



Medical Acupuncture

-- Past, Present and Future

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Relevant Financial Relationship(s)

None

Off Label Usage

None



Learning Objectives

- Review medical acupuncture
 - Background
 - Concept
 - Proposed mechanisms
- Discuss key evidence for acupuncture
- Reflect on integration in future practice

Task #1

- What do you know about acupuncture?

What is acupuncture?

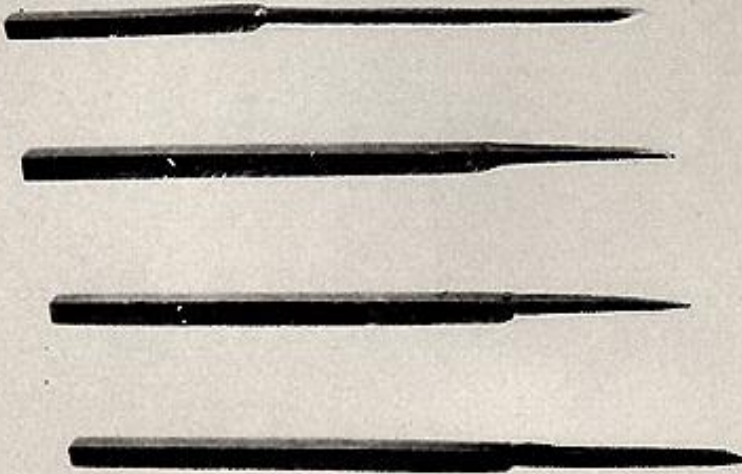
- Technique of insertion and manipulation of fine needles
- Specific points (acupuncture points)
- Channels or meridians
- Manipulation of “inner energy” known as *Qi*
- Practiced for over 4,000 years

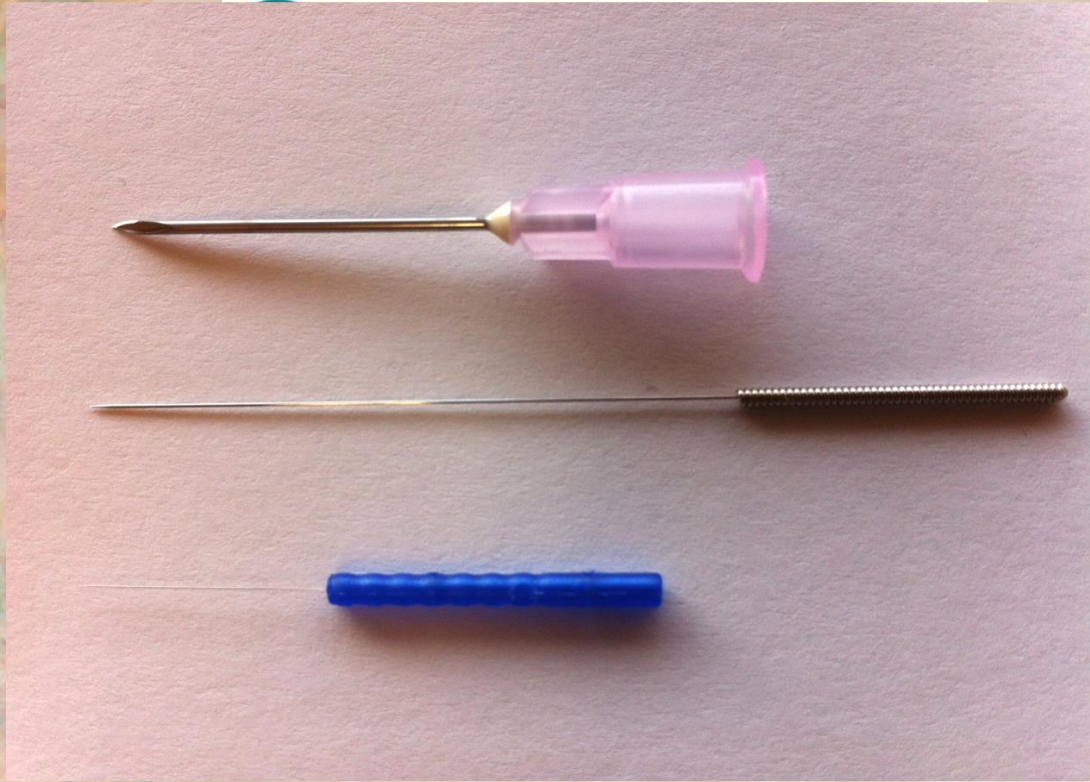


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by Mark Parisi









- >400 acupuncture points
- Locations where the Qi rises close to the surface of the body
- Microsystems
 - Auricular
 - Scalp
 - Palm

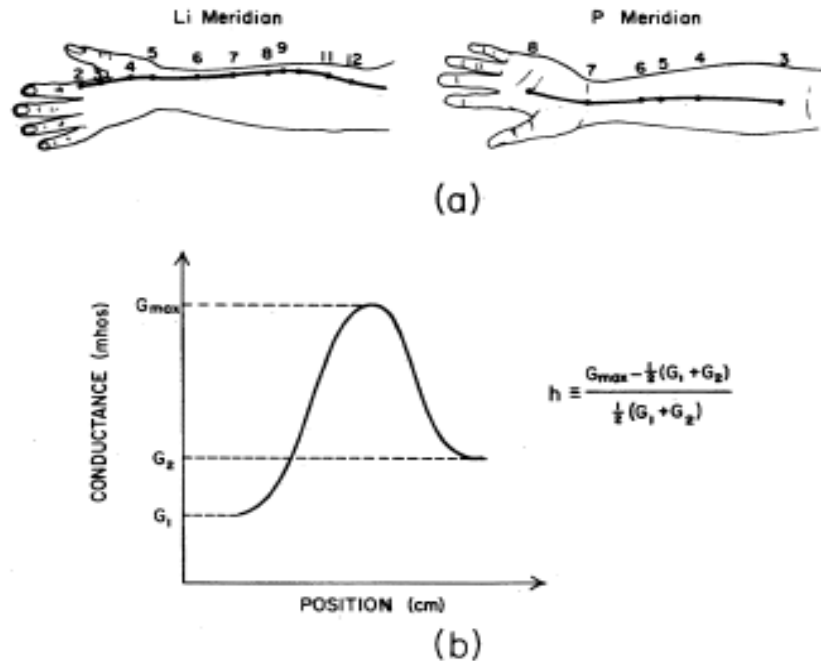


Fig. 1. (a) Approximate locations of acupuncture points on the large intestine (Li) and pericardium (P) meridians [6], [7]. (b) Idealization of conductance peaks seen at acupuncture points and the computational method employed to characterize the peaks. The fractional increase in conductance, h , implies a correction for individual differences in skin conductance level similar to that advocated by Lykken [9].

