

An Historical Review and Perspective on the Impact of Acupuncture on U.S. Medicine and Society

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ABSTRACT

Background: It took almost 300 years for Europe and 400 years for the United States to finally appreciate the therapeutic value of acupuncture. Findings from basic medical research that acupuncture stimulation causes release of endorphins, serotonin, enkephalins, and γ -amino-butyric acid (GABA; a major inhibitory neurotransmitter of the brain), norepinephrine, and dopamine helped to explain the acupuncture effect on a biomedical and pharmacological basis that was acceptable to the Western medical establishment.

Context: In the United States, there is significantly increased familiarity with acupuncture and U.S. patients have sought acupuncture treatment to relieve stress-related syndromes, to enhance the immune system, to reduce insomnia, to improve athletic performance, and to address Alzheimer's disease, as well as for cardiac and poststroke therapy. This article briefly reviews the history of acupuncture in the United States and discusses the potential of this modality in the future.

Discussion: Acupuncture can be combined with conventional Western medicine for pain management in patient with cancer to reduce dosages of narcotic medications, side-effects, adverse reactions, and the possibility of narcotic addiction. Because of acupuncture's increased popularity, acupuncture training schools have been set up in the United States, and some insurance companies cover acupuncture therapy.

Conclusions: By studying both Eastern and Western medicine and using them in a complementary fashion, we open ourselves to many discoveries for the benefit of humanity.

Key Words: Acupuncture, Impact, Health Care, Perspective.

INTRODUCTION

THE IMPACT AND STATUS OF ACUPUNCTURE in the United States have waxed and waned over the years. Whereas acupuncture is considered an alternative and complementary medicine in the United States, it is a traditional medicine in China. Acupuncture/acupressure was the earliest medicine practiced in China. Through the ages, the treatment has become sophisticated and clinical symptoms of various illnesses have proven to be effectively relieved or cured through this discipline alone.

In 1997, the National Institutes of Health (NIH), after mounting evidence from clinical trials, formally acknowl-

edged acupuncture for its value in relieving pain, nausea after surgery or chemotherapy, and morning sickness; and effectiveness in treating conditions, such as headaches, asthma, stroke rehabilitation, and fibromyalgia. The NIH also recommended that acupuncture be taught in medical schools.¹

HISTORICAL BACKGROUND

During the European Middle Ages, especially from 1500 to 1700, the Dutch East India Company, while pursuing merchant trading in China and Japan, brought Chinese acupuncture procedures back to Europe. One result of this

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was the development of the Western hypodermic needle from Chinese acupuncture needles. Sporadic clinical reports in Europe discussed the use of acupuncture to relieve pain.^{2,3} French Jesuits made the acupuncture technique known to the Europeans for the treatment of pain and a variety of other disorders² that, at the time, European physicians were treating with bloodletting and purging.

A Portuguese man named Fernam Mendez Pinto wrote a book known as *Pilgrimage of Fernam Mendez Pinto, 1614*, which was translated into Spanish in 1620, into French in 1628 and, finally, into English in 1663. In this book, he mentioned acupuncture as a part of medical treatment in Japan.⁴ In 1683, Dr. Willem ten Rhyne (1647–1700 AD)* wrote some medical reports on acupuncture, which were published as the *Dissertation on Arthritis, Logarithmic Text, Acupuncture and Three Subjects*.⁵ One of the earliest monographs on acupuncture was *The Secrets of Chinese Medicine*. Published in 1671, in Grenoble, France, it was written by one of the Jesuit missionaries in Canton, China. The book was translated into Italian in 1676 and English in 1707.⁶ Another early introduction to acupuncture in the Western world was published by the German physician, Engelbert Kaempfer (1651–1716 AD). In 1712, he described acupuncture in his writings, *Fascination of the Beloved Foreign Political and Physical Phenomenon and Acupuncture, a Japanese Cure for Colic and Moxa, a Most Efficacious Substance for Cautey Frequently Used by the Chinese and Japanese*.^{7,8,†}

When Napoleon invaded Egypt, Dr. Dominique Larrey, his chief physician, reported the utilization of devices similar to Chinese acupuncture–moxibustion to treat arthritis, paralysis, and spinal injuries on the battlefield. Nevertheless, many physicians in Europe regarded the entire matter with reservation and skepticism, and the attitude of these physicians regarding acupuncture did not change until several important case reports were published in authoritative medical journals.²

