

Diagnosis and treatment plan ·

Expressway

2019 New Coronary Virus Pneumonia Respiratory Rehabilitation Guidance (Second Edition)

- [Chinese Rehabilitation Medical Association](#)
- [Respiratory Rehabilitation Committee of Chinese Rehabilitation Medical Association](#)
- [Cardiopulmonary Rehabilitation Group, Physical Medicine and Rehabilitation Branch, Chinese Medical Association](#)

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Summary

The new coronavirus pneumonia (COVID-19) is a highly contagious respiratory tract infectious disease that can cause respiratory, physical, and psychological dysfunction in patients. Respiratory rehabilitation is essential for the recovery of patients in clinical treatment and after treatment. With the deepening of understanding and the accumulation of diagnosis and treatment experience, we combined the opinions of front-line experts in the fight against the epidemic and consulted relevant literature evidence to propose a practical and feasible respiratory rehabilitation program: (1) For inpatients with COVID-19, The purpose is to improve the symptoms of dyspnea, relieve anxiety and depression, maximize function retention and improve quality of life; (2) for patients with severe and critical illness during the period of unstable disease or progressive exacerbation, premature interventional respiratory rehabilitation (3) It is recommended that isolated patients provide respiratory rehabilitation guidance through education videos, brochures or remote consultation; (4) evaluation and monitoring should be conducted throughout the entire respiratory rehabilitation treatment; (5) according to the guidelines Do classification protection. With a view to providing clinical guidance and basis for respiratory rehabilitation of COVID-19.

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Since December 2019, the new coronavirus pneumonia (COVID-19), which originated in Wuhan City, Hubei Province, has become a public health event spreading in various provinces and cities across the country and in many regions outside the country. China has incorporated the disease into a Class B infectious disease in accordance with the Law of the People's Republic of China on the Prevention and Control of Infectious Diseases, and has adopted measures for the prevention and control of Class A infectious diseases. The National Health and Health Commission has also issued related diagnostic and treatment plans to guide clinical diagnosis and treatment. With the accumulation of clinical treatment experience for patients with COVID-19, especially severe and critically ill patients, the understanding of COVID-19 continues to deepen, and patients may have different degrees of respiratory function, physical function and psychological dysfunction ^[1], Standardizing the operating techniques and procedures of respiratory rehabilitation is vital to the development of respiratory rehabilitation in various places. To this end, we combine the opinions of experts and front-line fight against the epidemic access to relevant documentary evidence, in the "2019 novel coronavirus pneumonia, pulmonary rehabilitation guidance (first edition)" ^[2] based on the organization of domestic evidence-based medicine, breathing and dangerous Experts in the field of critical medicine and rehabilitation medicine, and invited some experts on the front lines of prevention and treatment in Wuhan and other cities in Hubei Province to jointly write this recommendation.

I. Methodology

1. registered:

This recommendation has been registered with the International Practice Guidelines Registry Platform (<http://www.guidelines-registry.org>), registration number: IPGRP-2020CN016.

2. Recommendation Working Group:

The working group of recommendations is the recommendation development group, the evidence evaluation group and the expert consensus group. The formulation group is responsible for determining the theme and scope of the recommendation, guiding the evidence evaluation group to summarize the evidence and write the recommendation. The evidence evaluation team is responsible for the retrieval, evaluation and summary of relevant evidence.

The expert consensus group is responsible for reaching consensus on the preliminary recommendations.

3. Document Retrieval:

This recommendation includes guidelines, systematic reviews, and randomized controlled trials related to the three infectious diseases and rehabilitation of new coronavirus pneumonia, severe acute respiratory syndrome, and Middle East respiratory syndrome. Two members of the evidence evaluation team independently searched the English database: PubMed, Ovid, Embase, and the Chinese database: CBM, CNKI, CMJD, and searched for new crown pneumonia columns in relevant online websites: WHO, Elsevier, the Lancet, the New England Journal of Medicine, JAMA, 2019 New Coronavirus Information Database, Chinese Medical Journal Network. The search time period is from the construction of the database to February 21, 2020. Chinese search terms include: "New Coronavirus Pneumonia", "Severe Acute Respiratory Syndrome", "Middle East Respiratory Syndrome", "Atypical Pneumonia", "Flu", "Psychotherapy", "Psychological Intervention", "Guide", "Consensus", "guidance", "randomized controlled trial", and Chinese search terms related to rehabilitation include "respiratory rehabilitation", "pulmonary rehabilitation", "physical therapy", and "operational therapy"; Novel Coronavirus Pneumonia ", " NCP ", " Severe Acute Respiratory Syndrome ", " SARS ", " Middle East Respiratory Syndrome ", " MERS ", " Influenza ", " Occupational Therapy ", " Psychological Therapy ", " guideline ", " " statement ", "

4. Literature screening and evidence summary:

Two members of the evidence evaluation group used Endnote X9 literature management software to independently perform literature screening according to the inclusion and exclusion criteria, and summarized the results of the literature according to different rehabilitation topics. During the screening and summary process, the two are cross-checked in stages. If there is a difference, the third researcher is involved in the discussion and resolution.

