

# Acupuncture

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## Abstract

Worldwide, acupuncture is integral to everyday medical practice. In recent decades its practice has gained popularity in the United States. With increasing evidence of its clinical efficacy, acupuncture is now a widely practiced treatment modality in complementary and integrative medicine. According to the 2007 National Health Interview Survey, an estimated 3.1 million US adults and 150,000 children had acupuncture in the previous year. The National Health Interview Survey also estimated that between 2002 and 2007, acupuncture use among adults increased by approximately 1 million people. Patients want more information from their clinicians about the use of acupuncture and its safety and efficacy. Although many clinicians may recommend acupuncture, they often believe they are not sufficiently informed to discuss acupuncture with their patients. This article provides answers to the most frequently asked questions regarding acupuncture.

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## WHAT IS ACUPUNCTURE?

Acupuncture is a technique of insertion and manipulation of fine needles in specific points on the body to achieve therapeutic purposes. Acupuncture has been practiced widely in China for more than 4000 years and is an integral part of traditional Chinese medicine. It was first described in the medical writings *The Yellow Emperor's Classic of Internal Medicine*<sup>1</sup> around 200 BC. As early as 5000 years ago, stones were sculpted and formed into crude needles to be used as medical instruments.<sup>2</sup> In time, other materials, including

bamboo, fish bones, bronze, gold, and silver, have been refined into acupuncture needles.

Acupuncture is based on the idea that living beings have an inner energy, known as Qi (pronounced *chee*), and it is the flow of this inner energy that sustains them. According to traditional Chinese medical philosophy, balanced Qi is vital to optimal health; illness and disease are caused by the imbalance or interruption in the flow of Qi. Although acupuncture was developed for prevention of illness, it is useful in managing disease symptoms by reintroducing balanced flow of Qi, its main focus.



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Jesuit missionaries introduced acupuncture to Europe in the 17th century, when they returned from China. The Jesuits were active in disseminating the idea and practice of acupuncture throughout Europe. In addition, traveling physicians helped pioneer acupuncture use in Europe.<sup>3</sup>

In the United States, acupuncture gained public and professional attention in 1971, when *New York Times* reporter James Reston wrote about his experience with acupuncture after an emergency appendectomy in China.<sup>4</sup> The operation was a success, but Reston soon had a considerable amount of postoperative pain and bloating. To provide relief, Chinese physicians offered acupuncture as a therapeutic modality. Reston, impressed by the effectiveness of this “ancient” procedure, described the overall improvement of his symptoms with no recurrence afterward. Through his newspaper article, he exposed countless Americans to acupuncture for the first time.

#### HOW MIGHT ACUPUNCTURE WORK?

Anatomically, acupuncture points have been reported to correspond to cutaneous areas of high electrical conductivity and distinct histologic differences compared with adjacent tissue.<sup>5</sup> There are many theories that may explain how acupuncture works.

#### Gate Control Theory of Pain

This theory postulates that specific nerve fibers transmit a pain signal to the brain via the spinal cord, and input of other nerve fibers can inhibit the pain signal transmission.<sup>6</sup> Acupuncture is thought to stimulate inhibitory nerve fibers for a short period, thus reducing transmission of the pain signal to the brain.

#### Endorphin Model

During the 1970s, researchers isolated endogenous endorphins in the central nervous system. Clinical studies reported that inserting acupuncture needles into specific acupuncture points triggered the production of endorphins in cerebrospinal fluid after patients underwent acupuncture treatments.<sup>7-9</sup> The pain-alleviating effects of acupuncture were reduced when naloxone was used to pretreat the patient, which may indicate that acupuncture-induced analgesia may be partly mediated through endogenous opioids.<sup>10</sup>

Recent research has found that traditional Chinese medicine acupuncture therapy has a direct effect in the up-regulation of  $\mu$ -opioid receptor binding availability in the central nervous system compared with placebo (sham) acupuncture.<sup>11</sup> This finding may help explain some of the analgesic effects seen with acupuncture therapy.

#### Neurotransmitter Model

Research in animals has found that acupuncture can modulate serotonin, norepinephrine, and neurons that transmit or secrete  $\gamma$ -aminobutyric acid.<sup>12-15</sup> It is postulated that through the neurotransmitter model, acupuncture can be efficacious for treatment of depression, anxiety, and addiction.

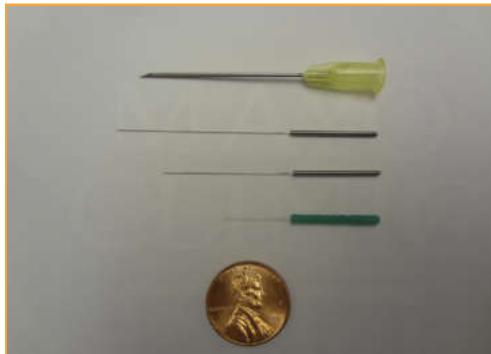
#### Other Theories

Other theories postulate that acupuncture indirectly influences the autonomic system. Acupuncture treatment can affect respiration, heart rate, blood pressure, circulation, and immune function.<sup>16</sup> Research indicates the increased electrical conductivity of tissues along acupuncture meridians.<sup>5</sup> This result suggests that manipulation of the acupuncture meridians with needles may modulate the transmission of certain signals within the body. The current scientific theories provide a basis for stating that acupuncture has an effect on the nervous system, but its effects cannot be explained with a single mechanism.

