) chronic knee pain,(29-31) some types of chronic headache(32) with low to moderate quality evidence in support of its benefits in fibromyalgia.(33)

- [Acupuncture for chronic low back pain](#) - For chronic low back pain, acupuncture is more effective for pain relief and functional improvement than no treatment.(34) There is weak evidence that acupuncture, when added to other conventional therapies, relieves pain and improves function more than the conventional medicine therapies alone.(28)
- [Acupuncture for chronic knee pain/osteoarthritis](#) - A number of systematic reviews of clinical trials have concluded acupuncture is superior to sham acupuncture and to no additional intervention (usual care or wait-list controls) in improving pain and function in patients with chronic knee pain and osteoarthritis;(29, 30, 35) the findings when acupuncture is compared to an active intervention are more nuanced: acupuncture treatment shows clinically important short- and long-term improvements in pain and function when compared to supervised osteoarthritis education or physician consultations, whereas acupuncture shows a similar treatment effect when compared to supervised exercise and home exercises. A Cochrane review published in 2010 found that in comparison with a sham control, acupuncture showed statistically significant, short-term improvements in both osteoarthritis pain and function. However, the authors noted that the pooled short-term benefits did not meet predefined thresholds for clinical relevance.(35) Further research is required to provide more information on long-term effects.(29, 30, 35)
- [Acupuncture for headaches](#) - Acupuncture has been shown to reduce frequency of tension-type headaches in regular sufferers when compared to usual treatment (typically with pain-relief medicines) and also when compared to sham acupuncture.(32) The same result was found with regard to episodic migraine headaches,¹ with the finding that acupuncture may be at least as effective as prophylactic drugs for the treatment of episodic migraine.(36)
- [Acupuncture for fibromyalgia](#) - A Cochrane review published in 2013 found there is low to moderate level evidence that acupuncture improves pain and stiffness in people with fibromyalgia when compared with no treatment and standard therapy (antidepressants and

¹ Migraine is sub-classified into episodic migraine (fewer than 15-days with migraine headaches per month) and chronic migraine (more than 15-days with migraine headaches per month).

exercise). This review also concluded that acupuncture with electrical stimulation is probably better than needling alone in reducing pain and stiffness.(33)

- [Acupuncture for temporomandibular joint disorders](#) - Several systematic reviews have been published on efficacy of acupuncture for temporomandibular disorders (TMD). A meta-analysis published in 2017 (n=9 RCTs; 231 participants) found that acupuncture was more effective than either sham acupuncture treatment or sham laser treatment, indicating that acupuncture is an effective tool for the management of pain in patients with TMD, but that there was no difference between acupuncture and splint treatment and both of these treatments resulted in equivalent pain relief.(37) Furthermore, subgroup analysis, according to the classification of diseases, indicated that patients with myogenous TMD² were more likely to benefit from acupuncture therapy than those with joint disorders.

Another meta-analysis published in 2019 assessed the efficacy of acupuncture on orofacial pain of myofascial origin in patients with temporomandibular dysfunction (n=7 RCTs; 199 participants) and found that acupuncture was better than other interventions (sham dry needling, pain education methocarbamol, paracetamol, lidocaine injection, procaine injection) in reducing pain intensity. However, the evidence was deemed very low-quality and with a small effect size.(38)

- [Acupuncture and acupressure for cancer pain](#) - A systematic review of 17 randomised controlled trials (RCTs) (and meta-analysis of 14 of these trials) published in 2019 found that acupuncture and/or acupressure was significantly associated with reduced cancer pain and decreased use of analgesics, although the evidence quality was moderate.(39) A previous 2015 Cochrane review evaluating the efficacy of acupuncture for the relief of cancer pain in adults concluded there was insufficient evidence to confirm whether acupuncture is effective.(40)

Acupuncture is recommended in some international guidelines for the management of chronic back pain and osteoarthritis of the knee, including guidelines developed in the United State of America,(21, 41) and Canada.(20) The most recent guidelines from the National Institute for Health and Care Excellence of the United Kingdom on treatments for low back pain and sciatica, however, specify that acupuncture for treating low back pain is not recommended because evidence shows that while it is better than no treatment (such as a wait list control) it is not better than the active control sham acupuncture.(42)

