

ACUPUNCTURE

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1. Core Definition and Mechanism of Action

Acupuncture is a fundamental therapeutic technique rooted in **Traditional Chinese Medicine (TCM)**, involving the insertion of extremely fine, sterile needles into specific points on the body known as acupoints. Historically, this approach has been employed primarily to alleviate physical aches, induce regional anesthesia for surgical procedures, or serve as a foundational, holistic treatment modality for a wide array of internal imbalances. Its core operational premise, according to classical TCM texts, is the regulation and restoration of the flow of vital life force energy, often referred to as **Qi** (pronounced "chee"). This energy is believed to circulate through designated pathways, or channels, known as **meridians**, which link the superficial skin surface with the body's internal organ systems.

The application of needles at these precise cutaneous points is intended to modulate the flow of **Qi**. When the body experiences illness or pain, TCM posits that there is either a blockage, excess, or deficiency of **Qi** in the associated meridian or organ system. By stimulating the specific acupoints, practitioners aim to unblock stagnation, disperse excess energy, or supplement deficiency, thereby restoring homeostasis. The effectiveness of **acupuncture**, when viewed through this traditional lens, depends entirely on the correct diagnosis of the patient's energetic pattern and the selection of the appropriate combination of points to harmonize the internal energetic landscape.

In contrast to the TCM explanation, modern biomedical research attempts to define the mechanism of action through neurophysiological and biochemical processes. Scientific hypotheses suggest that the insertion and manipulation of the needle stimulate peripheral nerves, which then transmit signals to the central nervous system, including the brain and spinal cord. This stimulation is hypothesized to trigger the release of endogenous opioid peptides, such as **endorphins** and **enkephalin**, which are the body's natural painkillers. Furthermore, research indicates that acupuncture may modulate neurotransmitter levels, reduce localized inflammation by affecting cytokine activity, and influence the autonomic nervous system, thereby contributing to relaxation and physiological regulation beyond simple pain gating.

Beyond local and systemic chemical releases, another prominent scientific theory involves the concept of 'descending pain control.' This posits that acupuncture input activates pathways originating in the midbrain that project down to the spinal cord, inhibiting the transmission of pain signals before they reach higher centers in the brain. This central modulation of pain processing is

supported by functional magnetic resonance imaging (fMRI) studies, which show altered activity in pain matrix regions of the brain following acupuncture treatment. Thus, while the classical model relies on **meridians** and **Qi**, the contemporary understanding focuses on neurohormonal modulation and central nervous system plasticity.

2. Etymology and Historical Development

The term **Acupuncture** derives from the Latin words *acus*, meaning "needle," and *pungere*, meaning "to prick." Despite its Latin derivation, the practice is intrinsically Chinese, having developed over millennia. The earliest archaeological evidence of tools potentially used for **acupuncture** dates back to the Neolithic era in China, where sharpened stones (*Bian Shi*) were employed for surgical incisions and possibly point stimulation. However, the foundational theories and systematic application of the practice were formalized during the Han Dynasty (206 BCE - 220 CE).

The definitive text establishing the intellectual framework for **acupuncture** and TCM is the *Huangdi Neijing* (The Yellow Emperor's Classic of Internal Medicine), compiled primarily around the 1st century BCE. This massive work detailed the systematic structure of the body's energy systems, defining the concept of **meridians**, the locations of specific acupoints, and the relationship between the external environment, the internal organs, and the flow of **Qi**. The *Neijing* established **acupuncture** as a sophisticated diagnostic and therapeutic system, differentiating it from earlier, cruder forms of physical treatment.

The practice evolved throughout subsequent dynasties, peaking in prestige during the Ming Dynasty (1368-1644), during which time comprehensive atlases detailing the complex network of **meridians** and acupoints were created. However, **acupuncture** suffered a period of decline and official rejection in the early 20th century as China sought to modernize and adopt Western medical practices. It was largely revitalized in the 1950s under the mandate of the People's Republic of China, which sought to integrate TCM into national healthcare alongside modern medicine, leading to a massive resurgence in research and clinical application.