How might acupuncture work?

- No single mechanism explanation
- Variety of theories to address the physiological mechanism of action

The Gate Control Theory of Pain

Endorphins

Indirect effects on autonomic system

Altering brain chemistry by release of neurotransmitters

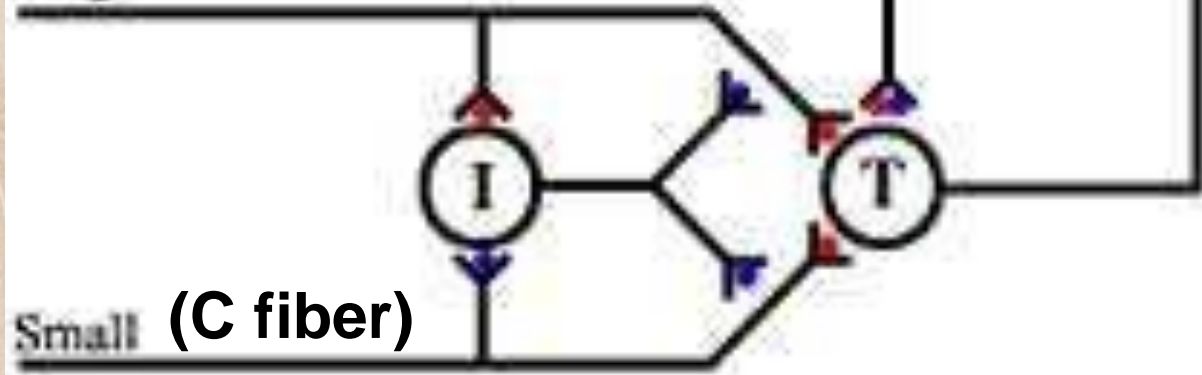


- Excitation
- Inhibition



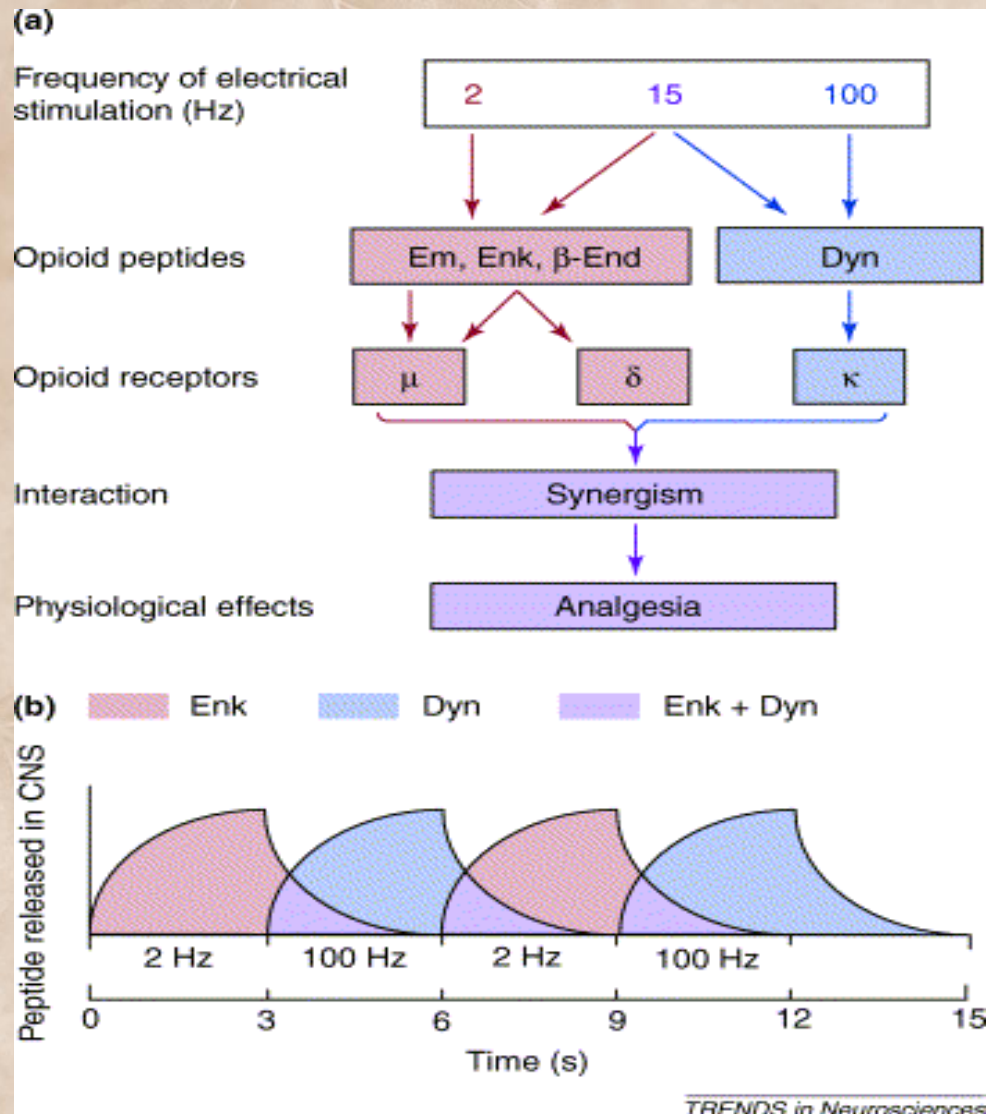
Large (A fiber)

Small (C fiber)

