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Clinical Practice Guidelines

Shanghai expert consensus on clinical protocol for traditional Chinese medicine treatment of COVID-19 among the elderly population (second edition)

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Abstract

This document is the revised edition of the previously issued Shanghai Expert Consensus on Clinical Protocol for Traditional Chinese Medicine Treatment of COVID-19 among the Elderly Population. Based on the clinical experience and the Protocol for Diagnosis and Treatment of COVID-19 (Trial 9th Edition), this revised edition provides treatment approaches and recommendations to proactively cope with Omicron variant and increase the therapeutic efficacy for coronavirus disease 2019 among the elderly population in Shanghai, China.

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1. Introduction

Shanghai is a metropolitan city with a large aging population, where 5.81 million people (23.4% of the overall population) are over 60 years old [1]. Data from China and Italy revealed a case-fatality rate of 2.3% in patients with COVID-19, with more than 50% of the fatalities occurring in patients 50 years of age or older [2]. In the largest reported series from Northern Italy, case-fatality rate in patients 64 years or older was 36%, substantially higher than in younger patients [3]. Under the ongoing epidemic of coronavirus disease 2019 (COVID-19) caused by Omicron variant in Shanghai, traditional Chinese medicine (TCM) treatment is one tool that can be used for critical cases, especially to improve treatment efficacy among COVID-19 cases in the elderly population. This expert consensus is released based on the symptoms of COVID-19 caused by Omicron variant in conjunction with its etiology and pathogenesis specific to the elderly population, and based on the Protocol for Diagnosis and Treatment of COVID-19 (Trial 9th Edition) [4]. The TCM experts searched domestic and foreign studies, consulted with other experts, and discussed their ideas in order to formulate a common understanding of the topic. This consensus is based on existing research to develop a declarative document, focusing on feasible approaches for our current clinical reality.

2. The application principles of TCM in the elderly population with COVID-19

(1) The goals of TCM treatment are to shorten COVID-19 nucleic acid polymerase chain reaction negativity conversion time, slow disease progression, and reduce mortality.

(2) For asymptomatic and mild cases, or those without high-risk factors or with well-controlled underlying chronic diseases, disease management follows the “Shanghai Protocol for Adults” [5] based on the Protocol for Diagnosis and Treatment of COVID-19 (Trial 9th Edition) [4].
(3) For moderate cases with high-risk factors, severe to critical cases, or patients with poorly controlled underlying chronic diseases, clinicians should identify the treatment priorities between COVID-19 and these underlying diseases, and pay close attention to any changes in these underlying conditions. A multidisciplinary team is recommended to establish individualized treatment strategy to address clinical factors associated with disease aggravation, halt or reverse disease progression and thus reduce mortality.

(4) Elderly patients often have multiple underlying diseases. TCM theory considers decline of healthy qi with age, which results in insidious onset of disease signs and symptoms. In these patients, early identification, diagnosis, and intervention of disease are important. When the patients present with fatigue, drowsiness, loss of appetite or decreased food intake, or constipation, along with decline of oxygen level, dynamic reduction in serum absolute lymphocyte count, dynamic elevation of inflammatory cytokines and blood coagulation indicators such as D-dimer, and notable progression of lung infiltration by chest imaging, initial intensive care is crucial to prevent mild or moderate cases progressing to severe or critical conditions.

(5) For newly infected moderate cases with a deficiency of healthy qi, the treatment strategy is to replenish qi, clear heat and resolve dampness in order to rapidly halt disease progression. The recommended herbal formula for this strategy is shown in Table 1.

(6) For severe and critical cases, the treatment strategy is to clear the lung, dredge intestines, remove toxins, and cool blood. The recommended formula for this strategy is shown in Table 2.