- [Acupuncture for acute pain and post-operative pain](#) - A recent systematic review shows that acupuncture on body or auricular points has a moderate effect in reducing postoperative pain (at 24 hours), in a variety of surgical procedures, compared with sham controls and compared with standard treatment, and reduces opioid and non-opioid medication use (43 trials, 6 trials RCTs, n = 399 patients).(43) In open abdominal surgeries, acupuncture compared with sham or standard therapies reduces postoperative pain at rest as well as pain on movement at 24 hours and reduces opioid consumption.(44) Peri-operative auricular acupuncture or

² Pain associated with TMD can be clinically expressed as masticatory muscle pain (MMP) referred to as a myogenous temporomandibular disorder or TMJ pain (synovitis, capsulitis, osteoarthritis) referred to as an arthrogeous temporomandibular disorder.

acupressure for a few days reduces pain after hip replacement at for up to 7-days post-operatively, and use of opioids.(45)

In the Emergency Department, auricular acupuncture reduces a variety of acute pain by 2.6/10 when compared with sham or standard care.(46) Adverse effect of auricular acupuncture is minor. It takes about 2-10 min to apply the treatment as a cost of \$7.50 AUD per patient.(46)

In conclusion, acupuncture is one of a few non-pharmacological interventions included in the acute pain management guidelines published by the Australian and New Zealand College of Anaesthetists (ANZCA) and Faculty of Pain Medicine (FPM).(47)

Dry mouth (xerostomia)

A Cochrane review published in 2013 that assessed the effects of non-pharmacological interventions to stimulate saliva production for the relief of dry mouth concluded that while there was no evidence of difference in dry mouth symptoms, there was low quality evidence that acupuncture results in a small increase in saliva production in patients with dry mouth following radiotherapy.(48)

This conclusion was in line with a systematic review published in 2010 which concluded that acupuncture is beneficial for irradiation-induced dry mouth, but that this evidence is limited.(49)

Little research has been done on the use of acupuncture administered prior to radiotherapy to prevent dry mouth in these patients. However, a randomised controlled trial of 86 patients with head or neck cancers examined whether acupuncture, delivered prior to each radiotherapy session, could prevent dry mouth. Those in the treatment arm received acupuncture. The authors concluded acupuncture given just prior to radiotherapy significantly reduced dry mouth and improved quality of life.(50)

Chemotherapy induced nausea and vomiting

Reviews of studies using various forms of acupuncture in cancer care—electro-acupuncture, manual acupuncture, acupressure, surface electrodes or magnets—show that acupuncture can be considered as an addition to anti-emetics to help control nausea and vomiting when people undergo chemotherapy or radiation treatment, but the studies are generally of low to moderate quality.(51-55)

Post-operative nausea and vomiting

Post-operative nausea and vomiting (PONV) affects 30 to 50 per cent of surgical patients.(56) There is high-quality evidence showing that acupuncture and/or acupressure is safe and effective for preventing and reducing the incidence of PONV in adults following a variety of surgical procedures.(56-58) A Cochrane systematic review of 59 trials, including 7667 patients, shows that needling, pressure or electrical stimulation applied to *Nei Guan* PC6, a point located above the wrist, reduced the chance of experiencing early post-operative vomiting (post-operative 0-6 hr) by two-thirds and nausea (0-24h) by three-quarters when compared with controls.(59) The review concludes that acupuncture is better than sham acupuncture in reducing PONV; and its effect is similar to anti-emetics. In addition, acupuncture and/or acupressure was particularly effective for high-risk patients of PONV.(60)

Acupuncture is the only non-pharmacological intervention included in the PONV management guidelines,(61) which has been endorsed by the Australian and New Zealand College of Anaesthetists.

