

# Acupuncture: panacea or placebo?



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This article is part of an occasional series on pain management.

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Acupuncture has been used for thousands of years and is used by many medical practitioners as a regular part of their clinical practice. However, there is still confusion and scepticism regarding the way that acupuncture works and whether it is of any use in treating patients. Here, current use and evidence of efficacy in a number of clinical conditions is reviewed.

Acupuncture has been used in China for over four thousand years but received little attention from Western medicine until the 1970s. In this decade, reporters accompanying President Nixon on his visit to China were effusive in their praise of acupuncture, sending home reports of major surgery being performed under acupuncture anaesthesia. This led to a surge of interest in acupuncture that to some extent has remained with us.

Now, over twenty years later, acupuncture still retains an avid following and, in 1996, figures from the Australian Health Insurance Commission demonstrate that more than one in six general practitioners in Australia use acupuncture as part of their practice.<sup>1</sup>

Although acupuncture is widely used, its place in modern medicine is still the subject of debate. A variety of acupuncture techniques are used based on different approaches to diagno-

sis and practice. While some regard acupuncture as a panacea for most ailments, others view acupuncture with scepticism and frank disbelief. For those who practise acupuncture, the recurring question from friends, colleagues and patients is: 'Does acupuncture do anything?'. This article explores the way that acupuncture is currently practised, the evidence for any effects it may have, and the evidence for its effectiveness in clinical practice.

## How is acupuncture practised? Conceptual models

One of the problems in the practice of acupuncture is the 'East-West medicine divide'. Acupuncture was developed and practised in the context of traditional Chinese medicine, which has an entirely different conceptual framework for diagnosis and treatment. For those trained in a Western medical model, it

### IN SUMMARY

- Although more than one in six GPs in Australia use acupuncture as part of their practice, its place in modern medicine is still under debate.
- The way acupuncture is practised may vary in terms of diagnosis ('Western' v. 'Eastern'), needle placement, needle manipulation, and length of treatment.
- There is now good experimental evidence that acupuncture has physiological effects, especially in the area of analgesia.
- There is good evidence for the effectiveness of acupuncture in treating acute postoperative pain, nausea and vomiting.
- There is not yet evidence to conclude firmly the efficacy of acupuncture in chronic pain.

can be perplexing and sometimes frustrating to come to terms with diagnoses such as 'Insufficiency of Qi in the Middle Heater' or 'Accumulation of Cold in the Liver Channel'. However, if the prescription of acupuncture is based on constellations of symptoms that are attributed diagnoses such as these, how are Western trained practitioners to use it? Either they learn Chinese medicine in its entirety, including tongue and pulse diagnosis, and diagnose and prescribe on this basis, or they try to accommodate acupuncture into the Western medical framework. Obviously, the latter is fraught with danger and yet this is the way that acupuncture is most often practised in Western settings.

It is no surprise, therefore, that the practice of acupuncture and the subjection of acupuncture to scientific methods is sometimes criticised by its traditional adherents. Some acupuncturists have claimed that their craft is not amenable to such analysis – that these 'Western' techniques are contextually inappropriate. However, if acupuncture is to advance in its understanding and application, it must be able to withstand the scrutiny of laboratory studies and controlled clinical trials.

## Acupuncture anaesthesia

The term acupuncture is associated in many peoples' minds with surgical anaesthesia (see Figure 1). In recent times, requests to see acupuncture anaesthesia in China have not easily been fulfilled – it seems that, even in China, acupuncture for surgical anaesthesia appears to have been relegated to a secondary role. When acupuncture



Figure 1. Electropuncture anaesthesia. This woman is about to undergo a caesarean section. Acupuncture needles have been placed above and below the lip.



Figure 2. Eye acupuncture. Techniques such as eye, ear, face, foot and hand acupuncture are practised on the basis of supposed connections or relationships between these different regions and organs of the body.

anaesthesia is seen, it is unclear how much the apparent success is due to other perioperative methods of analgesia, patient selection or sheer willpower on the part of the patient.

## Needle placement

Many sites other than traditional points on the body are now used in acupuncture. Ear acupuncture has been

developed in China, and nose, eye (Figure 2), face, foot and hand acupuncture are also practised. These techniques are used on the basis of supposed connections or relationships between these different regions and organs of the body.

Although stimulation of these sites may result in a nonspecific effect, there is no evidence for the concept underlying their use and no rigorous evidence to support their effectiveness in clinical practice.

## Needle manipulation

Traditional acupuncturists manipulate acupuncture needles by hand, often using quite complex patterns of manipulation to produce the desired effect.

Electroacupuncture is a modern and commonly practised development. A small electrical stimulator is used to stimulate one or two pairs of electrodes and the frequency of the stimulating current can be varied, usually between 1 and 100 cycles per second.

