Not just for pain, acupuncture is a natural way to treat anxiety. It works faster than therapy and keeps you drug-free. Research shows that acupuncture for anxiety is effective.

- Acupuncture controls anxiety by affecting the part of the brain that regulates emotions, meaning it reduces anxiety naturally.
- Compared with drug-based treatments, acupuncture has fewer side effects, works faster, and helps the body heal itself.

You might think acupuncture is for hipsters who don’t believe in Western medicine or for your aging parent with chronic back pain, but a growing body of research shows that acupuncture can help treat a condition that affects everyone from time to time: anxiety.

Managing severe anxiety can be tricky because it generally includes therapy, which might not provide results for months, according to the Anxiety and Depression Association of America. What's more, it can require medication, which can have serious side effects, says Ladan Eshkevari, PhD, CRNA, LAc, a certified acupuncturist, a physiologist, and the assistant director of the Nurse Anesthesia Program at the School of Nursing & Health Studies at Georgetown University in Washington, D.C. Yet when acupuncture for anxiety is effective, symptoms lessen after the first few visits, and practitioners are confident it attacks the problem at its roots.

How Acupuncture for Anxiety Works

Ancient Chinese medicine describes an energy force called Qi that regulates the body’s overall health, according to University of Chicago Medicine. Like blood in the circulatory system, Qi moves throughout the body via pathways called meridians. When factors like injury, stress, poor nutrition, or a change in environment disrupt the flow of Qi, health issues follow, according to the University of Miami Health System. By inserting needles at specific points in the body, acupuncturists restore the balance of Qi and the body’s overall health, University of Chicago Medicine reports.

This concept might seem outdated to some, but Daniel Hsu, DAOM (Doctor of Acupuncture and Oriental Medicine), LAc, a practitioner at New York AcuHealth Acupuncture in New York City, says Qi is just a metaphor for metabolic function, or the chemical reactions constantly taking place in the body.

Acupuncturists insert each needle half a millimeter away from a nerve, Dr. Hsu explains. Depending on where the needles go, acupuncture can cause the nervous system to produce painkilling chemicals, jump-start the body’s natural ability to heal itself, or stimulate the part of the brain that controls emotions, including anxiety. All of these results, Hsu adds, can help people feel more balanced and treat a variety of illnesses.

The Mechanics of Acupuncture for Anxiety Management
Hsu says acupuncture has increased in popularity since the 1970s simply because it works, and now there’s growing research supporting its effectiveness for anxiety and other mental conditions.

For instance, in a study published online in October 2013 in the Journal of Acupuncture and Meridian Studies, students who underwent a 20-minute acupuncture session were found to have less anxiety and better memory immediately afterward than those who didn't have acupuncture.

Why does it work? Eshkevari explains that external circumstances beyond your control can set off your anxiety and that acupuncture allows your body to take back control.

“We’re constantly under stress and pressure to perform, which can bring on disease and other serious health issues,” Hsu says. “Acupuncture is great for maintenance. It helps a long life become a better-quality life.”

How does it work? Led by Eshkevari, researchers at Georgetown University used lab studies to demonstrate that acupuncture slows the body’s production of stress hormones. Their findings were published in the April 2013 issue of the Journal of Endocrinology.

Few procedures work 100 percent of the time. That includes acupuncture, but it does have benefits that conventional treatments like psychotherapy and medication do not, Eshkevari says. She explains that side effects, such as bruising and dizziness, are minimal and uncommon, whereas some prescription drugs can have serious side effects and can lead to dependency.

Unlike with counseling, people treated with acupuncture often see results after one session, and the results improve with continued treatment. Hsu says acupuncture is particularly helpful for people who want to limit or stop drug use — prescription or otherwise. Because it regulates the body’s chemical balance naturally, acupuncture can even prevent people from needing medication at all, he says.

Getting Started With Acupuncture

When it comes to trying acupuncture, you have nothing to lose, Hsu says. With a certified acupuncturist, the risks are almost nonexistent and are far outweighed by the potential benefits. The majority of Eshkevari’s patients have told her they sleep better and have a stronger sense of overall well-being after just a few sessions.

If you’re already receiving treatment for anxiety, Eshkevari suggests adding acupuncture to your current regimen. If you decide it works for you, you can work with your doctor to wean off anxiety medication. First, though, contact your insurance provider to find out whether it covers any acupuncturists in your area. Then talk with a practitioner — ask questions and openly discuss a potential treatment plan.

Last Updated: 8/21/2014
Acupuncture – an effective stress management technique?

Researchers have revealed the healing technique for chronic stress.

Posted on January 31, 2014 by Suzanne Pish, Michigan State University Extension

Acupuncture, which has been valued as part of traditional Chinese medicine for thousands of years, is now used by millions of Americans each year, often to treat chronic pain. But now researchers have revealed the healing technique may also be effective in treating one of the most widespread ailments facing U.S. adults: Chronic stress.

In a new study published in the Journal of Endocrinology, Dr. Eshkevari and his colleagues aimed to explore the biological mechanisms involved in acupuncture’s stress relieving abilities at a molecular level. It is the constant increase in stress hormones that is associated with many of the health problems linked to chronic stress, such as depression, insomnia and anxiety. In stressed animals that received acupuncture, stress hormone levels were similar to those in the control animals that were not under chronic stress, which suggests the ancient healing modality helps to normalize stress hormone levels.

Long-term stress on the body can put you at risk for numerous conditions:

- Heart disease
- Sleep problems
- Digestive problems
- Depression
- Obesity
- Memory impairment

New research shows you can actually wear the effects of stress on your face. Acupuncture can be a great way to relieve stress naturally. Each person responds to treatment in a different way, so the number of sessions required can vary. Experts recommend a minimum of one session per week for five to eight weeks, and patients often start to feel an immediate reduction in stress after just one session.

You should always talk to your doctor before making any lifestyle changes, and make sure you find a licensed practitioner for treatment.

Feeling stressed lately? Michigan State University Extension offers an online RELAX: Alternatives to Anger course to help with stress management that you can complete in the comfort of your own home.

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FOR IMMEDIATE RELEASE: March 14, 2013

**Series of Studies First to Examine Acupuncture’s Mechanisms of Action**

*Understanding the molecular underpinnings of an ancient Chinese therapy’s success could increase its acceptance by mainstream medicine*

**WASHINGTON** — While acupuncture is used widely to treat chronic stress, the mechanism of action leading to reported health benefits are not understood. In a series of studies at Georgetown University Medical Center (GUMC), researchers are demonstrating how acupuncture can significantly reduce the stress hormone response in an animal model of chronic stress.

The latest study was published today in the April issue of *Journal of Endocrinology*.

“Many practitioners of acupuncture have observed that this ancient practice can reduce stress in their patients, but there is a lack of biological proof of how or why this happens,” says the study’s lead author, **Ladan Eshkevari, PhD**, an associate professor of nursing and assistant director of the nurse anesthesia program at Georgetown University School of Nursing & Health Studies, a part of GUMC. “We’re starting to understand what’s going on at the molecular level that helps explain acupuncture’s benefit.”

Eshkevari, a physiologist, nurse anesthetist and certified acupuncturist, designed a series of studies in rats to test the effect of electronic acupuncture on levels of proteins and hormones secreted by biologic pathways involved in stress response.

Eshkevari used rats because these animals are often used to research the biological determinants of stress. They mount a stress response when exposed to winter-like temperatures for an hour a day. “I used electroacupuncture because I could make sure that each animal was getting the same treatment dose,” she explains.

The spot used for the acupuncture needle is called “Zusanli,” which is reported to help relieve a variety of conditions including stress. As with rats, that acupuncture point for humans is on the leg below the knee. The study utilized four groups of rats for a 10-day experiment: a control group that was not stressed and received no acupuncture; a group that was stressed for an hour a day and did not receive acupuncture; a group that was stressed and received “sham” acupuncture near the tail; and the experimental group that were stressed and received acupuncture to the Zusanli spot on the leg.

The researchers then measured blood hormone levels secreted by the hypothalamus pituitary adrenal (HPA) axis, which includes the hypothalamus, the pituitary gland and the adrenal gland. The interactions among these organs control reactions to stress and regulate digestion, the immune system, mood and emotions, sexuality and energy storage and expenditure.

They also measured levels of NPY, a peptide secreted by the sympathetic nervous system in rodents and humans. This system is involved in the “flight or fight” response to acute stress, resulting in constriction of blood flow to all parts of the body except the heart, lungs and brain.
(the organs most needed to react to danger). Chronic stress, however, can cause elevated blood pressure and cardiac disease.

“We found that electronic acupuncture blocks the chronic, stress-induced elevations of the HPA axis hormones and the sympathetic NPY pathway,” Eshkevari says. She adds that the rats receiving the sham electronic acupuncture had elevation of the hormones similar to that of the stress-only animals.

Eshkevari says this research complements her earlier reported work that focused only on NPY. In that study, Eshkevari and her team found that NPY levels were reduced in the experimental group almost to the level of the control group, while the rats that were stressed and not treated with Zusanli acupuncture had high levels of NPY (Experimental Biology and Medicine Dec. 2011).

“Our growing body of evidence points to acupuncture’s protective effect against the stress response,” she continues. Eshkevari says additional research is needed to examine if acupuncture would be effective in reducing hormone levels after the animals are exposed to the stress of cold temperatures, and whether a similar observation can be made in humans.

The study was funded by the American Association of Nurse Anesthetists doctoral fellowship award to Eshkevari.

Co-authors include Georgetown researchers Susan Mulroney, PhD, and Eva Permaul. The authors disclose no conflicts of interest.

**About Georgetown University Medical Center**

Georgetown University Medical Center is an internationally recognized academic medical center with a three-part mission of research, teaching and patient care (through MedStar Health). GUMC’s mission is carried out with a strong emphasis on public service and a dedication to the Catholic, Jesuit principle of *cura personalis* -- or "care of the whole person." The Medical Center includes the School of Medicine and the School of Nursing & Health Studies, both nationally ranked; Georgetown Lombardi Comprehensive Cancer Center, designated as a comprehensive cancer center by the National Cancer Institute; and the Biomedical Graduate Research Organization (BGRO), which accounts for the majority of externally funded research at GUMC including a Clinical Translation and Science Award from the National Institutes of Health.
Auricular Acupuncture Effective in Treating Anxiety

Technique Could Reduce Pain and Stress in Postsurgical Patients

In the past few years, studies in China and Europe have shown that a combination of body and ear (or auricular) acupuncture can reduce symptoms in patients with minor depression, chronic anxiety disorders and general anxiety disorders.