In 1802, the British physician William Coley published one of the first clinical reports entitled “On Acupuncturation.”⁹ In this work, he described acupuncture techniques. In 1810, a French physician, Louis-Joseph Berlioz (1776–1858 AD), treated a female patient with acupuncture for her gastralgia, and the Paris Medical Society looked into the therapeutic value of acupuncture.^{2,10} He also published, in Paris, in 1816, *Memoir on Chronic Illness, Blood-letting and Acupuncture*. In this book, he described acupuncture as beneficial in relieving pains of various origins such as lumbago, rheumatism and various neuralgias.^{2,11} In 1821, James Morse Churchill, member of the Royal College of Surgeons in London published the book *Treatise on Acupuncturation, Being a Description of a Surgical Operation*

*Originally Peculiar to the Japanese and Chinese, and by Them Denominated zin-king, Now Introduced into European Practice, with Directions for its Performance and Cases Illustrating its Success*¹⁰ He also published an article about his clinical experience with acupuncture titled “On Acupuncturation (in Rheumatism).”¹² Between 1832 and 1850, a German physician, Philipp von Siebold, published three volumes of books including acupuncture and moxibustion entitled *Japan (Nipon)* in which he described his experience in Japan.⁷ He was the first person to conceive the idea of modern hypodermic needles. He thought that, if acupuncture could produce significant improvement without drugs, it could be even better if one could inject drugs into the same area through a hollow needle. Soon, his idea of the hypodermic needle spread and it became one of the most important tools in modern Western medical treatments.¹¹ In 1823, the British medical journal *The Lancet*, devoted an article to acupuncture in its first volume.^{2,11} In 1828, Dr. P.A. Charukovsky wrote the first article about acupuncture in a Russian military journal.¹³ In 1858, T. Ogier Ward, MD, reported in the *British Medical Journal* that a patient with severe sciatic nerve pain was completely cured after a third acupuncture treatment, after all conventional Western medical treatments had failed.^{2,14} In 1864, Dr. A. Haime, a French physician, recorded in the *French Encyclopedia of Medical Science* that an obstinate spasmodic hiccup was successfully cured by acupuncture alone after every known means of Western medical treatment had failed.¹⁴ The use of acupuncture in France became more popular after the late 1920s (particularly after 1934) following the introduction of Chinese acupuncture through the books written by George Soulie de Morant. He was not a physician but was in the French Council General of Shanghai, China.¹¹

In 1935, Professor A. Vinaj reported, in an Italian semi-monthly publication, *Medical News*, a case of a pilot suffering from neuritis of the leg after being struck by lightning. The patient was successfully treated with only three treatments of acupuncture after his condition had failed to respond to any treatment in a hospital.¹⁴ In 1935, Dr. M. Lavergne reported in France that a child with inappetence, whose condition failed to respond to every medication available at that time, got results after one treatment of acupuncture treatment.²

All of these cases and reports affected and shaped opinions about the value of acupuncture for pain relief in Europe and also helped establish the International Society of Acupuncture in Paris in 1941. Since then, the medical community in Europe has taken a more serious look at acupuncture.¹⁴

IMPACT OF ACUPUNCTURE ON MEDICINE IN THE UNITED STATES

Interest in acupuncture in the United States was aroused relatively late, compared to Europe. Through the eighteenth, nineteenth, and twentieth centuries, interest in acupuncture

*Information on degrees was not available for many of the individuals cited in this article; thus titles are being used when available.

†Information on some of the publications in this article can be found in the references cited.

within the medical establishment fluctuated. In the early 1800s, articles about acupuncture were published in several U.S. medical journals. Dr. Franklin Baché, a physician, experimented on prisoners (published in the *North American Medical and Surgical Journal* in 1826) and concluded that acupuncture was, at the time, the most effective pain-management technique.¹⁵ Dr. Baché was the great-grandson of Benjamin Franklin, who founded the University of Pennsylvania, which established the first medical school in the United States. He translated a French medical book on acupuncture in 1825. In 1829, a surgical book, *Elements of Operative Surgery*, contained a section describing acupuncture techniques,⁵ and, in 1836, Dr. William Markley Lee wrote an article in the *Southern Medical Journal* recommending acupuncture for pain relief. In the same year, he also published, in the *Boston Medical and Surgical Journal*, an article entitled “Acupuncture as a Remedy for Rheumatism.”¹⁶

