

# Taking Proactive Action: Introduction to the Prevention and Treatment of COVID-19 with Traditional Chinese Medicine

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## Abstracts

Since the outbreak of coronavirus disease-2019 (COVID-19), traditional Chinese medicine (TCM) has fully displayed its strength and specialty and has played an important role in the prevention and treatment of the pandemic. Faced with the unexpected development of the pandemic, the Chinese government has responded quickly and attached great importance to the effect of TCM. Comprehensive therapy integrating Chinese and Western medicine has achieved remarkable success. To summarize and introduce the prevention and treatment of COVID-19 with TCM, this article covers the perspectives of policy guideline issue, clinical diagnosis participation, and scientific research progress.

**Keywords:** COVID-19, integrated Chinese and Western medicine, traditional Chinese medicine

The outbreak and rapid spread of coronavirus disease-2019 (hereinafter referred to as COVID-19) has become a global public health emergency which threatens the human life and health seriously. A cumulative of 38,789,204 confirmed cases including 1,095,097 deaths had been reported globally by October 17 Beijing time.<sup>[1]</sup> Meanwhile, the epidemic situation in China was soon brought under control with reported sporadic cases. With its outstanding advantages, traditional Chinese medicine (TCM) has played a crucial role in this battle against the COVID-19 and has mutually reinforced its effect together with Western medicine. According to the white paper *Fighting COVID-19 China in Action* released by the State Council Information Office of the People's Republic of China, up to 92% confirmed cases were co-treated with TCM. For confirmed patients in Hubei province, both usage rate and total response rate exceeded 90%.<sup>[2]</sup> Due to insufficient evidence of antiviral and antibiotic therapies at the early stage of COVID-19 pandemic, there are not yet effective drugs against this novel coronavirus.<sup>[3]</sup> As the treasure of Chinese civilization, TCM guided by the concept of holism

and syndrome differentiation has combined with Western medicine and mutually complemented each other's advantages in the clinical diagnosis and treatment of COVID-19 patients, and its multiple targeting therapy has achieved good results. Looking back at the current progress in China, the epidemic would have never been subdued without the supplement and promotion of TCM from the government, medical staff, and science researchers. To provide further reference, this article summarize the relevant integrative clinical experience from the perspectives of policy guideline issue, clinical diagnosis participation, and scientific research progress.

## The Government has Incorporated Traditional Chinese Medicine to Prevent and Treat COVID-19

### Implement the participation of traditional Chinese medicine in anti-epidemic work

After the outbreak of COVID-19, the Chinese government has paid sufficient attention to the deployment of disease control and prevention repeatedly. On January 20, 2020, teleconference

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on the prevention and control of COVID-19 was held in Beijing. Sun Chunlan (孙春兰), the Vice Premier of the State Council, attended the conference. She emphasized the importance of lawful, scientific, and orderly prevention, as well as the resolution of curtailing the spread of virus.<sup>[4]</sup> On January 25, the Spring Festival, President Xi Jinping chaired the meeting on epidemic prevention and control. A working group for epidemic response was formed to promote and strengthen the first line local prevention and control defense.<sup>[5]</sup> In accordance with the unified deployment, the National Administration of Traditional Chinese Medicine (NATCM) has introduced a series of anti-epidemic policies with TCM. To deepen the implementation of integrative Chinese medicine and Western medicine treatment, on January 27, NATCM issued a *Notice* on this topic from the following five aspects: building joint treatment mechanism; improving medical care capacity of medical staff; carrying out standard medical care; focusing on the combination of clinical and scientific research, and sharing case information.<sup>[6]</sup> In order to further implement the overall plan of anti-epidemic effort, give full play to the supporting role of informatization and propel the deep engagement of TCM, on February 8, NATCM issued *the Notice on Strengthening Information Support for the Prevention and Treatment of COVID-19 with TCM*. The Notice summarized typical practice for the purpose of strengthening information support by carrying out the following five tasks; Internet-based diagnosis and treatment service provided by TCM medical organization, Internet-based TCM prevention and control at grass root level; online TCM advisory services; “Internet+” government affairs service; and basic guarantee.<sup>[7]</sup> As the epidemic has become constant, China will be in a situation of ongoing prevention and control. To fully implement the overall control strategy of “preventing both foreign input and domestic rebound,” on May 15, the office of NATCM released *the Notice on Implementing TCM Works under Normalized Prevention and Control*. In the notice, it is demanded that policies should be implemented accurately at different areas. Both TCM medical staff and materials should be in full supply. Rehabilitation therapy with TCM characteristics should be in widespread use, and TCM health education and scientific protection should be advocated.<sup>[8]</sup>