The Chinese herb moxa (see Figure 3), as well as microwave and laser, are used as adjuncts or alternatives for stimulation of acupuncture points.

## Length of treatment

What is a satisfactory trial of acupuncture? Some therapists will treat a patient for months on end in the hope that this will eventually produce some relief. However, there is no evidence that this approach is of benefit.

Most studies indicate that 95% of people, if they are going to respond to acupuncture, will do so after six sessions of treatment. Therefore, there is little justification for continuing

treatment beyond this point if there is no response. If a person does respond, a course of 10 sessions, usually on a weekly basis, is generally considered an appropriate length of time to continue treatment.

## Does acupuncture do anything?

### Traditional theories

What does acupuncture actually do? Traditional acupuncturists hold that acupuncture alters the flow of vital energy in defined channels through the body. A substantial amount of research has been conducted in an attempt to relate these channels to anatomic structures such as blood vessels, nerves or lymphatic vessels. However, there is little evidence to support the existence of channels as separate structures.

What about acupuncture points? The traditional theory of acupuncture insists that choosing and finding the correct location is essential for effective clinical practice. The theory also states that 'de qi' – a sensation of heaviness or fullness at the site of insertion – is an important part of effective treatment.

Although there do not appear to be specific structures that correlate with acupuncture channels, there is a correlation between some acupuncture points and major nerve bundles as well as the location of tender points in myofascial syndromes.

### Placebo effect?

It is often claimed that any effect from acupuncture is merely a placebo effect or that it will only work on Chinese people. Is this true?

Evidence for the physiological effects of acupuncture is derived from studies that have been performed over the last 30 years; not surprisingly, some of the original work in this area comes from China.

In the 1970s, physiologists in China reported that acupuncture resulted in an analgesic effect in animal studies.

Further, by transferring cerebrospinal fluid, the analgesic effect could be transferred from an animal that had received acupuncture to another untreated animal. They also reported that the analgesic effect of acupuncture could also be blocked by subsequent administration of the opiate antagonist naloxone. These findings led to the conclusions that acupuncture was exerting its effect by substances released into the cerebrospinal fluid and that the substances which produced analgesia were most likely to be the recently discovered endogenous opioids or endorphins.<sup>2</sup>

Although there are some exceptions, subsequent experiments have tended to

criticism that the effect of acupuncture is due to suggestibility.

### Counter-irritation effect?

Traditional acupuncture theory requires that needles be placed carefully at acupuncture points for the right effect. However, some pain research has demonstrated that painful input anywhere in the body activates inhibitory pain pathways in the brain. Some have argued that this mechanism, called diffuse noxious inhibitory controls, is the way in which acupuncture exerts its effect. If this is true, then acupuncture needles could be inserted anywhere on the body to produce an analgesic effect.



Figure 3. Acupuncture point stimulation. This man is receiving acupuncture treatment for sciatica. The Chinese herb moxa on the needles is used as an adjunct for stimulation of acupuncture points.

confirm these conclusions. Results of further experiments have also suggested a role for other neurotransmitters involved in endogenous analgesia, such as serotonin and noradrenaline.

Some researchers have suggested that these chemicals are released as part of a generalised stress response that is known to result in the release of similar chemicals and is also affected by naloxone. However, the effect of acupuncture on animals in the laboratory appears to argue against the

Another mechanism that has been proposed to account for the analgesic effect of acupuncture is linked to Melzack and Wall's gate theory of pain. Similar to the effect seen following transcutaneous electrical nerve stimulation (TENS) or counter-irritation, it is proposed that acupuncture activates large fibres in the dorsal horn of the spinal cord which then reduces the excitability of the spinal cord.<sup>3,4</sup> In the case of electroacupuncture, it may be that these effects depend on the fre-

quency of stimulation of the needles. It has been suggested that low frequency stimulation (one to eight cycles per second) results in the release of the endogenous opioids beta-endorphin and met-enkephalin, while high frequency stimulation (more than 40 cycles per second) results in the release of other chemicals within the nervous system.

There is little research that examines the physiological effect of moxa and microwave but any effect is presumably due to heating or stimulation of the acupuncture point. More studies have examined the effectiveness of laser acupuncture.

Laser acupuncture is appealing because it is painless and relatively quick, and some studies have shown a beneficial effect. However, the evidence that it is more effective than placebo in relieving pain is still inconclusive.<sup>5</sup>

### Other effects

It has been suggested that acupuncture may have physiological effects other than analgesia. The release of endogenous opioids has effects on the gastrointestinal and cardiovascular systems, and acupuncture also appears to have both a centrally and locally mediated sympathoinhibitory effect. Electroacupuncture, like TENS, has been found to increase blood flow distal to the site of stimulation.

Acupuncture has been used in some studies to reduce pain and increase blood flow in people with peripheral vascular disease and has been demonstrated to increase flap blood flow following plastic surgery. Although there are some studies that demonstrate these effects, the evidence is not as strong as that for mechanisms of analgesia.

