

## Theoretical Basis and Research Status of Auricular Acupuncture for Post-Stroke Sequelae: A Postprint

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### Abstract

Post-stroke patients are prone to sequelae such as hemiplegia, aphasia, insomnia, depression, and constipation, which severely affect quality of life. Ear acupuncture, as a traditional external therapeutic method of Traditional Chinese Medicine, offers advantages including readily available materials, convenient operation, minimal patient discomfort, safety, efficacy, and good acceptability, demonstrating remarkable therapeutic effects in treating post-stroke sequelae. This article summarizes and reviews relevant literature on ear acupuncture therapy for post-stroke sequelae, covering its origins, applications, and research, aiming to provide references for further standardized treatment of post-stroke sequelae with ear acupuncture therapy.

### Full Text

#### A Brief Discussion on the Theory and Research Status of Auricular Acupuncture in Treating Apoplexy Sequelae

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## Abstract

Stroke patients are prone to develop sequelae such as hemiplegia, aphasia, insomnia, depression, and constipation, which severely impact their quality of life. As a traditional external treatment method in Traditional Chinese Medicine (TCM), auricular acupuncture offers advantages including easy material access, convenient operation, minimal patient discomfort, safety, efficacy, and high acceptability, demonstrating significant therapeutic effects in treating stroke sequelae. This paper systematically reviews relevant literature on auricular acupuncture therapy for stroke sequelae, summarizing its origins, applications, and research developments to provide references for further standardized treatment of stroke sequelae using auricular acupuncture.

**Keywords:** sequela of apoplexy; auricular acupuncture; acupoint; hemiplegia; insomnia; depression

## Introduction

Traditional Chinese Medicine considers stroke as a condition of “deficiency in origin and excess in manifestation.” Patients with a preference for rich, greasy foods and sedentary lifestyles may experience impaired fluid metabolism, leading over time to qi and blood rebellion, thickening of fluids and blood, and stasis obstructing the cerebral collaterals. Current Western medical treatment for stroke sequelae primarily involves neurotrophic agents and antiplatelet or anticoagulant therapy, but these approaches are costly and have limited efficacy. In contrast, TCM treatment of stroke sequelae, based on syndrome differentiation and treatment theory, employs diverse methods with greater clinical flexibility. Auricular acupuncture, as an important TCM method for treating stroke sequelae, has a long history, broad therapeutic scope, and offers safety, efficacy, convenient operation, and minimal pain.

Auricular acupuncture therapy generally refers to the use of filiform needles or other methods to stimulate auricular points for disease prevention and treatment. The *Huangdi Neijing* (Inner Canon of the Yellow Emperor) documented the relationships between the ear and meridians, the ear and viscera, as well as theories and methods for treating diseases through auricular points. TCM holds that the ear maintains physiological connections with various body parts, and that diseases can be diagnosed through inspection and palpation of the auricle, while stimulation of auricular points can regulate bodily functions and balance qi, blood, and yin-yang to prevent and treat diseases. Modern medical research indicates that the ear contains abundant neural tissue and receptors. When specific reflex zones on the ear receive stimulation, these areas regulate the entire body through the neuro-humoral system, influencing endocrine and neurological functions to achieve therapeutic effects. In recent years, with the continuous development of TCM, the advantages of treating stroke sequelae with Chinese

medicine have become increasingly prominent, making auricular acupuncture a current research hotspot. Through ongoing clinical practice and innovation, it has become a commonly used TCM therapy in clinical settings, achieving favorable therapeutic outcomes in treating stroke sequelae.

## 1. Origins of Auricular Acupuncture Therapy

Auricular acupuncture therapy originated in China as part of acupuncture and moxibustion, representing a precious legacy of traditional Chinese medicine. The earliest records of auricular points appear in the silk manuscripts *Zubi Shiyi Mai Jiujing* (Moxibustion Classic of the Eleven Vessels of the Foot and Arm) and *Yinyang Shiyi Mai Jiujing* (Moxibustion Classic of the Eleven Yin and Yang Vessels) unearthed from the Mawangdui Han tombs, which documented an “ear vessel” unconnected to the eyes, cheeks, throat, and upper limbs. The *Huangdi Neijing* expanded the “ear vessel” to the Hand Shaoyang Sanjiao meridian, detailing the relationships between the ear and meridians, tendons, and viscera, and proposing that “the ear is the gathering place of the ancestral vessels.” This established the theoretical foundation for the relationship between the ear and the twelve meridians.

