



Acupuncture (PDQ®)—Health Professional Version

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General Information

Acupuncture, a complementary therapy used in symptom management,[1-4] is used clinically to manage cancer-related symptoms, treat side effects induced by chemotherapy or radiation therapy, boost blood cell count, and enhance lymphocyte and natural killer (NK) cell activity. In cancer treatment, its primary use is symptom management; commonly treated symptoms are cancer pain,[4,5] chemotherapy-induced nausea and vomiting (N/V),[6,7] and other symptoms that affect a patient's quality of life, including weight loss, anxiety, depression, insomnia, poor appetite, fatigue, xerostomia, hot flashes, chemotherapy-induced peripheral neuropathy, gastrointestinal symptoms (constipation and diarrhea) and postoperative ileus.[8-10] Acupuncture is acceptable and safe for children.[11]

More than 40 states and the District of Columbia have laws regulating acupuncture practice. The National Certification Commission for Acupuncture and Oriental Medicine offers national certification examinations for practitioners of acupuncture and traditional Chinese medicine (TCM) (www.nccaom.org); most, but not all, states require this certification. More than 50 schools and colleges of acupuncture and Oriental medicine operate in the United States, many of which offer master's-level programs and are accredited by or have been granted candidacy status by the Accreditation Commission for Acupuncture and Oriental Medicine (ACAOM). ACAOM standards for a master's-level degree require a 3-year program (approximately 2,000 hours of study) for acupuncture and a 4-year program for Oriental medicine, which includes acupuncture and herbal therapy (www.ACAOM.org). In recent years, some schools have begun to offer programs for Doctor of Acupuncture and Oriental Medicine with an additional 1,200 hours of clinical-based doctoral training. Some Western medical training, including the study of anatomy, physiology, and clean-needle technique is included in the curriculums of these schools. Postgraduate training programs in medical acupuncture for physicians also exist. In the United States, training to be a licensed acupuncturist is regulated according to individual state law. Because the educational and licensing requirements for acupuncture practice vary from state to state, one should inquire from each state board of acupuncture (or other relevant board) for particular information (www.nccaom.org). Third-party reimbursements also vary from state to state. Some insurance companies cover acupuncture or limited acupuncture treatment. Federal payers such as Medicare and Medicaid do not generally reimburse for acupuncture treatment.

Acupuncture has been practiced in China and other Asian countries for more than 4,000 years.[12-14] In China, acupuncture is part of a TCM system of traditional medical knowledge and is practiced along with other treatment modalities such as herbal medicine, tui na (massage and acupressure), mind/body exercise

(e.g., qigong and tai chi), and dietary therapy.[15,16] In the United States, several different acupuncture styles are practiced in addition to TCM. These include Japanese acupuncture (e.g., meridian therapy), English acupuncture (e.g., five-element or traditional acupuncture), French acupuncture (e.g., French energetic acupuncture), Korean acupuncture (e.g., constitutional acupuncture), and American medical acupuncture. Most of these are derived from ancient Chinese medical philosophy and practices. All are based on the view that the human body must be perceived and treated as a whole and as part of nature; health is the result of harmony among bodily functions and between the body and nature, and disease occurs when this harmony is disrupted. TCM therapeutic interventions, including acupuncture are used to restore the state of harmony.

Acupuncture is closely associated with Chinese meridian theory. According to this theory, there are 12 primary meridians, or channels, and eight additional meridians, each following a particular directional course along the body. A vital energy known as qi flows through these meridians and participates in the homeostatic regulation of various bodily functions. Along the meridians are approximately 360 points that serve as both pathognomonic signs of disorder and as loci for acupuncture treatments.[14,17] When the normal flow of energy over a meridian is obstructed (e.g., as a result of tissue injury or a tumor), pain or other symptoms result. Chinese medicine proposes that the purpose of acupuncture therapy is to normalize energy flow, thereby relieving the symptoms by stimulating specific sites (acupuncture points) on the meridians.[18] In acupuncture treatment, stainless steel needles, usually ranging from 0.22 mm to 0.25 mm in diameter, are inserted into relevant acupuncture points to stimulate the affected meridians. A needling sensation known as de qi sensation occurs, in which the patient may feel heaviness, numbness, or tingling during an acupuncture treatment. Length and frequency of treatment vary according to the condition being treated. Chronic conditions usually require a longer treatment period. Typically, two or three sessions per week are required initially and may decrease to once a week after several weeks of treatment. Needles are typically left in place for 15 to 30 minutes after insertion, and their effects may be augmented with manual or electrical stimulation and/or heat (e.g., moxibustion or heat lamps).

Classical techniques of acupuncture include needling, moxibustion, and cupping. Acupressure, using fingers or mechanical devices to apply pressure on acupuncture points is based on the same principles as acupuncture. Moxibustion is a method in which an herb (*Artemisia vulgaris*) is burned above the skin or on an acupuncture point for the purpose of warming it to alleviate symptoms. Cupping promotes blood circulation and stimulates acupuncture points by creating a vacuum or negative pressure on the surface of the skin.[18] During the past several decades, various new auxiliary devices have been developed. Acupuncture devices such as electroacupuncture (EA) machines and heat lamps are commonly used to enhance the effects of acupuncture.