Unfortunately, this information did not arouse significant interest in the U.S. medical establishment, and acupuncture pretty much faded from the American medical scene. Very little about acupuncture was mentioned for almost a quarter of a century until 1859, when Dr. Samuel Gross, in *A System of Surgery*, discussed acupuncture, saying its advantages had been overrated. Although there was some lingering interest in the last half of the eighteenth century, only six articles on acupuncture were published. In 1892, Sir William Osler stated in his classical textbook: *The Principles and Practices of Medicine* that lumbar acupuncture is the most efficient treatment for managing acute pain.¹⁷ This same book was republished by D. Appleton and Company in New York, NY, in six editions. However, interest in acupuncture remained confined to sporadic academic curiosity.¹¹

Acupuncture remained relatively unknown to the U.S. public until former President Nixon’s trip to China in 1972, where acupuncture as a potentially useful medical modality was noticed by the visiting people from the United States. Upon his return, Major General Walter R. Tkach, of the U.S. Air Force and physician to Nixon, wrote an article in the July 1972 issue of *Readers Digest*, entitled, “I Watched Acupuncture Work,”¹⁸ which helped to popularize acupuncture in the United States. Just prior to Mr. Nixon’s trip to China, James Reston, vice president of *The New York Times*, had an appendectomy performed in Beijing, China, under acupuncture anesthesia. He was awake during the entire surgical procedure. In 1971, Dr. Samuel Rosen, a New York surgeon, observed acupuncture being used as anesthesia during his visit to China and reported later that he could not explain medically the successful application he had witnessed.¹⁹ Since then, investigating teams consisting of U.S. physicians have been to China to witness acupuncture anesthesia being applied in open heart surgery, cesarean section, renal surgery, tonsillectomy, and dental extraction. These physicians saw that many surgical operations were performed successfully under acupuncture

anesthesia. The doctors were not only amazed to observe that the patients were conscious, alert, and responsive to the surgeons, but these physicians were also intrigued by the fact that some acupuncture needles were placed far away from the surgical sites with no apparent Western anatomical relevance between them.^{2,14}

There are many advantages of acupuncture anesthesia over conventional Western general anesthesia for certain surgeries, such as surgery involving the vocal cords. Given that a patient does not lose consciousness and can communicate with the surgeon during such an operation, the surgeon can test that patient’s ability to talk during the surgery, enabling the surgeon to decide to what extent a vocal cord can be cut away without seriously impairing the patient’s ability to talk. This would not be possible under general anesthesia. In addition, acupuncture anesthesia/analgesia does not pose some risks commonly found with general anesthesia. For example, if a patient had to be operated on urgently without *nil per os* preparation, acupuncture anesthesia would prove to be less problematic than general anesthesia.¹⁴

Historically, acupuncture anesthesia was first used for dental operations in China, followed by tonsillectomies, thyroidectomies, hernia repairs, and changing of burn dressings. In 1972, the first 2 cases using acupuncture anesthesia/analgesia for surgical operations were performed in the United States at the Hospital of Albert Einstein College of Medicine in the Bronx, New York. Acupuncture analgesia was supervised by Dr. Louis Orkin, and was administered by Dr. Pan L. Man for the surgery of an L-inguinal hernia and by Dr. Yoshiaki Omura for a skin-graft operation.^{19,20} Nevertheless, skepticism still remained in the medical establishment regarding acupuncture.

Today, acupuncture has been used for almost all varieties of surgical procedures. Thousands of open heart operations have been performed under acupuncture, with a success rate of >90%. Even children as young as 10 years old have had congenital heart problems repaired under acupuncture, including ventricular and atrial septal defects, pulmonary stenosis, and tetralogy of Fallot.²¹⁻²³ Operations for acquired heart disease have also been performed successfully with acupuncture. However, respiratory disturbances of open-chest surgery without positive-pressure ventilation remain problematic. In these cases, the patients need to undergo 2 weeks of preparation, concentrating on the abdominal breathing patients will use during the surgery. Mediastinotomy should be used with patients in the supine position. Advantages of acupuncture anesthesia include fewer arrhythmias, more stable blood pressure, less need for vasopressors, and fewer postoperative respiration complications.²¹ The advantages and the disadvantages of acupuncture anesthesia are listed in Table 1, and indications and contraindications are listed in Table 2.

Between the 1960s and the 1970s, many patients who had myofascial pain syndrome were treated with acupuncture.