However, few studies have examined the effect of ear acupuncture alone in treating anxiety. Moreover, many popular acupuncture textbooks have theorized that stimulating ear acupoints in and of themselves can help patients relax. To test this theory, two researchers from the Yale University School of Medicine - Drs. Shu-Ming Wang and Zeev N. Kain - assembled a group of 55 patients for a blinded, randomized controlled trial to ascertain whether auricular acupuncture could decrease acute anxiety. The study found that while treatment did not produce any significant physiological changes, subjects who received acupuncture at a particular point did experience a profound change in their behavioral anxiety levels - an effect that, the researchers theorize, could help reduce the levels of pain and stress in patients undergoing surgery.

Figure 1: Anatomical locations of the shen men, relaxation and sham acupoints.

The study population consisted of staff members of a hospital operating room - an occupation that, by nature, can generate a considerable amount of stress. Subjects were divided into three unequal groups of 22, 15 and 18 patients, respectively. The first group received bilateral auricular acupuncture at the shen men point, on the upper half of the ear near the inferior lateral wall of the triangular fossa. The second group received the same type of acupuncture at a "relaxation" point high on the ear, at the superior wall of the triangular fossa. The third group of patients received sham acupuncture at a point on the middle ear (see Figure 1). Treatment was performed using occlusive press needles, which were kept in place for 48 hours and then removed. The patients resumed working immediately after the needles were inserted and continued their daily work routine during the testing program.

The anxiety levels of each patient were measured just prior to needling, and at intervals of 30 minutes, 24 hours and 48 hours after treatment. Anxiety levels were determined using a variety of methods, including the State-Trait Anxiety Inventory (STAI) scale, which measures feelings of apprehension, tension and worry; the Life Experiences Survey, which measures the significance of specific events in a person's life; arterial blood pressure; heart rate; and electrical activity on the surface of the patient's skin. While all of the physiological traits measured -- electrodermal activity; heart rate; and blood pressure - remained relatively constant between all three groups,
an important behavioral change on the STAI scale was noted in those receiving acupuncture at
the relaxation point. Patients in the relaxation group reported being "significantly less anxious"
than those in the shen men and sham groups at the 30-minute and 24-hour intervals, and
remained "less anxious" than patients in the shen men group 48 hours after treatment began

Anxiety levels in patients receiving shen men, relaxation and sham acupuncture.
Based upon these results, the researchers theorized that auricular acupuncture could have a
variety of applications for reducing stress and anxiety. In particular, they believed this technique
could be useful in patients awaiting surgery - a group in which approximately two-thirds of all
subjects experience "intense" levels of anxiety.2,3 Although preoperative anxiety and the anxiety
of healthy volunteers may be different, it can be hypothesized that auricular acupuncture may be
equally effective for the reduction of anxiety by patients undergoing surgery," they wrote. "This
is of particular importance as auricular acupuncture is technically easy, reliable, inexpensive, and
is associated with minimal adverse affects."

Wang and Kain added that since several studies have documented an association between anxiety
and pain, and that since ear acupuncture would appear to reduce anxiety for an extended amount
of time, the use of acupuncture on a patient just prior to surgery could have a positive impact on
that patient's feelings of pain and anxiety immediately after surgery. "It may be that preoperative
auricular acupuncture may decrease postoperative anxiety and pain levels," they remarked. The
researchers did not explain how (or why) anxiety levels were lower for patients in the relaxation
group, saying only that "the mechanism behind the observation made in our study is unclear."
However, they noted previous studies suggesting that body acupuncture might affect the release
of certain neurotransmitters such as serotonin, a chemical that may help determine a person's
emotional state.

Although the number of patients treated was relatively small, Kain and Wang employed several
testing methods to enhance the quality of the study. First, they made sure the study volunteers
worked in the same type of environment, which helped ensure similar stress and anxiety levels
for each group. Second, the researchers made sure the volunteers were present and working
during the time of treatment. Finally, volunteers from all three groups were contacted daily, so
that any unexpected changes in the volunteers' personal lives or work environment could be
documented and factored into the final outcome. Based on their findings, the researchers
concluded that auricular acupuncture could decrease anxiety levels in otherwise healthy subjects.
They added that "the results of the study suggest that acupuncture may be an effective treatment
for individuals experiencing intense levels of daily stress and anxiety," and recommended "a
randomized controlled trial be performed to evaluate the effectiveness of this technique for the
treatment of preoperative anxiety."

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Author information

Abstract

BACKGROUND:

Recently, increasing evidence has indicated that the primary acupuncture effects are mediated by the central nervous system. However, specific brain networks underpinning these effects remain unclear.

RESULTS:

In the present study using fMRI, we employed a within-condition interregional covariance analysis method to investigate functional connectivity of brain networks involved in acupuncture. The fMRI experiment was performed before, during and after acupuncture manipulations on healthy volunteers at an acupuncture point, which was previously implicated in a neural pathway for pain modulation. We first identified significant fMRI signal changes during acupuncture stimulation in the left amygdala, which was subsequently selected as a functional reference for connectivity analyses. Our results have demonstrated that there is a brain network associated with the amygdala during a resting condition. This network encompasses the brain structures that are implicated in both pain sensation and pain modulation. We also found that such a pain-related network could be modulated by both verum acupuncture and sham acupuncture. Furthermore, compared with a sham acupuncture, the verum acupuncture induced a higher level of correlations among the amygdala-associated network.

CONCLUSION:

Our findings indicate that acupuncture may change this amygdala-specific brain network into a functional state that underlies pain perception and pain modulation.
Hypothalamus and Amygdala Response to Acupuncture Stimuli in Carpal Tunnel Syndrome

V Napadow,1,2 N Kettner,2 J Liu,1 M Li,1 KK Kwong,1 M Vangel,1 N Makris,3 J Audette,4 and KKS Hui1

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Go to:
Abstract

Brain processing of acupuncture stimuli in chronic neuropathic pain patients may underlie its beneficial effects. We used fMRI to evaluate verum and sham acupuncture stimulation at acupoint LI-4 in Carpal Tunnel Syndrome (CTS) patients and healthy controls (HC). CTS patients were retested after 5 weeks of acupuncture therapy. Thus, we investigated both the short-term brain response to acupuncture stimulation, as well as the influence of longer-term acupuncture therapy effects on this short-term response. CTS patients responded to verum acupuncture with greater activation in the hypothalamus and deactivation in the amygdala as compared to HC, controlling for the non-specific effects of sham acupuncture. A similar difference was found between CTS patients at baseline and after acupuncture therapy. For baseline CTS patients responding to verum acupuncture, functional connectivity was found between the hypothalamus and amygdala – the less deactivation in the amygdala, the greater the activation in the hypothalamus, and vice versa. Furthermore, hypothalamic response correlated positively with the degree of maladaptive cortical plasticity in CTS patients (inter-digit separation distance). This is the first evidence suggesting that chronic pain patients respond to acupuncture differently than HC, through a coordinated limbic network including the hypothalamus and amygdala.

Go to:
Introduction

Acupuncture is a component of traditional Chinese medicine, and has evolved empirically over thousands of years to treat a multitude of ailments (Kaptchuk 2002). While the efficacy of acupuncture for many conditions is still under debate, recent evaluation of this treatment modality has lent credence to the hypothesis that the brain and nervous system plays a leading role in processing acupuncture stimuli. Neuroimaging studies of acupuncture have noted stimulus-associated response in several limbic structures including the amygdala, cingulate cortex (Wu et al. 1999; Hui et al. 2000; Napadow et al. 2005), and hypothalamus (Wu et al.
However, the majority of acupuncture neuroimaging studies have been performed on healthy adults. Conversely, an interesting PET study which controlled for expectancy, found verum acupuncture-specific response in the insula (Pariente et al. 2005). However, this study did not directly contrast these results with healthy controls. Historically, it has been posited that acupuncture plays a homeostatic role (Zhu 1954; Kaptchuk 2000) and thus may have a greater effect on patient populations with a pathological imbalance, compared to healthy individuals. Hence, it remains to be seen if past acupuncture neuroimaging results in healthy adults will also apply to patients with chronic pain, for which a direct comparison is necessary. Chronic neuropathic and inflammatory pain alters processing in several limbic brain regions (e.g. amygdala, insula, ACC) and may initiate and be maintained by sensitization in brain processing. Evidence for this effect comes from both animal (Neugebauer et al. 2004) and human (Stern et al. 2006) studies. Acupuncture may alter brain function through neuroplasticity mechanisms by a combination of afferent somatosensory stimulus and affective evaluation, thereby modulating centrally maintained chronic pain states.

Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy, with a prevalence of 3.72% in the United States (Papanicolaou et al. 2001). CTS etiology is characterized by compression of the distal median nerve due to an elevated interstitial fluid pressure in the carpal tunnel. Ischemic injury to the median nerve leads to anoxic capillary damage, which then leads to increased membrane permeability, exudative edema and subsequent fibrosis (Keir and Rempel 2005; Sud and Freeland 2005). CTS is associated with a range of symptoms primarily in the first through fourth digit, including paresthesias, pain, and weakness.

We have previously demonstrated that CTS is associated with cortical hyperactivation to simple (non-acupuncture) somatosensory stimuli and maladaptive somatotopic plasticity in contralateral primary somatosensory cortex (Napadow et al. 2006a). This pathological central correlate of the peripheral CTS lesion was found to be altered after successful acupuncture treatment (Napadow et al. 2006b). In the current study, we explored brain processing of acupuncture stimulation in CTS patients compared to healthy controls (HC), controlling for cutaneous somatosensory/cognitive effects with sham acupuncture. Our hypothesis was that chronic pain patients would demonstrate greater response to verum acupuncture stimulation in limbic brain regions which have been associated with the maintenance of a persistent pain state.
The effectiveness of acupuncture research across components of the trauma spectrum response (tsr): a systematic review of reviews.