The global dissemination of **acupuncture** primarily occurred in the latter half of the 20th century. Its introduction to the West was notably accelerated following President Nixon's 1972 visit to China, during which American journalists observed surgical procedures performed using **acupuncture** anesthesia. This sparked immense interest in the United States and Europe, leading to the proliferation of clinics and academic study. Today, it is practiced worldwide, with varying levels of regulation and integration into standard healthcare systems, signifying a successful transition from a localized, ancient practice to a globally recognized therapeutic modality.

3. Philosophical Basis: Qi, Meridians, and Zang-Fu

The entire structure of **acupuncture** treatment rests upon the philosophical foundation of **Traditional Chinese Medicine**, which views the human body as a microcosm reflecting the macrocosm, governed by the continuous interplay of opposing yet complementary forces: **Yin and Yang**. Health is defined as a state of dynamic equilibrium between these forces, mediated by the smooth and balanced flow of **Qi**. Illness, conversely, arises when this balance is disrupted--either through external environmental factors (cold, heat, dampness) or internal emotional disharmony (stress, anger, worry).

Central to this philosophy is the concept of **Qi**, often translated as "vital energy" or "life force." **Qi** is not merely a metaphor; it is the fundamental energetic currency that animates the body, maintains metabolism, and provides defense against pathogens. TCM identifies several distinct types of **Qi**, including nutritive **Qi** (Ying Qi), which fuels the body; defensive **Qi** (Wei Qi), which protects the body's exterior; and original **Qi** (Yuan Qi), which is inherited and stored in the Kidneys. The quality and distribution of these various types of **Qi** dictate the overall health status of the individual.

The pathways through which **Qi** circulates are the **Jing Luo**, commonly known as **meridians** or channels. There are twelve principal meridians, each corresponding to a specific internal organ (e.g., Lung, Stomach, Heart), and eight extraordinary vessels. These channels form a complex, interconnected network that allows practitioners to access and influence the internal organs by stimulating points on the body's surface. The diagnostic process involves identifying which meridian is implicated in the patient's pathology--often through pulse or tongue diagnosis--and selecting points along that channel to restore proper flow.

The internal organ systems, referred to in TCM as **Zang-Fu**, are conceptualized functionally rather than purely anatomically. For example, the TCM concept of the Spleen encompasses not only the physical organ but also the function of digestion, transformation of nutrients, and the control of blood, while the TCM Kidney governs water metabolism, reproduction, and the storage of essential life force. **Acupuncture** aims to treat these functional disharmonies, addressing the root cause of the imbalance rather than simply alleviating symptomatic manifestations, making the holistic assessment of the **Zang-Fu** systems critical for successful treatment planning.

4. Needle Placement and Treatment Modalities

The physical procedure of **acupuncture** involves highly specialized tools and techniques. Needles used today are almost exclusively disposable, single-use, sterile stainless steel filaments, extremely thin (often less than 0.25 mm in diameter), which minimizes discomfort upon insertion. Acupoints are localized anatomical areas, typically situated where nerves, muscles, and connective tissue can be stimulated. The insertion depth varies significantly depending on the

point's location, the type of tissue beneath it, and the patient's constitution, ranging from superficial skin pricking to deeper insertion into muscle groups.

Once the needle is inserted, the practitioner aims to elicit a specific sensation known as *De Qi*, meaning "arrival of **Qi**." *De Qi* is typically described by patients as a dull ache, heaviness, distention, or a tingling sensation radiating from the needle site. Achieving *De Qi* is often considered crucial for therapeutic efficacy, as it suggests that the needle has successfully engaged the underlying energetic system or nerve structure. The practitioner may manipulate the needle through various techniques--including lifting, thrusting, twirling, or rapid rotation--to either tonify (strengthen) or sedate (reduce) the energetic flow, depending on the diagnostic requirements.

In addition to manual needle manipulation, **acupuncture** treatment often incorporates auxiliary modalities. **Electroacupuncture** involves attaching small clips to the inserted needles and applying a low-voltage electrical current. This technique is frequently used in pain management, as the consistent electrical stimulation can enhance the analgesic effects by promoting a steady release of endogenous opioids. The frequency and intensity of the electrical stimulation are carefully calibrated to target specific clinical outcomes.