### 3. The primary TCM strategies for elderly population with COVID-19

Elderly patients tend to experience a deficiency in healthy qi, weakness of the zang-fu organs, and poor circulation of qi and blood. Thus, elderly patients with COVID-19 are at risk of rapid deterioration because of the multiple underlying chronic diseases. When treating elderly patients with TCM, it is important to clear pathogenic factors while simultaneously working to protect and replenish healthy qi through invigorating the spleen and reinforcing the kidney, or activate blood. In choosing clinical treatment strategies, identifying the status or urgency of the disease pattern takes priority. Good clinical judgement takes into consideration how to balance the two treatment aspects between relieving acute symptoms in the short term, and protecting healthy qi for the long run. To help prioritize between removing pathogenic factors and reinforcing healthy qi, appropriate treatment strategies based on core symptoms and pathogenesis may include: (1) removing pathogenic factors being the major goal, supplemented by reinforcing healthy qi; (2) removing pathogenic factors and reinforcing healthy qi; (3) reinforcing healthy qi, securing yang and preventing collapse.

Timely administration of medicine and using accurate treatment strategies (e.g., fine-tuning the proportion of unblocking, clearing, and supporting strategies in a formula) are essential for regulation of the overall state. In addition to oral or intragastric administration, TCM injections are recommended for treating critical cases.

It is worth noting that the two recommended formulas can be modified according to the patient’s actual conditions. Detailed modifications are explained as follows.

(1) For a persistent high fever with an excess pattern, the treatment strategy is to cool blood, remove toxins and dredge intestines. Add the following herbs (Table 3) to the recommended formulas. Chinese patent medicines (Table 4) are also recommended. Acupuncture treatment is suggested. Acupuncture points: Dazhui (GV14) and Quchi (LI11).

(2) For altered state of consciousness, e.g. delirium, deficiency or excess should be distinguished. The treatment strategy for deficiency pattern is to protect fluids, replenish qi and nourish yin. Shengshaishen (Radix et Rhizoma Ginseng Cruda) 10 g or Xiyangshen (Radix Panacis Quinquefolii) 10 g (or their powder) is recommended for the formulas. Also, Shengmai Injection (20–60 mL) is also suggested by intravenous drip, twice a day. The treatment

### Table 1
The basic formula for newly infected moderate cases.

| Chinese Pinyin name | Latin name | Dose |
|---------------------|------------|------|
| Sheng Huangqi       | Radix Astragali | 15 g |
| Shengshaishen*      | Radix et Rhizoma Ginseng Cruda | 10 g |
| Jingjie             | Herba Schizonepetae | 9 g |
| Cangzhu             | Rhizoma Atractylodis | 15 g |
| Guanghualiang       | Herba Pogostemonis | 9 g |
| Jinyinhua           | Flos Lonicerae Japonicae | 15 g |
| Huzhang             | Rhizoma Polygony Cuspidati | 20 g |
| Legan               | Rhizoma Phragmitis | 30 g |
| Mudanpi             | Cortex Moutan | 9 g |
| Sheng Gancao        | Radix et Rhizoma Glycyrrhizae | 9 g |

* 10 g of Xiyangshen (Radix Panacis Quinquefolii) can be used interchangeably.

### Table 2
The basic formula for severe and critical cases.

| Chinese Pinyin name | Latin name | Dose |
|---------------------|------------|------|
| Zhi mahuang         | Herba Ephedrae Praeparata | 10 g |
| Kuxingren           | Semen Armeniacae Amarum | 10 g |
| Sheng Shigao        | Gypsum Fibrosu (decoc first) | 30–90 g |
| Jinyinhua           | Flax Lonicerae Japonicae | 20 g |
| Zhimu               | Rhizoma Anemarrhena | 10 g |
| Zhebeimu            | Bulbus Fritillariae Thunbergii | 15 g |
| Shang Gualou        | Fructus Trichosanthis | 30 g |
| Binglizi            | Semen Lepidi | 15 g |
| Chishao             | Radix Pareoae Rubra | 15 g |
| Xuan shen           | Radix Scrophulariae | 20 g |
| Sheng Da huang      | Radix Rehmanniae | 30 g |
| Sheng Dahuang       | Radix et Rhizoma Rhei (decoc last) | 6–9 g |