5. Quality Evaluation:

The staff of the evidence evaluation team used the AGREE II tool and the methodological quality of the included guidelines, the AMSTAR tool to evaluate the quality of the systematic review, and the Cochrane bias risk assessment tool to evaluate the bias risk of randomized controlled trials.

6. Recommendation generation and consensus:

Based on the summary of evidence and the results of quality evaluation, the recommendation formulation group initially formulated rehabilitation recommendations based on existing relevant recommendations. The recommendation opinions are transferred to the expert consensus group, and the expert consensus group reaches consensus through the symposium to determine the final recommendation opinion.

Second, the basic principles of respiratory rehabilitation

1. premise:

First, strictly follow the requirements of "Technical Guidelines for the Prevention and Control of New Coronavirus Infection in Medical Institutions (First Edition)" ^[3] issued by the

National Health and Health Commission . All personnel who come into contact with patients for respiratory rehabilitation assessment and treatment must pass the local hospital's sensory control training and assessment before passing the job.

2. purpose:

For hospitalized patients with COVID-19, the purpose of respiratory rehabilitation is to improve symptoms of dyspnea, relieve anxiety and depression, reduce complications, prevent and improve dysfunction, reduce disability, preserve function to the greatest extent and improve quality of life.

3. opportunity:

Premature interventional respiratory rehabilitation is not recommended for severe and critically ill patients during periods of unstable or progressive exacerbations. The timing of respiratory rehabilitation interventions should exclude contraindications to respiratory rehabilitation, and basic guidelines should not be used to increase the burden of clinical infection protection. For the different clinical residual problems of discharged patients in the later stage, phased respiratory rehabilitation measures can be taken.

4. the way:

For patients in isolated spaces, it is recommended to use respiratory videos, brochures or remote consultations to guide patients in respiratory rehabilitation to save resources for protective equipment and avoid cross infection. Patients who have reached the cure standard and released from isolation and observation can carry out various forms of comprehensive rehabilitation treatment according to the indications and their own conditions.

5. personalise:

Regardless of the method of respiratory rehabilitation intervention, personalized principles should be followed, especially for patients with severe / critical illness, advanced age, obesity, multiple underlying diseases, and combined single or multiple organ complications. The respiratory rehabilitation team should The patient's specific problem is tailored to his individual respiratory rehabilitation program.

6. Evaluation:

Evaluation and monitoring should be continued throughout the respiratory rehabilitation process.

7. Protection ([Table 1](#)):

Table 1

Graded protection of respiratory rehabilitation for COVID-19 patients

Table 1

Graded protection of respiratory rehabilitation for COVID-19 patients

Protection level	Treatment items	Recommendations for the configuration of protective materials									
		Disposable work cap	Medical protective mask	Protective screen / goggles	Latex gloves	Work clothes	Anti-penetration gown	Disposable protective clothing	Sho cover	Comprehensive Respirator / Positive Headgear	Quick-drying hand disinfectant (75% ethanol)
First level	Continuous negative patients	+	+	-	+	+	-	-	-	-	+
Second grade	Confirmed patient, no aerosol generation scenario	+	+	+	+	+	-	+	+	-	+
Third grade	Confirmed patient with aerosol production scene	+	+	+	+(2 pairs)	+	+	+	+	+	+

注：目前尚无统一的NCP患者气道管理个人防护标准，本表根据我国《医院感染管理规范》及国内外相关指南归纳。

It is recommended to refer to the requirements of "Recommendations on Airway Management in Adults with Severe New Coronavirus Pneumonia (Trial)" and select the appropriate protective measures based on the task type ^[4]:

3. Recommendations on Respiratory Rehabilitation During the Hospitalization of Light Patients (Limited Hospital)

The clinical symptoms of the patients are mild, and they may have one or more physical disorders such as fever, fatigue, and cough. ^[5, 6] The diagnosed patients will experience anger, fear, anxiety, depression, insomnia or attack, and loneliness during the isolation treatment Or psychological problems such as non-cooperation and abandonment of treatment due to fear of disease ^[7], respiratory rehabilitation can improve patients' anxiety and depression ^[8].