### Release traditional Chinese medicine coordination scheme

The Chinese National Health Commission has released the eight versions of COVID-19 diagnosis and treatment schemes successively from January to August 2020. Each version, especially the third version, included TCM prevention and control. On the basis of syndrome differentiation of the second edition, the third edition further confirmed the pathogenesis characteristics of COVID-19 as “dampness, heat, toxin and stasis,” and added specific treatment scheme.<sup>[9]</sup> The fourth edition of the schemes divided the TCM treatment of

COVID-19 into the medical observation phase and clinical treatment phase. The latter can be further divided into four stages, namely the initial stage, the intermediate stage, the severe stage, and the recovery stage, which correspond respectively to four syndrome types of TCM: Stagnation of cold-dampness in the lung, epidemic toxin blocking the lung, internal blockage and external collapse, and qi deficiency of the lung and spleen. Chinese patented medicine for the medical observation phase, intermediate stage, and severe stage was also recommended.<sup>[10]</sup> Through differentiating syndrome, the cause of this pandemic is identified as dampness toxin, and its principal pathogenesis are “dampness, heat, toxin, and stasis”. Considering the clinical manifestations of mild type, common type, severe type, and critical type, it was initially considered that COVID-19 had distinct stage-related progression and favorable or unfavorable prognosis. Therefore, the treatment based on syndrome differentiation by stage was suggested: The initial stage (mild type and common type), the progressive stage (severe type), the critical stage (critical type), and the recovery stage. In the initial stage, the location of disease was neither exterior nor interior. Instead, it was dampness toxin was stagnated at the membrane source of upper energizer. In the progressive stage, dampness toxin transformed into heat, and then the dampness immersed the lung, obstructed the lung and even blocked the lung, thus causing internal blockage and external collapse. For the severe type, patients should be treated from qi level and *ying* level, while for the critical type, there were deteriorated cases, so individual differentiation was required. As the epidemic aggravated, the herbal prescriptions also kept adjusting. Compared with the fifth edition, the differentiation of syndrome types for the herbal medicine treatment in the sixth and seventh editions was more precise, and the composition of prescriptions and dosages were more complicated. In the sixth edition, the clinical treatment phase was segmented into mild type, common type, severe type, critical type, and the recovery stage. A general prescription called “Qing Fei Pai Du Decoction” was recommended for the clinical treatment phase based on the summarization and analysis of empirical formulas and effective prescriptions across China.<sup>[11]</sup> Moreover, the application of TCM injection was valued in the treatment of severe and critical patients in the seventh edition. As the Head of Beijing Hospital of Traditional Chinese Medicine, Liu Qingquan was also the deputy chief of National Expert Group on TCM Treatment.<sup>[12]</sup> He pointed out that, “COVID-19 is an emerging disease for us, so the seventh edition provides us with more scientific guidance on the application of Chinese patented medicine and TCM injection.” For the severe and critical patients with mechanical ventilation, if they suffered from abdominal distension, inhibited defecation or constipation, 5–10 g of raw Da Huang (大黄 *Radix et Rhizoma Rhei*) could be used for

treatment. For patient-ventilator asynchrony, 5–10 g of raw Da Huang (大黄 *Radix et Rhizoma Rhei*) and 5–10 g Mang Xiao (芒硝 *Natrii Sulfas*) could be used after giving depressant and muscle relaxant. On August 18, the General Office of National Health Commission and the Office of NATCM issued *COVID-19 Diagnosis and Treatment Schemes (Trial Eighth Version)*.<sup>[13]</sup> By summarizing clinical experiences, Chinese medical staff have continually kept optimizing therapeutic measures by amending and perfecting the schemes, thus, providing comprehensive guidelines and specifications for improving COVID-19 diagnosis and treatment.

