

# The Development, Mechanisms, and Clinical Applications of Traditional Chinese Medicine Medicated Baths

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**Abstract:** The traditional Chinese medicine (TCM) medicated bath, as an essential component of TCM therapy, possesses profound historical significance and broad application prospects. This article focuses on the research and development of the TCM medicated bath. As a form of external treatment within TCM, the medicated bath demonstrates unique efficacy and wide applicability, offering significant advantages in health management, disease prevention, and treatment. This paper analyzes the historical origins, mechanisms of action, development, clinical applications, and existing challenges of medicated baths from various perspectives. Finally, it explores future directions for TCM medicated baths, emphasizing the need for strengthened multidisciplinary cooperation, foundational research, and clinical studies to foster innovation and development. This approach aims to provide safer and more effective therapeutic options for human health.

**Keywords:** TCM therapy; Medicated bath; Innovation; Mechanism of action

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## 1. Introduction

Traditional Chinese medicine (TCM), regarded as a treasure of Chinese heritage, has made remarkable contributions to human health over thousands of years of development. Among its various therapeutic methods, the medicated bath holds a prominent position due to its unique approach and significant therapeutic effects. In contemporary society, as awareness of health continues to grow, there is an increasing demand for natural and green therapies.

The medicated bath is a therapeutic method that involves immersing the entire body or specific areas of the skin in a medicated decoction prepared from Chinese medicinal herbs<sup>[1]</sup>. Due to its minimal side effects, notable efficacy, and ease of operation, the TCM medicated bath has garnered growing attention. By decocting specific medicinal herbs in water or preparing appropriate dosage forms, the therapy enables the absorption of medicinal

components through the skin during soaking, achieving both therapeutic and health-promoting effects.

Research and development of TCM medicated baths not only contribute to preserving and promoting the rich traditional culture of the Chinese nation but also offer innovative approaches and methodologies for modern medical treatments. Through an in-depth exploration of the mechanisms of action, optimization of formulas, and enhancement of efficacy and safety, this ancient therapy can be revitalized in the modern era, providing broader health benefits <sup>[2]</sup>.

## 2. The historical origin of traditional Chinese medicine medicated bath

The history of TCM medicated baths can be traced back to ancient times. As early as the *Huangdi Neijing*, references to medicated baths appeared, such as “for those afflicted by pathogenic factors, soak the body and induce sweating to expel the evil” <sup>[3]</sup>. Since then, successive generations of physicians have continuously enriched and developed medicated bath therapy through clinical practice.

In ancient times, medicated baths were widely used for treating various ailments, including skin diseases, rheumatic pain, and gynecological conditions. The theoretical foundation of medicated baths is primarily derived from the principles of Yin and Yang, the five elements, meridians, and the qi and blood theory in traditional Chinese medicine. Through the warming effect of medicinal substances, medicated baths stimulate the main and collateral channels, promote the flow of qi and blood, and harmonize Yin and Yang, thereby achieving therapeutic and health-maintenance objectives.

## 3. The mechanism of traditional Chinese medicine medicated bath

- (1) Skin absorption: During a medicated bath, herbal ingredients penetrate the skin and enter the body. As the largest organ of the human body, the skin possesses excellent absorption capabilities, allowing the active ingredients in the medicines to exert therapeutic effects. Active components such as alkaloids, volatile oils, and flavonoids can pass through the skin barrier, acting directly on local areas or distributing throughout the body via blood circulation. These components penetrate the skin and directly target affected areas <sup>[4]</sup>.
- (2) Meridian transmission: A TCM medicated bath involves bathing the whole body or specific parts in decoctions or exposing the body to steam generated by boiling herbs <sup>[5]</sup>. According to traditional Chinese medicine theory, the human body’s meridian system governs the operation of qi and blood. The meridian system forms an interconnected network, enabling medicated baths to stimulate acupoints on the skin meridians, regulate qi and blood circulation, and treat diseases. After absorption through the skin, medicinal effects are transmitted along the meridians, influencing related internal organs and tissues to balance blood flow and harmonize Yin and Yang <sup>[6]</sup>.
- (3) Warming effect: The warming effect of a medicated bath promotes blood circulation, accelerating the absorption of medicinal ingredients. Additionally, the warmth relaxes muscles, alleviates pain, and reduces inflammation, making it particularly beneficial for conditions such as rheumatoid arthritis and muscle pain.
- (4) Overall regulatory effect: A medicated bath not only addresses local symptoms but also regulates the body’s viscera functions, balances qi and blood, harmonizes Yin and Yang, and enhances immunity and disease resistance through the overall action of the herbs.