During the Jin, Tang, and Song dynasties, Huangfu Mi’ s *Zhenjiu Jiayi Jing* (AB Classic of Acupuncture and Moxibustion) documented auricular signs for diagnosing infantile diseases, while Sun Simiao’ s *Beiji Qianjin Yaofang* (Essential Formulas Worth a Thousand Gold Pieces) and *Qianjin Yifang* (Supplement to the Thousand Gold Formulas) made significant contributions to acupuncture, including records of the Erzhong (ear center) and Yangwei points. Wang Huaiyin’ s *Taiping Huimin Heji Jufang* (Formulas of the Peaceful Benevolent Dispensary) stated that “the ear is the gathering place of ancestral vessels; when essence and qi are harmonized, the kidneys are strong and hearing is acute; if labor injures qi and blood…deafness results.”

During the Yuan, Ming, and Qing dynasties, auricular point application became more widespread. Luo Tianyi’ s *Weisheng Baojian* (Precious Mirror of Health) recorded moxibustion on the blue vein behind the ear for treating infantile convulsions. Yang Jizhou’ s *Zhenjiu Dacheng* (Great Compendium of Acupuncture and Moxibustion) detailed the Erjian (ear apex) points: “two points at the ear apex, located by rolling the ear upward to find the apex, treat eye cataracts with five moxa cones,” clearly describing the location, point-finding method, and indications—information still in use today. Zhang Zhenchun’ s *Lizheng Anmo Yaoshu* (Essential Book of Corrected Massage) included the *Cha Er* (Ear Inspection) section with an auricular point chart dividing the ear into five sections corresponding to the heart, liver, spleen, lungs, and kidneys, demonstrating that auricular diagnosis and treatment were already popular in folk medicine during this period.

## 2. Theoretical Basis of Auricular Acupuncture Application

**Meridian Theory:** The *Huangdi Neijing* detailed the relationship between the ear and meridians. The hand and foot three-yang meridians, their collaterals, and muscle channels all connect to the ear, while the three-yin meridians indirectly connect to the ear through divergent meridians. The twelve meridians reach the ear either directly or indirectly. The *Lingshu · Kouwen* states: “When the ancestral vessels are vacuous, the tissues become slack; when the ancestral vessels are full, the tissues contract.” This demonstrates that the ear has close connections with all meridians, and auricular therapy can regulate the body’ s yin-yang balance holistically. Since the human body’ s twelve meridians belong to the viscera and form a network connecting internal and external, upper and lower parts, numerous meridians converging on the ear create a direct connection between “viscera-meridian-auricular points.”

**Organ Theory:** The ear has extremely close physiological relationships with the viscera. Auricular points correlate with internal organs not only generally but also specifically. The *Weisheng Baojian* records: “The five viscera and six bowels, the twelve meridians all have collaterals reaching the ear.” As an orifice, the ear connects internally with the viscera, establishing the theoretical foundation linking the ear with all organs. Many medical classics describe the interaction between the ear and viscera. For example, the *Jueqi Lun* states: “When essence collapses, there is deafness.” Since “the heart stores spirit, the kidneys store essence, the kidneys generate marrow, and the brain is the sea of marrow,” the *Lingshu* notes: “When the sea of marrow is abundant, there is lightness and strength; when the sea of marrow is insufficient, there is dizziness and tinnitus.” Both heart and kidneys open to the ear—one water, one fire, complementing each other and playing crucial roles in maintaining physiological balance. The “heart” in TCM theory shares functional similarities with the “brain” in Western medicine, both governing “spirit and consciousness.” Generally, the “spirit” resides in the brain but functions through the heart. Stimulating the ear can effectively regulate heart-spirit function. The *Yilin Gaicuo* (Corrections of Medical Errors) directly states: “Both ears connect to the brain; sounds heard enter the brain.”