In addition to classical acupuncture techniques, other techniques have been developed and are sometimes used in cancer management. These include trigger point acupuncture, laser acupuncture, acupuncture point injection, and techniques focusing on particular regions of the body: auricular acupuncture, scalp acupuncture, face acupuncture, hand acupuncture, nose acupuncture, and foot acupuncture. Of these, auricular acupuncture is the most commonly used.

In clinical practice, most acupuncturists in the United States follow the traditional theories and principles of Chinese medicine.

Although acupuncture has been practiced for millennia, it has come under rigorous scientific investigation only recently. In 1976, the U.S. Food and Drug Administration (FDA) classified acupuncture needles as investigational devices (class III) (www.fda.gov), resulting in a number of research studies on the effectiveness and safety of acupuncture.[19] In November 1994, the Office of Alternative Medicine (the predecessor of the National Center for Complementary and Integrative Health) at the National Institutes of Health (NIH) sponsored an NIH-FDA workshop on the status of acupuncture needle usage. Two years later, the FDA reclassified acupuncture needles as medical devices (class II) without, however, giving specific indications for their use.[20] In 1997, NIH held a Consensus Development Conference on Acupuncture to evaluate its safety and efficacy. The 12-member panel concluded that promising research results showing the efficacy of acupuncture in certain conditions have emerged and that further research is likely to uncover additional areas in which acupuncture intervention will be useful. The panel stated that “there is clear evidence that needle acupuncture treatment is effective for postoperative and chemotherapy N/V.” It also stated that there are “a number of other pain-related conditions for which acupuncture may be effective as an adjunct therapy, an acceptable alternative, or as part of a comprehensive treatment program,” and it agreed that further research is likely to uncover additional areas in which acupuncture intervention will be useful.[19]

These actions by the FDA and NIH have resulted in the establishment of a number of active programs of research into the mechanisms and efficacy of acupuncture, much of which is, or is potentially, relevant to cancer management. To date, the most extensively investigated aspect of these mechanisms has been the effect of acupuncture on pain management. The NIH Consensus Panel concluded that “acupuncture can cause multiple biological responses,” local and distal, “mediated mainly by sensory neurons...within the central nervous system.” Acupuncture “may also activate the hypothalamus and the pituitary gland, resulting in a broad spectrum of systemic effects,” including “alterations in peptides, hormones and neurotransmitters and the regulation of blood flow.”[19] Recent studies show the effect of acupuncture on chronic inflammatory pain.[21,22] Evidence suggests that acupuncture operates through the autonomic nervous system to balance the sympathetic and parasympathetic systems and suggests that the anti-inflammatory effects of acupuncture are mediated by its electrophysiologic effects on neurotransmitters, cytokines, and neuropeptides.[1,22-31] Many studies provide evidence that opioid peptides are released during acupuncture and that acupuncture analgesia is mediated by the endogenous opioid system.[32,33]

Although the mechanism of acupuncture is not fully understood, it has been proposed that beneficial results are mediated by changes in neurohormones and cytokines. Animal research suggests that acupuncture achieves its anesthetic effect by stimulating nerves in the muscle, which then relay the signal to the spinal cord, midbrain, and hypothalamus-pituitary system, ultimately triggering release of neurotransmitters and hormones, such as endorphins and enkephalins.[34,35] Laboratory and animal cancer studies have also explored the mechanisms of acupuncture through the activation and modulation of the immune system. Previous animal and human studies have suggested that acupuncture worked through immunomodulation,

with significant changes in cytokines including interleukin (IL)-1, IL-6, IL-8, IL-10, and tumor necrosis factor-alpha (TNF-alpha).[36-40] These studies were limited by small sample size and occasional conflicting results. Acupuncture has been associated with significant changes in proinflammatory cytokines including IL-1-beta, IL-6, IL-17 and TNF-alpha.[36-41]

Acupuncture treatment points are located by using standard anatomic landmarks and comparative anatomy. EA is the most commonly used treatment intervention; a few studies have used moxibustion.[42] These studies show that acupuncture may boost animal immune function by enhancing NK cell and lymphocyte activity.[42-44] According to one animal study, acupuncture may be a useful adjuvant for suppressing chemotherapy-induced emesis.[45]

Although several studies published in China examined the effect of acupuncture on the human immune system,[8,29,32,46-49] most cancer-related human clinical studies of acupuncture evaluated its effect on patient quality of life. These investigations mainly focused on cancer symptoms or cancer treatment-related symptoms, predominantly cancer pain [10,23,50-54] and chemotherapy-induced N/V.[25,27,55-63] Studies have also evaluated the effect of acupuncture on radiation -induced xerostomia (dry mouth), proctitis, dysphonia, weight loss, cough, thoracodynia, hemoptysis, fever, esophageal obstruction, poor appetite, night sweats, hot flashes in women and men,[64] dizziness, fatigue, anxiety, and depression in cancer patients.[8-10,65-68] The evidence from most of these clinical studies is inconclusive, despite their positive results; either poor research design or incompletely described methodologic procedures limit their value.[69] There is controversy about the most appropriate control for acupuncture, which also limits the interpretability of the results of clinical trials.[70] The positive results of the studies on chemotherapy-induced N/V, which benefit from scientifically sound research designs, are the most convincing.

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