[Recommended opinion]

1. Patient education: (1) help patients understand disease knowledge and treatment process through education, videos or manuals; (2) regular work and rest to ensure adequate sleep; (3) balanced diet; (4) quit smoking.

2. Activity recommendations: (1) exercise intensity: Borg dyspnea score ≤ 3 (total score of 10 points), it is advisable that fatigue does not occur on the second day; (2) exercise frequency: 2 times / d, exercise time 15 ~ 45 min / Times, after 1 h after a meal. (3) Exercise form: breathing rehabilitation exercises, Taijiquan, or square dance.

3. Psychological intervention: (1) quickly identify the type of psychological dysfunction through the self-assessment scale; (2) if necessary, seek the intervention of a psychiatric professional or a psychological hotline.

4. Recommendations on Respiratory Rehabilitation during Ordinary Patients' Hospitalization (Limited Hospital)

Isolation treatment is an effective means to cut off the transmission of the disease, but isolation treatment restricts the patient's space for movement, coupled with fever, fatigue, muscle pain and other discomforts ^[6]. Most patients have significantly increased sitting and lying time, and stay in bed for a long time. It can lead to decreased muscle strength, poor sputum drainage ^[9], and a significantly increased risk of deep vein thrombosis ^[10]. Psychological problems such as anxiety, depression, and lack of motivation can also cause exercise intolerance ^[11].

[Recommended opinion]

1. Intervention timing of respiratory rehabilitation for ordinary patients: Based on limited understanding of the pathophysiology of COVID-19, current clinical observations have found that approximately 3% to 5% of ordinary patients can progress to within 7 to 14 days of infection. Heavy or even critical, we recommend that the intensity of exercise activities should not be too large, in order to maintain the existing physical fitness. After the patient enters the cabin hospital, the patient's initial diagnosis, time from onset to dyspnea, and blood oxygen saturation ^[12, 13] are used to determine whether the patient can start respiratory rehabilitation.

2. Exclusion criteria: (1) body temperature: > 38.0 °C; (2) initial diagnosis time ≤ 7 d; (3) time from onset to dyspnea ≤ 3 d; (4) imaging: chest image progression within 24 to 48 h $> 50\%$; (5) blood oxygen saturation: $\leq 95\%$; (6) blood pressure: static blood pressure $< 90/60$ mmHg (1 mmHg = 0.133 kPa) or $> 140/90$ mmHg.

3. Exercise termination criteria: During the rehabilitation process, patients should stop breathing rehabilitation as soon as one of the following conditions occurs, and seek the help of doctors and nurses. (1) Dyspnea index: Borg dyspnea score > 3 (total 10 points); (2) chest tightness, belching, dizziness, headache, unclear vision, palpitations, sweating, inability to maintain balance, etc.; (3) other Clinicians judge situations that are inappropriate for activity.

4. The main interventions for respiratory rehabilitation include airway cleansing, breathing control, activity and exercise. (1) Airway cleaning: ① The method of dilation during deep inhalation can be used to help expel sputum when cleaning the airway; ② Use closed plastic bags to prevent sputum from spreading the virus. (2) Breathing control training: ① body position: generally sitting position, if you have shortness of breath can be taken in semi-

recumbent position / sitting position; ② action: relax the shoulder and neck auxiliary inspiratory muscles during training, slowly inhale through the nose, Exhale slowly and observe the expansion of the lower chest. (3) Recommendations for activities and exercise: ① intensity: recommended between resting (1.0 METs) and mild physical activity (<3.0 METs); ② frequency: 2 times a day, starting 1 h after a meal; ③ duration : Determine the activity time according to the patient's physical condition, each time 15 ~ 45 min; For patients who are prone to fatigue or frail, they can take intermittent exercise; ④ Form: Respiratory rehabilitation exercise, stepping, Tai Chi and thrombosis prevention exercise The management of patients with restricted autonomic activity is the same as that of severe patients.

