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Mapping the evidence base and use of acupuncture within the NHS

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Mapping the evidence base and use of acupuncture within the NHS

A WEST MIDLANDS HEALTH TECHNOLOGY ASSESSMENT COLLABORATION REPORT

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WEST MIDLANDS HEALTH TECHNOLOGY ASSESSMENT COLLABORATION (WMHTAC)

The West Midlands Health Technology Assessment Collaboration (WMHTAC) produce rapid systematic reviews about the effectiveness of healthcare interventions and technologies, in response to requests from West Midlands Health Authorities or the HTA programme. Reviews usually take 3-6 months and aim to give a timely and accurate analysis of the quality, strength and direction of the available evidence, generating an economic analysis (where possible a cost-utility analysis) of the intervention.

CONTRIBUTIONS OF AUTHORS:

Jonathan Roberts undertook the research and production of the report, guided by David Moore who commented on the content and presentation of the report.

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The authors all declare that they have no conflicts of interest.

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West Midlands Regional Evaluation Panel

Recommendation

The panel regarded this report as a mapping exercise only. Therefore, no recommendation regarding the clinical effectiveness and the cost-effectiveness of acupuncture was required. The panel did recommend that this report is circulated widely.

Anticipated expiry date:

This report has no specific expiry date. The report should be utilised as a starting point from which to consider the evidence of effectiveness of acupuncture for a given indication. Readers should be aware that more evidence from systematic reviews on acupuncture may have become available since this report was compiled.

EXECUTIVE SUMMARY

Acupuncture involves the stimulation of acupuncture points in the body to treat disease and disorders. Acupuncture may have a moderate effect on the immune system as well as stimulating the release of natural painkillers like endorphins. Acupuncture fits with the 'gate theory' of pain; it is therefore seen as a potential treatment for a very wide variety of conditions.

POPULATION AND SETTINGS

Estimates suggest that anywhere between 2.5% and 10% of the UK population receive non-conventional treatments each year and that only 10% of these are via referral in the NHS. Acupuncture is the most common treatment. As pressure to fund treatments increases, careful evaluation of the evidence base is required.

METHODS

A search for systematic reviews of the effectiveness of acupuncture was conducted. The evidence base was mapped out against conditions recommended by two leading UK acupuncture bodies and the World Health Organisation.

RESULTS

There are at least 64 published or in progress systematic reviews on the use of acupuncture for multiple conditions. Many conditions for which acupuncture can be used do not have evidence that has been systematically reviewed or systematic reviews have indicated that the current evidence base is insufficient to determine whether acupuncture is effective or not. Current evidence from systematic reviews suggests acupuncture is effective in the treatment of dental pain, temporomandibular pain and in the control of post operative and chemotherapy induced nausea.

CONCLUSION

This report should be used as a guide to the best available evidence for conditions listed as suitable for treatment with acupuncture. The tables contained within are aimed to be a guide to the current evidence base underpinning acupuncture use.

ABBREVIATIONS AND ACRONYMS

AACP	Acupuncture Association of Chartered Physiotherapists
ACTH	Adrenocorticotrophic Hormone
AMED	Allied and complementary medicines database
BAC	The British Acupuncture Council
BAWA	The British Academy of Western Acupuncture
BMA	British Medical Association
BMAS	British Medical Acupuncture Society
CAM	Complementary and Alternative Medicine
CI	Confidence Interval
CONSORT	Consolidated Standards for the Reporting of Trials
DOH	Department of Health
EED	Economic Evaluations Database
GP	General Practitioner
HTA	Health Technology Assessment
IBS	Irritable Bowel Syndrome
MRI	Magnetic Resonance Imaging
NHS	National Health Service
PR	Protocol
QALY	Quality Adjusted Life Year

RCT	Randomised Controlled Trial
REV	Systematic Review
SA	Structured Abstract
SD	Standard Deviation
STRICTA	Standards for Reporting Interventions in Controlled Trials of Acupuncture
TENS	Transcutaneous Electrical Nerve Stimulation
WCB	Workers Compensation Board
WHO	World Health Organisation

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1. AIM OF THE REPORT

To investigate the evidence base underpinning the effectiveness of acupuncture for conditions of potential use in the National Health Service by mapping evidence on effectiveness of acupuncture from published systematic reviews to conditions listed by the World Health Organisation (WHO), British Medical Acupuncture Society (BMAS) and the Acupuncture Association of Chartered Physiotherapists (AACP). It was beyond the scope of this brief report to critically appraise the extensive evidence base.

2. BACKGROUND

2.1 Brief overview of acupuncture

Acupuncture refers to the insertion of a solid needle into any part of the human body for disease prevention, therapy or maintenance of health

- Department of Health (DOH) definition[1]

Acupuncture developed from the traditional Chinese medicine techniques that can trace recorded origins back to the 2nd century BC.[2] Traditional Chinese medicine aims to restore the body's natural health state by balancing yin (negative) and yang (positive) forces. The forces of yin and yang flow through the body in the form of qi (chi) and mirror the flow of energy in the Universe known as Tao. Qi flows through 12 channels of energy (meridians) in the body that can be accessed at certain points near the surface of the skin (acupoints). Excessive flow of qi (Shi) or a deficiency of qi (Zu) leads to disease or disorders. The insertion of solid needles into acupoints is used as a means of restoring the correct flow of qi. Central to the success of acupuncture is the elicitation of 'de qi' or needling sensation, a dull ache around the site of needling.[3,4]

Acupuncture spread to the West in the late 17th century via the Jesuit missionaries and returning employees of the Dutch East Indies Company. The ideas were in contrast to the 16th Century western concepts of anatomy pioneered by Andreas Versalius and later William Harvey and therefore were not generally accepted by the European medical profession at that time.[2]

The first European countries to adopt the use of acupuncture were France and Germany. Electroacupuncture which involves stimulating acupoints with electrical devices was developed in France in 1825. In the early part of the 19th century German papers concerning the alleviation of rheumatic pain using needles were published.[5] The use of acupuncture techniques grew in these countries throughout the 19th and 20th Centuries, but remained largely isolated to this region. In the UK, interest in acupuncture techniques largely centred at the University College Hospital in London which produced papers on inserting needles at points of tenderness to relieve pain and in Oxford under the professor of medicine in 1912 Sir William Osler.[5]

In 1950 a British physician, Felix Mann, encountered these techniques whilst working as a junior doctor in France and Germany. His interest lead him to visit China and on his return to Britain in 1958 he set-up a clinic in London with the aim of both treating patients and educating doctors on the use of acupuncture.[5] This would later lead to the formation of the BMAS.