Co-morbid symptoms (for example, chronic pain, depression, anxiety, and fatigue) are particularly common in military fighters returning from the current conflicts, who have experienced physical and/or psychological trauma. These overlapping conditions cut across the boundaries of mind, brain and body, resulting in a common symptomatic and functional spectrum of physical, cognitive, psychological and behavioral effects referred to as the 'Trauma Spectrum Response' (TSR). While acupuncture has been shown to treat some of these components effectively, the current literature is often difficult to interpret, inconsistent or of variable quality. Thus, to gauge comprehensively the effectiveness of acupuncture across TSR components, a systematic review of reviews was conducted using the Samueli Institute's Rapid Evidence Assessment of the Literature (REAL©) methodology.

PubMed/MEDLINE, the Cochrane Database of Systematic Reviews, EMBASE, CINAHL, and PsycInfo were searched from inception to September 2011 for systematic reviews/meta-analyses. Quality assessment was rigorously performed using the Scottish Intercollegiate Guidelines Network (SIGN 50) checklist and the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) methodology. Adherence to the Standards for Reporting Interventions in Clinical Trials in Acupuncture (STRICTA) criteria was also assessed.

RESULTS:

Of the 1,480 citations identified by our searches, 52 systematic reviews/meta-analyses, all high quality except for one, met inclusion criteria for each TSR component except post-traumatic stress disorder (PTSD) and sexual function. The majority of reviews addressed most STRICTA components, but did not describe safety.

CONCLUSIONS:

Based on the results of our review, acupuncture appears to be effective for treating headaches and, although more research is needed, seems to be a promising treatment option for anxiety, sleep disturbances, depression and chronic pain. It does not, however, demonstrate any substantial treatment benefit for substance abuse. Because there were no reviews on PTSD or sexual function that met our pre-defined inclusion criteria, we cannot comment on acupuncture's effectiveness in treating these conditions. More quality data are also needed to determine whether acupuncture is appropriate for treating fatigue or cognitive difficulties. Further, while acupuncture has been shown to be generally safe, safety was not described in the majority of studies, making it difficult to provide any strong recommendations. Future research should address safety reporting in detail in order to increase our confidence in acupuncture's efficacy across the identified TSR components.


Hui KK¹, Liu J, Makris N, Gollub RL, Chen AJ, Moore CI, Kennedy DN, Rosen BR, Kwong KK.

Author information

Abstract

Acupuncture, an ancient therapeutic technique, is emerging as an important modality of complementary medicine in the United States. The use and efficacy of acupuncture treatment are not yet widely accepted in Western scientific and medical communities. Demonstration of regionally specific, quantifiable acupuncture effects on relevant structures of the human brain would facilitate acceptance and integration of this therapeutic modality into the practice of modern medicine. Research with animal models of acupuncture indicates that many of the beneficial effects may be mediated at the subcortical level in the brain. We used functional magnetic resonance imaging (fMRI) to investigate the effects of acupuncture in normal subjects and to provide a foundation for future studies on mechanisms of acupuncture action in therapeutic interventions. Acupuncture needle manipulation was performed at Large Intestine 4 (LI 4, Hegu) on the hand in 13 subjects [Stux, 1997]. Needle manipulation on either hand produced prominent decreases of fMRI signals in the nucleus accumbens, amygdala, hippocampus, parahippocampus, hypothalamus, ventral tegmental area, anterior cingulate gyrus (BA 24), caudate, putamen, temporal pole, and insula in all 11 subjects who experienced acupuncture sensation. In marked contrast, signal increases were observed primarily in the somatosensory cortex. The two subjects who experienced pain instead of acupuncture sensation exhibited signal increases instead of decreases in the anterior cingulate gyrus (BA 24), caudate, putamen, anterior thalamus, and posterior insula. Superficial tactile stimulation to the same area elicited signal increases in the somatosensory cortex as expected, but no signal decreases in the deep structures. These preliminary results suggest that acupuncture needle manipulation modulates the activity of the limbic system and subcortical structures. We hypothesize that modulation of subcortical structures may be an important mechanism by which acupuncture exerts its complex multisystem effects.
Acupuncture, Depression, and the Amygdala connection


by Gord Grant PhD, RAc

Recently studies have linked psychological depression with activation of the amygdalae, an important little pair of “almond” shaped structures located behind your eyes and about as far back as your ears. Here at the University of Alberta, Nikolai Malykhin and his team are documenting increases in both the size and “activation” of the amygdala in depressed people (see his website).

Acupuncture has traditionally been used to treat anxiety problems with or without depression, and now research shows it to be as clinically significant as psychological counselling in the treatment of depression (see the research). Research now demonstrates that certain points used in acupuncture are able to “calm” or “deactivate” these amygdala structures (compared to “sham or “placebo” treatment substitute for acupuncture), and may be one of several mechanisms that explain the acupuncture effect (see the research review).

MRI or magnetic resonance imaging has permitted researchers to investigate various diseases and mental illnesses looking for changes in brain structure. And more recently, functional or fMRI allows researchers to observe relative blood flow in the brain where they look for increases (called “activation”) or decreases (called “deactivation”) in blood flow.

The amygdala is part of a broad collection of brain structures called the “limbic system”, which is primarily responsible for our emotional experience, and it is centrally involved with the formation of memories. The paired amygdalae are important in the processing of memory, decision-making, and emotional reactions in a survival type level, and are intimately and structurally connected to the hippocampus (see diagram). The hippocampus is primarily involved in the formation of memory, and from these structures survival type reactions are formed. These are involved with the classic “Pavlovian” training of a dog to salivate to a bell (because he
usually gets fed when the bell rings), or a panic attack of a war veteran with agoraphobia and PTSD as he comes to an open space, decades after being traumatized in battle.

How scientists ask questions and design experiments to answer them influences both what they find and how they interpret. If you look for local affects on putting a needle in a muscle, you are able to find local effects (or not); the same goes for general effects on the whole body, or changes in brain activity. There are many mechanisms through which acupuncture likely has its “effects” and the sophistication of the research, as is demonstrated by these fMRI studies, is growing. The western preoccupation in both practice and research has been almost exclusively on pain and muscle problems.

I believe future research will continue to expand and explain how acupuncture may work to treat different conditions. Acupuncture represents a complex interaction of both direct and indirect affects on the mind and body. It time it may explain the traditional uses beyond muscle pain, by promoting a general relaxation response and calming the “fight or flight reaction”. From this place, it may explain why it can support critical health factors like improving sleep, mental well-being, immunity, and digestion, and have broad affects on things like cardiovascular function, fertility and states of being associated with health and thriving, not just absence of disease.

Research Article

Acupuncture and Counselling for Depression in Primary Care: A Randomised Controlled Trial

• Hugh MacPherson, Stewart Richmond, Martin Bland, Stephen Brealey, Rhian Gabe, Ann Hopton, Ada Keding, Harriet Lansdown, Sara Perren, Mark Sculpher, Eldon Spackman, David Torgerson, Ian Watt

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• DOI: 10.1371/journal.pmed.1001518
• Featured in PLOS Collections

Abstract

Background

Depression is a significant cause of morbidity. Many patients have communicated an interest in non-pharmacological therapies to their general practitioners. Systematic reviews of acupuncture and counselling for depression in primary care have identified limited evidence. The aim of this study was to evaluate acupuncture versus usual care and counselling versus usual care for patients who continue to experience depression in primary care.
Methods and Findings

In a randomised controlled trial, 755 patients with depression (Beck Depression Inventory BDI-II score ≥20) were recruited from 27 primary care practices in the North of England. Patients were randomised to one of three arms using a ratio of 2:2:1 to acupuncture (302), counselling (302), and usual care alone (151). The primary outcome was the difference in mean Patient Health Questionnaire (PHQ-9) scores at 3 months with secondary analyses over 12 months follow-up. Analysis was by intention-to-treat.

PHQ-9 data were available for 614 patients at 3 months and 572 patients at 12 months. Patients attended a mean of ten sessions for acupuncture and nine sessions for counselling. Compared to usual care, there was a statistically significant reduction in mean PHQ-9 depression scores at 3 months for acupuncture (−2.46, 95% CI −3.72 to −1.21) and counselling (−1.73, 95% CI −3.00 to −0.45), and over 12 months for acupuncture (−1.55, 95% CI −2.41 to −0.70) and counselling (−1.50, 95% CI −2.43 to −0.58). Differences between acupuncture and counselling were not significant. In terms of limitations, the trial was not designed to separate out specific from non-specific effects. No serious treatment-related adverse events were reported.

Conclusions

In this randomised controlled trial of acupuncture and counselling for patients presenting with depression, after having consulted their general practitioner in primary care, both interventions were associated with significantly reduced depression at 3 months when compared to usual care alone.

Trial Registration

Controlled-Trials.com ISRCTN63787732

Research Article

Characterizing Acupuncture Stimuli Using Brain Imaging with fMRI - A Systematic Review and Meta-Analysis of the Literature

Wenjing Huang, Daniel Pach, Vitaly Napadow, Kyungmo Park, Xiangyu Long, Jane Neumann, Yumi Maeda, Till Nierhaus, Fanrong Liang, Claudia M. Witt

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Abstract
**Background**

The mechanisms of action underlying acupuncture, including acupuncture point specificity, are not well understood. In the previous decade, an increasing number of studies have applied fMRI to investigate brain response to acupuncture stimulation. Our aim was to provide a systematic overview of acupuncture fMRI research considering the following aspects: 1) differences between verum and sham acupuncture, 2) differences due to various methods of acupuncture manipulation, 3) differences between patients and healthy volunteers, 4) differences between different acupuncture points.

**Methodology/Principal Findings**

We systematically searched English, Chinese, Korean and Japanese databases for literature published from the earliest available up until September 2009, without any language restrictions. We included all studies using fMRI to investigate the effect of acupuncture on the human brain (at least one group that received needle-based acupuncture). 779 papers were identified, 149 met the inclusion criteria for the descriptive analysis, and 34 were eligible for the meta-analyses. From a descriptive perspective, multiple studies reported that acupuncture modulates activity within specific brain areas, including somatosensory cortices, limbic system, basal ganglia, brain stem, and cerebellum. Meta-analyses for verum acupuncture stimuli confirmed brain activity within many of the regions mentioned above. Differences between verum and sham acupuncture were noted in brain response in middle cingulate, while some heterogeneity was noted for other regions depending on how such meta-analyses were performed, such as sensorimotor cortices, limbic regions, and cerebellum.