#### IS ACUPUNCTURE SAFE?

Modern acupuncture needles are thin and flexible and are made of solid surgical stainless steel. Unlike hypodermic needles, acupuncture needles are finely tapered, allowing them to slide smoothly into the skin (Figure). Certain acupuncture needles are thinner than the average strand of human hair.

Acupuncture in the developed parts of the world involves single-use, disposable needles packaged and sealed by the manufacturer in sterile conditions. Although case reports have highlighted major adverse events, such as organ puncture, infections, and bleeding complications, more recent, larger cohort studies using universal precautions have not found a significant complication rate. In a 2001 study of more than 34,000 acupuncture treatments in the United Kingdom, no serious adverse



**FIGURE.** Comparison of acupuncture needles with a 20-gauge hypodermic needle. Coin shown for indication of needle sizes.

events (eg, hospitalization, permanent disability, or death) were reported in relation to acupuncture therapy, and the rate of underlying minor adverse events (eg, nausea, fainting, prolonged aggravation of existing symptoms, and psychological or emotional reaction) was reported to be between 0 and 1.1 per 10,000 treatments.<sup>17</sup> Acupuncture involves puncturing the skin, and therefore slight bruising, bleeding, or soreness at the acupuncture site may occur because of needle penetration through capillaries. More serious adverse effects, such as a vasovagal response with a decrease in blood pressure and syncope, have been reported. Infections may occur at the needle site from the use of nonsterile needles. When herbs are burned too close to the skin, burn injuries can result around the needle site. Most patients communicate a sense of relaxation and well-being after a treatment.

Acupuncture is generally considered safe for persons with bleeding disorders or taking anticoagulants. However, it is important for the patient to advise the practitioner of these facts so the practitioner can use vigilance in selecting insertion points. Acupuncture during pregnancy is a matter of continued debate. Certain acupuncture points are contraindicated because they may induce uterine contractions and premature labor.

#### WHAT CAN PATIENTS EXPECT AS PART OF THEIR TREATMENT?

Every acupuncture practitioner has a distinct style and approach. Generally, a treatment

session involves an initial visit that consists of a patient questionnaire, verbal inquiry, and a focused physical examination. With the use of this information, a diagnosis and a therapy plan are established.

Patients are usually surprised to learn that acupuncture is associated with minimal or no discomfort. Some patients feel a slight pinch as the needles are inserted, but many feel no pain at all. As the needles are advanced to the indicated depth, several sensations may occur, including pressure, heaviness, and warmth at the needle site. After the insertion of acupuncture needles, stimulation of the site of these needle insertions often is necessary. The needle may be stimulated manually with gentle twisting back and forth and with slight movements up and down. Heat also may be used in various ways to stimulate the needle point, including moxibustion, in which an herb is burned near the acupuncture point or on the needle itself. Another technique of using heat is to include an indirect heat source, such as an infrared heat lamp, projected over the area of needle points. A low-intensity electric current may be connected to a pair of needles to provide another form of needle stimulation. Treatments can last from 30 minutes to an hour, with the needles being retained for 15 to 20 minutes.

Although many patients may have symptom improvement with the first acupuncture treatment, other patients may not see improvement until they have completed several treatments. Because acupuncture is individually tailored to each patient and the patient's medical condition, the frequency and duration of therapy differ. In general, most conditions can be treated with 6 to 12 sessions of acupuncture. The patient may need to return periodically for maintenance treatments to maintain long-term benefits from acupuncture.

#### IS ACUPUNCTURE COVERED BY INSURANCE?

Currently, Medicare does not cover acupuncture. Congressman Maurice Hinchey introduced the Federal Acupuncture Coverage Act in 1993 to add acupuncture as a benefit covered under both Medicare Part B and the Federal Employees Health Benefits program.<sup>18</sup> Congressional support for the bill was modest initially,

but it has increased steadily with increased public acceptance and use of acupuncture. Most recently, the Federal Acupuncture Coverage Act of 2011 was introduced in the House of Representatives, but it was not enacted.<sup>19</sup>

Many commercial insurance providers cover acupuncture treatments, either partially or totally, but they may place limits on the total number of treatments. Patients should be advised to check their eligibility of coverage before receiving treatment. If the insurance provider covers acupuncture, several questions should be asked to determine eligibility and coverage:

- How many treatments are covered?
- Who must provide the acupuncture services?
- Do I need a physician referral?
- What conditions are covered for acupuncture?
- What are my out-of-pocket costs?

#### WHO PROVIDES ACUPUNCTURE TREATMENTS?

Nonphysician, licensed acupuncturists provide most acupuncture treatments in the United States. Although formal training programs differ from state to state, the National Certification Commission for Acupuncture and Oriental Medicine has developed rigorous certification criteria and examination requirements for licensed acupuncturists. The licensing mandates of a state should be checked to ensure the qualifications of a practitioner before a patient begins acupuncture treatment by that practitioner.