In summary, the strongest evidence for a real effect of acupuncture is currently in the field of analgesia,<sup>6</sup> and is supported by a 1989 Australian

National Health and Medical Research Council (NHMRC) report and a 1997 US National Institutes of Health (NIH) consensus statement on acupuncture that conclude there is a neurophysiological basis to acupuncture's analgesic effect. Whatever conceptual framework or basis is used to explain the effect of acupuncture, there is now little doubt that it has physiological effects, espe-

cially in the area of analgesia.

The question that follows this point is: 'If acupuncture has an effect, what is it useful for?'

### What is acupuncture useful for?

#### The WHO view

How does the effectiveness of acupuncture in clinical trials stand up to scrutiny? It has been claimed that

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acupuncture is useful for a wide range of conditions but it may be useful to look at the proof in ascending order of rigor of investigation.

The World Health Organization compiled a list of 40 conditions for which acupuncture was indicated in 1979. Many acupuncturists also make claim that acupuncture is helpful for a range of conditions including chronic

pain, weight loss, smoking, irritable bowel syndrome, nausea, asthma and eczema. However, many of these claims are based on hearsay, anecdotal evidence or studies that are poorly designed and do not provide definitive evidence of real effectiveness. The WHO list was not based on evidence from controlled trials and there are only a handful of studies that have

been conducted in this manner.

How does acupuncture stand up to the standard test of evidence based medicine – that is, the randomised controlled trial?

### **The placebo problem**

One of the problems in conducting acupuncture research using a controlled study design is the development of a suitable placebo.<sup>7</sup> Obviously it is difficult to perform a procedure that is perceived by the subject as having a needle inserted without actually doing so. Probably the most widely used placebo is sham acupuncture. This involves placing a needle in a non-acupuncture point. Although this may produce an effect in itself, it remains the most satisfactory of the placebo techniques in use.

### **Controlled trials**

Despite the placebo control problem, a number of studies have attempted to assess the effectiveness of acupuncture using a placebo-controlled study design. Although there are single studies which purport to show that acupuncture is effective in a range of conditions, many studies have methodological problems including subjects with a wide range of conditions, high drop out rates, short follow up and suboptimal assessment techniques. Systematic reviews have analysed studies that satisfy certain criteria and the conclusions from these reviews are presented below.

### **Asthma**

An analysis of 13 trials on the efficacy of acupuncture in treating asthma found that the design of many of the studies was poor and that results from the better studies were highly contradictory. Therefore, it was not possible to say that there was clear evidence for the superiority of acupuncture over placebo for the treatment of asthma.<sup>8</sup>

### Addiction

Similarly, of 22 controlled studies in the field of addiction, very few were well designed according to standard criteria. For smoking cessation, there were more studies with negative than positive outcomes from acupuncture and little that was meaningful could be made from the studies on heroin and alcohol addiction.<sup>9</sup>

### Nausea and vomiting

In contrast with the findings for asthma and addiction, acupuncture does appear to be beneficial for the treatment of nausea and vomiting. The P6 (neiguan) point on the volar surface of the wrist has been used for the treatment of nausea and/or vomiting associated with chemotherapy, pregnancy, or surgery. In a systematic review it was found that in 11 of 12 high quality, randomised, placebo-controlled trials (involving nearly 2,000 patients), acupuncture produced a consistent beneficial effect.<sup>10</sup>

### Acute postoperative pain

As recognised in the 1999 NHMRC document *Acute Pain Management: Scientific Principles*, there are several randomised controlled trials that demonstrate the effectiveness of acupuncture in reducing pain following surgery. In particular, there is strong evidence for an analgesic effect of acupuncture following dental surgery.<sup>11</sup>

### Chronic pain

A number of studies suggest that acupuncture is effective in the treatment of some specific chronic pain conditions. One systematic review, which compiled the results of some of these studies, found many had methodological flaws and suggested that the evidence of efficacy of acupuncture for the treatment of chronic pain is doubtful.<sup>12</sup> Two, more recent, systematic reviews of the effectiveness of acupuncture in the treatment

of low back pain found no evidence that acupuncture was superior to placebo,<sup>13,14</sup> although one suggested that it compared favourably with various control interventions.<sup>14</sup>

### Conclusion

In summary, it appears that there is evidence from physiological studies that acupuncture has an analgesic effect. The evidence for other effects is

not as strong. Although a large number of clinical studies have been conducted and suggest that acupuncture is useful in a range of chronic pain conditions, very few are of a quality that allows firm conclusions to be made about efficacy. In contrast, there is good evidence for the effectiveness of acupuncture in treating acute postoperative pain, nausea and vomiting. Although acupuncture will always have its adherents, its place in modern medicine and its advancement as a rational and effective treatment approach will benefit from more, well designed studies. **MT**

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