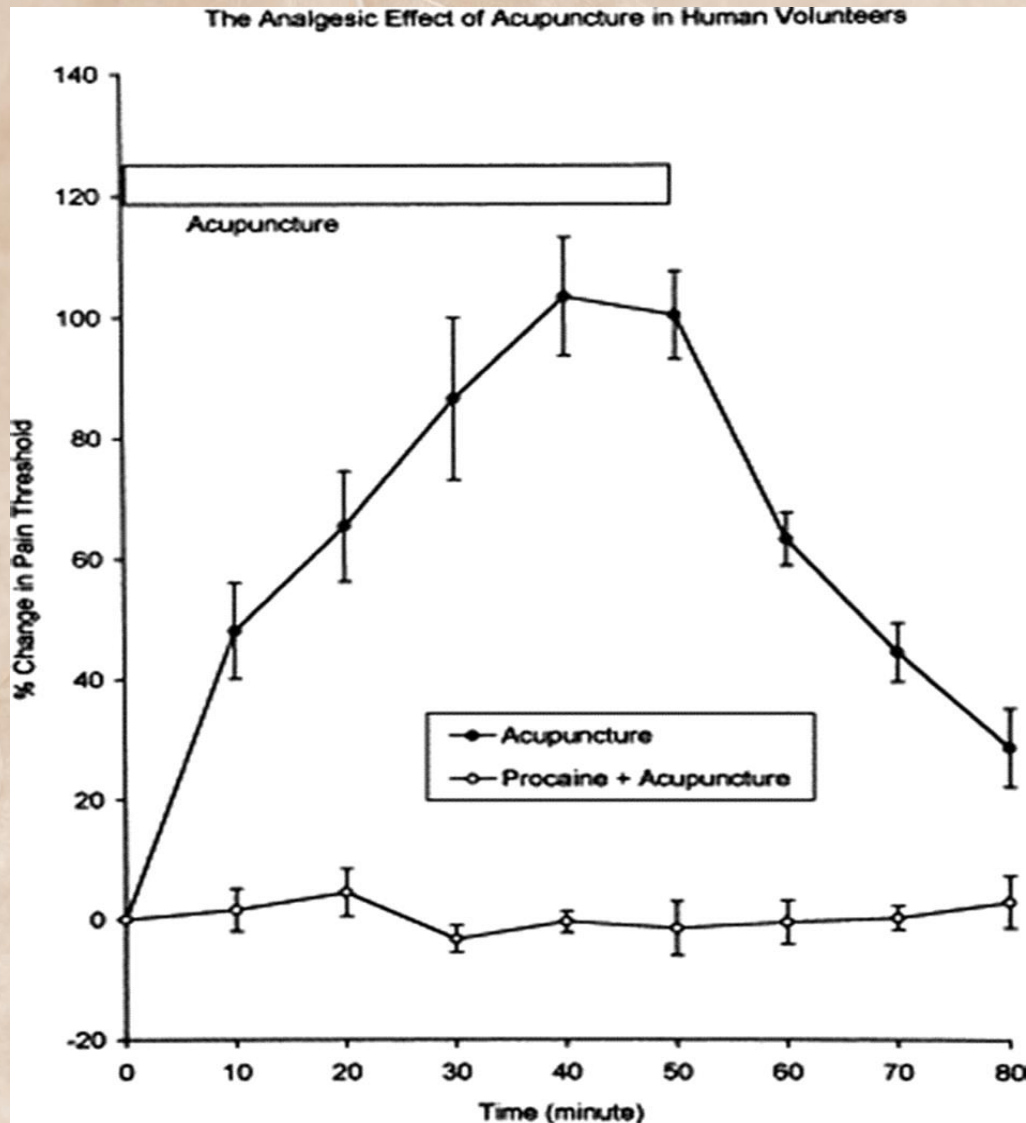


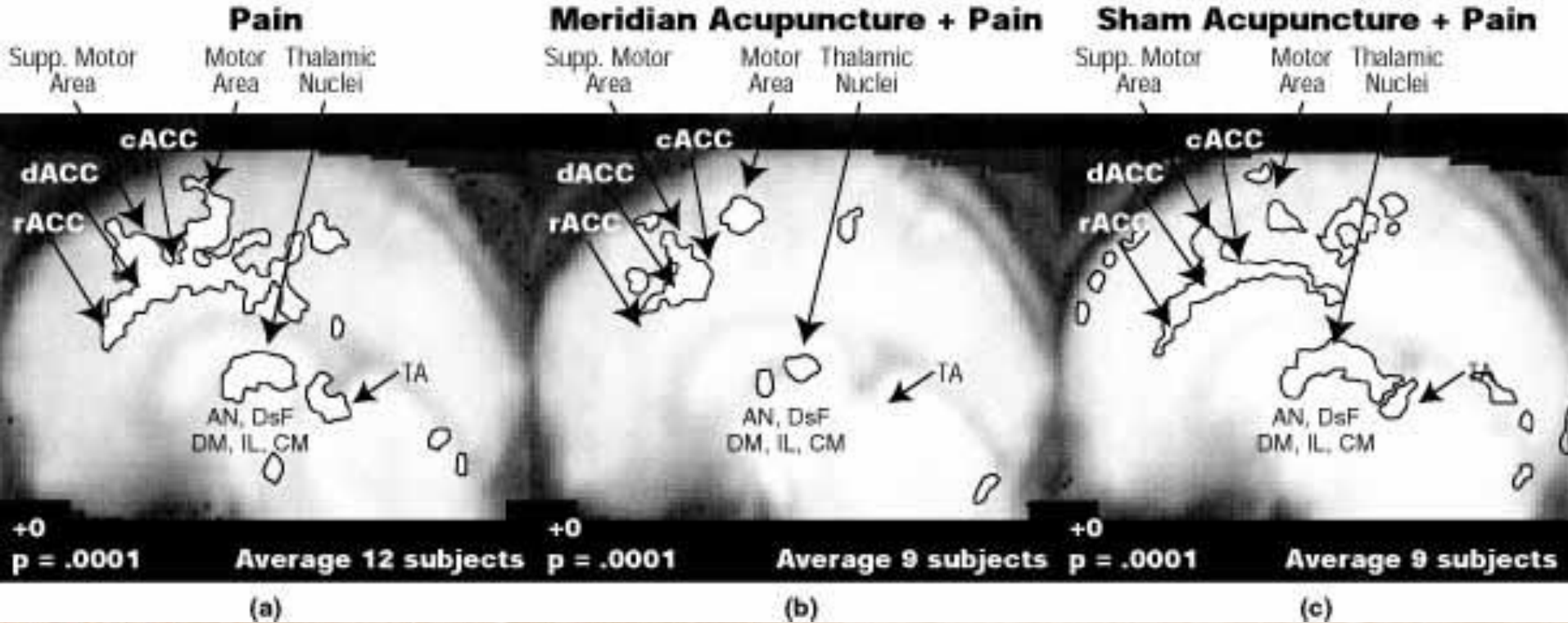
I = Inhibition neuron

T = Transmission neuron

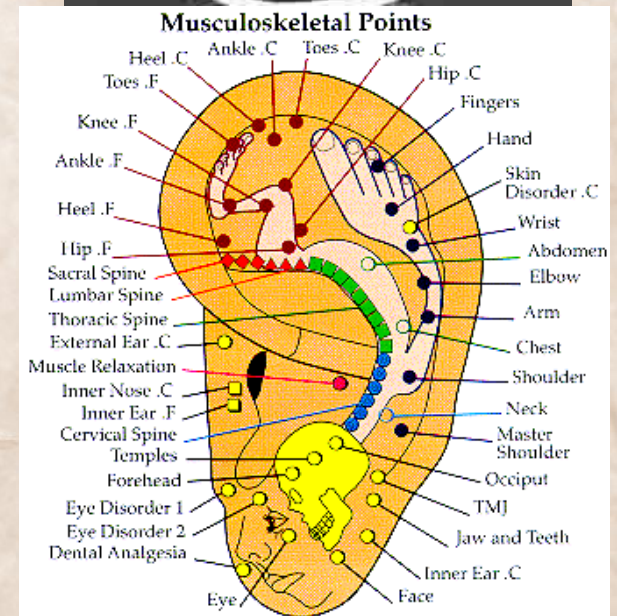
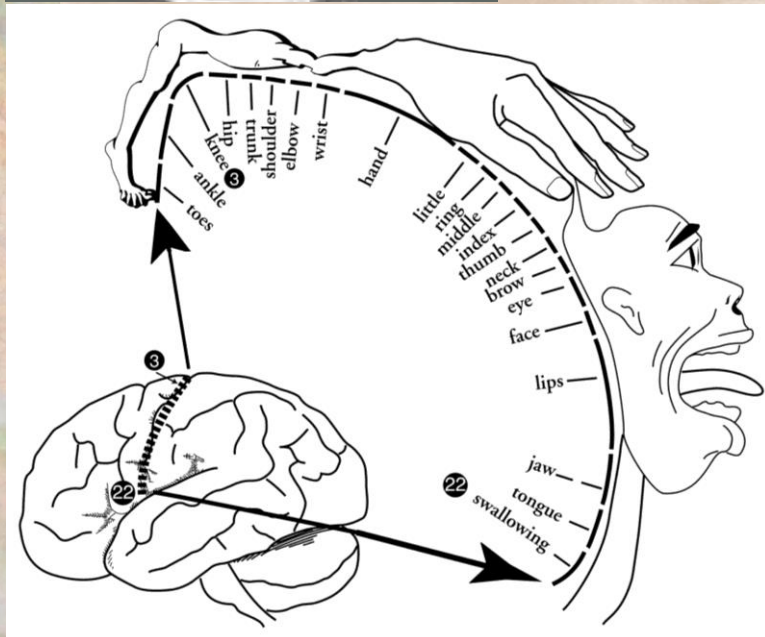
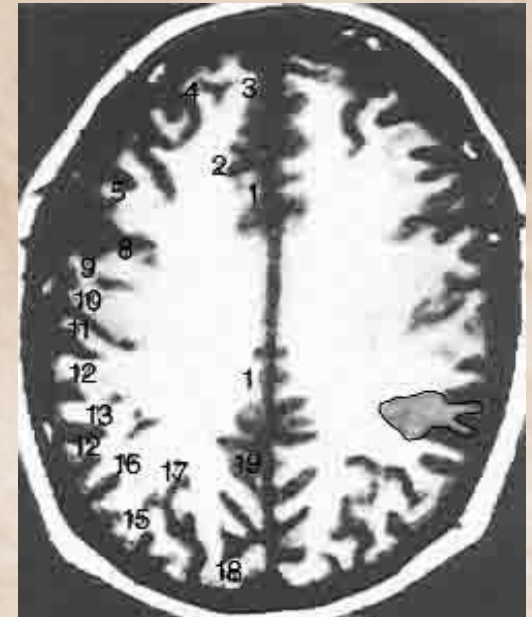
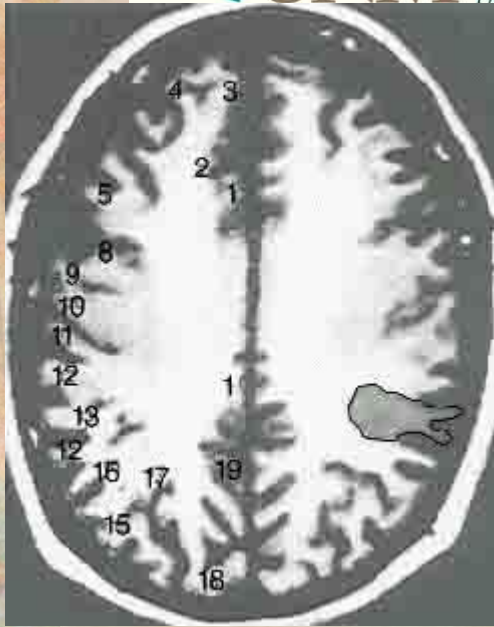


Han JS (2003). Acupuncture: neuropeptide release produced by electrical stimulation of different frequencies. *TRENDS in Neurosciences*. 26(1), 17-22.





Zang-Hee Cho et al. *M. Acupuncture* 2001



Acupuncture

National Institutes of Health
Consensus Development Conference Statement
November 3-5, 1997



- Provide health care providers, patients, and general public with a responsible assessment of the use and effectiveness of acupuncture for a variety of conditions

- NIH Consensus Statement (1997) found promising results supporting the efficacy of acupuncture in:
 - Adult post-op pain
 - Chemotherapy nausea and vomiting
 - Post-op dental pain

- Also noted other situations “*where acupuncture may be useful as an adjunct treatment or an acceptable alternative...*”

Addiction
Stroke rehab
Headaches
Menstrual cramps
Tennis elbow
Fibromyalgia
Myofascial pain
Osteoarthritis
Low back pain
CTS
Asthma

Acupuncture: Review and Analysis of Reports on Controlled Clinical Trials (WHO; 2003)

- **Diseases, symptoms or conditions for which acupuncture has been proved through controlled trials-to be an effective treatment:**

Adverse reactions to radiotherapy and/or chemotherapy
Allergic rhinitis (including hay fever)
Biliary colic
Depression (including depressive neurosis and depression following stroke)
Dysentery, acute bacillary
Dysmenorrhoea, primary
Epigastralgia, acute (in peptic ulcer, acute and chronic gastritis, and gastrospasm)
Facial pain (including craniomandibular disorders)
Headache
Hypertension, essential
Hypotension, primary
Induction of labour
Knee pain
Leukopenia
Low back pain
Malposition of fetus, correction of
Morning sickness
Nausea and vomiting
Neck pain
Pain in dentistry (including dental pain and temporomandibular dysfunction)
Periarthritis of shoulder
Postoperative pain
Renal colic
Rheumatoid arthritis
Sciatica
Sprain
Stroke
Tennis elbow

What does the evidence show?