**Conclusions**

Brain response to acupuncture stimuli encompasses a broad network of regions consistent with not just somatosensory, but also affective and cognitive processing. While the results were heterogeneous, from a descriptive perspective most studies suggest that acupuncture can modulate the activity within specific brain areas, and the evidence based on meta-analyses confirmed some of these results. More high quality studies with more transparent methodology are needed to improve the consistency amongst different studies.
New research confirms that acupuncture reduces pain levels. Investigators discovered that electroacupuncture decreases pain by regulating the expression of several proteins in the hypothalamus, a part of the brain responsible for autonomic nervous system, endocrine and limbic system functions. A total of 17 hypothalamic proteins demonstrated significant changes as a result of electroacupuncture stimulation for the treatment of pain.

The acupuncture points chosen for the study were ST36 (Zusanli) and GB34 (Yanglingquan). Electroacupuncture at these points effectively reduced pain, enriched three gene ontologies and regulated the glycolysis-gluconeogenesis-hexose metabolism pathway. The researchers note that the data demonstrates that electroacupuncture lessens pain through the “regulation of expression of multiple proteins in the hypothalamus.”

These findings are consistent with other research on the relationship between acupuncture and brain chemistry. Researchers discovered that electrical and manual acupuncture “improve menstrual frequency and decrease circulating androgens in women with polycystic ovary syndrome (PCOS).” Acupuncture caused normalization of estrogen activity and decreased excessive androgen levels. Electroacupuncture demonstrated changes in the central opioid receptors of the hypothalamus suggesting that it may be “mediated by central opioid receptors…” Manual acupuncture demonstrated changes in the steroid receptors of the hypothalamus suggesting that it “may involve regulation of steroid hormone-peptide receptors.”

Another study focusing on acupuncture’s ability to reduce carpal tunnel pain discovered a brain pathway by which acupuncture exerts its therapeutic results. The researchers measured brain responses to neuropathic pain using fMRI technology. Acupuncture caused significant activation of the hypothalamus and greater deactivation of the amygdala. The researchers concluded that acupuncture benefits chronic pain sufferers “through a coordinated limbic network including the hypothalamus and amygdala.”

A weight loss study found that acupuncture controls the expression of leptin, a hormone that regulates appetite and metabolism. The investigators observed that “electroacupuncture treatment led to a reduction of body weight, decrease in the plasma leptin levels, and an increase in leptin receptor expression in the hypothalamus.” The researchers continue, “Our results suggested that regulating the expression of leptin and the leptin receptor might be one of the molecular mechanisms underlying the reduction of body weight in diet-induced obese rats by electroacupuncture treatment.”

Similar findings show that acupuncture regulates the hypothalamus-pituitary-adrenal-axis. Researchers discovered that the application of electroacupuncture to acupoint ST36 reduces the production of stress induced hormones via this cortical pathway. Acupuncture prevented sympathetic nervous system elevations via the NPY pathway and also prevented elevations in ACTH and CORT.
Reference:

Electrical and manual acupuncture stimulation affects estrous cyclicity and neuroendocrine function in a DHT-induced rat polycystic ovary syndrome model. Yi Feng1,2, Julia Johansson1, Ruijin Shao1, Louise Mannerås Holm1, Håkan Billig1, Elisabet Stener-Victorin1,3. Experimental Physiology. DOI: 10.1113/expphysiol.2011.063131.


- See more at: http://www.healthcmi.com/Acupuncture-Continuing-Education-News/771-hypothalamusgb34#sthash.ItmiXUFi.dpuf
Acupoint Stimulation, Changes in the Brain, and Anxiety Reduction

Ulett's (1992) review of scientific acupuncture studies on pain reduction indicates that acupoint stimulation produces: internal opioids (endorphins, enkephalins and dynorphins) which reduce pain; serotonin, a mood regulator; and changes of up to 50% in cortisol, which signals the homeostatic mechanisms in the midbrain to reduce the FFF response. Internal opioids, such as endorphins, both reduce pain and slow down the heart rate. A fast heart rate often is an indication of anxiety and fear for the person experiencing this proprioceptive stimulus. Ulett cites acupuncture studies which found a doubling of pain-reducing endorphin levels in the cerebrospinal fluid within 30 minutes of acupuncture stimulation.

Many neuroimaging studies of acupuncture indicate that midbrain structures, particularly the amygdala, are influenced by acupoint stimulation (Dhond et al., 2007; Fang et al., 2008; Hui et al., 2000; Napadow et al., 2007; Napadow et al., 2009). Rudin (2005) indicates that an increase in serotonin stimulates the basolateral amygdala to produce GABA, an anxiety-reducing neurotransmitter that blocks the production of glutamate and delinks the biochemical pathway that produces and maintains the fear response. Regulatory genes, such as EGR-1 and c-fos, are triggered by stressful experiences (Sabban & Kvetnansky, 2001; Davis, Bozon, & Laroche, 2003). Church (2009b) summarizes epigenetic studies demonstrating that relaxation downregulates the expression of the genes involved in the FFF response, and increases the reuptake of stress hormones such as cortisol.

Several fMRI neuroimaging studies have noted that acupuncture results in significant decreases in the activity of the limbic system, amygdala, brain stem and midbrain structures involved in the FFF response (Dhond et al., 2007; Fang et al., 2008; Hui et al., 2000; Napadow et al., 2007; Napadow et al., 2009). The activation of the amygdala is associated with a heightened FFF response, while the hippocampus, which is responsible for contextual associations, reduces it (LeDoux, 2002; Phelps & LeDoux, 2005; Perry, 1999). Both studies by Napadow et al. (2007, 2009) showed significant differences occurring in fMRI images resulting from true versus sham acupuncture points, indicating that acupoint stimulation has greater efficacy than other forms of somatic stimulation.

Acupoint stimulation is an effective treatment for fear because it terminates the sympathetic nervous system’s (SNS) alarm or FFF response, and replaces it with the parasympathetic nervous system’s (PNS) relaxation response (Korber et al., 2002; Napadow et al., 2007; Rudin, 2005). The SNS alarm response is terminated through a biochemical feedback mechanism in the midbrain that produces calming neurotransmitters such as opioid neuropeptides, serotonin, and GABA, and regulates cortisol. These biochemical changes are active ingredients in the counterconditioning process.

Perry (1999) notes that the human midbrain lies between the brainstem and neocortex and is structured to sense, process, store, perceive and mobilize responses to threat. It provides, along with the brainstem, regulatory functions affecting the whole body (e.g., activation or relaxation). He notes that sensory input is matched against stored patterns of threat, so that incoming sensory information associated with threat sets off a sympathetic nervous system alarm response.
17 and 18 compared with its sham point. They also found that acupuncture at LI4 evoked specific activation at the temporal pole, but deactivation in the precentral gyrus, superior temporal gyrus, pulvinar thalamus and BA 8, 9 and 45 compared with its sham point. These results reveal that acupuncture at different acupoints may induce specific patterns of brain activity. Bai et al. (2010) investigated the neural specificity of pericardium PC6, with the same meridian acupoint PC7 and a treatment-irrelevant acupoint GB37 as separate controls. In their experiment, a non-repeated event-related design paradigm was applied. This study demonstrated that acupuncture at PC6 can selectively evoke the hemodynamic response in the insula and cerebellar-hypothalamus pathway in order to exert modulatory effects on the regulation of vestibular functions. 

In 2000, Hui first described the signal decreases in the limbic system in the brain during acupuncture at LI4 (K. K. S. Hui et al., 2000). They designated that network as the limbic-paralimbic-neocortical network (Fang et al., 2009, K. K. S. Hui et al., 2005; K. K. S. Hui et al., 2009). Dhond, Yeh, Park, Kettner, & Napadow (2008) evaluated acupuncture modulation of resting functional connectivity within the brain’s default mode network (DMN) and sensorimotor network (SMN) with the help of multivariate independent component analysis (ICA). Increased DMN connectivity with pain- and affect- and memory-related brain regions was found, as well as increased SMN connectivity with pain-related brain regions, supporting the limbic-paralimbic-neocortical network theory. Bai et al. (2009) employed a special approach to investigate the dynamics underlying sustained effects of acupuncture, designing two separate models to evaluate baseline activities using a nonmeridian point (NMP) stimulation and a visual task. In their results, no significant changes were detected in the major structures of the brainstem or limbic-related regions.

As can be seen in our review, most studies have focused on the short-term neural responses or acute effects of acupuncture. However, other clinical reports indicate that acupuncture effects can exist beyond the needling time (Medicine, 1980) and create a sustained effect. For example, according to the theory of TCM, the analgesic effects of acupuncture can last up to several hours after the needling time (Medicine, 1980; Price, Rafii, Watkins, & Buckingham, 1984). Wei et al. (2006) investigated the neural mechanisms behind the stimulation of acupoint Liv3 and found that the activation remained even after the needling time. Yu et al. (2009) studied time-related changes in resting-state activity induced by acupuncture at acupoint ST36 by analyzing changes in the amplitude of low-frequency fluctuation (ALFF). They found that acupuncture at ST36 can influence resting-state brain activity, and post-effects were found at 10 minutes and 25 minutes after acupuncture.

The Issue of Deqi

Deqi is a TCM term in acupuncture used to describe the sensations a person feels during acupuncture needle manipulation, such as aching, pressure, soreness, fullness, distension, numbness, tingling, local warm or cool sensations, pain and the spreading of these sensations (Asghar, Green, Lythgoe, Lewith, & MacPherson, 2010; K. K. S. Hui et al., 2005; Kong, Gollub, Huang et al., 2007; Park, Park, & Lee, 2002). It is generally considered to be an important aspect of acupuncture that is associated with the therapeutic effect. Although the underlying mechanism behind deqi is not clear, many studies indicate that deqi may be essential for attaining the salubrious effects of acupuncture (Kong, Gollub, Huang et al., 2007). Considering the importance of deqi, it is necessary to qualify and quantify the needle sensations of deqi in an acupuncture study, and many investigators have attempted to clarify these sensations more precisely. MacPherson & Asghar (2006) used expert opinion to delineate the sensations of deqi and differentiate them from those that might be more

Traditional manual acupuncture (MA) plays an important role in the history of the technique, and dates back more than 2000 years (Napadow et al., 2005). MA involves the insertion of fine needles into acupoints followed by manual manipulation. However, with the development of modern techniques, new acupuncture modalities have appeared. One is electroacupuncture (EA) and the other is laser needle acupuncture. EA is a technique in which two needles are inserted as electrodes for passing an electric current. Compared with MA, one of the advantages of EA is the capacity to objectively and quantifiably set the stimulation frequency and intensity. Many studies have compared the differences between MA and EA (Kong et al., 2002; Napadow et al., 2005; Tsai & Leung, 2002). Napadow et al. (2005) found that EA produced a more widespread signal increase than did MA. Kong et al. (2002) used fMRI to investigate the brain regions involved in electroacupuncture and manual acupuncture needle stimulation, and their results suggested that different brain mechanisms may be recruited during each of these techniques.