## Traditional Chinese Medicine has Been Widely Applied in the Clinical Diagnosis and Treatment of COVID-19

### Traditional Chinese medicine participates in the clinical diagnosis and treatment

Looking back at its history, TCM has played an important role in fighting against infectious diseases, including small pox, plague, SARS, influenza A, and avian influenza.<sup>[14]</sup> In the early outbreak of COVID-19, various provinces and cities actively responded to the call of the central government. Integrated Chinese medicine and Western medicine therapy and syndrome differentiation were applied in an individualized way to help patients detach from ventilator and Extracorporeal Membrane Oxygenation. These measures reduced bacterial cross-infection and improved rescue rate. According to the information

published by NATCM, summarization of data about TCM diagnosis and treatment from some provinces and cities at the early outbreak of COVID-19 are presented in Table 1. The rates of applying integrated Chinese medicine and Western medicine were close among provinces and cities, whereas effective rate and cure rate of TCM-involved treatment varied greatly. Different provinces and cities had different evaluation criteria on therapeutic efficacy and they conducted different independent treatments but what causes such variations remains to be further explored.

### Frequently-used traditional Chinese medicine prescriptions, Chinese patent medicine, and other therapies

On January 6, 2020, the General Office of National Health Commission and the Office of NATCM issued *Notice on Recommending “Qing Fei Pai Du Decoction” in the Treatment of COVID-19 with Integrated Chinese Medicine and Western Medicine Approach*, thus providing guidance for the clinical application of this prescription.<sup>[15]</sup> “Qing Fei Pai Du Decoction” was first applied in the emergency clinical observation of 214 confirmed cases in the provinces of Shanxi, Hebei, Shaanxi, and Heilongjiang, with an effective rate over 90%.<sup>[16]</sup> Furthermore, as the most-used prescription in Wuhan city, Hubei province, a total of 390,000 bags of decoction and half a million doses of compound “Qing Fei Pai Du Decoction” granule were distributed to designated hospitals and isolation centers. The extensive use of this prescription acquired good curative effect and received no

**Table 1: Effective rate and cure rate of Traditional Chinese Medicine involved treatment from some domestic provinces and cities at the early outbreak of COVID-19**

Region	Rates of integrated Chinese medicine and western medicine therapy (%)	Cure rate of TCM-involved treatment	Cutoff date
Shanxi	96.90	-	February 17
Guangdong	93.54	89.00	February 19
Anhui	98.50	97.60	February 20
Fujian	98.00	70.70 (effective rate)	February 20
Guizhou	94.50	92.20	February 21
Shaanxi	93.50	-	February 23
Ningxia	98.60	98.20	February 23
Beijing	90.00	92.00	February 24
Hainan	93.00	-	February 24
Hebei	97.10	96.80	February 25
Zhejiang	97.76	95.00 (effective rate)	February 26
Hunan	100.00	80.63	February 27
Jilin	100.00	-	February 27
Henan	98.74	99.27	February 27
Shandong	-	98.00	February 29
Gansu	97.80	100.00	March 2
Guangxi	97.60	97.60	March 3
Liaoning	-	80.00 (effective rate)	March 4
Chongqing	92.36	-	March 4
Guangzhou	95.38	-	March 4

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obvious specific adverse drug reaction reporting.<sup>[17]</sup> Various clinical observations and fundamental researches have proven that “Qing Fei Pai Du Decoction” is quick-acting, efficient, safe, and cost-effective.<sup>[18-21]</sup>

According to the 8<sup>th</sup> edition of the Scheme, the following Chinese patented herbal products are recommended: Jin Hua Qing Gan Granule (金花清感颗粒), Lian Hua Qing Wen Granule / Capsule (连花清瘟颗粒/胶囊), Shuang Huang Lian Granule / Oral Liquid (双黄连颗粒/口服液), Qing Kai Ling Capsule (清开灵胶囊), She Ma Oral Liquid (射麻口服液), Xin Xue Granule (新雪颗粒), and Zi Xue Elixir (紫雪丹); Angong Niu Huang Pills (安宫牛黄丸) and Su He Xiang Pills (苏合香丸) are applicable to those in coma with high fever. For intravenous drip, the following products are recommended: Tan Re Qing Injection (痰热清注射液), Xue Bi Jing Injection (血必净注射液), Re Du Ning Injection (热毒宁注射液), Shen Mai Injection (参麦注射液), and Shen Fu Injection (参附注射液). In addition, under the supervision of physicians, COVID-19 patients are encouraged to choose various TCM therapies, including acupoint application, acupuncture and moxibustion, Baduanjin exercise, Tai Chi, breathing exercises, Qigong rehabilitation, exercise training, psychological counseling, and music-related therapy. After clinical observation and fundamental research screening, “Three drugs and three prescriptions” have been proven to be effective, and they are Jin Hua Qing Gan Granule, Lian Hua Qing Wen Granule / Capsule, Xue Bi Jing Injection, Qing Fei Pai Du Decoction, Hua Shi Bai Du Decoction and Xuan Fei Bai Du Decoction.<sup>[22]</sup> Obviously, TCM plays a crucial role in fighting against COVID-19.