Interest in acupuncture grew but was accelerated by the goodwill visit of the then president of the United States, Richard Nixon, to China in 1972. On this visit, several demonstrations of acupuncture were made to the president and his personal physician including a demonstration of surgery performed under anaesthesia induced solely by acupuncture. On their return, the president's physicians wrote about their experiences and promoted the use of acupuncture. Acupuncture along with other complementary and alternative medicines (CAM) grew and gained a greater acceptance throughout the 20th and now into the 21st Centuries.[3,4,6,7]

Variations of acupuncture techniques have also evolved such as moxibustion, where the acupuncture needle has burning moxa attached (a dried material

derived from the mugwort plant) and cupping, where the skin is cupped using a heated glass. Acupuncture of the ear (auricular acupuncture) was developed in France by Nogier and is based on the theory of the outline of the human anatomy in the outer surface of the ear. Needling is then carried out in areas corresponding to organs affected by disease. Laser acupuncture involves stimulating acupoints with a low level laser unit from a helium neon source[3,4,7]. It is important when evaluating acupuncture to be clear of the exact technique being used. Traditional Chinese interpretation of acupoints may also differ from Western interpretation.

2.2 Scientific rationale behind acupuncture use

The 'Gate Theory' of pain was proposed in 1965 by Melzack and Wall[8] based on the fact that small diameter nerve fibres carry pain stimuli through a 'gate mechanism' but larger diameter nerve fibres going through the same gate can inhibit the transmission of the smaller nerves carrying the pain signal.[7] Neuro chemicals released in response to pain stimuli also influence whether the gate is open or closed for the brain to receive the pain signal. Therefore, in theory pain signals can be interfered with by stimulating the periphery of the pain site to stimulate nerves at the spinal cord and corresponding areas in the brain stem or cerebral cortex. MRI scanning of the brain has shown a reproducible pattern of activity in the brain after repeated acupuncture sessions.[3]

The 'neural opiate theory' is the evolution of the gate theory to include the effects of opioids. Opioids are an endogenous group of chemicals that bind to opioid receptors and influence nerve activity and the transmission of pain in the substantia gelatinosa part of the spinal cord (known as the spinal root).

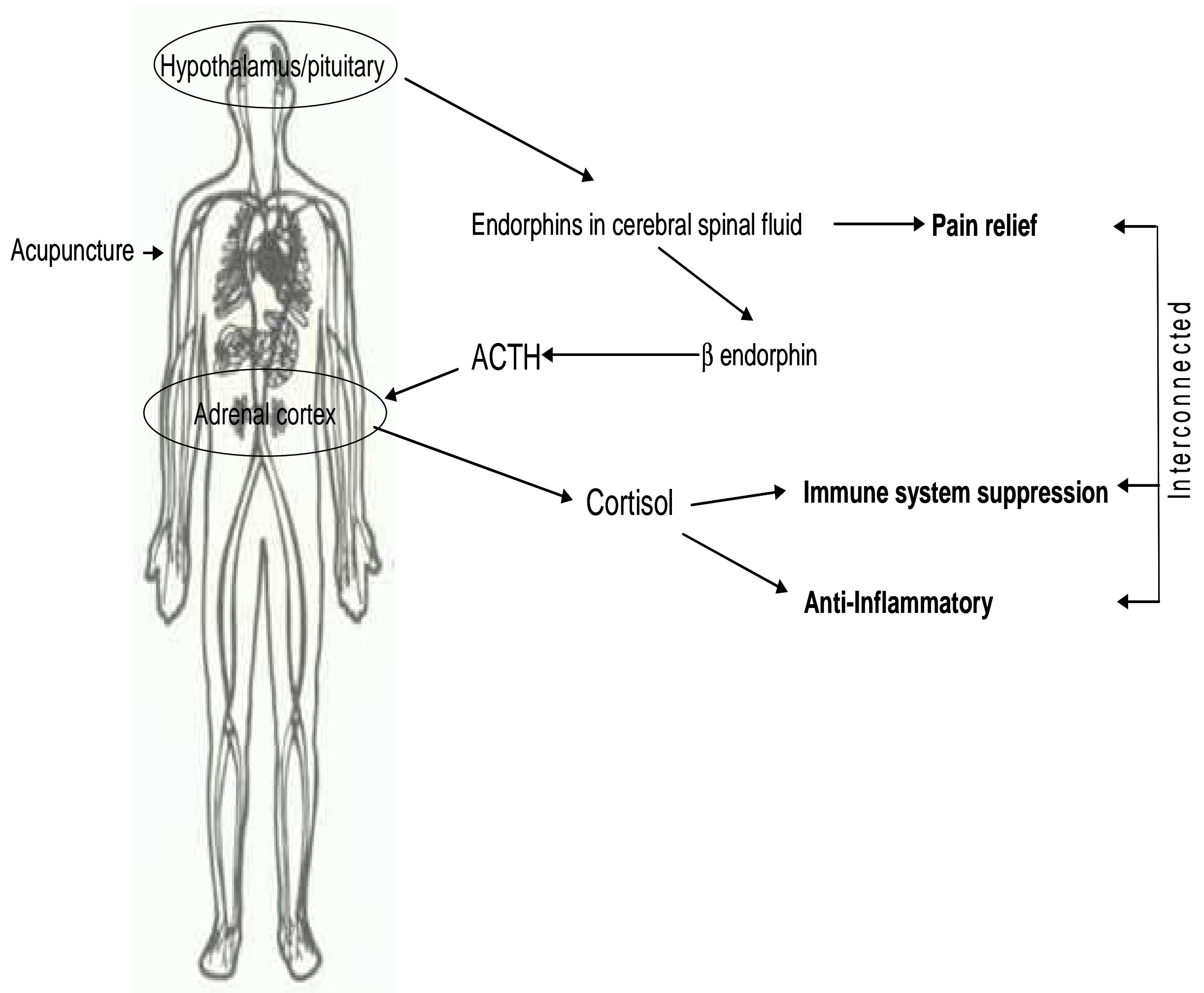
Stimulation of peripheral nerves in muscles can send an impulse to the central nervous system and stimulate the pituitary/hypothalamus to induce the release of endorphins (Figure 1). Endorphins in the cerebrospinal fluid are thought to produce an analgesic effect which is likely to influence pain sensation.[9,10] Naloxone, an opiate antagonist of endorphins has been used to

demonstrate the effects of acupuncture analgesia. Pre-treating or injecting with naloxone has been shown to negate the analgesic effect of acupuncture.[7] The release of one type of endorphin (β endorphin) is coupled to the release of adrenocorticotrophic hormone (ACTH). ACTH acts on the adrenal cortex to release cortisol. It is thought that some of the anti-inflammatory effects of acupuncture may be related to the effects of cortisol. The effects of ACTH and cortisol are important in drug dependence and abstinence from drugs. ACTH and cortisol levels are high in drug users during abstinence and are unaffected by methadone. Acupuncture may be used to influence the release of these chemicals to help in addiction.

Acupuncture treatment is also thought to have an effect on motor function and be mildly sedative. The reasons for this are not clear but its calming effects are often used in combination with other techniques in complex disorders such as depression, insomnia and addiction.[11-14]

A recent review investigated the number of trials over a one year period that reported a mechanism for the effects of acupuncture.[15] The review identified 79 trials published in English in 2005. They found that 33% offered no physiological rationale and 67% posited a physiological basis for acupuncture. The mechanisms proposed were neurochemical (62%), autonomic nervous system regulation (11%), effects on brain function (9%), local effects (6%), segmental nervous system effects (4%) and other effects (9%).[15]

Figure 1 Overview of the potential mechanism of action of acupuncture.