Laser acupuncture (LA), which was first applied in the 1970s, is defined as the stimulation of traditional acupuncture points with low-intensity, nonthermal laser irradiation (Whittaker, 2004). Many researchers have employed laser acupuncture to study the mechanisms of acupuncture with fMRI (Litscher et al., 2004; Litscher & Schikora, 2002; Siedentopf et al., 2002; Siedentopf et al., 2005). Litscher, Wang, & Wiesner-Zeichmeister (2000) made a comparison between MA and LA, and showed that MA of vision-related points increased blood flow velocity, but LA of the same points had no effect. Litscher & Schikora (2002) also found that MA increased blood flow; a similar increase was observed with LA, however to a lesser extent. In one study using LA, stimulation performed with a laser needle could not be felt by the patient, and the operator was also unaware of whether the stimulation was active, allowing for the possibility that a true double-blind study could be performed with laser (Litscher et al., 2004).

Because of the lack of comparison studies between MA and LA and the fact that laser acupuncture’s mechanism is poorly understood, more basic research is needed on LA prior to its use in fMRI studies on acupuncture. However, both EA and MA are well-studied techniques that can be explored further with the means of fMRI.

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Abstract

de-qi, comprising mostly subjective sensations during acupuncture, is traditionally considered as a very important component for the possible therapeutic effects of acupuncture. However, the neural correlates of *de-qi* are still unclear. In this paper, we reviewed previous fMRI studies from the viewpoint of the neural responses of *de-qi*. We searched on Pubmed and identified 111 papers. Fourteen studies distinguishing *de-qi* and sharp pain and eight studies with the mixed sensations were included in further discussions. We found that the blood oxygenation level-dependent (BOLD) responses associated with *de-qi* were activation dominated, mainly around cortical areas relevant to the processing of somatosensory or pain signals. More intense and extensive activations were shown for the mixed sensations. Specific activations of sharp pain were also shown. Similar BOLD response patterns between *de-qi* evoked by acupuncture stimulation and *de-qi*-like sensations evoked by deep pain stimulation were shown. We reckon that a standardized method of qualification and quantification of *de-qi*, deeper understanding of grouping strategy of *de-qi* and sharp pain, and making deep pain stimulation as a control, as well as a series of improvements in the statistical method, are crucial factors for revealing the neural correlates of *de-qi* and neural mechanisms of acupuncture.
4.2. **Acupuncture Modulates Endogenous Anti-Nociceptive Brain Networks**

Data from animal research suggests that acupuncture analgesia may be largely supported by endogenous opioidergic and/or monoaminergic anti-nociceptive networks (35). Endogenous analgesia manifests at least partially through inhibition of afferent pain signaling by brainstem modulation (36). Specifically, the periaqueductal gray (PAG) may activate off cells in the rostral ventral medulla (RVM), which inhibits afferent pain signaling at the level of the dorsal horn (37). In humans, PAG activity may be triggered or facilitated by "top-down" pain signaling from higher centers including the PFC and ACC. These areas along with limbic regions including the hippocampus and amygdala are activated during pain and are associated with the pain neuropeptide. Importantly, brainstem activity may also modulate opioidergic and/or monoaminergic transmission within the pain neuropeptide thereby decreasing the subjective/conscious experience of pain.

Neuroimaging data demonstrate that multiple areas supporting endogenous antinociception are also modulated by acupuncture. Furthermore, some fMRI studies have demonstrated acupuncture stimulation-associated signal decrease in limbic structures including the amygdala (Figure 3) (27,28,30,38). The amygdala plays an important role in pain perception and a decrease in amygdala activity may correspond to decreased affective pain processing. An fMRI study of transcutaneous electrical acupuncture stimulation (TEAS) found greater limbic deactivation in high compared to low acupuncture analgesia responders (Figure 4) (39). However, TEAS is different from insertive electroacupuncture in many ways, and results from these studies may not apply to acupuncture. EEG studies also support possible limbic involvement in acupuncture. High-frequency TEAS at large intestine-4 was associated with processing in the ACC and decreased theta frequency power (40). Unfortunately, neither EEG nor fMRI studies have shed light on whether acupuncture’s analgesic effects are supported by opioidergic and/or monoaminergic neurotransmission.

While many of the above studies have mapped brain response to acupuncture stimulation, other studies have explored the direct effects of acupuncture stimulation, e.g., how brain response to a pain stimulus is altered by acupuncture. For example, Harris et al. have demonstrated that both verum and sham acupuncture have been found to reduce fMRI pain responses in the thalamus and insula of fibromyalgia patients (41); PET data using carfentanil in this same population also supports μ-opioid receptor involvement in acupuncture and/or sham analgesia. Other studies in healthy adults also

http://www.amazon.ca/Integrative-Pain-Medicine-Complementary-Contemporary-ebook/dp/B001BU55ZS/ref=sr_1_1?ie=UTF8&qid=1433765630&sr=1-1&keywords=9781597453448
The Status and Future of Acupuncture Mechanism Research

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Abstract

On November 8–9, 2007, the Society for Acupuncture Research (SAR) hosted an international conference to mark the tenth anniversary of the landmark NIH [National Institutes of Health] Consensus Development Conference on Acupuncture. More than 300 acupuncture researchers, practitioners, students, funding agency personnel, and health policy analysts from 20 countries attended the SAR meeting held at the University of Maryland School of Medicine, Baltimore, MD. This paper summarizes important invited lectures in the area of basic and translational acupuncture research. Specific areas include the scientific assessment of acupuncture points and meridians, the neural mechanisms of cardiovascular regulation by acupuncture, mechanisms for electroacupuncture applied to persistent inflammation and pain, basic and translational research on acupuncture in gynecologic applications, the application of functional neuroimaging to acupuncture research with specific application to carpal-tunnel syndrome and fibromyalgia, and the association of the connective tissue system to acupuncture research. In summary, mechanistic models for acupuncture effects that have been investigated experimentally have focused on the effects of acupuncture needle stimulation on the nervous system, muscles, and connective tissue. These mechanistic models are not mutually exclusive. Iterative testing, expanding, and perhaps merging of such models will potentially lead to an incremental understanding of the effects of manual and electrical stimulation of acupuncture needles that is solidly rooted in physiology.

Introduction

In November 8–9, 2007, the Society for Acupuncture Research (SAR) hosted an international conference to mark the tenth anniversary of the landmark NIH [National Institutes of Health] Consensus Development Conference on Acupuncture. This paper summarizes important invited lectures from the SAR conference in the area of basic and translational acupuncture research. Two companion manuscripts have been written in parallel and appear in this section of the issue. One covers clinical research (Park et al., 2008, pp.
873–883), and the other presents overviews of qualitative studies, the impact of the 1997 NIH consensus conference, and future directions in acupuncture research (MacPherson et al., 2008, pp. 885–889). In this paper, individuals who delivered lectures on basic and translational acupuncture research and have provided the summaries have been listed as coauthors.

Ahn discussed the scientific assessment of the acupuncture point and meridian. Longhurst described the neural mechanisms of cardiovascular regulation by acupuncture. Lao discussed mechanisms for electroacupuncture (EA) applied to persistent inflammation and pain. Stener-Victorin outlined basic and translational research on acupuncture in gynecologic applications. Napadow discussed how functional magnetic resonance imaging (MRI) has been used to evaluate mechanisms of acupuncture action. Harris focused on functional neuroimaging of acupuncture in fibromyalgia. Finally, Langevin delivered an overview lecture, titled “Acupuncture Basic Research: How Do We Put It All To-

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gether?” While this summary does not cover every development in basic acupuncture research in the past 10 years, many of the important advancements that have led to a better understanding of acupuncture mechanisms were indeed covered by the invited speakers. Through continued research into the mechanisms subserving acupuncture’s clinical effects, we will be able to optimize and apply acupuncture to the clinical conditions, which may benefit most from this ancient therapeutic system.

Scientific Assessment of the Acupuncture Point and Meridian (Ahn)
The anatomical and physiologic nature of the acupuncture point/meridian remains elusive. Our limited understanding, however, is not for lack of existing hypotheses. Numerous physiologic and anatomical associations have been proposed within the literature. This summary provides a brief review of the scientific assessment of the acupuncture point and meridian. The discussion is limited to reported associations
that (a) reflect common belief, (b) are sufficiently specific to the acupuncture point and meridian, or (c) are supported by more than 2 good-quality studies. With this criteria, the talk focuses on two anatomical associations (nervous system and connective tissue), and three physiologic associations (trigger point, nuclear tracer migration, and electrical properties) are discussed.

Neural correlates reported in the literature include large peripheral nerves,
1 neurovascular bundles,
2 motor points,
3 mechanoreceptors,
4 free nerve endings,
5 and neuromuscular attachments.
1
The studies were performed predominantly in the 1970s and 1980s and were generally poor in quality. These studies lacked appropriate controls, had small sample sizes, and lacked detailed descriptions of acupoint localization. Overall, no macroscopic anatomical neural structure was clearly linked with acupuncture points.

The most recent anatomical association reported in the literature is the intermuscular/intramuscular loose connective tissue. According to recent studies, many acupuncture meridians and points align with intermuscular and intra-muscular tissue.
6 Additionally, the collagen within the loose connective tissue may account for the needle-grasp effect reported at acupuncture points.
6–8 The biomechanical implications of this association are evolving, although the physiologic and clinical significance are yet unclear. The analogy between trigger points and acupuncture points became widely discussed since Melzack et al.’s landmark study in 1977.
9 There are a number of similarities between the two: the two structures have similar locations; needles are used at both points to treat pain; the pain associated with the local twitch response at trigger points is similar to the de qi sensation; and the referred pain generated by needling trigger points is similar to the purported propagated sensation along the meridians. However, the acupoints located at these trigger points are not frequently used by acupuncturists and do not share the same clinical indications as the trigger point therapy.
10 Trigger points may represent a subset of acupuncture points—specifically, the ah shi points.