Other important adjunct therapies include **Moxibustion**, which involves burning dried mugwort (moxa) near or on the surface of the skin to apply warmth to the acupoints, thereby promoting circulation and addressing conditions characterized by cold or deficiency; and **Cupping**, which uses heat or a mechanical pump to create suction on the skin surface. Cupping is primarily utilized to move stagnant blood and **Qi**, often leaving distinct circular bruises, and is frequently applied to the back and shoulders to relieve muscle tension and pain. These combined modalities allow the practitioner to tailor the treatment intensely to the patient's specific energetic needs, drawing upon the wide arsenal of TCM techniques.

5. Clinical Applications and Efficacy

The scope of clinical applications for **acupuncture** is vast within the TCM framework, addressing conditions ranging from digestive disorders and respiratory illnesses to gynecological issues and mental health imbalances. However, in the context of Western medicine, its most widely accepted and empirically studied application remains in the realm of **pain management**. Numerous studies and clinical trials have focused on its effectiveness in treating chronic low back pain, neck pain, osteoarthritis of the knee, and tension headaches or migraines, often showing results superior to sham controls or standard non-pharmacological care.

The World Health Organization (WHO) has issued reports acknowledging the effectiveness of **acupuncture** for dozens of conditions. High-quality evidence supports its use for reducing chemotherapy-induced nausea and vomiting, mitigating postoperative pain, and easing dental pain. Furthermore, systematic reviews suggest that **acupuncture** can be a valuable non-

pharmacological intervention for chronic musculoskeletal pain, serving as an important alternative or supplement to opioid-based treatments, thereby aiding in strategies to combat the global opioid crisis.

Beyond pain relief, **acupuncture** has shown promising results in treating conditions related to stress and autonomic nervous system dysfunction. It is frequently employed to manage anxiety, insomnia, and symptoms associated with depression, likely due to its regulatory effects on hormones like cortisol and its ability to shift the nervous system from a sympathetic (fight-or-flight) dominance toward a parasympathetic (rest-and-digest) state. This calming effect makes it a popular tool in integrated mental health settings.

Despite the wide array of conditions treated in TCM, efficacy debates persist, requiring rigorous clinical trial methodology. Generally, conditions that involve functional disruption, inflammation, or neurophysiological dysregulation tend to respond most favorably. For instance, the use of **acupuncture** in women's health--specifically for managing hot flashes associated with menopause or regulating menstrual cycles--is increasingly supported by evidence suggesting its influence on the endocrine system. The sustained effectiveness over time, particularly for chronic conditions, suggests that **acupuncture** facilitates long-term regulatory changes rather than providing merely transient symptomatic relief.

6. Integration into Western Medicine

The journey of **acupuncture** from an ancient, exotic practice to a globally accepted complementary treatment reflects a significant shift in Western medical philosophy toward integrative care. Initially viewed with suspicion, the practice gained traction in the late 20th century, particularly within specialized pain clinics and rehabilitation centers, where conventional treatments often failed to provide adequate relief for chronic conditions. This integration was driven by patient demand and clinical evidence demonstrating its low risk profile and effectiveness for certain types of pain.

Today, many major hospitals and academic medical centers in North America and Europe offer **acupuncture** services, often staffed by licensed acupuncturists or medical doctors who have received specialized training. This shift towards integration means that **acupuncture** is frequently used collaboratively, such as employing it alongside physical therapy for sports injuries, or using it during chemotherapy to mitigate side effects like dry mouth and nausea, rather than serving as a replacement for conventional care.

A key facet of integration involves the professional distinction between licensed acupuncturists (who practice within the full philosophical framework of TCM) and practitioners of **dry needling**. Dry needling is a technique utilized primarily by physical therapists or chiropractors, which involves inserting thin needles into myofascial trigger points (knots in the muscles) to relieve pain and

improve movement. While the tool (the needle) is the same, dry needling operates purely on a neuroanatomical basis, ignoring the **meridian** system and the **Qi** philosophy, leading to ongoing professional and regulatory debates about scope of practice.

Furthermore, economic considerations have accelerated integration, particularly in countries where rising healthcare costs demand effective, non-pharmacological interventions. Insurance coverage for **acupuncture** has expanded in many regions, especially when used for conditions like chronic back pain or migraines, as it offers a cost-effective intervention that can potentially reduce the reliance on expensive pharmaceuticals or invasive procedures. This institutional acceptance signals that **acupuncture** has established itself as a standardized, evidence-based adjunct therapy in the modern healthcare ecosystem, provided it adheres to strict safety and regulatory guidelines.