2.3 Uses of acupuncture

It is estimated the UK spends an average of £1.6 billion per year on CAM. Acupuncture is the fourth most common CAM treatment behind aromatherapy, homeopathy and herbal medicines.[16]

The WHO developed a strategic framework on the use of traditional medicines with an action plan between 2002-2005.[17] The WHO estimated at the time, up to 80% of people in some countries use a CAM treatment or therapy. In the

UK it was estimated that up to 40% of the population had used a CAM treatment.[17]

The WHO framework suggests integrating CAMs into national health care systems and developing policy to regulate its use. It suggests guidance on the safety, efficacy and quality of CAM treatments should be provided, and there should be a drive to increase the access and availability of CAM treatments where appropriate.[17] For acupuncture the WHO produced a list of potential disorders that may be treated with acupuncture at a 1979 symposium on acupuncture held in China. Physicians practising acupuncture were invited to identify conditions that might benefit from acupuncture. A list of 43 conditions was constructed, however, this list was not based on clinical trial evidence only the clinical opinion and experience of the delegates. In 1996 the WHO held a consultation on acupuncture in Italy. The need for an evidence based review was highlighted and in 2003 a report evaluating the clinical trial evidence of effectiveness of acupuncture was produced.[18] The report breaks conditions down into four groups namely conditions that have proven trial evidence of effectiveness (Table 1), conditions for which further evidence is needed (Table 2), conditions with limited data on effectiveness and conditions which it may be tried by a practitioner with special knowledge (Appendix 1).

Table 1 WHO list of indications 'for which acupuncture has been proved through clinical trials to be an effective treatment'.

Type*	Indication
Respiratory	Allergic rhinitis
Gastrointestinal	Biliary colic, dysentery, epigastralgia (in peptic ulcer, acute and chronic gastritis and gastrospasm)
Pain	Facial pain, headache, knee pain, low back pain, neck pain, dental and temporomandibular pain, periarthritis of the shoulder, postoperative pain, rheumatoid arthritis, sciatica, sprain, tennis elbow
Gynaecological and Renal	Renal colic, primary dysmenorrhoea, induction of labour, correction of malposition of fetus
Cardiovascular	Hypertension, hypotension, stroke
General	Adverse reactions to radiotherapy and/or chemotherapy, depression (including depressive neurosis and depression following stroke), leukopenia, morning sickness, nausea and vomiting

Adapted from WHO[18]

* Classification of disease by this author, not the WHO

Table 2. WHO list of indications for which 'a therapeutic effect of acupuncture has been shown, but further evidence is needed'

Type*	Indication
Respiratory	Asthma, post extubation in children, whooping cough
Ear, Nose and Throat (also eye and Mouth)	Eye pain, epistaxis (nose bleeds), herpes zoster, Menière's disease, sore throat, sjögren syndrome
Gastrointestinal	Cholecystitis, cholelithiasis, gastrokinetic disturbance, hepatitis B carrier status, ulcerative colitis
Neurological	Bell's palsy, facial spasm, fibromyalgia, neuralgia, reflex sympathetic dystrophy, dementia
Pain	Abdominal pain, cancer pain, earache, radicular pain, spinal pain, pain due to endoscopic examination
Skin	Acne vulgaris, neurodermatitis, pruritus
Gynaecological and Renal	Female infertility, female urethral syndrome, hypo-ovarianism, labour pain, male sexual function, polycystic ovary syndrome, premenstrual syndrome, prostatitis, recurrent lower urinary tract infection, urolithiasis, retention of urine
Cardiovascular	Cardiac neurosis, hyperlipaemia, pain in thromboangiitis, Raynaud's syndrome
General	Alcohol dependence, competition stress syndrome, craniocerebral injury, diabetes (non-insulin dependent), haemorrhagic fever, obesity, gouty arthritis, insomnia, lactation deficiency, opium, cocaine and heroin dependence, osteoarthritis, post operative convalescence, schizophrenia, stiff neck, temporomandibular joint dysfunction, tobacco dependence, Tourette syndrome, Tietze syndrome

Adapted from WHO[18]
*Classification of disease by this author, not the WHO

There are four key British/UK organisations for practicing acupuncturists. The BMAS, the Acupuncture Association of Chartered Physiotherapists (AACP), The British Acupuncture Council (BAC) and The British Academy of Western Acupuncture (BAWA). The BMAS and the AACP list on their websites that acupuncture is useful for the conditions listed in table 3. Both state that this is a non-exhaustive list. The BAC and BAWA do not list conditions on their websites.

Table 3. BMAS and AACP conditions listed as suitable for acupuncture treatment.

Type of Condition	BMAS	AACP
Painful conditions	Musculoskeletal pain, back, shoulder, neck and leg pain. Chronic muscle strains, sports injuries and various kinds of arthritic and rheumatic pain	Acute injuries, sports injuries, whiplash, chronic injuries, back pain, neck pain, osteoarthritis, rheumatoid arthritis, joint pain
Functional bowel or bladder problems	Irritable bowel syndrome (IBS), mild forms of incontinence	IBS, bladder and bowel dysfunction
Menstrual and menopausal symptoms	Period pains and hot flushes	Women's health, hormone imbalances
Allergies and Respiratory	Hay fever, perennial allergic rhinitis, allergic rashes such as urticaria and prickly heat.	Asthma, bronchitis, hay fever
Skin problems	Rashes and ulcers, itching, some forms of dermatitis and some cases of excessive sweating	Eczema
Sinus problems	chronic catarrh, dry mouth and eyes	
Neurological	Headaches, migraines, trapped nerves	Headaches, migraine, multiple sclerosis
Other	Smoking cessation.	Stress related illness, stroke, chronic fatigue syndrome

2.4 Acupuncture within the NHS

There are five homeopathic hospitals within the NHS, based in Bristol, Glasgow, Tunbridge Wells, Liverpool and London. Acupuncture is offered as part of treatment programs at the Royal London and Glasgow homeopathic hospitals.

It is difficult to determine the exact number of people who receive CAM treatment per year in the UK. The British Medical Association (BMA) reports that there may be up to 15 million consultations to non-conventional therapists each year in the UK, which is approximately 25% of the population, other estimates have ranged from 2.5%-10% of the population seeking CAM treatments.[1,16 19,20] It is also estimated that up to 90% of all these CAM treatments in the UK are private (non NHS) consultations.[1,19,20] This number obviously reflects the large number of patients who will seek CAM treatment without consulting their GP or primary care practitioner first, and in part is likely to be due to the large amount of CAM treatments available ‘over the counter’. Therefore, the estimated 10% of NHS treatments in this group is very unlikely to be representative of the actual number of treatments given relative to the number of people seeking a CAM treatment.

