

## Covid-19 and physiotherapy

### Information for physiotherapists

The WHO recommend limiting the number of health care workers in contact with a suspected and confirmed COVID-19 patients. Limit number of persons present in the room to the absolute minimum required for the patient's care and support. This has been confirmed for physiotherapists working with COVID-19 patients the intensive care unit (ICU) and wards.

Acutely unwell confirmed or suspected COVID-19 patients should NOT be routinely in physiotherapy. There are currently no reports that suggests COVID-19 patients have high secretion loads requiring intensive respiratory physiotherapy/airway clearance.

Physiotherapists will have a role in the rehabilitation of COVID-19 patients who have not returned to their functional baseline once they are no longer acutely unwell.

The COVID-19 may present with mild, moderate, or severe illness. Among severe clinical manifestations, there are severe pneumonia, acute respiratory distress syndrome (ARDS), sepsis, and septic shock. The symptoms can be dyspnoea and increased oxygen requirement due to increased fluid in the alveoli and mucus distal in the bronchioles. Other patients can present with high fever and dry cough.

- **Uncomplicated (mild) Illness:** These patients usually present with symptoms of an upper respiratory tract viral infection, including mild fever, cough (dry), sore throat, nasal congestion, headache, muscle pain, or malaise. Signs and symptoms of a more serious disease, such as dyspnoea, are not present. Non-respiratory symptoms such as diarrhea can be present.
- **Moderate Pneumonia:** Respiratory symptoms such as cough and shortness of breath (or tachypnoea in children) are present without signs of severe pneumonia.
- **Severe Pneumonia:** Fever is associated with severe dyspnoea, respiratory distress, tachypnoea (> 30 breaths/min), and hypoxia (SpO<sub>2</sub> < 90% on room air). However, the fever symptom must be interpreted carefully as even in severe forms of the disease, it can be moderate or even absent. Cyanosis can occur in children.
- **Acute Respiratory Distress Syndrome (ARDS):** The diagnosis requires clinical and ventilatory criteria. This syndrome is suggestive of a serious new-onset respiratory failure or for worsening of an already identified respiratory picture. Different forms of ARDS are distinguished based on the degree of hypoxia.

### MEDICAL TREATMENT

Symptomatic treatment, prevention of complications, possible oxygen therapy in patients with severe infection, mechanical ventilation (MV) and hemodynamic support. Non invasive ventilation (NIV) and high flow oxygen is to be avoided in Landspítali due to possible aerosol distribution.

### PHYSIOTHERAPY

**Only enter into the patient's isolation area if there is a direct indication for respiratory physiotherapy or mobilization.** Then use full protective equipment for infection control.

Hypoxia and increased oxygen requirement (severe viral pneumonia or ARDS) can be due to fluid in the lungs, not sputum. Physiotherapy is tailored to patient needs and depends on conscious state, psychological and physical function of the patient. It can incorporate any therapy that promotes movement and includes mobilization, as well as respiratory therapy.

Bear in mind that certain physiotherapeutic techniques come with possible aerosol distribution who increase the risk of contamination.

- Cough machine, High frequency oscillation devices (CoughVest / Percussionaire). Cough machine is generally not used in ARDS due to possible barotrauma.
- Positive Expiratory Pressure (PEP) Acapella and other devices that may lead to coughing and expectoration of sputum. If PEP is used it is advised to turn the expiratory part downwards.
- Manual Techniques (percussion and manually assisted cough) that may lead to coughing and expectoration of sputum. Percussion is not supported by scientific evidence.
- Any Mobilization or Therapy that may result in coughing and expectoration of mucus

### **Patients on the out-patient unit in Birkiborg**

**Education:** The patient will be advised to download a LSP app with multidisciplinary information on COVID-19, including education from physiotherapist on breathing and mobilization. If needed the patient can ask for further information by a telephone contact.

### **Patients admitted to Landspítali, with less severe cases**

**Only enter into the patient's isolation area if there is a direct indication for respiratory physiotherapy or mobilization.** Then use full protective equipment for infection control.

**Education on breathing exercises and upright mobilization.** The patient may have downloaded the LSP app with multidisciplinary information on COVID-19 treatment, if not it is recommended. The physiotherapist assesses the patient's condition by reading the SAGA notes and through dialog with the patient's nurse and/or physician. Then the physiotherapist writes down an individual plan for respiratory therapy and mobilization the patient in the LSP booklet "Öndunaræfingar", and asks the nurse to hand it to the patient with explanations, if the patient can read and receive information. The patient needs to be educated on the importance of mobilization to an upright position, sitting on the edge of the bed or in a chair for a minimum of 20 minutes,  $\geq 2$  times a day. Mobilization to an upright position will "open up the lungs", (increase functional residual capacity) and increase the efficacy of the respiratory muscles. Provide educational material "Fræðsla til deilda, mobilisering, COVID-19.