- Nausea & vomiting
- Postoperative pain management
- Stress & anxiety
- Postoperative ileus
- Headache
- Back Pain

- Postoperative nausea and vomiting (PONV)

2009 Cochrane Collaboration review of 40 trials involving 4,858 participants

Suggest that use of P6 acupuncture point can reduce the risk of nausea and vomiting after surgery



Postoperative pain – pain score

Acupuncture and postoperative pain

Review: Acupuncture and postoperative pain (systematic review)
Comparison: 01 Acupuncture vs placebo control
Outcome: 02 Postoperative Pain Score

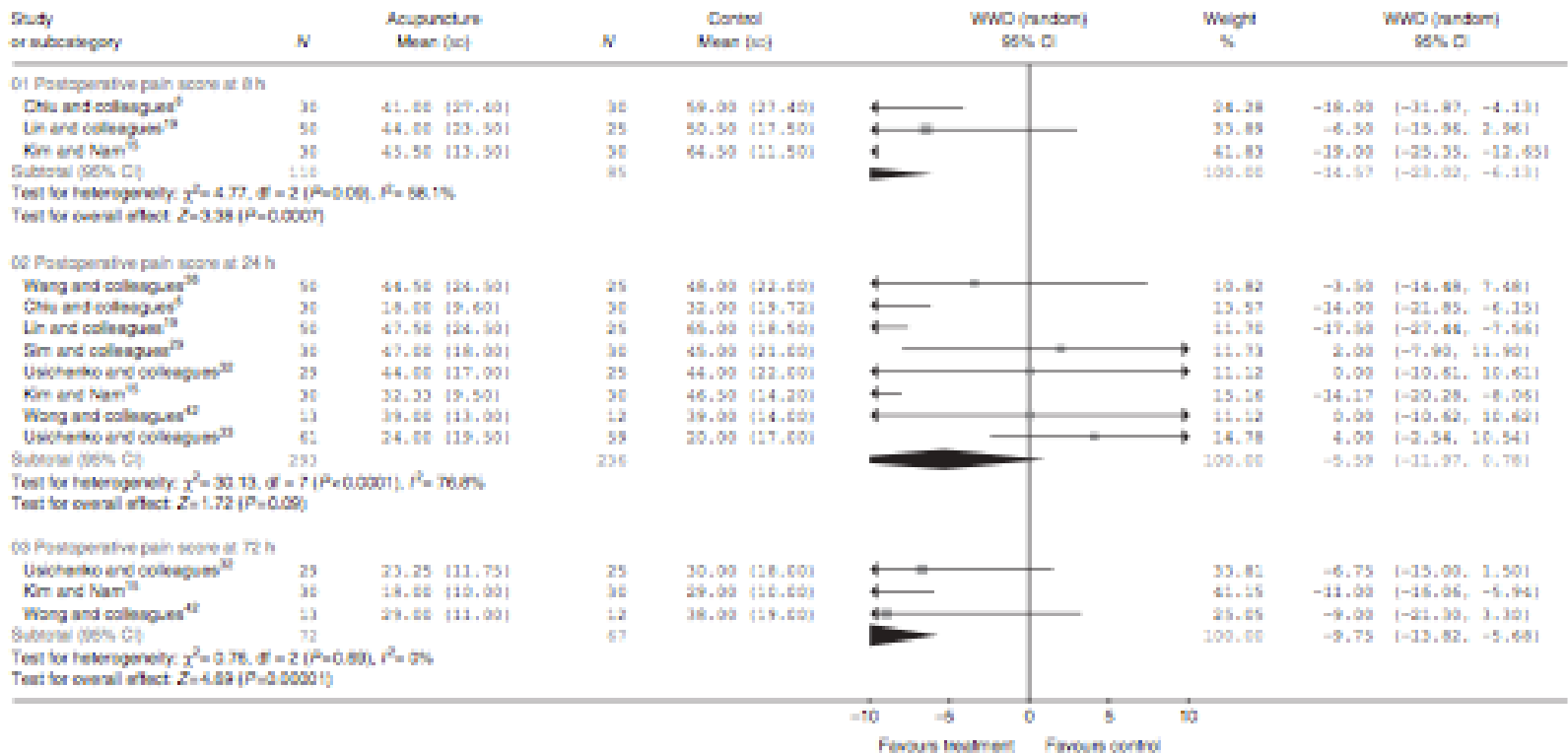


Fig 2 VAS for postoperative pain intensity at 8, 24, and 72 h (0–100 mm). A WMD <0 indicates less pain with acupuncture compared with control. When the 95% CI does not include zero, the difference is considered statistically significant.

Postoperative pain – opioid consumption

Review: Acupuncture and postoperative pain (systematic review)
 Comparison: 01 Acupuncture vs placebo control
 Outcome: 01 Postoperative Opioid Consumption