Nuclear tracers have been used to track the trajectory of acupuncture meridians in both humans and dogs. In most cases,
99m Tc, in the form of sodium pertechnetate, was injected at low electrical resistance points to a superficial depth of 3–5 mm. The tracer migrated along the course of meridian at a rate of approximately 3–5 cm per minute.
11 For areas where the tracer was injected at nearby controls, the migration was not observed.
12 According to various experiments, this phenomenon is not directly attributable to veins or lymphatics although the interpretation of the results remains controversial.
11 The electrical characteristics of acupuncture points and meridians are the most widely studied physiologic association in the literature. Acupuncture points have been reported to be local electrical resistance/impedance minima with diameters of approximately 1–4 mm. Acupuncture meridians have been reported to have lower
electrical impedance and higher capacitance compared to adjacent controls. A systematic review of this literature suggests that there is insufficient evidence to support the electrical association, although these data are suggestive.

13 Interestingly, a significant proportion of studies on the anatomical and physiologic nature of acupuncture structures have used low electrical resistance points as a surrogate for acupuncture points. Our understanding of the anatomical and physiologic nature of acupuncture points and meridians remains insufficient. The scientific characterization of these acupuncture structures is critical for the proper execution of a clinical trial—this characterization determines the proper localization of controls and helps identify the optimal therapeutic intervention. Further attention is needed to address this relatively neglected area of research.

Neural Mechanisms of Cardiovascular Regulation by Acupuncture (Longhurst)

There is evidence from a series of clinical trials for reduction in myocardial ischemia in patients with coronary disease and there are more variable data for acupuncture’s ability to lower blood pressure (BP). For the last decade, scientists at our laboratory have sought to understand the signaling events and neurobiologic actions of acupuncture’s regulation of the cardiovascular system better. Our initial studies, published in the late 1990s, indicated that acupuncture was capable of reversing demand-induced myocardial ischemia in a feline model of partial coronary ligation.

14 This action of acupuncture involved Group III and IV somatic afferents and the endogenous opiate system, which lowered myocardial oxygen demand by reducing reflex-induced increases in BP.

15,16 Subsequent studies demonstrated that both - and -opioid, but not-opioid receptors in the rostral ventrolateral medulla (rVLM) were involved in acupuncture’s action in the brainstem.

17 These studies, supported by immunohistochemical confocal microscopy,

18 therefore suggest that -endorphin, endomorphin, and enkephalin, but not dynorphin, act as modulatory neuropeptides in this region during acupuncture. More recently, we have shown that nociceptin and gamma aminobutyric acid (GABA) are involved in inhibition of visceral reflex-induced increases in blood pressure following 30 minutes of low-frequency EA at P5–P6 acupoints, located over the median nerve on the forearms.

19,20 In our experimental models, we have demonstrated that low-frequency (2–4 Hz) but not high-frequency (20–100 Hz) EA effectively stimulates somatic afferents to provide input to regions such as the rVLM that regulate sympathetic outflow.

15,21 Our studies have also examined the concept of point specificity with regard to acupuncture’s ability to lower elevated BP.

21–23 Using a positive and a negative electrode connected to needles at two adjacent acupuncture points, we have demonstrated that acupoints P5–P6, LI10–LI11, LI4–LI7, and St36–St37 effectively lower BP, whereas LI6–LI7 and G37–G39 are ineffective.
The extent of BP depression is dependent on the extent of convergent input to premotor sympathetic neurons in the rVLM. Simply placing a needle in an effective acupoint without mechanical or electrical stimulation did not influence elevated BP, suggesting that either needle placement without stimulation or electrical stimulation of an inactive acupoint can serve as adequate sham-control interventions.

Carefully comparing 2 Hz electro- and manual acupuncture showed similar lowering of reflex elevations in BP of approximately 40% with both interventions. Recently, we have begun to identify other regions, including the arcuate nucleus in the ventral hypothalamus and the ventrolateral periaqueductal gray (vlPAG) in the midbrain that constitute parts of a long-loop pathway activated during prolonged (10–30 minutes) somatic afferent stimulation with EA at P5–P6.

Our data show that the arcuate is an important source of opioid peptides that are transported to other regions such as the rVLM, whereas the vlPAG is a known cardiovascular-depressor region. Stimulation of the median nerve, underlying P5–P6, increases activity in the arcuate, which through its projections, provokes activity in the vlPAG. The vlPAG either directly or indirectly provides inhibitory input to the rVLM to ultimately modulate premotor sympathetic outflow. Immunohistochemistry and microdialysis combined with electrophysiology have shown that sympathoexcitatory visceral reflexes stimulate premotor glutamatergic neurons in the rVLM that are modulated during EA through an opioid mechanism, because the process is blocked by microinjection of naloxone.

Furthermore, EA at P5–P6 frequently induces prolonged inhibition of rVLM premotor sympathetic neurons, lasting for more than 90 minutes.

This prolonged neuromodulation depends on an intact arcuate nucleus, and both opioids and GABA, but not nociceptin, systems in the rVLM. Several of our studies have shown that acupuncture does not reduce BP in normotensive human subjects or experimental preparations.

However, in addition to acupuncture’s BP-lowering effects, recent intriguing preliminary studies suggest that acupuncture also may be able to raise BP after it has been lowered reflexly.

Thus, we are beginning to understand the central neurocircuitry and neuro-transmitter mechanisms underlying acupuncture’s ability to lower BP in hypertensive states. These studies may have clinical utility for treating patients with hypertension, myocardial ischemia, and perhaps even congestive heart failure—all of which are associated with heightened sympathetic tone. Future studies will be directed at identifying still other regions in the brainstem, such as the medullary raphe nuclei, particularly the nucleus raphe obscurus, in addition to the nucleus tractus solitarii, the nucleus ambiguus and the dorsal motor nucleus of the vagus, as well as the many interactions among these nuclei that, together, modulate autonomic outflow and, hence, cardiovascular function during acupuncture.

**Electroacupuncture Mechanisms on Persistent Inflammation and Pain (Lao)**

Chronic or persistent inflammatory pain animal models, produced by inflammatory agents such as carrageenan and complete Freund’s adjuvant (CFA), induce inflammation lasting for hours or days, respectively, and have recently been used to study the mechanisms of EA. During the past 8 years, scientists in our laboratory have been investigating mechanisms of EA antihyperalgesia and EA anti-inflammation in a CFA-induced persistent inflammatory pain rat model.

In the behavioral tests on this animal model, we observed that the effect of EA is parameter-dependant. EA at 100 Hz has a potent and short-term inhibitory effect on hyperalgesia but little effect on inflammation, while 10 Hz of EA has a moderate and prolonged antihyperalgesic effect as well as an anti-inflammatory effect.
Furthermore, our studies also demonstrate that the effect of EA on hyperalgesia and inflammation is mediated by two distinct pathways.

**The hormonal pathway**

EA anti-inflammation is mediated by hypothalamus–pituitary–adrenal (HPA) axis activities, as demonstrated by several lines of evidence: (1) At the adrenal level, EA treatment significantly elevated plasma corticosterone levels and decreased paw edema compared to sham EA. This antiedema effect was eradicated in animals given an adrenalectomy (ADX) and in those pretreated with a corticosterone antagonist RU486,34,35 but neither treatment blocked the antihyperalgesia effect of EA. (2) At the pituitary level, EA significantly increased plasma adrenocorticotropic hormone (ACTH) levels, while the ACTH receptor antagonist ACTH (1124) blocked EA antiedema but not EA antihyperalgesia (unpublished data). (3) At the hypothalamus level, a corticotropin-releasing factor (CRF) receptor antagonist, astressin, blocked EA antiedema but only partially blocked the effect of EA antihyperalgesia (unpublished data). We also found that EA did not increase plasma corticosterone (CORT) and ACTH levels in naive rats, which suggests that EA affects healthy and pathologic conditions differently.

**The neural pathway**

At the spinal level, EA significantly inhibited CFA-induced Fos expression in the spinal dorsal horn, particularly at laminae I-II.34,35 Pharmacologic studies showed that EA antihyperalgesia is mediated by mu and delta but not kappa opioid receptors.

36 Studies also show that lesioning of the G-protein-coupled receptor by pertussis toxin blocks EA antihyperalgesia.

37 Specifically, lesioning of mu receptor–containing spinal neurons with dermorphin-saporin shows this effect.

38 Furthermore, a dorsolateral funiculus lesion in the lower thoracic spinal cord significantly diminishes the effect of EA antihyperalgesia.

39 At the supraspinal level, EA activates Fos expression in the nucleus raphe magnus and locus coeruleus.

Our immunochemistry double-staining data show that EA specifically activates serotonin- or tyrosine hydroxylase–containing neurons in these nuclei, which project to the spinal cord.

In conclusion, the rat persistent inflammatory pain model has provided an ideal animal model for investigating the effect and mechanisms of acupuncture on inflammatory pain and has produced data with potential clinical relevance for the treatment of chronic inflammatory pain. EA antihyperalgesia and antiedema are parameter-dependent and, moreover, are mediated via two distinct pathways. EA-produced antihyperalgesia is mainly mediated by sensory nerve pathways involving both spinal and supraspinal mechanisms, while EA-produced anti-inflammatory effects are mainly mediated by activation of the HPA axis.

**Acupuncture in Gynecology (Stener-Victorin)**

Female infertility—basic and clinical studies

Despite the lack of a large body of evidence—we cannot ignore the fact that many women receive acupuncture treatment to address infertility issues. Whether there is a true effect within the area of infertility or not, is a compelling reason for the scientific community to investigate. Acupuncture is a safe intervention in the hands of competent practitioners. In this sense, special acupuncture training in the area of women’s health is essential.
Recent basic and clinical research demonstrate that acupuncture regulates uterine and ovarian blood flow, that the effect most likely is mediated as a reflex response via the ovarian sympathetic nerves, and that the response is controlled via supraspinal pathways.

It is important to point out that these studies show that the effect of acupuncture, at least partially, is mediated via sympathetic nerves but shed no light on the role of acupuncture in infertility treatment.