- (5) Medicinal properties and efficacy: Different Chinese herbs possess various properties (e.g., cold, heat, warm, cool, rising, falling, floating, sinking) and functions (e.g., clearing heat and detoxifying, promoting blood circulation and removing blood stasis, and dispelling wind and dampness)<sup>[7]</sup>. Medicated bath formulas are tailored based on the nature of the disease and individual constitution, utilizing the properties and efficacy of the herbs to achieve therapeutic goals.
- (6) Overall conditioning and personalized treatment: Traditional Chinese medicine emphasizes a “holistic concept.” In medicated bath treatments, focus is placed not only on local symptoms but also on overall conditioning. By regulating the balance of Yin and Yang and promoting the coordination of internal organ functions, the treatment addresses the root cause of diseases<sup>[8]</sup>. Personalized treatment is another hallmark of TCM. Medicated bath formulas are adjusted based on individual physical constitution, disease type, and seasonal factors to achieve optimal therapeutic outcomes.
- (7) Psychological and emotional adjustment: The warmth and aroma of medicated baths relax the body and mind, relieve stress, and have a positive effect on psychological and emotional well-being. This dual action of treating physical conditions and promoting mental health maintenance further enhances its value<sup>[9]</sup>.

The mechanisms of TCM medicated baths are multifaceted, offering not only a method of treating diseases but also a comprehensive approach to health regulation. Through skin absorption, meridian transmission, warming effects, medicinal properties, overall regulation, individualized treatment, and psychological adjustment, TCM medicated baths showcase their unique therapeutic efficacy. These qualities position them as valuable gems of TCM therapy<sup>[10]</sup>.

## **4. The development of traditional Chinese medicine medicated bath prescription**

Modern medicated bath agents commonly exist in dosage forms such as liquids, powders, granules, and blocks. The preparation process involves extracting the active ingredients of traditional Chinese medicine and combining them with various substrates and spices. These formulations are cost-effective, efficient, safe, and reliable, preserving traditional characteristics while ensuring ease of application and promotion.

### **4.1. Selection of medicines**

Medicinal selection is tailored to specific diseases and treatment objectives, incorporating compatible traditional Chinese medicines with targeted effects. Commonly used drugs possess properties for clearing heat and detoxifying, promoting blood circulation and removing blood stasis, eliminating dampness, and benefiting qi and blood, among other functions<sup>[11]</sup>.

### **4.2. Formulation optimization**

Through clinical practice and experimental research, continuous efforts are made to optimize medicated bath formulations to enhance efficacy and safety. Additionally, advancements in modern technologies, such as extraction and preparation methods, contribute to the development of more efficient and user-friendly medicated bath preparations.

### **4.3. Research on drug extraction technology**

To increase the content and utilization rate of active components in drugs, ongoing innovations in traditional

Chinese medicine extraction technology are applied. Advanced techniques, including supercritical fluid extraction, microwave extraction, and ultrasonic extraction, have significantly improved the efficiency and quality of drug extraction.

#### **4.4. Research and development of medicated bath equipment**

With advancements in science and technology, medicated bath equipment has undergone continual updates and upgrades. Modern medicated bath devices now feature temperature control, time regulation, and drug concentration adjustment, offering enhanced functionality to better meet clinical treatment needs.

### **5. Clinical application of traditional Chinese medicine medicated bath**

With advancements in science and technology and the growing demand for health promotion, the modern application of medicated baths has achieved significant development. In the treatment of traditional diseases, medicated baths are widely utilized for conditions such as skin diseases, joint disorders, and rehabilitation therapy. Their unique efficacy has been validated by modern medical research <sup>[12]</sup>. Additionally, medicated baths are increasingly applied in contemporary life for purposes such as exercise recovery, stress relief, and skin care, demonstrating notable health care benefits.