Gastrointestinal disorders

The results of studies in both humans and animals suggest that acupuncture has the potential to treat functional gastrointestinal disorders, such as constipation or diarrhoea and abdominal pain or discomfort, by regulating gut motility, the gastrointestinal barrier and visceral sensitivity, and by also impacting the brain-gut axis.(62, 63)

- [Constipation](#) - A meta-analysis published in 2013 of acupuncture for chronic functional constipation concluded that it is safe and may improve weekly spontaneous bowel movements, quality of life, and relevant symptoms of constipation.(64) All of the 15 RCTs included in this study (n=1256 participants) were completed in China and whilst the methodological quality of included studies was deemed high, as sample sizes were small these findings need to be confirmed in other population groups.
- [Irritable Bowel Syndrome \(IBS\)](#) - A Cochrane review published in 2006 concluded there was insufficient evidence to determine if acupuncture was an effective treatment for IBS.(65) However, the 2012 update of the 2006 Cochrane review, which included more clinical trials, reached more definitive conclusions.(66) The 2012 Cochrane meta-analysis, including 17 RCTs (n=1806 participants), reported that sham-controlled RCTs (5 RCTs; n=411 participants) found no benefits of acupuncture relative to a credible sham acupuncture control for IBS symptom severity or IBS-related quality of life. The authors noted that these RCTs were well-designed and of high methodological quality. There was, however, evidence from four Chinese language comparative effectiveness trials that acupuncture was superior to two antispasmodic drugs (pinaverium bromide and trimebutine maleate), both of which provide a modest benefit for the treatment of IBS, although neither is approved for treatment of IBS in Australia. The most recent meta-analysis published in 2019 (41 RCTs; n=3440 participants)(67) also found there was no significant difference when acupuncture was compared with sham acupuncture, on IBS symptoms and quality of life. This review, however,

found that when compared with current pharmaceuticals (antispasmodics, antidiarrheal agents, probiotics, osmotic laxatives, cellulose), acupuncture seemed to have a better effect regarding efficacy rates, clinical symptoms and health-related quality of life. Further to this, acupuncture used as an adjunct to pharmaceutical treatment resulted in greater efficacy and symptom improvements than drugs alone. Finally, this meta-analysis found that quality of life and clinical symptoms saw a greater improvement when acupuncture was used with Chinese medications than if used alone.

- [Gastro-oesophageal reflux disease \(GORD\)](#) - The effectiveness of acupuncture for the treatment of gastro-oesophageal reflux disease (GORD) was reviewed in a meta-analysis published in 2017.(68) This study included 12 RCTs involving 1235 patients that assessed the efficacy of manual acupuncture (MA) or electroacupuncture (EA) alone or combined with pharmaceuticals (proton pump inhibitors) compared to WM alone for the treatment of GORD. The authors noted that included studies were of small sample size and poor methodological quality in general and recommended the findings be interpreted with caution, however the meta-analysis suggests that MA and EA improve recurrence rates compared with pharmaceutical therapy when used alone, and lead to greater global symptom improvement when used as an adjunct to pharmaceutical therapy in patients with GORD.

Premenstrual syndrome and dysmenorrhoea

While the data appears to indicate that acupuncture may improve menstrual health, there are frequent methodological shortcomings in these acupuncture studies.(69-71) While there is some evidence that acupuncture and acupressure are effective at reducing severity of menstrual pain (dysmenorrhoea), most trials to date appear to be of low quality with methodological limitations.(72-76)

Polycystic Ovary Syndrome (PCOS)

Acupuncture may have beneficial endocrine, metabolic, and reproductive effects in women with PCOS and reduce severity, but there is limited evidence that these treatments are safe and effective.(77-80)

Labour and birth

A Cochrane review published in 2020 found limited benefit that acupuncture may be effective in the management of labour pain as well as reducing pain intensity, use of analgesia, and rate of instrumental delivery when compared to no intervention. However, lack of high-quality trials suggest there remains insufficient evidence of a consistent treatment effect from acupuncture.(81)

While there is no clear benefit from acupuncture or acupressure in reducing caesarean section rates, there is limited evidence from single trials that acupuncture improves cervical maturity.(82)