**Acupuncture in endocrine and metabolic disorders**

Polycystic ovary syndrome (PCOS) is the most common endocrine and metabolic disorder—“the female metabolic syndrome”—associated with ovulatory dysfunction, abdominal obesity, hyperandrogenism, hypertension, and insulin resistance. The precise etiology of the disease is unknown but excessive ovarian androgen production and secretion seem to play a key role. A potential contribution of the sympathetic nervous system as a primary factor in the development and maintenance of PCOS has been suggested.

We have conducted a study on women with well-defined and diagnosed PCOS and anovulation to elucidate the effect of repeated low-frequency (2 Hz) EA treatments on endocrinologic and neuroendocrinologic parameters as well as on anovulation.

This study showed that repeated low-frequency EA treatments exert long-lasting effects on both endocrinologic parameters as well as on anovulation. These results are in accordance with previous studies, but it is obvious that randomized, comparative studies are needed to verify these results. However, these studies do not enlighten possible underlying mechanisms of EA, but it can be hypothesized that these EA effects are mediated through inhibition of the activity in the ovarian sympathetic nerves. In recent studies on an estradiol valerate (EV)–induced rat polycystic ovary (PCO) model, we showed that repeated low-frequency EA treatments resulted in a reduction of high ovarian nerve growth factor (NGF), corticotrophin-releasing factor, and endothelin-1 concentrations—all markers for sympathetic activity—as well as increased low hypothalamic b-endorphin concentrations and immune function.

We have tested the hypothesis further that repeated low-frequency EA treatments as well as physical exercise modulates sympathetic nerve activity in rats with steroid-induced PCO by studying the expression of mRNA and proteins of 1a-1b-1d- and 2-adrenoceptors and the NGF receptor p75 NTR and immunohistochemical expression of tyrosine hydroxylase (TH).

Physical exercise almost normalized ovarian morphology and both EA and physical exercise normalized the expression of NGF and NGF-receptors, as well as 1- and 2-AR, suggesting that these interventions may have a therapeutic effect. Recently, our group developed a new rat PCOS model that incorporates ovarian and metabolic characteristics of the syndrome.

After continuous exposure to 5-dihydrotestosterone, from prepuberty until adult age, the rats have typical PCO with an increased number of apoptotic follicles. Moreover, the rats develop obesity accompanied by enlarged adipocyte size and insulin resistance, indicating that high levels of androgens induce alterations in body composition and reduced insulin sensitivity in this PCOS model. What is of great importance is that we have shown that low-frequency EA and exercise ameliorate insulin resistance in rats with PCOS. This effect may involve regulation of adipose-tissue metabolism and production because EA and exercise each partially restore divergent adipose-tissue gene expression associated with insulin resistance, obesity, and inflammation. In contrast to exercise, EA improves insulin sensitivity and modulates adipose-tissue gene expression without influencing adipose tissue mass and cellularity. These rat PCO/PCOS studies demonstrate that low-frequency EA induces effects on the endocrine, the metabolic and the sympathetic nervous system.
Acupuncture in conjunction to in vitro fertilization and embryo transfer

Since the first publications reporting the use of acupuncture as an analgesic method during oocyte retrieval in in vitro fertilization (IVF) treatment, and later studies investigating the role of acupuncture before, during and after embryo transfer (ET), the clinical use of acupuncture has become widespread. These recent studies regarding the role of acupuncture in IVF/ET treatment, focusing on oocyte aspiration and ET, has been given much attention in debate and review papers.

Many of the trials are underpowered and the study designs among the trials differ, which makes it hard to interpret the data. However, the authors of a recent review concluded that current preliminary evidence suggests that acupuncture given before and after ET improves rates of pregnancy and live births among women undergoing IVF. In this context, it is important to emphasize that, in a comment in the British Medical Journal, it is noted that a Danish randomized controlled trial (RCT) on adjuvant acupuncture that includes more than 600 women having IVF (twice as many as in the largest RCT included in the meta-analysis) is currently underway.

Before adding adjuvant acupuncture for IVF to any national guideline, we must wait for the results of this and other studies to clarify the value of this treatment.

In conclusion, it appears that acupuncture may have a beneficial effect on women with PCOS; this possibility is supported by both clinical and experimental evidence. However, there is a need for more RCTs on women with well-defined diagnoses of PCOS. The results indicate that low-frequency EA modulates sympathetic activity. Furthermore, acupuncture in conjunction with IVF/ET treatment might have a potential role but still there is a lack of clear evidence to support this possibility yet.

Evaluating Acupuncture with Functional Magnetic Resonance Imaging: From Characterization to Translational Research (Napadow)

Although animal research clearly supports a role for antinociceptive limbic, hypothalamic, and brainstem networks in acupuncture analgesia, these results must be placed in the context of more complex human cognition. One complementary approach to study neurophysiologic correlates of acupuncture in humans includes neuroimaging—mapping or localizing brain function.

A leading noninvasive neuroimaging method with good spatial and adequate temporal resolution is the hemodynamic-based functional MRI (fMRI), which can estimate activity anywhere in the brain every few seconds. The use of fMRI to study acupuncture has occurred since the mid-1990s and has included both characterization studies in which needle stimulation was performed during neuroimaging, as well as studies in which brain responses to conventional, well-characterized stimuli were evaluated both before and after acupuncture.

Characterization studies from several groups have demonstrated overlapping responses to acupuncture within multiple cortical, subcortical/limbic, and brainstem areas. This should not be surprising as acupuncture is a complex somatosensory stimulus that is sure to elicit sensorimotor, affective and higher cognitive/evaluative processing. Regions include the primary and secondary somatosensory cortices (SI, SII), which support initial localization and early qualitative characterization of somatosensory stimuli. Limbic brain regions (e.g., the hypothalamus, amygdala, anterior cingulate cortex [ACC], and hippocampus) are also recruited, and probably mediate any affective/emotional response. Furthermore, many characterization studies have demonstrated modulation of the anterior and posterior insula, and the prefrontal cortex (PFC). The insula have been implicated in pain processing and may play a specific role for acupuncture, while the PFC has multiple distributed connections with the limbic system and is likely to also play an important role in expectancy-related responses.
Studies using fMRI have also investigated how acupuncture modulates well-characterized pain stimuli, nonpain somatosensation, and even resting brain function. For instance, we recently found that following verum, but not sham, acupuncture, there was increased resting functional connectivity between specific brain areas and the default mode network (DMN)—a network of brain regions more active during a nontask processing state, and thought to subserve interoception or self-referential cognition.

Specifically, postacupuncture, the DMN was more connected with pain- (ACC, periaqueductal gray [PAG]), affective- (amygdala, ACC), and memory- (hippocampal formation, middle temporal gyrus) related brain regions. These results demonstrate that acupuncture does not just affect brain function during needle stimulation but can enhance the poststimulation spatial extent of resting brain networks. This effect may play a role in acupuncture analgesia, which is known to develop after significant time delays.

Neuroimaging can also be coupled with longitudinal clinical evaluation, as we have done for carpal tunnel syndrome (CTS). After a 5-week course of acupuncture, patients with CTS had less hyperactivation to finger stimulation, and more focused SI finger representation. Furthermore, we found that, compared to healthy adults, patients with CTS had more closely separated somatotopic representations for the second and third fingers (both median-nerve innervated).

After acupuncture treatment, the second and third finger representations were further apart, approximating the separation seen in healthy adults. Furthermore, we found that, compared to healthy controls, patients with CTS responded to acupuncture (at LI-4, distal to the lesion) with greater hypothalamic activation and more prevalent amygdala deactivation.

In the future, characterization studies will continue to be important (especially in correlation with peripheral and clinical metrics), as we still do not know the “specific effect” of acupuncture. However, newer approaches to fMRI (e.g., functional connectivity) coupled with clinical evaluation will become more prominent in the coming years as we try to understand the mechanisms behind some of the ambiguous results (acupuncture vs. sham) from recent RCTs.

Functional Neuroimaging of Acupuncture in Fibromyalgia: Insights into Mechanisms and Clinical Trial Design (Harris)

Fibromyalgia (FM) is a common chronic pain condition that afflicts approximately 2%–4% of individuals in industrialized countries. Although the underlying pathology of this condition is unknown, a disturbance in central neural function has been suggested. Research using fMRI has shown that brain regions known to process and modulate pain information have augmented activity in these patients.

More recently, positron emission tomography (PET), a brain-imaging technique that can be used to assess static and dynamic aspects of neurotransmitter systems, has been used to study μ-opioid receptor (MOR)–binding ability in FM. MORs within the nucleus accumbens, the cingulate, and the amygdala show reduced binding ability in patients with FM. Because these receptors normally function to inhibit neural activity, these patients may have reduced inhibitory neurotransmission in pain-modulating brain regions.

Several clinical trials of acupuncture in FM have been performed to date; however, the findings have been equivocal, with most studies showing that acupuncture and sham acupuncture (SA) are equally effective for reducing pain.
As a consequence, the acupuncture field has had trouble separating acupuncture analgesic effects from placebo effects in FM. Neuroimaging methods such as PET may provide insights into this problem. Because MORs have been implicated in both acupuncture as well as placebo analgesia, functional imaging of these receptors may provide information into acupuncture effects.

We utilized PET imaging to find out whether acupuncture and SA would have the same effects on central opioid receptors in patients with FM. Seventeen (17) patients with FM were randomized to receive either 9 traditional acupuncture (TA; n=9) or 9 SA (n=8) sessions over the course of 1 month. PET imaging and clinical pain ratings, assessed with the short form of the McGill Pain Questionnaire (SFMPQ), were performed pre- and post-treatment. As expected there, was no difference in clinical pain reduction for both groups (SFMPQ total: MeanDiff (standard deviation) TA=5.4 (9.6); SA=2.3 (6.4); p=0.44). However the two interventions had dramatically different effects on central MOR binding ability. In the insula, the amygdala, the thalamus, the cingulate (anterior and perigenual), the caudate, and the prefrontal cortex, TA caused an increase in MOR binding ability, whereas SA caused a decrease in receptor binding ability (all p < 0.001; uncorrected). These data suggest that, while acupuncture and SA have similar effects on clinical pain, their underlying opioid-receptor mechanisms are not equivalent.