### Table 3
Herbs recommended for persistent high fever.

| Chinese Pinyin name | Latin name | Dose |
|---------------------|------------|------|
| Huangqin            | Radix Scutellariae | 30 g |
| Huanglian           | Rhizoma Copidis | 6 g |
| Shengma             | Rhizoma Cimicifugae | 30 g |
| Qinghao             | Herba Artemisiae Anuae | 30 g |
| Shu nu jiao          | Cornu Bubahi (decoc first) | 30 g |
| Mudanpi*            | Cortex Moutan | 30 g |

* Danshen (Radix et Rhizoma Salviae Militorrhizae) can be used interchangeably.

### Table 4
Recommended Chinese patent medicines for persistent high fever.

| Name                  | Dosage                                      |
|-----------------------|---------------------------------------------|
| Zixue Powder          | 1.5–3 g for each dose (oral route), 2 doses a day |
| Angong                | 1–3 pills (oral route after dissolving in warm water), 2–3 doses a day |
| Antelopehorn Power    | 0.6 g for each dose, 2–3 doses a day          |
| Tan xue Injection     | Intravenous drip, 40 mL for each dose, 2 doses a day |
ment strategy for excess phlegm heat includes adding the following herbs (Table 5) to the recommended formulas. The recommended Chinese patent medicines are listed in Table 6. Acupuncture treatment is suggested. Acupuncture points: Renzhong (GV26), Laogong (PC8) and Zhonghong (PC9). Method: Shallow puncture or prick for mild bloodletting.

(3) For constipation, the treatment strategy is to move the bowels and benefit the lung. For deficiency patterns, Quangualou (Fructus Trichosanthis) 30 g, Huomaren (Fructus Cannabis) 30 g and Houpo (Cortex Magnoliae Officinalis) 20 g are recommended additions to the formulas; the decoction can be taken orally or intragastrically. For excess patterns, add the following herbs (Table 7) to the recommended formulas and take the decoction orally or intragastrically. Acupuncture treatment is suggested. Acupuncture points: Zhigou (SJ6), Zhaohai (KI6) and Tianshu (ST25).

(4) For sticky sputum that is difficult to expectorate, the treatment strategy is to clear heat, resolve phlegm, regulate qi and disperse stagnation. Add the following herbs (Table 8) to the recommended formulas. Recommended Chinese patent medicine: Tanreqing Injection: 40 mL, twice a day, intravenous drip. Acupuncture treatment is suggested. Acupuncture points: Tianfu (CV17), Shanzhong (GV11) and Taixi (KI3).

Table 5
Recommended herbs for excess phlegm heat syndrome.

| Chinese Pinyin name | Latin name        | Dose |
|---------------------|-------------------|------|
| Shichangpu          | Rhizoma Acori Tatarinowii | 12 g |
| Yuyan               | Radix Polygalae   | 9 g  |
| Yujin               | Radix Curcumae    | 15 g |
| Dannaixing          | Arisaema cum Bile* | 15 g |
| Tianzhuhuang        | Concreto Silicea Bambusae | 15 g |

Table 6
Recommended Chinese patent medicines for excess phlegm heat syndrome.

| Chinese Pinyin name | Dosage (intravenous drip) | Actions/indications |
|---------------------|----------------------------|---------------------|
| Shengmai            | 20–60 mL for each dose, 2 doses a day, per oral | Deficiency pattern |
| Xingnaoqing         | 20 mL for each dose, 2 doses a day, per oral | Excess pattern |
| Shuhuxiang Pill     | 1–2 pills for each dose, 2–3 doses a day, per oral | Loss of consciousness |
| Angong Niuhuang Pill| 1–3 pills for each dose, 2–3 doses a day, per oral | Clears heat and refreshes the mind |
| Zhibao Pill         | 1 pill for each dose, 2–3 doses a day, per oral (oral or nasal route after dissolved in warm water) | Refreshes and calms the mind |

Table 7
Recommended herbs for excess patterns of constipation.

| Chinese Pinyin name | Latin name          | Dose  |
|---------------------|---------------------|-------|
| Sheng Dahuang       | Radix et Rhizoma Rhei | 10–30 g |
| Houpo               | Cortex Magnoliae Officinalis | 20 g |
| Zhishi             | Fructus Auranti Immaturus | 20 g |
| Mangxiaojiao       | Natrii Sulphas (dissolved) | 10 g |

These herbs are also recommended for use in enema format, in which case the dose of Mangxiaojiao (Radix et Rhizoma Rhei) powder mixed in water can also be taken orally.