There are a number of studies that have investigated the referral rate from a primary care setting. In 2002 the BMA conducted a UK-wide postal survey of GPs, to assess the use of CAM, specifically acupuncture. There were 365 GP practices contacted (response rate 56%).[19,20] The results found that 58% of GPs were arranging CAM treatments for their patients. This is similar to an estimate by the WHO of 46% in the UK.[17] The most common referral was for acupuncture (47%). GPs’ knowledge of acupuncture was found to be low overall, with only 16% saying that they had “considerable knowledge” of acupuncture or “knew a lot about the subject”. However, almost half said that they would like to receive further training in acupuncture in order to treat their own patients in the future.[19,20] Those GPs not using acupuncture cited a lack of patient demand, a lack of knowledge or information about services available, a lack of guidelines to assess competency of acupuncturists, and a lack of financial resources as the most common reasons for not doing so. A

large proportion of GPs (79%) reported that they would like to see acupuncture provided in the NHS.[19,20]

A DOH survey in 2003 identified 7,500 acupuncture practitioners of whom approximately 2,200 were Doctors registered with the BMAS, 2,650 were physiotherapists registered with the AACP, and 250 were Nurses belonging to the BAWA.[1,6] This obviously doesn't include people practicing who are not members of a professional group, but is likely to be a reasonable broad indication of the number of acupuncture practitioners within the NHS.[1,6] The DOH also estimated in a national study that 14% of GP practices employed an independent practitioner in 1995, but updated information in 2001 suggested this number to be lower (6%) with the majority of treatments being administered in house by a member of the primary care team, or by an NHS referral.[6]

A study by van Haselen[20] which looked at primary care workers (GPs, practice and district nurses) use of CAM treatments and found that 83% of responders had previously referred patients for CAM treatments. Of the CAM treatments, acupuncture was the most common with 73% stating they had referred for this. The main reasons given were patients request, conventional treatment failure and in response to evidence.[20] A study by Lewith[21] attempted to question the entire membership of the Royal College of Physicians which at the time consisted of 12,168 members.[21] The authors only received a response rate of 23% (n=2875) and excluded GP based responses. 78% of responders had referred, on average, up to 3 patients per month. The authors conclude that if the non-responding physicians can be assumed to have no interest in CAM treatments, this still equates to 1 in 10 UK based physicians referring patients for CAM treatments.[21]

2.4.1 Overview

From this information it is clear that determining an exact number of patients who receive NHS acupuncture is difficult. For total CAM treatments it would appear from the BMA survey and WHO estimate that around 50% of GP practices arrange a CAM treatment for their patients. Other studies suggest

this number is a conservative estimate. The DOH survey suggests only a small percentage have their own practitioner on site, and treatments may be administered by a member of the primary care team. The studies are consistent in that acupuncture is the most common referral but estimates range between 47-73% for this. Many factors such as highlighted by the BMA survey are likely to contribute to the number of patients being offered these services.

It is therefore difficult to estimate in a population the size of the West Midlands 5,267, 308 (2001 census data). However, If 2.5% of the population in one year sought a CAM treatment, it would equate to 131,682 people. Assuming that only 10% are treated in the NHS this would equate to 13,168 people receiving CAM. Using the above estimates, if 47% of these were for acupuncture, this would equate to 6,188 people receiving acupuncture on the NHS in the West Midlands per year (119 per week).

The type of person likely to seek acupuncture services was addressed in a recent national survey of 9408 acupuncture patients who consulted members of the British Acupuncture Council.[22] It revealed a weighting towards female patients (74%) with an average age of 51 years. The most common problem for seeking referral was musculo-skeletal (38%) followed by psychological (11%) and other general (9%), neurological (8%) and gynaecological/obstetric (8%) with 5% of patients were seeking acupuncture for their general well-being (full details in appendix). The majority of patients in this sample group (87%) had also previously received acupuncture.[22]

2.5 Acupuncture Regulation

The Acupuncture Regulatory Working Group in 2003 reported on the need for a regulatory system for acupuncture practitioners in the UK.[6] This was in consultation with key acupuncture bodies including the BAC, the AACP, the BAWA and the BMAS. The timetable for completion of the process in accordance with the Health Act 1999 and move towards a generalised registration system was late 2005. However, these steps did not take place because the Government commissioned a further review of non medical

professional regulation which was published in July 2006.[23] Currently the DOH is seeking a public consultation on the document and proposed changes with a deadline of November 2006 for responses.

In April 2006 the Scottish Parliament brought into effect its own legislation requiring the registration of all acupuncturists working outside the NHS. http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060043.htm.

3. ACUPUNCTURE STUDIES

There are numerous systematic reviews and randomised controlled trials (RCTs) comparing the effects of acupuncture in various diseases. The main problem with systematically reviewing RCTs in acupuncture is that they are generally of low quality. This is due to problems with placebo controlled groups, blinding and allocation concealment. Heterogeneity between studies due to diverse treatment techniques such as differing acupoints or duration of needle insertion makes meta-analysis difficult. Also acupuncture may be suitable for a small group of patients with a specific clinical problem that doesn't lead to high numbers of patients in trials and hence studies are often under powered. A general system of rules for the reporting of trials using acupuncture was developed in 2001 to address some of problems.[24] The standards for reporting interventions in controlled trials of acupuncture (STRICTA) guidelines are based on the CONSORT guidelines of assessing the quality of clinical trials.[25]

One of the major problems in acupuncture studies is the issue of the use of an appropriate control or comparator. Studies have generally addressed the issue by having control patients receiving

- no acupuncture but standard care alone. Obviously this can not be blinded and may exaggerate any effect
- acupuncture at a non-acupoint. The choice of sham location and degree and duration of needle insertion may influence outcome.
- sham acupuncture needles that press on the skin, but do not penetrate the skin so can be applied to the same acupoint as the real needle.

There have been clinical trials validating the use of sham needles in relation to patient perception of the treatment they are receiving and the inactivity of the sham needle measured by de qi sensation.[26] The placebo effect especially in studies comparing acupuncture to standard treatment without a sham acupuncture treatment may still be playing a part in any positive treatment effects. Audit data has shown that the best predictors for success of acupuncture treatment are patients and therapists expectation of success, whereas the expectations of the GP or the evidence base of effectiveness for the treatment had no effect on success.[27]

The possible limitations of the clinical trial data in the acupuncture field means it is vitally important that secondary evidence is produced to critically evaluate this evidence base, especially if funds are to be used in this area.

It is the intention of this brief report to assess the volume of secondary evidence underpinning the use of acupuncture within the NHS. Given that systematic reviews are seen as the ’gold standard’ of evidence, the method chosen was to identify systematic reviews of acupuncture and map these reviews by indication to the areas of use in the NHS and to report the review author’s findings on the direction of any effects. This mapping exercise also aimed to identify indications where no robust secondary research was available or planned.

4. METHODS

4.1 Acupuncture systematic reviews already published

Systematic reviews of acupuncture effectiveness were searched for in the following databases using modified text word and MESH search terms including ‘acupuncture’ ‘acupuncture therapy’ and ‘systematic review’ as previously described[28] (appendix 2).