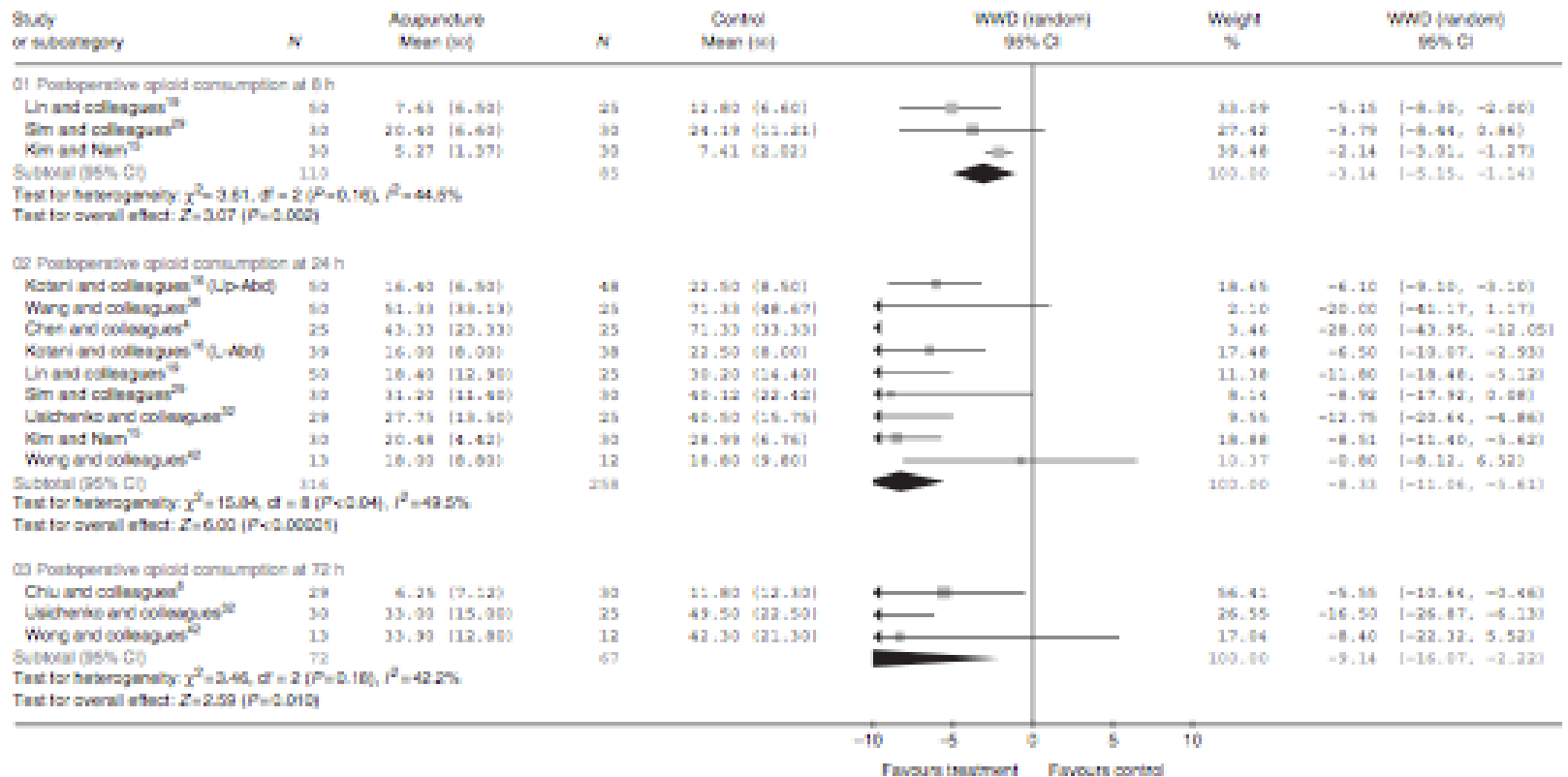


Fig 3 Cumulative postoperative opioid consumption at 8, 24, and 72 h (in mg morphine equivalents). A WMD <0 indicates less morphine consumption with acupuncture compared with control. When the 95% CI does not include zero, the difference is considered statistically significant.

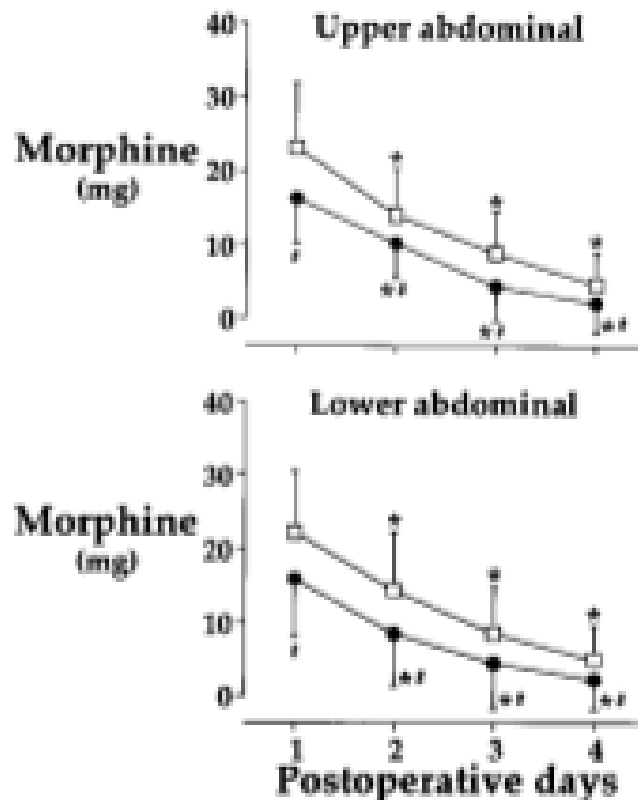


Fig. 2. Daily consumption of morphine in patients undergoing upper and lower abdominal surgery on each postoperative day. For upper abdominal surgery, results were obtained from 50 acupuncture patients (circles) and 48 control patients (squares). For lower abdominal surgery, data were obtained from 39 acupuncture patients (circles) and 38 control patients (squares). Data are expressed as mean \pm SD. *Statistically significant differences ($P < 0.0001$) between first and other postoperative days in each group; #statistically significant differences ($P < 0.01$) from the control group.