Table 8
Recommended herbs for difficult expectoration of sticky sputum.

| Chinese Pinyin name | Latin name | Dose |
|---------------------|------------|------|
| Pugongyong         | Herba Taraxaci | 30 g |
| Maidong            | Radix Ophiopogonis | 30 g |
| Yiirenen            | Semen Coicis | 30 g |
| Dongguazi          | Semen Benincasae | 30 g |
| Jiegeng            | Radix Platycodonis | 9 g |
| Zhuli Shui         | Succus Bambusae water | 30 mL |
| Zaojiaoci           | Spina Gleditiae* | 15 g |
| Dannaxing           | Arisaema cum Bile* | 6 g |

* Used for intractable sputum retention.

(5) For progressing infiltration of lung lesions seen on chest imaging, the treatment strategy is to clear heat and activate blood circulation. Add the following herbs (Table 9) to the recommended formulas for severe or critical cases. The recommended Chinese patent medicines are shown in Table 10.

(6) For persistent turbid greasy tongue coating, chest tightness, nausea, vomiting, headache, and restlessness due to qi stagnation and pathogenic factors hidden in the pleuro-diaphragmatic interspace (known as Mo Yuan in Chinese medicine), the treatment strategy is to remove pathogenic factors out of the pleuro-diaphragmatic interspace and facilitate functional activities of qi. The following herbs (Table 11) are recommended additions to the formulas.

(7) For qi deficiency, it is important to invigorate qi as early as possible to help remove pathogenic factors. Chinese herbal formula modifications include adding Huangqi (Radix Astragali) up to 30–60 g and Danshen (Radix Codonopsis) 15 g or Taizishen (Radix Pseudostellariae) 30 g to the recommended

Table 9
Recommended herbs for aggravated infiltration lung lesions on chest imaging.

| Chinese Pinyin name | Latin name | Dose |
|---------------------|------------|------|
| Jinqiaomai          | Rhizoma Fagopyri Dibotryis | 30 g |
| Yuxingcao           | Herba Houtuyuanae | 30 g |
| Huangqin            | Radix Scutellariae | 15 g |
| Sanghaipi           | Cortex Mori | 15 g |
| Zhi Zisuri          | Fructus Perilleae Praeparata | 15 g |
| Mabiancao           | Herba Verbenae | 30 g |
| Guijanyu            | Ramulus Euonymi | 15 g |
| Dilong              | Pheretima | 15 g |

Table 10
Recommended Chinese patent medicines for progressing infiltration of lung lesions on chest imaging.

| Name                  | Dosage (intravenous drip) |
|-----------------------|---------------------------|
| Xuebijing Injection   | 100 mL for each dose, 2 doses a day |
| Tanreqing Injection   | 40 mL for each dose, 2 doses a day |

Table 11
Recommended herbs for persistent turbid greasy tongue coating.

| Chinese Pinyin name | Latin name | Dose |
|---------------------|------------|------|
| Binglang            | Semen Areciae | 12 g |
| Houpo               | Cortex Magnoliae Officinalis | 12 g |
| Caoguo              | Fructus Tsaoko | 9 g |
| Shaoyao             | Radix Paeniae | 15 g |
| Huangqin            | Radix Scutellariae | 15 g |
| Yiirenen            | Semen Coicis | 30 g |
| Sharen              | Fructus Amomi (dectoc last) | 6 g |
| Roudoukou           | Semen Myristae (dectoc last) | 6 g |
4. The primary TCM strategies for COVID-19 in the elderly population with chronic underlying diseases

Since chronic underlying diseases have a critical role for increasing morbidity and mortality in elderly patients with COVID-19, it is important to determine the treatment priorities and place more emphasis on the chronic underlying diseases in order to halt disease progression and protect the Zang-fu organs in this population. Other measures include general medical care, sufficient management of the chronic underlying diseases, proper daily nutrition, supporting normal bowel movements and preventing aspiration pneumonitis. The recommended formulas or treatment strategies for three underlying diseases are listed as follows.