**Embryological Theory:** In 1957, French physician Paul Nogier published research on somatic correspondences on the ear, proposing that the ear’ s shape resembles an inverted fetus in the womb. The fetus’ s organs and tissues correspond to human organs and tissues, meaning each ear location corresponds to a specific organ or tissue. In 1975, Nogier and his students published a new auricular point chart showing the distribution of human systems on the auricle, proposing over 40 points and suggesting that the anterior auricle reflects sensory disturbances while the posterior reflects motor disturbances.

**Holographic Biology:** Professor Zhang Yingqing first proposed the biological holographic law in 1980, referencing holographic photography theory in physics, and subsequently proposed the holographic point distribution law and holo-

graphic acupuncture method. This explained the relationship between local and whole-body from another perspective, providing new insights for special point systems like auricular and scalp acupuncture. Later, Chen Shaozong revised this theory, defining “holographic units” as basic structural units distributed in various organ systems that project onto corresponding regions according to their spatial arrangement in the whole body. The proposal and development of biological holographic law partially explain the theory that auricular point distribution represents a microcosm of the human body, promoting the overall development of auricular acupuncture theory. Domestic and international theories on auricular acupuncture mechanisms include bioelectricity theory, biological holographic law theory, gate control theory, and delta reflex theory, among others. These theories investigate auricular acupuncture mechanisms from different angles, providing theoretical foundations for basic research in auricular point therapy.

**Nervous System Theory:** The auricle is richly innervated, particularly concentrated in the concha cavity, concha fossa, and triangular fossa regions. Neurological theory has become an important research direction for auricular mechanisms in recent years. Zhu Bing and colleagues proposed that the auricular branch of the vagus nerve contains projection fibers directly to the vagus sensory and motor nuclei, suggesting that vagus nerve auricular branch reflexes possess both somatic and visceral reflex properties. Modern medical research shows that auricular acupuncture can enhance regulation of blood circulation. The auricle contains abundant nerves, blood vessels, and lymphatic vessels. Stimulating auricular points connects with various body parts through neuro-humoral pathways, increasing blood perfusion in local ischemic areas and promoting recovery of damaged brain cells.

### 3. Clinical Application of Auricular Acupuncture in Stroke Sequelae

**Auricular Acupuncture for Post-Stroke Insomnia:** Post-stroke insomnia refers to disturbances in sleep duration, quantity, or quality following stroke. It not only increases patient suffering and affects quality of life and rehabilitation progress but may also exacerbate stroke risk factors such as hypertension and diabetes, potentially triggering recurrent stroke. Yao Xujie et al. randomly divided 60 post-stroke insomnia patients into a hypnotic medication group and an auricular acupuncture group, concluding that auricular acupuncture based on syndrome differentiation demonstrates good clinical efficacy for post-stroke insomnia with high patient acceptance. Luo Meifeng et al. found that combining syndrome-based nursing care with auricular point pressing for post-stroke insomnia patients with heart-spleen deficiency represents a safe and effective nursing technique for improving sleep status. Auricular acupuncture treatment achieves therapeutic effects through two mechanisms: first, through meridian conduction to circulate qi-blood and regulate yin-yang; second, through systematic stimulation of auricular nerves to regulate excitatory and inhibitory

states, restoring balance and normal sleep patterns while avoiding medication side effects.

**Auricular Acupuncture for Post-Stroke Depression:** Post-stroke depression is a complex affective disorder occurring after stroke, encompassing various psychological and somatic symptoms. It manifests as a syndrome of depressive symptoms and corresponding physical manifestations, characterized by low mood, sleep disturbances, slow thinking, and reduced activity. It is a serious stroke complication that, if not detected and treated promptly, affects neurological recovery and social reintegration. Professor Liu Yujie believes that post-stroke depression results from dysfunction of the brain's primary spirit, abnormal spirit storage in the five viscera, and subsequent imbalance of yin-yang in the organs. Yang Qing et al. divided 80 stroke patients into intervention and control groups, with the control group receiving routine care and the intervention group receiving auricular acupuncture plus nursing care, demonstrating that auricular acupuncture effectively improves depressive symptoms and helps reverse depressive tendencies. Wang Fei et al. randomly divided 60 post-stroke depression patients into a treatment group receiving acupuncture combined with auricular electroacupuncture and a control group receiving oral fluoxetine hydrochloride capsules, concluding that acupuncture combined with auricular electroacupuncture is a significant therapeutic method that improves quality of life without causing drug dependence or withdrawal reactions, with fewer adverse effects. Fu Hao's comparative analysis of auricular acupuncture combined with oral medication versus medication alone showed that auricular acupuncture combined with Western medicine (Prozac) was superior to Prozac alone. These studies indicate that syndrome-based auricular acupuncture therapy, alone or combined with other treatments, can regulate abnormal neurotransmitter levels in post-stroke depression patients, nourish brain spirit, significantly improve depressive symptoms, enhance quality of life, and is safe and operable.