Respiratory rehabilitation for severe and critically ill patients

Severe and critically ill patients account for approximately 15.7% of confirmed patients [6]. The latest pathological results show that early [14] and advanced lung lesions are mainly diffuse alveolar injury, no obvious fibrosis, and myocardial fibers are interspersed with lymphocyte infiltration, which may not exclude the possibility of viral myocarditis [15]. Many COVID-19 patients receiving mechanical ventilation completely lose spontaneous breathing under deep sedative analgesics, have no or only weak reflexes to stimuli, and have a high incidence of delirium [16]. Starting respiratory rehabilitation intervention at the right time can significantly reduce the time of delirium and mechanical ventilation, and improve the functional status of patients [17].

Before the rehabilitation intervention of severe and critically ill patients, a comprehensive assessment of the overall functional status of the patient must be performed, especially the state of consciousness, respiratory system, cardiovascular system and musculoskeletal system; patients who meet the respiratory rehabilitation intervention standards should start treatment as soon as possible ; Get the medical team's consensus and make adequate preparations before starting treatment; Patients who do not meet the rehabilitation intervention standards should be re-evaluated daily until the intervention standards are met; if an adverse event occurs during the rehabilitation process, the patient should be terminated in time and Report to the doctor in charge, identify the cause, and re-evaluate safety. Based on safety and human resources considerations, rehabilitation and treatment of severe and critically ill patients are only recommended for bed and bedside activities. Rehabilitation interventions should cover three major areas: (1) posture management; (2) early activities; (3)) Respiration management. According to the patient's consciousness and functional status, the selected therapeutic intervention techniques should be different.

[Recommended opinion]

1. Timing of intervention: Respiratory rehabilitation treatment can be started when all the following conditions are met [18]: (1) Respiratory system: ① inhaled oxygen concentration (FiO_2) ≤ 0.6 ; ② blood oxygen saturation (SpO_2) $\geq 90\%$; ③ respiratory frequency : ≤ 40 times / min; ④ positive end expiratory pressure (PEEP) ≤ 10 cmH₂O; ⑤ no ventilator-man-machine confrontation; ⑥ no unsafe airway hidden dangers. (2) Cardiovascular system: ① systolic blood pressure ≥ 90 mmHg and ≤ 180 mmHg; ② mean arterial pressure (MAP) ≥ 65 mmHg and ≤ 110 mmHg; ③ heart rate: ≥ 40 beats / min and $120 \leq$ beats / min ④ no new arrhythmia and myocardial ischemia; ⑤ no signs of shock accompanied by blood lactic acid ≥ 4 mmol / L; ⑥ no new unstable deep vein thrombosis and pulmonary embolism; ⑦ no suspicious aortic stenosis. (3) Nervous system: ① The Richmond Agitation-Sedation Scale

(RASS) -2 ~ + 2; ② Intracranial pressure <20 cmH₂O. (4) Others: ① No unstable limb and spine fractures; ② No serious liver and kidney disease or new and progressive liver and kidney function damage; ③ No active bleeding; ④ Body temperature ≤ 38.5 °C.

2. The following situation should immediately stop the rehabilitation ^[18]: (1) Respiratory system: ① oxygen saturation: <90% decrease or a change from baseline> 4%; ② respiratory rate:> 40 times / min; ③ breathing Man-machine confrontation; ④ artificial airway detachment or displacement. (2) Cardiovascular system: ① systolic blood pressure: <90 mmHg or> 180 mmHg; ② mean arterial pressure (MAP) <65 mmHg or> 110 mmHg, or a change of more than 20% from the baseline value; ③ heart rate <40 beats / min Or> 120 times / min; ④ new onset of arrhythmia and myocardial ischemia. (3) Nervous system: ① poor consciousness; ② restlessness. (4) Others: ① the disconnection of any treatment and monitoring pipelines connected to the patient; ② the patient's conscious palpitations, dyspnea or shortness of breath, and fatigue and intolerance;

3. Respiratory rehabilitation interventions: (1) Posture management: If physiological conditions allow, gradually increase the simulated anti-gravity position until the patient can maintain an upright position, such as a bedside elevation of 60 ° (the lower edge of the pillow rests on the scapula One to prevent the head from overstretching, a pillow is placed under the popliteal fossa to relax the lower limbs and abdomen). Orthostatic treatments are performed 3 times a day for 30 min each ^[19]. Patients with severe acute respiratory distress syndrome (ARDS) should be placed in a prone position for more than 12 hours per day ^[20]. (2) Early activities: Pay attention to prevent the disconnection of the pipeline connecting the patient during the entire activity, and monitor vital signs throughout. ① Intensity: patients with poor physical strength can reduce the degree of exertion, maintenance time or range of activities, and complete the action; ② duration: the total training time does not exceed 30 minutes at a time, as long as it does not cause increased fatigue; ③ form: First, regular bed rollovers and activities, sitting up from bed, bed-chair transfer, sitting on chair, standing and stepping in place, step by step in this order; second, active / passive full joint range exercise training ^[21]; Third, because of the use of sedatives or patients with cognitive impairment or physical limitations, the selected treatment techniques include passive power vehicles at the bedside, passive joint activities and stretching, and neuromuscular electrical stimulation ^[22]. (3) Respiration management: It mainly includes lung expansion and sputum discharge. The therapist does not need to contact the patient for a long time. Be careful not to cause the patient to have a severe irritating cough and increase in respiratory work. High frequency chest wall oscillation (HFCWO) is recommended ^[23] Or vibratory positive expiratory pressure (OPEP) treatment ^[24].