- (1) Skin diseases: TCM medicated baths moisturize the skin, open the pores, and facilitate the absorption of medicinal ingredients through the skin, penetrating the meridians and deeper tissues to exert therapeutic effects similar to internal treatments <sup>[13]</sup>. Medicated baths are effective in alleviating conditions such as eczema, psoriasis, and urticaria. They help reduce itching, relieve inflammation, and promote skin repair.
- (2) Joint diseases: For conditions such as rheumatoid arthritis, osteoarthritis, and similar joint disorders, medicated baths help eliminate wind and dampness, unblock meridians, alleviate pain, and improve joint function.
- (3) Chronic fatigue syndrome: Medicated baths aid in relaxation, reduce fatigue, and improve sleep quality, making them beneficial for managing chronic fatigue syndrome.
- (4) Other diseases: TCM medicated baths also have auxiliary therapeutic effects for male reproductive conditions, gynecological disorders, and anorectal diseases.
- (5) Rehabilitation treatment: In rehabilitation settings, medicated baths promote blood circulation, relieve muscle fatigue, accelerate wound healing, and positively contribute to the recovery of patients with stroke sequelae or post-surgical fractures.

### **6. Challenges in the research of traditional Chinese medicine medicated baths**

- (1) Low degree of standardization: Currently, the lack of unified standards regarding the formulation, operational methods, and therapeutic dosages of TCM medicated baths limits the promotion and application of medicated bath therapy.
- (2) Insufficient research on mechanisms of action: While the clinical efficacy of medicated baths has been partially confirmed, research on their mechanisms of action remains insufficient and lacks comprehensive scientific theoretical support.
- (3) Safety concerns: The use of certain medicinal substances in medicated baths may result in adverse

reactions, such as allergies. This necessitates enhanced research into the safety of these substances and the implementation of robust monitoring systems.

## **7. Future development directions for traditional Chinese medicine medicated baths**

### **7.1. Strengthening standardization research**

Unified standards for medicated baths should be established to standardize formulations, operational methods, and therapeutic dosages, thereby improving the safety and efficacy of the therapy. Standardization encompasses aspects such as formula composition, procedural execution, and efficacy evaluation. Additionally, industrialization should focus on the research, development, production, and marketing of medicated bath products while promoting branded and large-scale services to enhance market competitiveness and societal impact.

### **7.2. Conducting in-depth mechanism research**

Modern scientific methods should be employed to explore the mechanisms underlying medicated bath therapy, providing robust scientific support for its clinical application.

### **7.3. Strengthening safety research**

A comprehensive safety evaluation system for medicated bath substances should be established. This includes rigorous quality control of the herbal materials and continuous monitoring of adverse drug reactions to ensure the safety and reliability of medicated bath therapy.

### **7.4. Innovation and development**

Integrating modern technology with traditional methods, medicated bath therapy can evolve by developing more convenient and effective products and treatment techniques.

### **7.5. International development**

Efforts should be made to foster international collaboration and introduce TCM medicated bath therapy to the global market. This would allow a broader audience to understand and benefit from its therapeutic effects.

## **8. Conclusion**

Looking ahead, TCM medicated baths, with their distinctive advantages and vast application potential, are poised for significant contributions to human health. Advancing research and development in this field can further enhance the efficacy and safety of medicated bath therapy, offering solutions for a variety of health conditions, including sub-health states that modern medicine often struggles to address.

The modern lifestyle, characterized by high stress and rapid pace, creates a growing demand for therapies that promote relaxation and holistic well-being. Medicated baths, with their gentle and therapeutic qualities, align with the health aspirations of contemporary society<sup>[14]</sup>. Future efforts should emphasize standardization, mechanism research, safety assurance, and innovative advancements to optimize formulations, enhance efficacy, and ensure ease of use. Additionally, expanding clinical applications and fostering international collaboration will bring the

benefits of TCM medicated baths to a global audience.

With dedicated scientific research and development, TCM medicated baths are expected to make greater contributions to the advancement of global health.

## Disclosure statement

The author declares no conflict of interest.

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