A Cochrane review published in 2017 assessing the efficacy of acupuncture or acupressure for induction of labour concluded there was no clear evidence for the benefit of acupuncture over sham acupuncture in the induction of labour. However, subgroup analysis suggested that electroacupuncture may reduce the rate of caesarean section and increase the rate of instrumental vaginal birth compared to usual care.(82) An earlier systematic review including seven trials and 748 participants compared acupressure with placebo or no treatment for stimulating uterine contractions to initiate labour onset and shorten the duration of labour. This review concluded acupressure may be associated with shortening the duration of first stage of labour but the impact of acupressure on influencing the onset of spontaneous labour in women who are postdates and augmentation of labour, remains unknown. The authors noted the small number of studies included in the review and their methodological weaknesses suggesting the findings be interpreted with caution.(83)

Fertility

A meta-analysis published in 2019 (n=20 RCTs; 5130 women) examined the efficacy, effectiveness and safety of acupuncture as an adjunct to embryo transfer to improve reproductive outcomes in women undergoing in vitro fertilization (IVF), compared to sham acupuncture controls or no adjuvant treatment. This study found increased pregnancies, live births and reduced miscarriage when acupuncture was used as an adjunct treatment within one day of embryo transfer compared with no adjunctive control, but not when acupuncture was compared to sham controls.(84) However, these findings differ from other systematic reviews published in 2013(85, 86) and 2015.(87) The reviews published in 2013 found no difference in clinical outcome when pooling data from all trials of acupuncture around the time of embryo transfer. The 2015 review, however, found a benefit from acupuncture when performed during ovarian stimulation plus on the day of transfer, and when performed after embryo transfer and during the implantation phase. Acupuncture may have an effect on clinical pregnancy rates when used in women who have had multiple previous IVF cycles, or where was a low baseline pregnancy rate, regardless of the comparator.(84)

Menopausal hot flushes

A meta-analysis published in 2018 assessing the effectiveness of acupuncture for vasomotor symptoms and health related quality of life in menopausal women concluded there is some evidence that acupuncture reduces hot flush frequency and severity and also improves health related quality of life (compared to no acupuncture).(88) However, acupuncture appears to be less effective than hormone therapy.(89)

Chronic prostatitis and chronic pelvic pain syndrome

A meta-analysis published in 2016 assessed the efficacy and safety of acupuncture and routine oral medications used as monotherapies or dual therapies (alpha-blockers, antibiotics, NSAIDs) for ameliorating the symptoms of chronic prostatitis(CP)/chronic pelvic pain syndrome (CPPS) and included 12 RCTs with 1203 participants.(90) The analysis showed that all treatments other than sham acupuncture were more efficacious than placebo (as measured by change in National Institutes of Health Chronic Prostatitis Symptom (NIH-CPSI) Total Score).

However, the absolute effects and rank test indicated that electro-acupuncture was the most effective strategy in terms of reducing the total NIH-CPSI score.

In terms of safety, acupuncture was associated with the lowest incidence of adverse events compared with alpha-blockers, antibiotics and dual therapy, and dual therapy was associated with the highest incidence of adverse events.

Most included studies were characterised by a low risk of bias. Two meta-analyses published around this time – one in 2016 and one in 2017 - concluded that acupuncture more effectively decreases the total NIH-CPSI score than sham acupuncture and standard medicine (levofloxacin, tamsulosin, and ibuprofen), which is consistent with the findings of the 2016 meta-analysis.(91, 92) There is however, conflicting evidence on whether acupuncture/ electro-acupuncture improves health-related quality of life of men with CP/CPPS.(90, 93)

Stroke

There are a number of systematic reviews on the efficacy of acupuncture in various aspects of post stroke rehabilitation, however these reviews provide conflicting results and the original clinical trials were often of variable quality.(94-97)