**Auricular Acupuncture for Post-Stroke Constipation:** Constipation is a common stroke complication that directly affects neurological rehabilitation and disease outcomes, potentially worsening the primary condition. Current clinical treatments include medications such as lactulose, glycerin suppositories, polyethylene glycol, rhubarb, and mirabilite, as well as acupuncture and enemas. While these treatments produce rapid and significant effects, they create strong dependency with high recurrence rates after discontinuation. Hu Zhenzhen et al. divided stroke patients with constipation into observation and control groups, with the control group receiving routine constipation care and the observation group receiving auricular seed embedding combined with acupoint massage during Chen period (7-9 AM). This approach stimulates neural networks in local auricular points closely related to gastrointestinal electrical activity, adjusting gastrointestinal motility to improve constipation symptoms simply and safely. Gu Rong confirmed through clinical trials that auricular point pressing in nursing care for stroke recovery patients can comprehensively improve various gastrointestinal discomfort symptoms and effectively prevent constipation. These

studies demonstrate that auricular acupuncture for post-stroke constipation can holistically improve gastrointestinal symptoms with significant long-term efficacy, simple operation, and high patient acceptance, making it valuable for promotion and application.

#### **Auricular Acupuncture for Post-Stroke Shoulder-Hand Syndrome:**

Shoulder-hand syndrome is a common post-stroke complication belonging to the TCM categories of “hemiplegia” and “bi syndrome.” It manifests as swelling, pain, and joint dysfunction in the affected shoulder and hand, with potential muscle atrophy, shoulder joint contracture, and mobility difficulties in later stages, severely impacting daily life. Clinical studies have applied auricular acupuncture to treat post-stroke shoulder-hand syndrome. Meng Xiaonan et al. found that auricular acupuncture significantly reduces pain and improves motor function in the affected upper limbs in ischemic stroke patients with shoulder-hand syndrome. Zuo Gang demonstrated that auricular acupuncture combined with warm needle acupuncture and Western medicine effectively improves joint mobility with definite therapeutic effects. These studies show promising clinical efficacy of auricular acupuncture for post-stroke shoulder-hand syndrome, though current reports involve small case numbers requiring deeper research. Auricular acupuncture can improve local sensory receptor capacity and stimulate local meridian qi to enhance muscle tone in the affected limb. Combined treatment approaches offer complementary advantages, effectively improving blood circulation, enhancing efficacy, reducing suffering, and improving quality of life.

Auricular acupuncture has also been applied to other stroke sequelae such as hemiplegia, aphasia, and dysphagia, though clinical literature on these conditions remains limited with insufficient standardized efficacy evaluation and observation indicators.

## **Conclusion**

TCM holds that stroke results from qi-blood deficiency and yin-yang imbalance in major organs, leading to impaired qi-blood circulation and malnourishment of tendons and vessels due to prolonged stasis. Approximately 70-80% of stroke patients are left with varying degrees of functional impairment in limbs, language, and motor function, severely affecting quality of life. With continuous development of TCM in recent years, auricular acupuncture therapy, as a distinctive component of traditional Chinese treatment, possesses solid TCM theoretical foundations and modern medical theoretical support, demonstrating clear advantages and definite clinical efficacy. However, literature review reveals that while numerous studies address auricular acupuncture for insomnia, depression, and constipation after stroke, clinical literature on hemiplegia and aphasia remains scarce, requiring further exploration of mechanisms and efficacy. Future research requires substantial evidence-based medical evidence to optimize auricular acupuncture treatment protocols, identify optimal point selection, needling techniques, and quantitative standards to improve clinical efficacy, promote rehabilitation in stroke sequelae patients, and advance the application and de-

velopment of auricular acupuncture therapy.

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