With the growth of integrative medicine, more physicians are seeking formal training in medical acupuncture. Physicians trained in medical acupuncture may be desirable practitioners, especially in complex cases in which conventional allopathic therapies need to be considered in developing an integrative treatment plan. The American Academy of Medical Acupuncture is a physician resource for training and certification.

#### WHAT ARE THE COMMON INDICATIONS FOR ACUPUNCTURE?

The Chinese people continue to use acupuncture as a primary healing modality for the prevention and treatment of most ailments. In the United States, physicians and patients most frequently request acupuncture as an adjuvant

therapy for managing conditions associated with acute and chronic pain. These conditions range across different neurologic, musculoskeletal, and gastrointestinal symptoms (Table). As acceptance of acupuncture increases within the medical community, the scope of acupuncture practice will likely broaden to mirror what is practiced worldwide to include non-pain-related conditions. These changing trends are likely to lead to additional research efforts focused on conditions in which a paucity of evidence for use exists.

#### WHAT DOES THE EVIDENCE SHOW?

Although acupuncture has been used for thousands of years in Asia, the research community has started studying it only in the past few decades. The nature of acupuncture therapy involves tailoring treatments to the individual patient, and thus research on acupuncture has been difficult because of variable treatment interventions, techniques, and study size. Meta-analysis studies of acupuncture are limited because of the heterogeneity of pooling acupuncture treatment data. In 2005, Sood et al<sup>20</sup> analyzed the considerable methodologic diversity in the Cochrane systematic reviews on acupuncture, which could introduce bias and complexity when reviewing acupuncture literature.

The number of acupuncture studies and randomized controlled trials has increased substantially since the 1997 National Institutes of Health Consensus Conference highlighted several medical conditions in which acupuncture is effective or may be useful.<sup>21</sup> In 2003, a review and analysis of reports on controlled clinical trials by the World Health Organization identified 28 diseases or conditions for which acupuncture has been proved effective.<sup>22</sup> With the advent of such technological advances as functional magnetic resonance imaging, emerging evidence and research have found much promise in improving the understanding of acupuncture. Review of acupuncture research highlights a number of common conditions in which acupuncture may be efficacious (Table).

#### CONCLUSION

In recent years, the practice and acceptance of acupuncture in the medical community and

**TABLE. Evidence-Based Indications for Acupuncture Therapy**

Indication	Example	Comments
<b>Common</b>		
Neurologic	Migraine	Evidence suggests acupuncture can be helpful for management of migraine and tension-type headaches
	Tension headache	
Musculoskeletal	Osteoarthritis (knee)	Evidence suggests acupuncture can be helpful for management of osteoarthritis of the knee, fibromyalgia, and back, neck, and postoperative pain
	Fibromyalgia	
	Back pain	
	Neck pain	
Gastrointestinal	Postoperative pain	Evidence suggests acupuncture can be helpful for management of chemotherapy-induced nausea and postoperative nausea and vomiting
	Nausea and vomiting	
	Constipation	Inconsistent evidence suggests efficacy of acupuncture for management of constipation, postoperative ileus, and IBS Further research may be helpful
	Postoperative ileus	
Gynecologic/reproductive	Hot flashes	Inconsistent evidence suggests efficacy of acupuncture for management of hot flashes, infertility, and PMS Further research may be helpful
	Infertility	
	PMS	
Psychiatric/mood	Stress	Inconsistent evidence suggests efficacy of acupuncture for management of stress, anxiety, and depression Further research may be helpful
	Anxiety	
Addiction	Depression	Inconsistent evidence to make recommendations about the value of acupuncture in treatment of nicotine and alcohol dependence Further research needed
	Nicotine dependence	
Endocrine	Alcohol dependence	Inconsistent evidence to make recommendations about the value of acupuncture in treatment of obesity Further research needed
	Obesity	
<b>Less common</b>		
ENT	Allergic rhinitis	Inconsistent evidence to make recommendations about the value of acupuncture in treatment of allergic rhinitis and sinusitis Further research needed
	Sinusitis	
Respiratory	Asthma	Inconsistent evidence to make recommendations about the value of acupuncture in treatment of asthma and COPD Further research needed
	COPD	
Cardiovascular	Hypertension	Inconsistent evidence to make recommendations about the value of acupuncture in treatment of hypertension and angina Further research needed
	Angina	
Sleep	Insomnia	Inconsistent evidence to make recommendations about the value of acupuncture in treatment of insomnia and enuresis Further research needed
	Enuresis	

COPD = chronic obstructive pulmonary disease; ENT = ear, nose, throat; IBS = irritable bowel syndrome; PMS = premenstrual syndrome.

the general US public continue to increase. However, there are still challenges on how to fully integrate acupuncture into the Western medical paradigm. As acupuncture continues to withstand the test of time, the medical community must continue to investigate and provide evidence of its merits.

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