- Cochrane library (Including DARE, Central and HTA resources).
- Medline (1966-date)
- Embase (1988-date)

- The allied and complementary medicines database (AMED) of the British library
- Acubriefs (specialist acupuncture database)

Two existing systematic reviews were identified that have collated the existing review data at that time. The first is the University of York's centre for reviews and dissemination effectiveness bulletin from 2001, which reviews the systematic review evidence for acupuncture under areas such as acute and chronic pain, addiction, asthma, nausea and vomiting and obesity.[29] The second a similar review of reviews was produced in 2003 by the workers compensation board (WCB) in Canada which covered reviews including health technology assessment (HTA) reports from New Zealand, Sweden and Canada.[30]

5. RESULTS

The searches found 258 potential reviews, of which, after reviewing the titles and abstracts, 82 systematic reviews and protocols were identified (appendix 3). This was further reduced to 64 reviews, 38 being full reviews and 26 being protocols, when the most up-to-date reviews were included for conditions with more than one review. The reviews are tabulated in table 4 along with any conclusions drawn by the author's of the systematic reviews. Where a potential positive effect has been found details of the comparator group has also been included within the table.

The reviews identified in table 4 were then mapped to the conditions for which acupuncture has been listed by the BMAS, AACP and WHIO. The findings are presented in table 5. The table is intended to be used as a resource of the most up-to date information in the secondary evidence base behind acupuncture. It reads from right to left with indications listed in groups of conditions, first from the WHO list and then followed by matching conditions from the BMAS and AACP lists. The evidence base is then presented first with the 2001 York review, then the 2003 WCB review and finally the most up-to

date systematic review on the topic. It is intended that this could serve as a quick reference point as to the source of evidence on a condition.

5.1 Acupuncture Evidence Base

From the author's conclusions in Table 4, there are 4 conditions to which the systematic review evidence suggests acupuncture may be effective

- Chemotherapy induced vomiting (on first day)
- Knee pain (osteoarthritis, rheumatoid arthritis)
- Post-operative nausea and vomiting
- Dental and temporomandibular pain

Chemotherapy induced nausea and post-operative nausea are not specifically mentioned by any of the three bodies, although the WHO does have adverse reactions to chemotherapy. Rheumatoid arthritis is on all three lists. Dental pain is only on the WHO list but not the acupuncture bodies lists.

From table 5, it is clear that there are several areas listed by the acupuncture bodies that do not currently have any systematic review evidence evaluating their use. In particular the following three areas are on all three lists, yet do not have review evidence.

- Hay fever (allergic rhinitis)
- Bladder dysfunction
- Skin conditions

It should be stressed that none of these lists are claimed to be exhaustive or to include all conditions that may be suitable for acupuncture treatment.

Table 4. Systematic reviews and protocols for systematic reviews of Acupuncture in the Cochrane library (search date August 2006).

Condition	Year	Type of review*	Authors conclusion**
Osteoarthritis of the knee[31]	2006	REV	Significant reductions in pain and QOL against sham controls suggest effective.
Chemotherapy induced nausea and vomiting[32]	2006	REV	Acupressure shown to be beneficial on first day vomiting against no acupuncture. All patients also took anti-emetics.
Post-operative pain[33]	2006	PR	-
Glaucoma[34]	2006	PR	-
Benign prostatic hyperplasia[35]	2006	PR	-
Chronic Fatigue syndrome[36]	2006	PR	-
Stroke Rehabilitation[37]	2006	REV	No clear evidence – longer trials needed
Neck disorders (including neck pain)[38]	2006	REV	Moderate evidence of positive effect in short term vs. sham treatment
Smoking Cessation[39]	2006	REV	No consistent evidence – methodological problems
Cocaine Dependence (Auricular acupuncture)[40]	2006	REV	No evidence – poor quality trials make data inconclusive
Pain relief during oocyte removal[41]	2006	PR	-
Smoking Cessation[39]	2006	PR	-
Temporomandibular disorders[42]	2005	PR	-
Depression[43]	2005	PR	-
Alcohol and substance abuse[44]	2005	PR	-
Cocaine dependence[45]	2005	PR	-
Rheumatoid Arthritis[46] (Electroacupuncture)	2005	REV	Reduces knee pain in short term. Low number and quality of trials. Sample sizes low
Low back pain (acupuncture and dry needling)[47]	2005	REV	More effective than doing nothing in short term, but not against standard treatments – may be a useful adjuvant.
Acute stroke[48]	2005	REV	Safe but without clear evidence of effect. Small number of patients in trials
Cancer related pain[49]	2005	PR	-
Chronic hepatitis B virus infection[50]	2005	PR	-
Epilepsy[51]	2005	REV	Current evidence does not support use – inappropriate controls used in studies
Insomnia[12]	2005	PR	-
Premenstrual syndrome[52]	2005	PR	-
Schizophrenia[53]	2005	REV	Insufficient evidence – low numbers in trials and blinding inadequate

Condition	Year	Type of review*	Authors conclusion**
Shoulder pain[54]	2005	REV	Lack of evidence – can't support or refute
IBS[55]	2005	PR	-
Acupuncture analgesia during surgery[56]	2005	PR	-
Chronic low back pain[57]	2005	REV	No evidence to support or refute
GI endoscopy[58]	2005	PR	-
Rotator cuff pathology (acupuncture assessed with other interventions)[59]	2005	REV	Lack of evidence to draw definitive conclusions
Asthma[60]	2004	PR	-
Bell's palsy[61]	2004	REV	Inadequate quality of included trials to make conclusion
Depression[13]	2004	REV	Insufficient evidence – small number of studies
Induction of labour[62]	2004	REV	Only one trial – lack of evidence
Labour pain management[63]	2004	REV	Promising as an adjuvant but limited data
Vascular dementia[64]	2004	PR	-
Lateral epicondylitis [65]	2004	PR	-
Lateral epicondyle pain [66]	2004	PR	-
Post-operative nausea and vomiting[67]	2004	REV	Evidence supports effectiveness of P6 stimulation in patients without anti-emetics. Reduces nausea only when compared to non-treatment group when anti-emetics also given.
Chronic asthma[68]	2003	REV	Not enough evidence to make recommendations
Chronic constipation[69]	2003	PR	-
Stroke rehabilitation[70]	2003	PR	-
Women's reproductive health care[71]	2003	PR	-
Improvement in motor recovery after stroke[72,73]	2002	REV	Acupuncture added to a recovery program has small effect on disability but not motor function
lateral elbow pain[74]	2002	REV	Insufficient evidence to support or refute – short term benefit shown in two trials
Opioid dependence[75]	2002	PR	-
Dysmenorrhoea (menstrual cramps)[76]	2002	REV	Small number of trials report benefit of high frequency TENS, but not low frequency TENS compared to placebo or no treatment.
Back pain[77]	2002	PR	-
Fibromyalgia[78]	2002	REV	Limited data – suggestion that real acupuncture is more effective than sham for pain.
Idiopathic headache[79]	2001	REV	Evidence supporting is of poor quality
Chronic pain[80]	2000	REV	Inconclusive evidence
Pain, dyspnoea, and nausea	2000	REV	No evidence to support use of