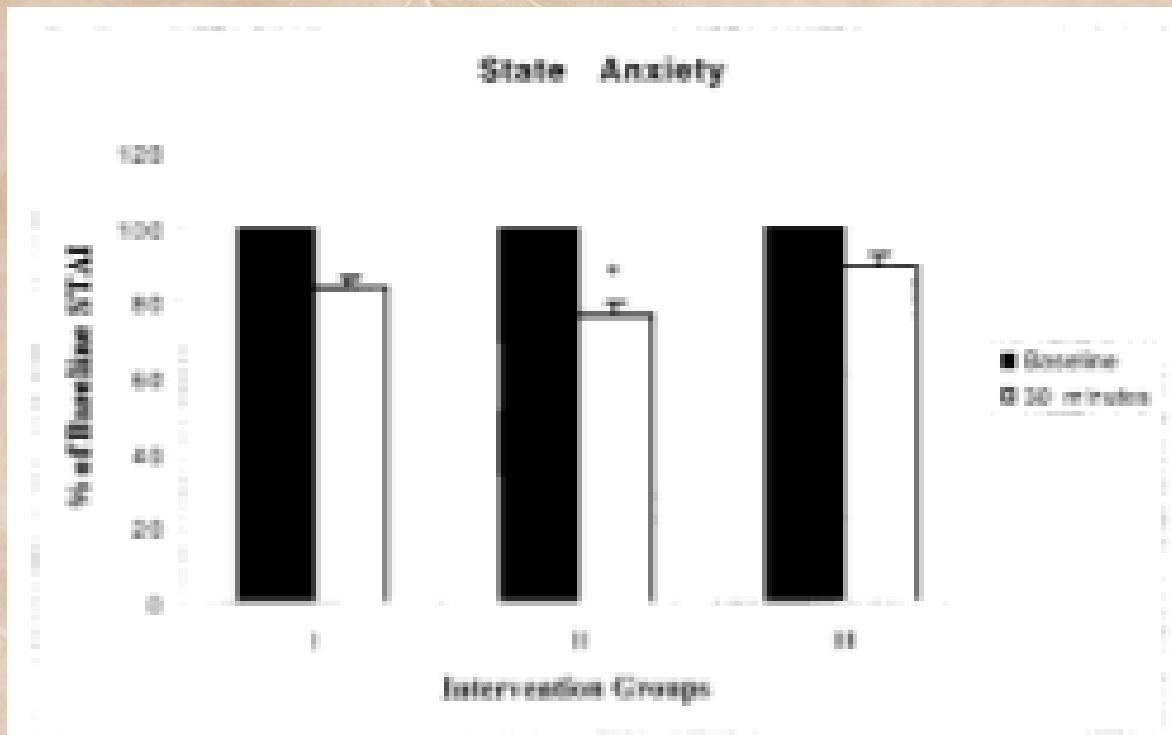


Figure 2. Changes in anxiety level as assessed by the STAI (State Trait Anxiety Inventory). A significant group difference ($F_{2,88} = 4.5$, $P = 0.014$), a group \times time interaction ($F_{2,88} = 3.5$, $P = 0.02$), and a time difference ($F_{1,88} = 8.2$, $P = 0.001$) were observed among the three study groups. Please see text for details. I = Traditional Chinese Medicine group; II = Relaxation group; III = Control group.

Post-operative ileus

- Three RCTs in patients with abdominal surgeries improved GI motility with acupuncture
 - first bowel sound time
 - flatus passage time
 - excretion time
 - *Sun P et al 1996*
 - *Liu XJ et al 1991*
 - *Zhang X et al 1998*
- Addition of auricular acupuncture also relieved abdominal distension and discomfort after abdominal surgery.
 - *Wan Q et al 2000*

- **Headache**

2009 Cochrane Collaboration review of
22 trials involving 4,419 participants

Suggest that acupuncture is at least as
effective as, or possibly more effective
than, prophylactic drug treatment

- Back pain

Meta-analysis by Manheimer et al. 2005
of 22 RCT

Suggest acupuncture is an effective
treatment of chronic low back pain.

Acupuncture – Minimal Risk

- Overall Risk 0 – 1.1 per 10,000
Bruising, soreness, bleeding
Vasovagal response
Pain at insertion site
Pneumothorax
- Infection rate negligible in two large prospective studies of 34,000 and 97,733 patients

MacPherson et al. BMJ 2001

White et al. BMJ 2001

Acupuncture Costs – avoiding surprises

- Medicare does not cover acupuncture services
- Many third-party payers cover acupuncture
 - Partially or totally
 - May pose limits on number of treatments
 - Indications for treatment
- \$80-\$120 per acupuncture session







Neuroscience Letters 327 (2002) 53–56

**Neuroscience
Letters**

www.elsevier.com/locate/neulet

Functional magnetic resonance imaging detects activation of the visual association cortex during laser acupuncture of the foot in humans

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Abstract

The aim of this study was to investigate the effect of laser acupuncture on cerebral activation. Using functional magnetic imaging (fMRI) cortical activations during laser acupuncture at the left foot (Bladder 67) and dummy acupuncture, were compared employing a block design in ten healthy male volunteers. All experiments were done on a 1.5 Tesla magnetic resonance scanner equipped with a circular polarized head coil. During laser acupuncture, we found activation in the cuneus corresponding to Brodmann Area (BA) 18 and the medial occipital gyrus (BA 19) of the ipsilateral visual cortex. Placebo stimulation did not show any activation. We could demonstrate that laser acupuncture of a specific acupoint, empirically related to ophthalmic disorders, leads to activation of visual brain areas, whereas placebo acupuncture does not. These results indicate that fMRI has the potential to elucidate effects of acupuncture on brain activity. © 2002 Elsevier Science Ireland Ltd. All rights reserved.

Keywords: Laser acupuncture; Acupoint Bladder 67; Functional magnetic resonance imaging; Visual cortex

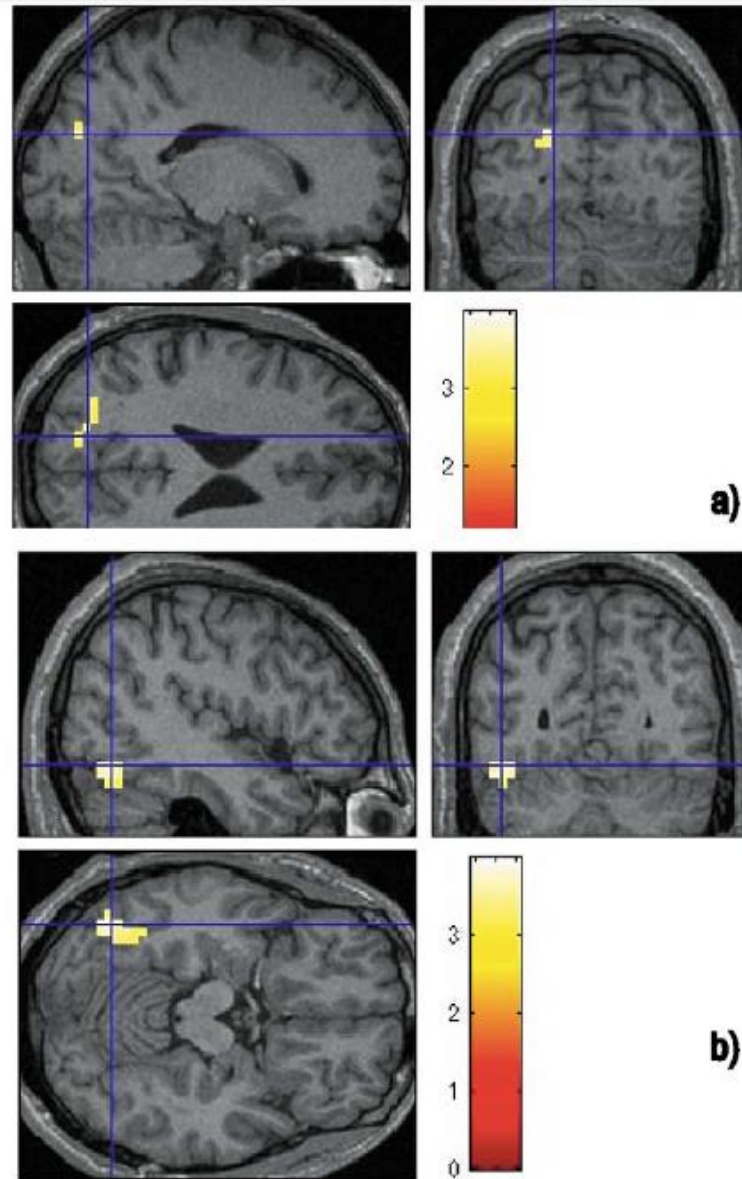


Fig. 2. Cerebral activation pattern induced by laser acupuncture.