TABLE 1. ADVANTAGES AND DISADVANTAGES OF ACUPUNCTURE, COMPARED WITH GENERAL ANESTHESIA

<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> • Expensive equipment not needed • Monitoring personnel not needed • Does not cause postoperative hangover • Does not cause physiologic depression • Does not cause nausea or vomiting • Does not potentiate antihypertensive drugs • Does not create risk of air embolism • Does not cause vascular spasms, emerging delirium, or cosmetic problems • Alternative for patients with have or are recovering from drug addiction 	<ul style="list-style-type: none"> • 15% of patients do not respond to acupuncture • Longer induction period necessary • More bleeding may occur • Does not cause amnesic effects • May not produce satisfactory relaxation of muscles • Acupuncture needle may interfere with surgical site

Dr. Burnell R. Brown, Jr. of the University of Arizona at Tucson, who treated 500 cases, and Dr. Lawrence W. Friedman of the State University of New York at Stony Brook, who treated 1000 cases, found that this syndrome involved extremely sensitive areas in the muscle (trigger points). Once these areas were located and injected with a local anesthetic or a steroid, the pain was controlled. Nevertheless, the syndrome is painful, puzzling, and manifests as highly diverse conditions. Both researchers found that it took systemic exploration because the trigger points were sometimes located at a distance from the painful areas. Interestingly, these trigger points, Dr. Friedman found, coincided exactly with Chinese acupuncture points.² Also, a study at the University of California—Los Angeles in 1980 statistically verified the scientific accuracy of auricular diagnosis and acupuncture, finding a statistically significant level of 75% accuracy in diagnosing the musculoskeletal

pain problems of 40 patients who had this kind of pain.³ Therefore, using a remote area to treat a disease entity is no longer considered to be unscientific.

Since then, much research has been conducted throughout the United States and other parts of the world to try to unlock the mystery of acupuncture, and there is much in the literature about these investigations. These findings that acupuncture stimulation causes the release of endorphins, serotonin, enkephalins, adenosine, γ -amino-butyric acid (GABA, a major inhibitory neurotransmitter of the brain), norepinephrine, and dopamine, all help to explain the acupuncture effect on a biomedical and pharmacological basis that acceptable to the Western medical establishment. Scientists at international meetings of the World Health Organization (WHO) have sought to standardize the terminology for acupuncture nomenclature. These medical meetings took place in China, Korea, and the Philippines, culminating in 1990 in an international conference in Lyon, France.²

CURRENT STATUS OF ACUPUNCTURE IN THE UNITED STATES

After the acknowledgment of the value of acupuncture for its pain relief value in 1997, an NIH panel declared that there was sufficient evidence of acupuncture's value to expand its use into conventional medicine. Acupuncture continues to intrigue and fascinate the American medical establishment. In late 1998, the *Journal of the American Medical Association (JAMA)*, published a study examining how the herb mugwort, when allowed to smolder (and removed before it became too hot) on the little toes of pregnant women, affected fetuses in the dangerous breech position.²⁴ The scientists were testing the ancient Chinese practice of burning mugwort on a designated acupuncture point to cause the fetuses to move into a safer head-first orientation. Chinese moxibustion corrects breech presentation by using moxibustion to stimulate the acupoint BL 67 (*Zhiyin*, located beside the outer corner of the fifth toenail). This promotes a change of position of the fetus in the uterus, from the breech presentation, by increasing fetal activity.

TABLE 2. INDICATIONS AND CONTRAINDICATIONS FOR ACUPUNCTURE ANESTHESIA

<i>Indications</i>	<i>Contraindications</i>
<ul style="list-style-type: none"> • Allergy to local or general anesthetic(s) • Cellulitis or abscess causing local tissue acidosis • Objections to dental injections in the mouth • Sinus problems, cold symptoms, or respiratory disease • Supplement for local or general anesthesia • Patient is afraid of loss of consciousness during surgical operations • Abnormal airway or deformity 	<ul style="list-style-type: none"> • Malignant or acute dermatitis • Hemophilia • Pregnancy • Struggling or uncooperative patient who cannot sit still or lie down • Disease producing choreiform movement • Exhausted, fasting, emotionally upset, or profusely perspiring patient (patient should wait until calming down or regaining normal or physical state before acupuncture)

The *JAMA* study found that, among primigravidas with breech presentation during the thirty-third week of gestation, moxibustion for 1–2 weeks increased fetal activity during treatment and cephalic presentation after treatment and at delivery.²⁴ “It is bizarre,” commented Dr. George Lundberg, the then *JAMA* editor, in describing the results of the study.²⁵ Most fetuses carried by women treated with burning mugwort moved to a headfirst position; not one fetus carried by members of the control group, who received the same treatment with a randomly selected herb, moved.²⁴