Respiratory rehabilitation treatment for discharged patients
(A) light and general discharge patients

The rehabilitation of light and ordinary patients after discharge is mainly to restore physical fitness and psychological adjustment. You can choose step by step aerobic exercise to gradually restore the patient's ability to move before the onset of illness and return to society as soon as possible.

(II) Patients discharged from severe / critical

Patients with COVID-19 severe / critically ill patients who still have respiratory and / or limb dysfunction after discharge should receive respiratory rehabilitation. Based on the current

evidence of patients discharged from SARS and Middle East respiratory syndrome (MERS) [25, 26] and clinical experience of ARDS patients recovering from discharge, patients with COVID-19 may have poor performance, shortness of breath after exercise, and muscle atrophy (including respiratory muscles and trunk muscles) [27] and psychological disorders such as post-traumatic stress syndrome [28]. When patients with pulmonary hypertension, myocarditis, congestive heart failure, deep venous thrombosis, unstable fractures and other diseases should consult the specialists for relevant precautions before starting respiratory rehabilitation.

[Recommended opinion]

1. Exclusion criteria: (1) heart rate > 100 beats / min; (2) blood pressure <90/60 mmHg or > 140/90 mmHg; (3) blood oxygen saturation ≤95%; (4) other diseases not suitable for exercise.

2. Exercise termination criteria: (1) body temperature fluctuates, > 37.2 °C; (2) respiratory symptoms and fatigue worsen and do not ease after rest; (3) the following symptoms should be stopped immediately and consult a doctor: chest tightness, chest pain, dyspnea, Severe cough, dizziness, headache, unclear vision, palpitations, sweating, unstable standing and other symptoms.

3. Rehabilitation evaluation: (1) Clinical evaluation: physical examination, imaging examination, laboratory examination, lung function examination, nutrition screening, ultrasound examination, etc. (2) Evaluation of exercise and respiratory function: ① Respiratory muscle strength: maximum inspiratory pressure / maximum expiratory pressure (MIP / MEP); ② Muscle strength: the sixth grade muscle strength assessment (the UK medical research council (MRC), manual muscle test (MMT), isokinetic muscle testing (IMT); ③ joint range of motion (ROM) measurement; ④ balance function evaluation: Berg balance Scale (Berg balance scale, BBS); ⑤ Aerobic exercise capacity: 6 minute walk test (6MWT), cardiopulmonary exercise test (CPET); ⑥ Physical activity assessment: International physical activity level Table (international physical activity questionnaire, IPAQ), physical activity scale for the elderly (PASE), etc. (3) Assessment of daily living ability: assessment of activities of daily living (ADL) (barthel index).

4. Respiratory rehabilitation interventions: (1) Patient education: ① Make manuals or video materials to introduce the importance, specific content, and precautions of respiratory rehabilitation treatment to increase patient compliance; ② Healthy lifestyle education; ③ Encourage patients to more Participation in family and social activities. (2) Recommendations for respiratory rehabilitation: ① Aerobic exercise: formulate aerobic exercise prescriptions for patients with combined basic diseases and residual dysfunction, such as walking, brisk walking, jogging, swimming, etc., starting from low intensity, gradually increasing intensity Duration: 3 to 5 times per week, each time 20 to 30 minutes. Intermittent exercise can be used for patients who are prone to fatigue; ② Strength training: Progressive resistance training is recommended for strength training [25, 29]. The training load of each target muscle group is 8 ~ 12 RM (Repetition Maximum, that is, each group Repeat the load of 8 to 12 actions), 1 to 3 groups / times, each group has a training interval of 2 minutes, a frequency of 2 to 3 times / week, a training period of 6 weeks, and a weekly increase of 5% to 10%; ③ balance training : Patients with balance dysfunction should be involved in balance training, including free-hand balance training and balance training equipment under the guidance of a rehabilitation therapist; ④ breathing training: if the patient has shortness of breath, wheezing, difficulty in sputum discharge, etc. Symptoms should be combined with the assessment results to target