## Traditional Chinese Medicine Researches on Anti-epidemic

### Traditional Chinese medicine clinical researches

Since the outbreak of pandemic, researchers have carried out a large number of clinical studies on TCM treating COVID-19, and thus providing valuable experimental evidence for summarizing clinical experience, discovering effective intervening measure, and optimizing clinical protocols. A clinical trial registry follow-up study<sup>[23]</sup> tracked Chinese Clinical Trial Registry and ClinicalTrials.gov as data source and its result showed that by April 20, 2020, there had been a total of 137 registered clinical researches related to using the TCM treatment against COVID-19 (including integrated Chinese medicine and Western medicine). The sample size was 58,266 and most of the researches were randomized controlled trial. Potential effective intervening measures included classical TCM prescriptions, Chinese patent medicine, TCM exercises, acupuncture, moxibustion, and Tuina, as shown in Table 2.

With the deepening of TCM clinical research, a larger number of achievements have been reported. Statistics showed that by October 17, 2020, newly included literature on TCM treating COVID-19 by SinoMed and PubMed were 1,780, among which 160 were evidence-based ones. These theses covered clinical observation, controlled trial, and randomized controlled trial, as well as systematic review based on clinical trial.<sup>[24-26]</sup>

### Researches on traditional Chinese medicine characteristic theories

From the perspective of TCM, the qi of cold-dampness and pestilence obstructs the spleen and stagnates the lung,

**Table 2: Main intervening measures of Traditional Chinese Medicine registered for clinical trials**

Classification	Medicine/measures	n
Chinese patent medicine	Xi Yan Ping Injection (喜炎平注射液), Tan Re Qing Injection/Capsule (痰热清注射液/胶囊), Lian Hua Qing Wen Granule/Capsule(连花清瘟颗粒/胶囊), Xue Bi Jing Injection (血必净注射液), Compound Chai Yin Granule (复方银柴颗粒), Qing Qiao Antiviral Granule (青翘抗病毒颗粒), Re Du Ning Injection (热毒宁注射液), Shuang Huang Lian Oral Liquid (双黄连口服液), Jin Ye Bai Du Granule (金叶败毒颗粒), Ba Bao Pills (八宝丹), Shu Feng Jie Du Capsule (疏风解毒胶囊), Shen Qi Fu Zheng Injection (参芪扶正注射液), Antiviral Granule (抗病毒颗粒), Compound Yuxingcao Mixture (复方鱼腥草合剂), Jin Yin Hua Oral Liquid (金银花口服液), Ke Su Ting Syrup (咳速停糖浆), Ke Qing Capsule (咳清胶囊), Liu Shen Capsule (六神胶囊), Antiviral Oral Liquid (Xiangxue Pharmaceuticals)(抗病毒口服液 (香雪制药)), Shen Fu Injection (参附注射液), Granule for Qing Wen Bai Du Decoction (清瘟败毒饮配方颗粒剂), Jing Yin Granule (荆银颗粒), Liu Shen Pills (六神丸), E Zhu Oil Injection (莪术油注射液), Hua Ju Hong Tan Ke Liquid (化橘红痰咳液), Han Ma Capsule (汉麻胶囊), Gu Shen Ding Chuan Pills (固肾定喘丸), Hua Shi Bai Du Granule (化湿败毒颗粒), Yin Hu Qing Wen Granule (银胡清瘟颗粒), Granule for Xiao Tan San Jie decoction (消痰散结方颗粒剂)	40
TCM exercises	TCM conduction exercise, “six-character formula” breathing exercises, expiration and inspiration exercises, Tai Chi, fitness Qigong for nourishing the lung, Baduancao exercises for rehabilitating and strengthening the lung, Baduanjin exercise	10
Classical prescriptions	Ma Xing Shi Gan Decoction (麻杏石甘汤), Sheng Jiang Powder (升降散), Shen Ling Bai Zhu Powder (参苓白朮散), Dang Gui Shao Yao Powder (当归芍药散)	4
Acupuncture/Acupoint	Zang-fu organ Acupoint pressure, acupuncture, auricular point pressing with bean	3
Tuina	Chest relieving and regulating technique, tuina	2

