



## Chest Physiotherapy in COVID-19

Authors

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### Abstract

*This document outlines respiratory physiotherapy for COVID-19 in the hospital care. It includes physiotherapy screening, planning and implementing in the acute care setting caring for adult patients with suspected and/or confirmed COVID-19. Airway management of patients with COVID-19 is very essential and aimed to develop chest physiotherapy principles for airway management of patients with COVID-19 to encourage safe, accurate and better performance. This consensus statement has been brought together at short notice to advise on airway management for patients with COVID-19, drawing on published literature and immediately available information from clinicians and experts.*

**Keywords:** Corona virus, COVID 19, chest physiotherapy, rehabilitation.

### Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a new coronavirus that emerged in 2019 and causes Coronavirus Disease 2019 (COVID-19)<sup>1</sup>. SARS-CoV-2 is highly contagious. It differs from other respiratory viruses in that it appears that human-to human transmission occurs approximately 2 to 10 days prior to the individual becoming symptomatic. The virus is transmitted from person to person through respiratory secretions. Transmission is thought to be predominantly by droplet spread. Most common complication in covid patients is severe pneumonia and others include Adult respiratory distress syndrome<sup>2</sup>

### Purpose

Physiotherapy will have a role in providing exercise, mobilization and rehabilitation interventions to survivors of critical illness associated with COVID-19 in order to enable a functional return to home. It is therefore essential to initiate early rehabilitation after the acute phase of respiratory distress in order to limit the severity of ICU-acquired weakness and promote rapid functional recovery<sup>6</sup>.

### Indications

- Mild symptoms and/or pneumonia and evidence of exudative consolidation,
- Co-existing respiratory or neuromuscular co-morbidity<sup>7</sup>

- With difficulty clearing or inability to clear secretions independently.
- Severe symptoms suggestive of pneumonia/ lower respiratory tract infection (eg, increasing oxygen requirements; fever; difficulty breathing; frequent, severe or productive coughing episodes<sup>3</sup>
- Chest x-ray, CT or lung ultrasound changes consistent with consolidation
- Any patient at significant risk of developing or with evidence of significant functional limitations eg, patients who are frail or have multiple co-morbidities.<sup>4</sup>
- Impacting their independence eg in ICU patients with significant functional decline and/or (at risk for) ICU acquired weakness<sup>5</sup>

#### Contra Indications

- Mild symptoms without significant respiratory compromise (eg, fever, dry cough, no chest x-ray changes)<sup>10</sup>
- Pneumonia presenting with features:
  - a) a low-level oxygen requirement (eg, oxygen flow  $\leq 5$  l/min for SpO<sub>2</sub>  $\geq 90\%$ )
  - b) non-productive cough<sup>11</sup>
  - c) or patient coughing and able to clear secretions independently

#### Method

##### World Health Organization Guidelines:

Respiratory physiotherapy interventions in hospital wards or ICU may be indicated for patients who have suspected or confirmed COVID-19 and concurrently or subsequently develop exudative consolidation, mucous hyper secretion and/or difficulty clearing secretions<sup>12</sup>.

- Techniques to facilitate secretion clearance include assisted or stimulated cough maneuvers and airway suctioning<sup>8</sup>.
- Prescribe exercise and assist patients to mobilize.

To Progressively wean the patient from o<sub>2</sub> support and ventilator specific strategies and respiratory intervention are needed<sup>9</sup>

#### Physiotherapy Management Principles

##### A. Mobilization, B. Exercise and C. Rehabilitation

Personal protective equipment is essential for droplet precautions

- ✚ an N95/P2 mask
- ✚ fluid-resistant long-sleeved gown
- ✚ goggles or face shield
- ✚ gloves should be appropriate for the provision of mobilization, exercise<sup>10</sup>.

#### Chest Physiotherapy

##### A. Mobilization and other specific techniques

**Physiotherapy specific Aerosol Generating techniques need to be carried out only when essential and minimised as possible<sup>18</sup>.**

**Negative pressure Rooms are preferred for carrying out the procedures.**

- Cough-generating procedures (eg, cough during treatment or huff)<sup>19</sup>
- Positioning or gravity-assisted drainage techniques and manual techniques (eg, expiratory vibrations, percussion and manual assisted cough) that may trigger a cough and sputum expectoration<sup>13</sup>
- Use of positive pressure breathing devices (eg, inspiratory positive pressure breathing), mechanical insufflation-exsufflation devices, intra/extra pulmonary high-frequency oscillation devices (eg, The Vest, MetaNeb, Percussionaire)
- PEP and oscillating PEP devices
- Bubble PEP
- Nasopharyngeal or oropharyngeal suctioning
- Manual hyperinflation
- Sputum inductions- Inhaling an aerosol of saline

Posture of the patient in extended semi sitting or sitting position and avoiding a slumped position is recommended in spontaneously breathing patients or those of the patients in Non-invasive Ventilatory support<sup>14</sup>. Pronation position is recommended in invasive mechanical ventilation which is well recommended to treat hypoxemic respiratory failure.

Treatments and procedures used by the physiotherapist should not increase the patient work of breathing<sup>15</sup>. It is better to avoid common practices like Diaphragmatic breathing, pursed lip breathing, Respiratory muscle training and incentive spirometer in acute cases.

## B. Exercise

### ● Aerobic Exercise

Before infection aerobic exercise is recommended to strengthen cardiovascular health. Once infected, during the period of mild symptoms, moderate daily aerobic exercise can improve lung ventilation. Such exercise may benefit immune function as well. Ideally, do this exercise outdoors or with open windows or otherwise well ventilated areas. In sufficient warm climates, longer walks or even running may improve lung capacity. Jumping jacks, jogging in place, or dancing can be done even in small spaces<sup>16</sup>.

### ● Deep Breathing

Deep breathing and exhalation bring fresh air in and can improve lung capacity. Expelling viral particles from the more stagnant areas of the lung may further decrease self-exposure to viral particles. Deep breathing is often recommended for health and well being and can be done multiple times a day on a regular schedule<sup>17</sup>.

## C. Rehabilitation

- Physiotherapists are responsible for the provision of musculoskeletal / neurological / cardiopulmonary rehabilitation tasks including:
- Passive, active assisted, active, or resisted joint range of motion exercises to maintain or improve joint integrity and range of motion and muscle strength<sup>18</sup>
- Mobilization and rehabilitation (e.g. bed mobility, sitting out of bed, sitting balance, sit to stand, walking, tilt table, standing hoists, upper limb or lower limb ergometry, exercise programs)<sup>19</sup>.
- Sit out of bed

- Perform simple exercises and activities of daily living.
- Use elastic resistance bands rather than distributing hand weights.
- Larger equipment (eg, mobility aids, ergometers, chairs and tilt tables) must be easily decontaminated. Stretcher chairs or tilt tables with appropriate cleaning and are indicated for progression of sitting/standing<sup>20</sup>.

## D. Equipments for mobilization, exercise and rehabilitation<sup>21</sup>

- Trans motion/oxford chairs
- High back sitting chairs
- Rollators
- Tilt Table
- Cycle ergometers
- Steps/blocks
- Bariatric equipment

## Conclusion

The management of patients with known or suspected COVID-19 requires specific considerations to safety and accuracy and avoid unreliable, unfamiliar or repeated techniques during airway management. This document highlighted chest physiotherapy principles that may achieve the goals for better functional recovery of patients with COVID-19.

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