Condition	Year	Type of review*	Authors conclusion**
and vomiting near the end of life (includes other CAM treatments)[81]			CAM in terminally ill patients.
Neck pain[82]	2000	REV	No supporting evidence
Tinnitus[83,84]	2000	REV	No effect demonstrated
Tension-type and cervicogenic headache (includes other CAM treatments)[85]	1999	REV	No evidence
Postoperative nausea and vomiting[86]	1999	REV	More effective than placebo in first 6hrs
Temporomandibular joint dysfunction[87]	1999	REV	Trend towards positive effect compared to sham or no treatment but confirmation required
Osteoarthritis[88,89]	1999	REV	No evidence to suggest superior to sham needling
Acute dental pain[90]	1998	REV	Positive effect for dental pain vrs sham treatment – optimal technique needs investigating
Dentistry[91]	1998	REV	No evidence for analgesic but positive effect on dental and temporal pain against placebo or no treatment
Weight reduction[92]	1997	REV	No evidence
Adjuvant therapy in stroke rehabilitation[93]	1996	REV	Methodological flaws make data inconclusive
Addiction[14]	1990	REV	Positive effect when added to an addiction program

Rev – Full systematic review
PR – Protocol for a systematic review

*The most up-to-date review has been cited where more then one review exists. If the newer review is a protocol then the previous review has also been cited.

** These reviews have not been critically appraised by this author and are the conclusions of the report authors themselves.

Table 5. Acupuncture Evidence, a comparison of WHO/BMAS/AACP criteria and existing systematic reviews in the Cochrane database and reviews previously evaluated by the University of York and WCB, Canada.

Condition Group	WHO	BMAS	AACP	Conditions covered by York Review 2001	Conditions covered by WCB group 2003	Systematic Reviews (most up-to-date cited)
Respiratory	Allergic rhinitis Asthma Whooping cough	Allergic Rhinitis Chronic Catarrh	Hay Fever Bronchitis Asthma	Asthma		Asthma 2003[68]
Ear, nose and throat (also eye and mouth)	Eye Pain Epistaxis Herpes Zoster Menière's disease Sore Throat Sjögren syndrome Earache	Dry Eyes/Dry Mouth			Tinnitus	
GI Tract and digestive	Biliary Colic Dysentery Epigastralgia Cholecystitis Cholelithiasis Gastrokinetic disturbance Ulcerative colitis	IBS IBS	Bowel dysfunction IBS IBS			Constipation 2003*[69] IBS 2005*[55]
Neurological	Headache Bell's Palsy Facial spasm Neuralgia Sympathetic dystrophy	Headache Migraine	Headaches Migraine	Headache	Idiopathic headache	Idiopathic Headache 2001[79] Bell's Palsy 2004[61] Epilepsy 2005[51]

Condition Group	WHO	BMAS	AACP	Conditions covered by York Review 2001	Conditions covered by WCB group 2003	Systematic Reviews (most up-to-date cited)
	Urine retention	Mild Incontinence	Bladder dysfunction			
		Mild Incontinence				
		Trapped nerve				
			Multiple Sclerosis			
	Fibromyalgia		Chronic fatigue syndrome		Fibromyalgia	Chronic fatigue 2006*[36]
Pain	Post-operative pain	Musculoskeletal pain		Chronic Pain	Chronic pain	Chronic pain 2000 [80]
						post operative pain 2006*[33]
	Arthritis of shoulder	Shoulder Pain				Shoulder pain 2005[54]
	Sprain/tennis elbow	Sports injuries	Sports Injuries		Lateral epicondylitis	Elbow pain 2002[74]
	Sciatica/spinal pain	Back Pain	Chronic Injuries	Back Pain	Acute Low Back pain	Back Pain 2005[47]
	Low back pain	Back Pain	Back Pain		Chronic low back pain	
	Rheumatoid Arthritis	Rheumatoid Arthritis	Rheumatoid Arthritis	Rheumatoid Arthritis		Rheumatoid Arthritis 2005[46]
					Acute Neck pain	
	Neck Pain		Neck Pain		Chronic Neck pain	Neck disorders 2006[38]
			Whiplash			
	Osteoarthritis		Osteoarthritis		Osteoarthritis	
	Dental and temporomandibular pain			Dental pain	Dental and temporomandibular pain	Dental pain 1998[90]
					Myofascial trigger point	
					Rotator cuff tendonitis	
	Knee pain				Patellofemoral pain	
	Cancer pain					Cancer related pain 2005*[49]
Cardiovascular	Cardiac neurosis					
	Stroke		Stroke			Stroke rehabilitation 2006* [37]
	Hyper/hypo tension					acute stroke 2005[48]
	Hyperlipaemia					

Condition Group	WHO	BMAS	AACP	Conditions covered by York Review 2001	Conditions covered by WCB group 2003	Systematic Reviews (most up-to-date cited)
	Pain in thromboangiitis Raynaud's syndrome					
Gynaecological and Renal	Renal colic Dysmenorrhoea Induction of labour Malposition of foetus Female infertility Female urethral syndrome Hypo-ovarianism Labour pain Male sexual function Polycystic ovary syndrome Premenstrual syndrome Prostatitis Lower urinary tract infection Urolithiasis	Menstrual pain/hot flushes	'Women's Health'			Labour pain management 2004[63] Pre-menstrual syndrome 2005*[52] Prostatic hyperplasia 2006*[35]
Skin	Pruritus Neurodermatitis Acne Vulgaris	Allergic rash Dermatitis Excessive sweating	Eczema Hormone Imbalances			
Other	Tobacco dependence Alcohol dependence Cocaine/heroin dependence	Smoking Cessation		Smoking Cessation	Post-operative nausea and	Smoking Cessation 2002[94] Alcohol and substance abuse 2005*[44] Cocaine dependence 2006[40] Chemotherapy induced nausea

Condition Group	WHO	BMAS	AACP	Conditions covered by York Review 2001	Conditions covered by WCB group 2003	Systematic Reviews (most up-to-date cited)
	Adverse reactions to radio/chemo therapy				vomiting/ Chemotherapy induced nausea and vomiting	and vomiting 2006[32]
	Craniocerebral injuries		Acute Injuries			
	Depression (including following stroke)		Stress related illness/Stroke			Depression 2006*[43]
	Schizophrenia					
	Hep B carrier status					Hep B infection 2005*[50]
	leukopenia					
	Diabetes					
	Tourette's syndrome					
	Tietze syndrome					

* Protocol only

6. ECONOMIC ANALYSIS

A search of the NHS Economic Evaluation Database (NHS EED) for UK perspective studies, using general search terms 'acupuncture' and 'cost' revealed 15 articles of which the following two studies relevant to this report were identified. Both are HTA reviews published in 2004 and 2005.