breathing pattern training [30, 31] and expectoration training [32]. Breathing mode training: including body management, adjusting breathing rhythm, thorax activity training, and mobilizing breathing muscle group participation; sputum training: first, patients with original chronic airway disease can use the breath when cleaning the airway early in the hospital. Techniques help reduce sputum and reduce energy consumption in coughing. Secondly, assist with positive expiratory pressure (PEP) / OPEP and other equipment. (3) ADL guidance: ① Basic activities of daily living (BADL): Assess the patient's ability to perform daily activities such as training transfer, grooming, toileting, and bathing, and provide rehabilitation guidance for these daily life obstacles [33] ② Instrumental activities of daily living (IADL): Assess the ability of instrumental daily activities, find out the obstacles of task participation, and conduct targeted intervention under the guidance of occupational therapists.

Respiratory rehabilitation in Chinese medicine

Traditional Chinese medicine respiratory rehabilitation is mainly targeted at patients with mild and common types and post-hospital patients. If there are no contraindications (such as limb dysfunction, abnormal consciousness, etc.), it is recommended to perform Baduanjin after evaluation by professionals [34, 35, 36], Jian Taijiquan [34, 35, 36, 37, 38], breathing guidance exercise training [39, 40], Liu Zi Jue [34, 37], etc., can choose one or two. The recommendations are as follows.

1. Baduanjin:

When practicing, pay attention to being calm and natural, accurate and flexible, training and supporting, and step by step. The eight actions were repeated 6 to 8 times, for a total of about 30 minutes; 1 set / d.

2.24-style Taijiquan:

The movements are gentle, emphasizing consciousness to guide breathing and cooperate with whole body movements. Each set of time (including pre-training activities and relaxation activities after the end) takes about 50 minutes, 1 set / d (<https://mp.weixin.qq.com/s/NYY5Ts4N09zzZCpiL8nAvG>).

3. Breath Guiding Exercise:

Including 6 periods of loose standing, two-field breathing, conditioning lungs and kidneys, turning side fingers, Moyun Shentang, nourishing qi and recuperating power, each set takes about 30 minutes, 1 set / d (<https://mp.weixin.qq.com/s/1eNdxRWRoPKoxgIvZ9xpQw>).

4. Qigong rehabilitation method:

Liu Zi Jue regulates the breathing and entrainment method of visceral and meridian qi and blood movement through different pronunciation patterns of six characters: 呬, 呵, 呼, 呼, 嘘. Each set will practice each word 6 times, a total of about 30 minutes, 1 set / d (<https://mp.weixin.qq.com/s/ibsxWq5cDo40Jxz8mZzv-Q>).

Concluding remarks

Combining the latest research results on respiratory rehabilitation and COVID-19 at home and abroad, as well as the accumulation of clinical experience, we carefully added the timing of rehabilitation intervention on the basis of the first edition, and modified the respiratory rehabilitation in accordance with the clinical problems at different stages. The plan hopes to assist the front-line clinical diagnosis and treatment, maintain the physical function of the patient, and promote their psychological reconstruction and remodeling of their ability to move. As the understanding of COVID-19 continues to increase and a large number of patients are cured and discharged, the third edition of the update will give more detailed guidance on home respiratory rehabilitation.

Finally, I would like to pay the highest tribute to all medical staff who are fighting in the front line of the epidemic.

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- 表1

对COVID-19患者进行呼吸康复治疗的分级防护

防 护 级 别	治疗项目	防护物资配置建议									
		一 次 性 工 作 帽	医 用 防 护 口 罩	防 护 面 屏/ 护 目 镜	乳 胶 手 套	工 作 服	防 渗 透 隔 离 衣	一 次 性 防 护 服	鞋 套	全 面 型 呼 吸 防 护 器/ 正 压 头 套	速 干 手 消 毒 剂 (75%乙 醇)
一 级	连续转阴患者	+	+	-	+	+	-	-	-	-	+
二 级	确诊患者，无气溶胶产生场景	+	+	+	+	+	-	+	+	-	+
三 级	确诊患者，有气溶胶产生场景	+	+	+	+(2 双)	+	+	+	+	+	+

注：目前尚无统一的NCP患者气道管理个人防护标准，本表根据我国《医院感染管理规范》及国内外相关指南归纳。

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