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enters from superficialities to interior and transforms itself into heat. These are the clinical features of COVID-19. Hence, resolving dampness and removing toxicity can be applied with strengthening body resistance and eliminating evil simultaneously. TCM therapies are mainly applied to patients with mild and common types. Decoction or Chinese patented medicine is used together with auricular point pressing with bean to quickly alleviate symptoms and hold the progression of disease at bay, so patients can be cured clinically. For severe and critical patients, integrated Chinese medicine and Western medicine therapies were applied to rescue them. TCM puts emphasis not only on strengthening the body resistance for relieving depletion, purging the lung to relax bowel, but also on removing toxicity, nourishing yin, and inducing resuscitation. Academician Zhong Nanshan pointed out<sup>[27]</sup> that “the present clinical practice has proven the objectivity and effectiveness of TCM. The modern medical study methods should be adopted to better interpret and explain TCM, so that recognition can be gained from both domestic and international medical colleagues.” Chinese researchers Wang *W et al.*<sup>[28]</sup> analyzed the therapeutic schemes for COVID-19 and prescriptions of TCM in relevant clinical cases across the country, discussed prescription patterns on preventing and treating COVID-19, thus providing reference for the clinical prescriptions and medication. Data mining was adopted by Bai *M et al.*<sup>[29]</sup> to sort the prevention and treatment of epidemics in ancient books. They set up a database of prescription formulating, explored potentially valid herbal pairs and their compatibility, thus offering new ideas for the clinical application of Chinese medicine. Modern medical researches focus more on commonalities of diseases when developing drugs, but when individual factors dominate, there will be poor treatment response. On the country, TCM takes holistic concept and syndrome differentiation as the principles, attaching full importance to individual factors, so its targeted treatment can achieve good results. However, due to individual differences and environmental factors, it is difficult to repeatedly test on the same prescription; hence, the curative effect of specific prescriptions cannot be guaranteed or promoted. In addition, TCM experiment and fundamental research are rather backward and have impeded its development. We should strengthen the basic research, lay emphasis on the type of syndrome, pathogenic characteristics and evolution of disease, and find specific medicine and prescription for specific disease based on the above emphasis. To achieve better therapeutic effect, clinicians should modify and adjust these specific medicine and prescription according to the individual conditions of patients.

Facing the outbreak of COVID-19, Chinese medicine and western medicine can join hands and build a solid lifeline of defense, and this is a highlight of epidemic prevention and

control in China. At present, the situation is generally under control, but the novel coronavirus is to be wiped out yet. The nationwide virus control is now being conducted in an ongoing normalized basis, for a long time. “In this fighting against COVID-19, TCM has played a crucial and all-round role in the overall process of prevention and treatment,” said Zhang Boli, the academician of Chinese Academy of Engineering who continued thus: “TCM will always prevail as long as an opportunity is given. The virus is new in each epidemic, and there is no specific medicine available, so I think TCM should take responsibility upon itself.”<sup>[30]</sup> Although the epidemic is now generally under control, the virus is borderless. Now COVID-19 still wreaks havoc on a global scale and multiple outbreaks have been reported. Wu Zunyou, the chief expert of the Chinese Center for Disease Control and Prevention, predicted that COVID-19 will maintain high prevalence for the indefinite future, and even aggravate in winter.<sup>[31]</sup> Recently, a piece of news about Timoshenko, the former Prime Minister of Ukraine, has circulated online. She said she would actively promote the internationalization of TCM.<sup>[32]</sup> In August 2020, she was infected with COVID-19, and then fully recovered with the help of integrated Chinese medicine and western medicine therapy. This is an epitome of many stories about TCM fighting against COVID-19 outside China. As a part of the outstanding traditional Chinese culture, TCM culture is rooted in the ancient civilization of our country. To better spread the classical theory of TCM, we should combine it with time-honored history and civilization of our nation. We can also promote TCM culture to people outside of China from the dimension of history, humanities, folk customs and geography, and elaborate the mechanism of TCM treatment via fundamental researches. The internationalization of TCM needs both humanities and science. As the leader of NATCM expert group for medical rescue, Huang Luqi, the academician of Chinese Academy of Engineering, president of the China Academy of Chinese Medical Science, said,<sup>[33]</sup> “We would like to fight side by side and jointly response to the pandemic with people from all the countries. We are willing to share TCM experiences and achievements against COVID-19!”

Translator: Guoqi Shi (石国旗)

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### Conflicts of interest

None.

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