Table 13
Recommended Chinese patent medicines for severe Yang deficiency.

| Name         | Chinese Pinyin name | Latin name                        | Dose |
|--------------|---------------------|-----------------------------------|------|
| Shengmai     | Fructus Corni       | 15–30 g                           |
| Shendu       | Radix Rehmanniae Praeparata | 15–30 g                        |
| Xuebijing    | Herba Cistanches    | 15 g                              |
| Zhi Wumei    | Fructus Mume Praeparata cum Melle | 6–9 g                          |

(1) For cases with chronic renal disease, the treatment strategy is to replenish qi, warm yang, activate blood and dredge intestines. The Chinese herbal formula should include an increased dose of Huangqi (Radix Astragali) to 30–90 g and the following additions (Table 14) to the recommended formulas.

(2) For cases with chronic cardiac disease, the treatment strategy is to replenish qi, warm yang, activate blood and promote urination. Add the following herbs (Table 15) to the recommended formulas.

(3) For cases with deficits caused by cerebrovascular disease, the treatment strategy is to replenish qi, warm yang, activate blood and dredge collaterals. The core herbs from Buyang Huanwu Tang (Yang-Supplementing and Five-Returning Decoction), Xuefu Zhyu Tang (Blood Stasis-Expelling Decoction), Tongqiao Huoxue Tang (Orifice-Unblocking and Blood-Invigorating Decoction), and Dahuoluo Dan (Major Collateral-Activating Elixir) can be added to the recommended formulas.

This expert consensus was given only as a reference for clinical decision making. While treating individualized patients, doctors need to take all causative factors into consideration, identify the etiology, pathogenesis and symptoms, make treatment strategy based on pattern identification, and modify the herbal dosage regimen according to the patient’s volume of fluid intake and output. Acupuncture treatment is suggested for once a day: use disposable filiform needles with a plastic guide tube, conduct even reinforcing-reducing manipulation, and retain the needles for 30 minutes for each treatment.

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Declaration of competing interests

The authors have no conflict of interests.

References

[1] Fang EF, Scheibye-Knudsen M, Jahn HJ, Li J, Ling L, Guo H, et al. A research agenda for aging in China in the 21st century. *Ageing Res Rev* 2015;24:197–205.
[2] Porcheddu R, Serra C, Kelvin D, Kelvin N, Rubino S. Similarity in case fatality rates (CFR) of COVID-19/SARS-COV-2 in Italy and China. *J Infect Dev Ctries* 2020;14(2):125–8.
[3] Grasselli G, Zangrillo A, Zanella A, Antonelli M, Cabrini L, Castelli A, et al. Baseline characteristics and outcomes of 1591 patients infected with SARS-CoV-2 admitted to ICUs of the Lombardy Region, Italy. *JAMA* 2020;323(16):1574–81.
[4] National Health Commission & State Administration of Traditional Chinese Medicine. Protocol for diagnosis and treatment of COVID-19 (trial 9th edition). (2020-02-22) [2022-05-28]. http://www.nhc.gov.cn/yzygj/s7653p/202002/ b74ade1ba494583805a3d2e4000388.shtml [Chinese].
[5] Zhang W. Consensus of Chinese medicine experts on novel coronavirus infection in Shanghai (Spring 2022 edition). *Shanghai Zhong Yi Yao Za Zhi* 2022; https://doi.org/10.16305/j.1007-1334.2022.2205047 [Chinese].