Results from neuroimaging studies such as these have had minimal impact on clinical trials of acupuncture to date. If TA is not simply the sum of SA plus any specific needling effects, this finding has implications for the design of acupuncture clinical trials. One may not be able to assume that the effects of SA are embedded in the active treatment arm in the same way that “placebo effects” are thought to operate in the active arm of a drug trial. Replication and validation of these findings requires further investigation.

Acupuncture Basic Research: How Do We Put It All Together? (Langevin)

Although basic research on acupuncture has made considerable progress in the past 10 years, we still lack a clear picture of “how acupuncture works.” An ongoing source of frustration, especially among practitioners of acupuncture, is that existing mechanistic models have tended to greatly “simplify” acupuncture. Although such models may apply to specific situations (e.g., obtaining immediate analgesic effects), it is not clear how they relate to acupuncture practice as a whole, which includes treatment of complex chronic conditions. An additional source of confusion is that the term “acupuncture” is used by some people to describe a variety of procedures performed at acupuncture points but not necessarily involving needles (e.g., “noninsertive” methods or laser stimulation), while other people define acupuncture as a procedure involving the insertion of acupuncture needles, but not necessarily at acupuncture points. Despite these difficulties, mechanistic models are important as they provide a framework to test specific hypotheses. To be optimally useful, models need to have a well-defined scope and a solid physiologic foundation, and be testable, given currently available technology.

So far, mechanistic models that have been investigated experimentally have focused on the effects of acupuncture-needle stimulation on the nervous system, muscles, and connective tissue. By far, the most extensively tested model has been that of neural stimulation. Well-documented and reproducible effects on the peripheral, central, and autonomic nervous systems have been demonstrated for both manual and electrical stimulation with acupuncture needles in humans and animals. The relevance of these mechanisms to pain reduction, peripheral anti-inflammation, cardiovascular, gastrointestinal, and endocrine regulation are summarized in the preceding papers by Longhurst, Lao, Stener-Victorin, Napadow, and Harris. Another model that has received a substantial amount of attention is the “trigger-point” muscle stimulation model. Acupuncture needle manipulation can be used to stimulate hyper-irritable foci at neuromuscular junctions causing a specific “twitch response” that can alter extracellular inflammatory mediators surrounding the trigger point, suggesting that this mechanism may be related to local pain reduction.
Finally, the connective-tissue stimulation model was based on the observation that manual stimulation with acupuncture needles causes highly specific mechanical stimulation of subcutaneous loose connective tissue. Fibroblasts within the loose connective tissue respond to this mechanical stimulation with active cytoskeletal remodeling that may have important downstream effects within connective tissue.

Although the relationship between these connective-tissue responses and clinical effects remains unknown, the intriguing overlap between acupuncture meridians and connective tissue suggests a possible relevance of this connective-tissue model to poorly understood Traditional Chinese Medicine concepts, such as propagation of effects along acupuncture meridians.

It is of course important to emphasize that these mechanistic models are not mutually exclusive. Iterative testing, expanding, and perhaps merging of such models will potentially lead to an incremental understanding of the effects of manual and electrical stimulation with acupuncture needles that is solidly rooted in physiology.

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Treating Peripheral Neuropathy with Acupuncture and Chinese Medicine

https://www.acufinder.com/Acupuncture+Information/Detail/Treating+Peripheral+Neuropathy+with+Acupuncture+and+Chinese+Medicine

By: Diane Joswick, L.Ac., MSOM

For some people it is experienced as the uncomfortable sensation of "pins and needles" or burning pain (especially at night) of their hands or feet. Others may suffer even more extreme symptoms such as muscle wasting, paralysis, or organ or gland dysfunction.

With more than 100 types of peripheral neuropathies in existence, each with its own characteristic set of symptoms, pattern of development, and prognosis, the symptoms can vary as much as the cause. Nevertheless, Peripheral Neuropathy is a condition that can be treated with Acupuncture and Oriental Medicine.

What is Peripheral Neuropathy?

Peripheral neuropathy describes damage to the peripheral nervous system, which transmits information from the brain and spinal cord to every other part of the body.

In most cases, peripheral neuropathy is secondary to conditions including diabetes, lupus, rheumatoid arthritis, scleroderma, alcoholism, nutritional deficiencies, AIDS, or poisoning from heavy metals, chemotherapy, or various drugs.

Other causes include compression or entrapment (carpal tunnel syndrome), direct physical injury to a nerve (trauma), penetrated injuries, fractures or dislocated bones, pressure involving superficial nerves (ulna or radial) which can result from prolonged use of crutches or staying in same position, tumor, intraneural hemorrhage, exposure to cold, radiation or atherosclerosis.

It is a syndrome which includes symptoms of numbness, tingling, pricking sensations, sensitivity to touch, burning pain, and muscle weakness and atrophy of the arms and legs. The feet and legs are likely to be affected before the hands and arms.

Symptoms of peripheral neuropathy may include:

- numbness or insensitivity to pain or temperature
a tingling, burning, or prickling sensation
sharp, burning pain or cramps
extreme sensitivity to touch, even a light touch
loss of balance and coordination
muscle weakness
muscle wasting
paralysis

These symptoms are often worse at night.
Many people have signs of neuropathy upon examination but have no symptoms at all.

How can acupuncture treat peripheral neuropathy?

Traditional Chinese medicine teaches that Peripheral neuropathy is due to dampness moving to the limbs, where it obstructs the flow of Qi (energy) and Blood within them. The treatment is twofold, to treat the underlying factor that is causing this dampness to accumulate and to directly facilitate the circulation of Qi and Blood in the affected area. By improving the circulation, the nerve tissues of the affected area can be nourished to repair the nerve functions and reduce pain.

Peripheral neuropathy is a symptom for many different patterns of disharmony within the body. Oriental Medicine aims to treat each individual uniquely depending on what caused the neuropathy and how it manifests.

Your acupuncturist may do an interview and ask questions about how, what, where and when you feel pain, perspire, sleep, eat, drink and exercise, to name a few. The practitioner may also feel the pulse and observing the tongue. This interview and physical examination will help create a clear picture on which your practitioners can create a treatment plan specifically for you.

In addition to acupuncture, other methods such as transcutaneous electronic nerve stimulation (TENS), which uses small amounts of electricity to block pain signals, cutaneous acupuncture, herbal and physical therapy may be combined to achieve faster results.

What is Cutaneous Acupuncture?

Cutaneous Acupuncture is the use of acupuncture needles to stimulate an area superficially by tapping to promote the smooth flow of Qi and Blood.

The Plum blossom needle and the Seven-Star needle are special tools that are composed of a small bunch of needles attached to a handle like a hammer or broom. They are often used in the treatment of peripheral neuropathy. The affected area would be lightly tapped starting at the toes or fingers and then up the legs and arms.

Plastic, disposable plum blossom needles or seven-star needles are available for treatment at home.

What Points Are Used?
In treating peripheral neuropathy, acupuncture points on the affected area are used (treating the branch) as well as points on various parts of the body to treat the person according to their particular pattern (treating the root).

Each patient is custom-treated according to his or her specific and unique diagnosis. There are many acupuncture points on the hands and feet. Often the points will be chosen by which are the most tender to obtain the best results.

**Commonly used points**

**Upper Limb**
- LI-15
- LI-11
- SJ-5
- LI-4
- Baxie Points

**Lower Limb**
- GB-30
- GB-34
- GB-39
- SP-6

**Body Points**
- DU-14
- DU-12
- DU-9
- UB-14
- UB-16
- LI-11
- UB-60

**What will an Acupuncture Treatment feel like?**

There seems to be little sensitivity to the insertion of acupuncture needles. They are so thin that several acupuncture needles can go into the middle of a hypodermic needle. Occasionally, there is a brief moment of discomfort as the needle penetrates the skin, but once the needles are in place, most people relax and even fall asleep for the duration of the treatment.

The length, number and frequency of treatments will vary. Typical treatments last from five to 30 minutes, with the patient being treated one or two times a week. Some symptoms are relieved after the first treatment, while more severe or chronic ailments often require multiple treatments. To find an acupuncturist go to [www.Acufinder.com](http://www.Acufinder.com)

**What Studies have been done on Acupuncture and Peripheral Neuropathy?**
Studies have suggested that acupuncture and Chinese herbal medicine are effective treatments for peripheral neuropathy.

In a study of 46 diabetic patients with PN, 34 of them reported a significant improvement in their symptoms after six courses of acupuncture treatment, and only eight of them required further sessions. However, only seven of the 34 had complete relief of their symptoms.

A larger study of 250 patients with HIV-related peripheral neuropathy compared the effects of acupuncture, amitriptyline, and placebo. Participants were assigned to receive acupuncture at standardized acupuncture points or at placebo ("fake") points, or amitriptyline or a placebo. The researchers found no significant difference in pain relief between the active treatments or the placebos. The acupuncture points studied in this trial were standardized so that everyone received exactly the same treatment. Acupuncture treatments are usually designed to fit the individual, and, as the researchers concluded, individualized treatments may have a different effect.

**What Lifestyle and Dietary Changes Should I Make?**

Adopting healthy habits - such as maintaining optimal weight, avoiding exposure to toxins, following a physician-supervised exercise program, eating a balanced diet, correcting vitamin deficiencies, and limiting or avoiding alcohol consumption - can reduce the physical and emotional effects of peripheral neuropathy.

Consider relaxation techniques such as yoga, meditation, self-hypnosis or biofeedback. These can help you learn to control the external factors that trigger pain.

**Finding the Right Acupuncture and Chinese Medicine Practitioner**

Acupuncture and Chinese Medicine work! But your experience with acupuncture will depend largely on the acupuncturist and herbalist that you choose.

You want to find the right acupuncturist for you. If you like and trust your practitioner, your encounter with acupuncture will be more positive. You will also want to know about the acupuncturists training and experience and what to expect from the acupuncture treatment.

Decide in advance what your expectations are and discuss them with your acupuncturist. A chronic illness may need several months of acupuncture treatment to have a noticeable effect. If you are not happy with your progress, think about changing acupuncturists or check with your western doctor for advice about other options.

The clearer you are about who it is that is treating you and exactly what the treatment entails, the more you will be able to relax during the acupuncture session and benefit from this ancient form of health care.

Find your acupuncture practitioner on [www.Acufinder.com](http://www.Acufinder.com)