- [Insomnia post stroke](#) - A meta-analysis published in 2016, which included 13 RCTs (11 completed in China and two completed in Korea), aimed to summarise and evaluate evidence on the effectiveness of acupuncture for insomnia relief after stroke.(98) The findings of this review suggest that compared to drug treatment, acupuncture might be an effective treatment for insomnia after stroke, and that compared to sham treatment, intradermal acupuncture might have significant effects on insomnia after stroke.
- [Dysphagia](#) - The effectiveness of acupuncture for the treatment of post stroke dysphagia, or difficulty swallowing, has been assessed in several systematic reviews. The most recent review published in 2019 assessed the effectiveness of acupuncture combined with swallowing training for post stroke dysphagia compared to swallowing training alone.(99) This review included 17 RCTs (n=1479 participants) and all were completed in China. In the meta-analysis, the estimated effect sizes of effectiveness rate, swallowing function assessment, and individual activity as measured using the modified Barthel Index suggested that the combined application of acupuncture and swallowing training improved swallowing

function and activities of daily life to a significantly greater degree than swallowing training alone. As all studies included in the review only reported short-term effects, no comment can be made on long-term efficacy. Limitations of the present study were that there was substantial heterogeneity and publication bias observed in included studies (for the pooled estimate of effective rate)

Another systematic review and meta-analysis published in 2018 aimed to determine if acupuncture was an effective treatment for post stroke dysphagia.(100) Meta-analysis found there was evidence supporting the efficacy and safety of acupuncture in treatment to post stroke dysphagia in the short-term compared with rehabilitation or medication, a finding in line with an earlier meta-analysis.(101) However, the 29 RCTs (2190 participants) included in this study were generally of poor methodological quality; all trials were completed in China.

- [Aphasia \(impairment of language\)](#) - One meta-analysis on the use of acupuncture to treat stroke-related aphasia (language impairment) included 28 RCTs (n=1747 participants), all of which were completed in China, and trials compared the effectiveness of acupuncture (used either as a monotherapy or as an adjunct to language rehabilitation) to language rehabilitation treatment alone.(102) Meta-analysis showed that acupuncture was effective in treating post-stroke aphasia by improving functional communication, severity of language impairment, spontaneous speech, auditory comprehension, naming, repetition, reading, and writing. The authors noted the mixed quality of the studies.

Mental health conditions

- [Depression](#) - While there is little evidence that acupuncture is an effective treatment for depression (when used as a monotherapy),(103) there is emerging evidence that acupuncture used as an adjunctive treatment with standard medicinal treatments for depression is beneficial in reducing the severity of depression by end of treatment. However, the studies reported are generally of low quality.(104, 105)
- [Anxiety](#) - A 2019 review of systematic reviews indicated that acupuncture may be an effective treatment for anxiety, however the methodological quality of the reviews and the quality of the primary clinical trial evidence were low.(106)
- [Post-traumatic stress disorder \(PTSD\)](#) - Acupuncture is reported as a possible treatment option for PTSD.(17, 107) A recent meta-analysis and systematic review identified potential clinical benefits of acupuncture on PTSD symptoms and functional status immediately post-intervention, as well as PTSD and depressive symptoms in the months following completion of acupuncture treatment.(108)

Neurological conditions

- [*Mild cognitive impairment \(MCI\)*](#) - A meta-analysis published in 2020 (including 15 RCTS and 1051 participants) found that acupuncture is beneficial for improving aspects of cognitive function in elderly people with MCI.(109) The authors noted, however, that the methodological quality of some trials included in the review was low. Another meta-analysis of RCTs assessing the efficacy of acupuncture for amnesic MCI concluded acupuncture appears effective for amnesic MCI when used as an alternative or adjunctive treatment.(110) The authors of this review also noted the low methodological quality of included trials.
- [*Parkinson's disease*](#) - A meta-analysis published in 2017 which included 25 RCTs (n=1616 participants) evaluated the use of acupuncture for relief of Parkinson's disease (PD) symptoms. The included RCTs showed favourable results for acupuncture plus conventional treatment compared with conventional treatment alone in the unified Parkinson disease rating scales II (motor experiences of daily living), III (motor examination), and IV (motor complications) and the total score. Acupuncture was effective in relieving PD symptoms compared with no treatment and conventional treatment alone, and acupuncture plus conventional treatment had a more significant effect than conventional treatment alone. The RCTs included in the analysis were from Korea and China and 19 of 25 were high-quality studies (a score of 6 or higher on the PEDro scale).