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DOI 10.1007/s10103-004-0296-8

ORIGINAL ARTICLE

Peter Whittaker

Laser acupuncture: past, present, and future

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Abstract Laser acupuncture is defined as the stimulation of traditional acupuncture points with low-intensity, nonthermal laser irradiation. Although the therapeutic use of laser acupuncture is rapidly gaining in popularity, objective evaluation of its efficacy in published studies is difficult because treatment parameters such as wavelength, irradiance, and beam profile are seldom fully described. The depth of laser energy transmission, likely an important determinant of efficacy, is governed not only by these parameters, but also by skin properties such as thickness, age, and pigmentation—factors which have also received little consideration in laser acupuncture. Despite the frequently equivocal nature of the published laser studies, recent evidence of visual cortex activation by laser acupuncture of foot points, together with the known ability of laser irradiation to induce cellular effects at subthermal thresholds, provides impetus for further research.

orders—conditions confirmed to be present in this individual [3]. Although an extensive narrative of thousands of years of acupuncture theory and practice is beyond the scope of this review, a brief description is necessary to provide context for the discussion of laser acupuncture.

Acupuncture theory and practice

A central tenet of acupuncture contends that energy (Qi—pronounced CHEE), flows through the body along defined subsurface paths [1, 2]. The maintenance of good health requires that such flow be in balance. Conversely, any disturbance in this flow results in an energy imbalance, either an excess or a deficiency, which in turn results in disease. Acupuncture attempts to regulate and restore energy balance by stimulating specific points along the paths and hence treat the disease. Traditional

Table 1 Positive laser acupuncture studies (arranged in order of increasing wavelength); – information not provided, *cw* continuous wave laser irradiation, *X* multiple treatments

Reference no.	Subject	Laser parameters					Acupuncture points, number	Blinded treatment	Sham group
		Wavelength (nm)	Power (mW)	Frequency (Hz)	Beam diameter (mm)	Treatment time (s)			
[54]	Pain	632.8	2	100	1–2	30	5–6 included ear points	Yes	No
[19]	Smoking cessation	632.8	3	<i>cw</i>	0.015	10 X	4 ear points via needle insertion	No	No
[21]	Dental analgesia	632.8	2.8–6.0	<i>cw</i>	1.5–2.0	300	2–4	No	No
[57]	Carpal tunnel syndrome	632.8/904	15/Variable	<i>cw</i> /73–3,500	25	67–462 X/60 X	> 11	Yes	Yes
[66]	Hiccups	670	10	<i>cw</i> ^a	–	60 X	4 Korean hand points	No	No
[77]	PONV	670	10	<i>cw</i> ^a	–	30	1	Yes	Yes
[67]	Enuresis	670	10	<i>cw</i>	–	30 X	7	No	No
[65]	Pain—rabbits	780	5	9,720	–	120	2	No	No
[89]	Stroke-related paralysis	780	20	<i>cw</i>	–	20–40 X	14–19	No	No
[91]	Dry eye	780	4	–	–	20 X	> 9	Yes	Yes
[48]	Pain—horses	904	0.3	360	–	120 X	~3–5	–	No
[28]	Pain	904	5	1,000	–	20 X	5 + ahshi points	Yes	Yes
[56]	Dental analgesia	10,600	20–30	<i>cw</i>	–	300	2–4	No	No
[92]	Pain—rabbits	10,600	–	<i>cw</i>	–	2–3	1	–	–
[68]	Weight loss	–	24	900	–	10–15 X	8 included ear points	No	No

^aNot stated, but deduced from information provided in the paper

Table 2 Negative laser acupuncture studies; *cw* continuous wave laser irradiation, *X* multiple treatments

Reference no.	Subject	Laser parameters					Acupuncture points, number	Blinded treatment	Sham group
		Wavelength (nm)	Power (mw)	Frequency (Hz)	Beam diameter (mm)	Treatment time (s)			
[70]	Asthma	632.8	5.6	<i>cw</i>	1.13 ^a	10–20	> 8 included ear points	Yes	Yes
[93]	Whiplash pain	632.8	5	<i>cw</i>	–	15	11 included ear points	No	No
[94]	Analgesia	632.8	10	Pulsed	–	60	4	Yes	Yes
[71]	Smoking cessation	632.8	2.5–3.0	<i>cw</i>	1	60	4 ear points	Yes	Yes
[81] ^b	Nausea in dental surgery	632.8	6	<i>cw</i>	–	180	1	–	No
[95]	Sinusitis	632.8 ^a	2	–	–	–	5	No	No
[96]	Gastric secretion	632.8 ^a	2 ^a	20	–	1,800	3	No	Yes
[51]	Pain	632.8 ^a	–	–	–	15 X	12	Yes	Yes
[47]	Pain—rats	632.8904	1.560.07	<i>cw</i> 73	–	60	2	–	–
[53]	Pain	632.8904	1.560.07	<i>cw</i> 73	–	60 X	10	Yes	Yes
[73]	Asthma	830	22.5	<i>cw</i>	1	60 X	6	Yes	Yes
[72]	Alcohol withdrawal	830	–	–	–	60	2–10 ear points	Yes	Yes
[52]	Epicondylagia	904	12	70	–	30 X	5	Yes	Yes
[69]	Migrane	904	–	Pulsed	–	40 X	4	Yes	Yes
[74]	Asthma	–	1.5	–	–	20	5	Yes	Yes

^aNot stated, but deduced from information provided in the paper

^bResults from one component of a multifaceted study



"You can have our standard treatment for \$150 or, for just \$25, you can hug this cactus as hard as possible."

Questions?

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