The first study from 2004 looked at the cost effectiveness of acupuncture in relation to its use in headache. The study involved a clinical trial set in a UK primary care setting with 255 patients (136 acupuncture, 119 control) with a 1-year follow-up.[95] The cost to the NHS was £289.65 (SD=165.86) in the acupuncture arm and £88.65 (SD=130.28) in the control arm. The mean difference was £205.34 (95% CI: 169.33 - 241.35). The cost to the patient was £113.75 (SD=258.24) in the acupuncture arm and £128.56 (SD=426.56) in the control arm. The mean difference was £15.91 (95% CI: -86.24 - 54.42). The total cost to the NHS and patients was £403.40 (SD=356.69) in the acupuncture arm and £217.20 (SD=486.00) in the control arm of usual care. The mean difference was £189.42 (95% CI: 102.24 - 276.61). The incremental cost per QALY gained was £9,951 from the NHS perspective, £9,180 from the total cost perspective, and £3,263 from the societal perspective.[95] The authors conclude that the probability of the treatment being cost effective at a £30,000 per QALY threshold is 92% using the base-case or 84% when only complete responder data is used. They also suggest the treatment is more cost-effective if performed by a physiotherapist than a GP, assuming equal outcomes.

A second study of the cost effectiveness of acupuncture from a 2005 HTA report and recent journal article looked at its effectiveness in back pain in relation the quality of life data using the SF-36 (SF-6D version) and EQ-5D measures.[96,97] The trial randomised 159 patients with chronic back pain to receive acupuncture treatment and 80 patients with chronic back pain to receive standard care. The study took place in a UK primary care setting and had a 2 year follow-up. The total cost to the NHS per patient was £471 in the treatment arm and £322 in the control arm (difference £139). The additional cost for acupuncture treatment was less than the cost for acupuncture

treatment alone, suggesting that some of the usual care resource was offset. The total societal costs were £2135 (SD=£3798) in the acupuncture arm and £2469 (SD=£3619) in the control arm, difference £333. The values were not altered by inputting missing data values compared to base-case estimates. The service was reported to be cost-effective as the estimated cost per QALY was £4241, but with large confidence intervals (95% CI £191 to £28,026) using responses to the SF-6D, and £3598 (95% CI £189 to £22,035) using the EQ-5D. The authors constructed a cost-effectiveness acceptability curve and the probability of acupuncture being cost effective at a £30,000 QALY was just below 100%. The curve reached 90% at a cost of approximately £8,000.

Both of these studies suggest acupuncture treatment is highly likely to be cost-effective for the conditions studied.

7. DISCUSSION

This report identified 64 systematic reviews or protocols for systematic reviews for the effectiveness of acupuncture in a range of conditions. Only the most up to date reviews were included, so the actual volume of systematic review evidence available is extremely large. It was the intention of this report to map the systematic review evidence base against conditions that acupuncture may be used for within the NHS. In order to choose these conditions three key bodies were identified, the WHO and UK acupuncture bodies the BMAS and AACP. These bodies currently list conditions on their website that they claim can be treated by acupuncture. Patients can freely access this information. As pressure is likely to increase to fund acupuncture treatments on the NHS, it is vital that the evidence base behind the use of acupuncture is carefully evaluated before decisions are made to fund treatments that may not be effective. As systematic reviews are the ‘gold standard’ of evidence, they were chosen for the purposes of this report. The current systematic review evidence suggests acupuncture may be a useful treatment in the control of nausea and vomiting. This has been studied in chemotherapy induced and post-operative nausea and vomiting and compared to no treatment groups, placebo and with anti-emetic drugs.[32,67] Acupuncture has also been shown to be effective in the control of dental and temporomandibular pain against placebo or no treatment.[90] Recent review evidence has suggested that acupuncture may be useful in the control of pain associated with osteoarthritis in the knee.[46]

However, there are currently no systematic reviews on the use of acupuncture for some of the conditions listed by the BMAS, AACP and the WHO. In particular, allergic rhinitis, bladder dysfunction and a number of skin conditions. There may be primary evidence to support the use of acupuncture in these and other conditions listed by the bodies, so potential for further systematic reviews.

The overall quality of evidence in acupuncture trials is low[98]. Common problems include inadequate reporting of allocation concealment, blinding procedures and under powering due to the small numbers of participants in

trials.[99,100] This may improve with guidelines for reporting trials in acupuncture and improvements in sham intervention techniques[24,26] When systematically reviewing acupuncture trials, heterogeneity is usually high[100] which prevents meta-analysis and definitive conclusions being made. One potential reason is that population groups and disease groups are often very open, with many disorders that may have different aetiologies being grouped together. These disorders may have sub-groups of conditions or patients some of which may be more responsive to treatment than others.

Access to acupuncture treatment is not uniform and is dependent on clinician interest/awareness; however, in 2001 a survey by the BMA reported that 79% of responding GPs said they would like to see acupuncture provided in the NHS.[19,20] It is very difficult to estimate the number of people who use CAM treatments, estimates suggest between 2.5 -10% of the population[1,101,102] but estimates suggest that 10% of all CAM treatments are via the NHS with acupuncture being the most common and representing between 48-76% of this amount.[20,22] Therefore, there is a need to ensure that NHS referrals for acupuncture are in areas where there is robust evidence that acupuncture is effective.

Acupuncture appears to be a safe treatment, with serious adverse events rare and minor events such as bruising and inflammation at the site of needling the most likely, occurring in 7-15% of treatments.[100,103,104] There is limited data on the cost-effectiveness of acupuncture with the available evidence suggesting it is cost effective for headache and back pain.[95,96,96]

7.1 Limitations of this work

The purpose of this report was to map the current evidence base against the treatment indications suggested suitable for acupuncture use by the leading acupuncture bodies in the UK and the WHO. Where there is a lack of systematic review evidence this may not reflect a genuine lack of evidence to support the use of acupuncture in a condition, as there may be numerous RCT's supporting its use. It has been beyond the scope of this report to look at the RCT evidence, where systematic reviews do not exist. It has not been

possible to critically appraise the findings of the systematic reviews contained in this report and the author's conclusions have been used.

7.2 Conclusions

- There are many systematic reviews on acupuncture covering many of the indications listed by the WHO and UK acupuncture bodies BMAS and AACP.
- Some conditions listed by these bodies do not have secondary evidence evaluating the effectiveness of acupuncture. This report acts as a pointer to the best available evidence.
- Cost-effectiveness information is limited, but for conditions where information is available acupuncture appears to be cost-effective.

7.3 Further work

- An update of the critical appraisal of the current systematic review evidence.
- To fill in the gaps where systematic reviews are not present. The author of this report is undertaking a systematic review of the effectiveness of acupuncture for allergic rhinitis.
- More economic evaluations and cost analysis for the UK.

8. APPENDICES

8.1 Appendix 1. Further conditions listed by the WHO

Diseases, symptoms or conditions listed by the WHO as being worth trying acupuncture treatments on but there is are only individual trial or a limited amount of information on effectiveness.