7. Safety, Regulation, and Adverse Effects

When performed by a trained, licensed practitioner using sterile techniques, **acupuncture** is recognized as a remarkably safe procedure with a very low incidence of serious adverse effects. The most common side effects are minor and transient, including slight bleeding, mild bruising, or temporary soreness at the needle insertion sites. Fainting during treatment, though rare, can occur, particularly in individuals who are sensitive to needles or are treated while fasting, necessitating careful patient management during the initial stages of a session.

The most critical factor affecting safety is the maintenance of sterility. Since the late 1980s, the mandatory use of single-use, disposable needles has virtually eliminated the risk of transmitting infectious diseases such as Hepatitis B or HIV, which was a historical concern. Regulatory bodies worldwide now enforce strict hygiene protocols, ensuring that practitioners adhere to medical standards for skin preparation and needle disposal, making infection risk negligible in clinical settings within regulated environments.

However, serious adverse events, though extremely uncommon, can occur if procedures are performed incorrectly, particularly by inadequately trained individuals. The most significant concern involves the risk of **pneumothorax** (collapsed lung), which can result from improper, deep insertion of needles in the chest or upper back region. Other rare, severe risks include organ puncture (if needles are inserted too deep near the liver or kidney) or injury to major blood vessels or nerves. These risks underscore the necessity of rigorous training, mandatory licensing, and comprehensive anatomical knowledge for all practicing acupuncturists.

In most developed nations, the practice is regulated by state or national licensing boards that mandate specific educational hours, clinical training, and examinations. These regulations ensure that practitioners understand not only the theories of **TCM** but also essential Western biomedical knowledge, contraindications, and emergency procedures. Patient safety is also maintained by ensuring clear communication regarding conditions like pregnancy (where certain points are

contraindicated) or the use of anticoagulants (which increase bruising risk).

8. Scientific Scrutiny and Debates

The primary scientific debate surrounding **acupuncture** centers on distinguishing between its genuine physiological effects and the powerful influence of the placebo response. Because the physical act of needle insertion is highly noticeable and involves significant ritual and expectation, it is exceptionally difficult to design true blinded studies comparable to pharmaceutical trials. Researchers often employ "sham" or "minimal" **acupuncture**--using non-penetrating needles or placing needles at non-acupoints--as a control.

Meta-analyses and large-scale clinical trials (such as the German acupuncture trials) have consistently demonstrated that real **acupuncture** is statistically superior to no treatment, suggesting tangible effects beyond the natural history of the condition. However, when compared directly to well-designed sham **acupuncture**, the difference in clinical outcomes often narrows significantly. This phenomenon has led to the hypothesis that the therapeutic benefit is derived not only from stimulating specific classical acupoints but also from the peripheral mechanical stimulation of nerve endings and connective tissue anywhere on the body, combined with the comprehensive psychological and ritualistic context of the therapy itself.

Critics often argue that the entire philosophical basis of **Qi** and **meridians** lacks anatomical or empirical validation according to Western scientific standards. While research has mapped the neurological effects, the concept of a dedicated energy channel system remains unverified by standard physiological mapping techniques. This dichotomy forces researchers to evaluate **acupuncture** based solely on empirical outcome data (does it work?) rather than validating its theoretical model (how does the **Qi** flow?).

Despite these ongoing conceptual challenges, the growing body of evidence supporting the clinical effectiveness of **acupuncture** for chronic pain has shifted the debate from "Is it real?" to "How does it work, and for whom is it best suited?" Contemporary research focuses on identifying specific patient populations, conditions, and biological markers that predict a positive response, moving toward personalized medicine. The robust evidence for pain relief, reduction in inflammation, and modulation of the autonomic nervous system ensures that **acupuncture** remains a subject of intense scientific scrutiny and a pillar of the integrative medicine movement.

9. Further Reading

[Wikipedia: Acupuncture](#)

[World Health Organization \(WHO\): Acupuncture: Review and Analysis of Reports on Controlled Trials](#)

[National Center for Complementary and Integrative Health \(NCCIH\): Acupuncture](#)

Wikipedia: Traditional Chinese Medicine (TCM)

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