The above treatment should be through educational material that the nurses provide to each patient (through the physiotherapist). The physiotherapist then follows up by a telephone contact with the patient.

Additionally the physiotherapist monitors each patient daily for increased sputum or atelectasis or immobilisation, and initiates appropriate physiotherapy intervention if there is a direct indication. Then use full protective equipment.

**Mobilization.** If the nurses cannot perform upright mobilization when indicated, the physiotherapist will intervene and direct mobilization. Aim toward sitting on the edge of the bed or in a chair for a minimum of 20 minutes,  $\geq 2$  times a day

**Techniques to improve lung volume if indicated.** Teach the patient Active Cycle of Breathing Control Technique (ACBT) using the Breathing Control (BC) with pursed lip breathing (PLB) (5x), and Thoracic Expansion Exercises (TEE), possibly with end inspiratory hold for 3 seconds (2-3x). If it is difficult for the patient to reach full inspiration in TEE, breath stacking can be initiated where the patient draws many small breaths to full lung volume. Voldyne or Incentive Spirometry can also be used.

**Airway clearance techniques if indicated.** Teach the patient to huff (expiration with the vocal cords open), long soft huff where the sputum will slowly move towards the mouth, and

short strong huff to mobilize the sputum from a more central lung areas. Do not stay close to the patient if he starts to cough, preferably behind him some distance away. Huff can be in combination ACBT, PEP therapy or Acapella. If PEP is used, turn the part with resistance (expiratory flow) down.

**Techniques to improve dyspnea.** Use positioning (high resting position in bed (30-40°) and possible forward leaning with arm support on knees or a table if sitting). Teach BC with PLB for the patient to use during mobilization. Provide educational material "Fræðsla til deilda, mobilisering, COVID-19.

### **Patients in ICU or ward with more severe cases**

Likely be in the ICU, intubated and on mechanical ventilation. **Only enter into the patient's isolation area if there is a direct indication for respiratory physiotherapy or mobilization.** Then use full protective equipment for infection control.

**Positioning** is a vital component of management for the mechanically ventilated COVID-19 patient, with regular turning recommended to prevent atelectasis, optimise ventilation and prevent pressure sores. Positioning can include high sitting in bed (30-40°) with pillows to support the arms or side lying. Prone ventilation may improve lung mechanics and gas exchange, thus improving oxygenation in the majority of patients with ARDS, and could improve outcomes.

**Contracture prevention:** Advise nurses on contracture prevention during the first days. Support ankles in a 0°, support wrists in 30° extension, move shoulders to 80-90° abduction with external rotation (very carefully). If MV is longer than 6-7 days, the physiotherapists will see the patient daily and perform passive range of motion exercises to monitor for and prevent contractures.

**Mobilization** to an upright position is to start as soon as the patient's condition allows. If the ICU staff is not able to perform upright mobilization with the patient when indicated, the physiotherapist will intervene and direct mobilization. Aim toward sitting on the edge of the bed or in a chair for a minimum of 20 minutes,  $\geq 2$  times a day

**Respiratory physiotherapy** after extubation as indicated, see description in section on less severe cases. In the case of pandemic viral pneumonia illness with ARDS, mechanical in-exsufflation is absolutely not indicated for patients who may have an acute lung injury. Manual techniques: There is not great evidence for percussion, but expiratory vibrations or a manually assisted cough could be used to improve cough effectiveness.

### **On Call Physiotherapy**

If On-call physiotherapy is indicated, it is generally decided by the ICU or ward physiotherapist. The following is not appropriate for emergency call-out for patients with COVID-19: Patients with a diagnosis of COVID 19 with a dry unproductive cough. Patients with a diagnosis of COVID 19 with a severe hypoxaemia requiring intubation. The nurses can assist most patients with mobilization who are then unlikely to require on-call physiotherapy.

### **Rehabilitation phase**

This is the main role of the physiotherapist in the management of the patient with COVID-19. There is strong evidence to suggest that early mobilization with a focus on returning to functional activities helps in reducing length of hospital stay and minimising functional decline, thus the sooner patients start mobilizing, the sooner they can leave the ICU, and potentially have better long-term outcomes. Rehabilitation is initiated in the ICU, followed by

ward-based rehabilitation. Rehabilitation should incorporate a multi-disciplinary approach including measures to prevent avoidable physical and non-physical morbidity.

This information is based on the current knowledge. This document is dynamic and will be revised. As of today we do not know when the use of full protective equipment can be discontinued.

## **HEIMILDIR**

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