Chloasma
Choroidpathy
Colour Blindness
Deafness
Hypophrenia
Irritable colon syndrome
Neuropathic bladder in spinal cord injury
Pulmonary heart disease
Small airway obstruction

Diseases, symptoms or conditions listed by the WHO for which treatment may be tried by a specialist practitioner.

Breathlessness in chronic obstructive pulmonary disease
Coma
Convulsions in infants
Coronary heart disease
Diarrhoea in infants and young children
Encephalitis, viral, in children
Paralysis

8.2 Appendix 2. Detailed reason for seeking acupuncture treatment.

Study by MacPherson *et al*[22] of 9408 patients seeking acupuncture treatment in 2005 in the UK.

Presenting complaint (percentage)*
General (13.9%) Unspecified pain, general weakness/tiredness, Allergic reaction, Other viral diseases (ME/chronic fatigue)
Blood (0.33%) HIV infection, Other
Digestive (4.66%) Stomach/abdominal pain, Flatulence, Constipation, Mouth/teeth/tongue/lip problems, Infectious hepatitis, stomach function/gastritis, IBS, Ulcerative colitis/Crohn's, other digestive
Eye (0.36%)
Ear (1.10%) Tinnitus, Other ear problems
Circulatory (3.56%) High blood pressure, stroke, palpitations, swollen ankles/oedema, other abnormal heartbeat, other circulatory,
Musculo-Skeletal (37.29%) Neck symptoms, Back symptoms, Lower back symptoms/sciatica, Jaw, Shoulder symptoms, Arm symptoms, Elbow symptoms, Wrist, hand or finger, Hip, Leg/thigh, Knee, Ankle, Foot or toes, Muscle symptoms (incl fibromyalgia), Multiple joint symptoms, Injuries, Rheumatoid Arthritis, Other osteoarthritis, Other musculo-skeletal
Neurological (8.11%) Headache, Migraine, Neurological face symptoms, Vertigo/Dizziness, Sensation disturbances/involuntary movements, Multiple sclerosis, Carpal tunnel, Other neurological.
Psychological (11.24%) Anxiety/nervous tension, Acute stress, Depression, Irritability/anger, Insomnia, Tobacco abuse, Other substance abuse, Other psychological

Presenting complaint (percentage)*
Respiratory (5.67%) Asthma and breathing difficulties, Hayfever/allergic rhinitis, cough, Nose and sinus symptoms, Respiratory infection, Other respiratory
Skin (2.8%) Rashes/sores/lumps, Baldness, Herpes zoster or simplex, Contact or atopic dermatitis, Psoriasis, Other skin problems
Endocrine, metabolic and nutritional (1.33%) Hyperthyroidism, Hypothyroidism, Diabetes Mellitus, Weight gain and appetite problems
Urology (0.99%) Urination difficulties, Other urinary system problems
Pregnancy (2.47%) Morning sickness, Infertility, Other pregnancy
Female genital system (4.75%) Menstrual problems, premenstrual symptoms, Menopausal symptoms, Breast malignancy, Uterine fibroid/myoma, Other female genital
Male Genital System (0.21%)
Social problems (0.19%)

* no data on 1% of patients in study

8.3 Appendix 3. Search strategies

A very broad strategy was used to search MEDLINE and EMBASE for general studies and reviews looking at acupuncture within the NHS.

1. Acupuncture OR electro acupuncture OR TENS
2. Health OR Service OR National Health Service OR NHS
3. 1 AND 2

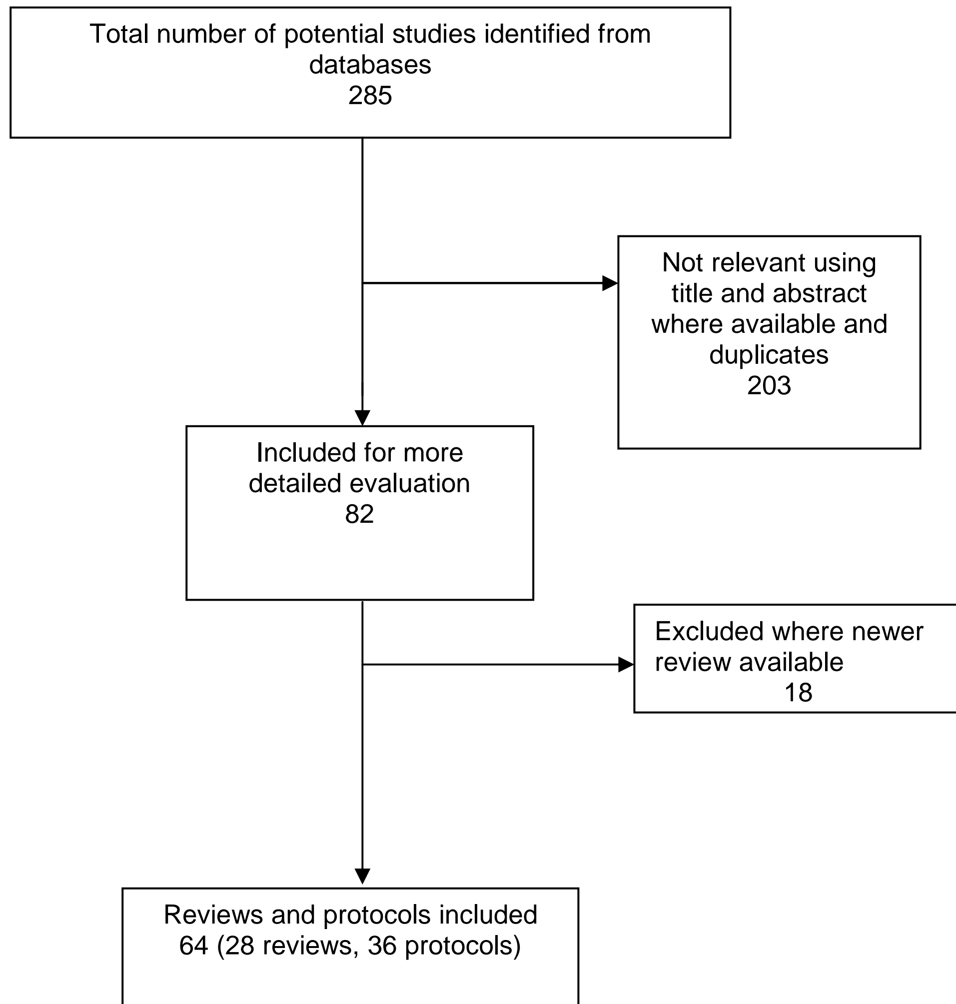
The Cochrane library was searched with simple terms to find all systematic reviews of acupuncture treatments

1. Acupuncture OR electro acupuncture OR TENS
2. Systematic OR Review OR meta-analysis
3. 1 AND 2

NHS EED Economic Evaluation Database

1. Acupuncture

8.4 Appendix 4. Breakdown of results from searches of literature databases.



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