Allergic rhinitis

While earlier reviews noted that either there was insufficient evidence to support or refute the use of acupuncture in patients with allergic rhinitis(111) or were inconclusive as to the efficacy of acupuncture for allergic rhinitis,(112) a meta-analysis published in 2015 suggests that acupuncture could be a safe and valid treatment option for allergic rhinitis patients.(113) This study included 13 clinical trials with 2365 participants all of whom were diagnosed with allergic rhinitis. Acupuncture treatment exerted a significant reduction in nasal symptom scores (weighted mean difference [WMD]: -4.42, 95% confidence interval [CI]: -8.42 to -0.43, $p = 0.03$), medication scores (WMD: 1.39, 95% CI: -2.18 to -0.61, $p = .0005$), and serum IgE (WMD: -75.00, 95% CI: -91.17 to -58.83, $p < 0.00001$). While only three of the clinical trials reported on changes in quality of life there was a non-significant trend in favour of acupuncture treatment.

Insomnia

There is a substantial research literature on acupuncture for insomnia. However, an assessment of the methodological quality and outcome measures of this body of research found that while reviews concluded acupuncture (compared to a variety of different controls including placebo controls) was effective for the treatment of insomnia, the methodological quality of most of the included studies and the quality of evidence were low.(114)

A 2019 meta-analysis including 73 RCTs with 5333 participants assessed the effectiveness and safety of acupuncture for primary insomnia.(115) While this review found that acupuncture treatment showed a greater reduction in Pittsburgh Sleep Quality Index score when compared to no treatment and acupuncture used as an adjunctive to regular medication for insomnia provided greater effect than medication alone, the clinical trials were of low to very low methodological quality. Another meta-analysis published in 2020 included 15 RCTs (n=1108 participants) and showed that the efficacy of acupuncture therapy was superior to that of placebo acupuncture in treating insomnia.(116) The limitations of this review were that it included a relatively small number of trials (of small sample size) with participants with varying severity of insomnia.

Mechanisms of action

Acupuncture has been shown to stimulate various nerve pathways and a large number of our chemical neurotransmitters and neurohormones, including endogenous opioids (endorphins, enkephalins and dynorphins). Its actions cannot be explained by any one mechanism alone.(117-120) For example, the use of acupuncture for pain relief is mediated through various mechanisms and receptor sites. Acupuncture stimulates afferent fibres of the nervous system activating different pain inhibitory systems dependent upon the stimuli provided.(117) It also activates endogenous opioids in the spinal cord and supraspinal fluid, providing pain relief through descending inhibition mechanisms. For fuller explanations of the potential mechanisms of action of acupuncture several reference texts are available.(3, 4, 121)

Some good studies on brain imaging have shown stimulation of acupuncture points result in activation of parts of the brain which may be related to the disease.(122)

Safety of acupuncture

Acupuncture is a safe treatment option for patients when performed by qualified practitioners; it has low rates of complications and the incidence of infections is rare.(123-126) Large-scale studies have shown that major adverse events requiring hospitalisation are extremely rare and no deaths were seen in over 3 million treatments performed by qualified professionals.(123-126)

However, precautions are needed in particular situations:

- Pregnancy: acupuncture may cause contractions which can induce labour,(127)
- Malignant tumours: acupuncture should not be used to treat a malignant tumour and the site of the tumour should never be needled,(128)
- Bleeding disorders: people who suffer from bleeding disorders or who take blood-thinning medications should check with their doctor before receiving acupuncture treatment.(129)
- In rare circumstance, acupuncture needling may puncture the lungs.(130)

All of those adverse effects are rare among those who are well-trained and registered acupuncturists.

The Chinese Medicine Board of Australia has adopted the National Health and Medical Research Council's *Australian guidelines for the prevention and control of infection in healthcare* for which all healthcare professionals including acupuncturists, must comply.(131) Acupuncture needles are single-use pre-sterilised and disposed of immediately after use in a rigid-walled sharps container.(131)

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