ACUPUNCTURE IMPACT ON U.S. SOCIETY

The impact of acupuncture in the United States has been marked by vicissitudes throughout the foregoing years. There have been various degrees of acceptance and influences on society in general, and the health care system in particular. In the United States, acupuncture anesthesia for surgery is currently rarely done because it is more time consuming and does not achieve the total muscle relaxation that general anesthesia does. Nevertheless, acupuncture has been more widely used since the NIH acknowledged this modality’s usefulness.¹ There are many hospitals with acupuncturists on staff. It has been estimated that nearly 20 million Americans have tried acupuncture for various ailments and the number of acupuncture procedures almost tripled between 2000 and 2010.²⁶ According to Yemen M. Chen, OMD, PhD, the president of the New York College of Traditional Chinese Medicine, there are currently 16,000 acupuncturists in the United States (personal communication). Throughout professional sports—from football to baseball to tennis and track and field—a growing number of athletes are seeking acupuncture to treat injuries, musculoskeletal tenderness, inflammation, and pain. Many patients in the United States routinely rely on acupuncture to alleviate non-sports-related health problems—including allergies, asthma, flu, stress, depression, insomnia, irritable bowel syndrome, sciatic pain, carpal tunnel syndrome, and discomforts from postcancer therapy.^{26,27}

Presently, almost every state in the United States has laws regulating acupuncture practice. There are 55 acupuncture schools in the United States, and many practitioners in this country have received their certificates. Many licensed physicians and dentists acquired their acupuncture licenses through continuing education, and several universities offer acupuncture courses to both post and predoctoral students of health science. In addition, an increasing number of insurance companies cover acupuncture costs for patients. Since 1975, author D.P.L. has offered acupuncture information and instruction to postdoctoral dental residents at Sacred Heart Hospitals and Lehigh Valley Health Network, both in Allentown, PA, and also to predoctoral dental students at University of Pennsylvania since 1994 as part of an elective course on Pain and Anxiety Control. Clinicians seeking

continuing education credits and certificates are also offered similar acupuncture courses as part of intravenous-sedation workshops at St. Joseph Hospital of Seton Hall University School of Health and Medical Sciences.

DISCUSSION

In the United States, both acupuncture and herbal medicine are often practiced as two distinctive entities and disciplines, although both are often combined in China to enhance their therapeutic effects. Acupuncture has been incorporated in many clinical situations, including use for patients who are allergic to local or general anesthetic drugs; patients with psychiatric conditions who are sensitive to the side-effects of conventional medications, such as tranquilizers and other mood-changing drugs; patients who tolerate opioid analgesics poorly; and patients with cancer who need high doses of narcotics to relieve severe pain. Patients needing heavy doses of narcotics because of chronic pain or postsurgical pain a potential risk of becoming addicted to narcotics. Nevertheless, patients with this pain can benefit from acupuncture treatment, because of the release of β -endorphin, serotonin, dopamine, and norepinephrine resulting from acupuncture stimulation.¹⁰ Acupuncture has been substituted for those drugs in pain and anxiety management, and can be used in conjunction with conventional medications to reduce drug dosing, so that patients will have fewer side-effects and minimized potential for drug addiction. Also, as previously mentioned, acupuncture-moxibustion could also help to correct breech fetal position and increase fetal safety as well as reducing the need for Caesarian section.

The advantages of acupuncture anesthesia are that the patient remains conscious and able to communicate, has minimal postoperative pain, and has fewer side-effects or serious complications. However, the lengthy induction needed may preclude the routine use of acupuncture anesthesia in the United States.²³ However, for patients whose airways are difficult to maintain for general anesthesia, acupuncture anesthesia may be the solution to that problem. A compromised airway may involve cervical-spine disease, trauma or tracheal deviation, a dysmorphic facial feature, Pierre Robin syndrome, an adult mouth opening smaller than 3 cm, protruding incisors, loose or crowned teeth, dental appliances, high arch palates, tonsil hypertrophy, nonvisible or significant malocclusion, and edentulism. Acupuncture anesthesia can also benefit medically compromised patients, young children, patients with severe chronic obstructive pulmonary disease or emphysema, chronic bronchitis, acidosis, severe asthma (bronchial and cardiac), pulmonary edema, pleurisy, advanced tuberculosis, massive pulmonary embolism, severe pneumonia, advanced lung cancer, or pulmonary fibrosis.

CONCLUSIONS

Acupuncture occupies a unique place in modern medicine. Research on acupuncture has taken place in many universities and research institutions around the world, increasing our understanding of how the human body works. Knowledge has been greatly increased especially in the areas of physiology, biochemistry, pharmacology, kinesiology, neurology, and neuroanatomy. By integrating Eastern and Western medicines, both disciplines can be complementary to each other for the benefit of patients.

DISCLOSURE STATEMENT

No competing financial interests exist.

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