Irish Society of Chartered Physiotherapists
The Voice of Physiotherapy in Ireland

Guide

for

Rehabilitation of In-Patients with COVID-19

(Version 1.1 -26-05-2020)

May 2020

ASTHMA COPD

1. Policy Statement

The Irish Society of Chartered Physiotherapists (ISCP), hereafter referred to as the Society, is the sole professional organisation for chartered physiotherapists in Ireland. The ISCP expects its members to follow this Guide.

2. Purpose

The purpose of the document is to guide chartered physiotherapists in relation to treating inpatients with COVID-19.

3. Scope

The document applies to all members who are providing a rehabilitation service to inpatients with COVID-19.

4. Legislation and other related policies and documents

The information contained in this document is intended to be used in conjunction with the Society's Rules of Professional Conduct incorporating the Code of Ethics and Guidelines for Professional Behaviour, the European Region (WCPT) Quality Assurance Standards of Physiotherapy, the ISCP Scope of Practice and relevant employer policies.

5. Glossary of Terms and Definitions

In this document:

"Chartered Physiotherapist" is a member of the Irish Society of Chartered Physiotherapists.

"Treatment" and "intervention" are used interchangeably throughout the document.

"Patient" and "client" are used interchangeably throughout the document.

Introduction

COVID-19 emerged in China in December 2019, so there is limited evidence available in relation to rehabilitation needs and there is currently no robust evidence detailing long-term outcomes for this patient cohort. Physiotherapists are utilising the available information from other countries and previous experiences with ARDS (Acute Respiratory Distress Syndrome). Carda et al (2020) have outlined the importance of physical medicine and rehabilitation in this cohort, considering the extensive disabilities being encountered by those patients with mild, severe or critical forms of COVID-19. These include respiratory symptoms, deconditioning, critical illness myopathy and neuropathy, joint stiffness and pain. Physiotherapy is anticipated to be of vital importance in the recovery process.

This document divides the physiotherapy rehabilitation management of these patients into three distinct phases: Intensive Care Unit (ICU management), ward-based management (with or without ICU stay) and post-acute.

This document has been developed for reference and guidance by the Irish Society's Chartered Physiotherapists' Clinical Interest Group in Respiratory Care (CPRC) and endorsed by its Clinical Interest Group in Neurology and Gerontology (CPNG).

Disclaimer: The document was developed based on the available evidence on 26th April 2020. It is expected that all physiotherapists utilising this document will work within their scope of practice in line with local policies, procedures and guidelines.

Information common to all phases of treatment

Treatment options

- Passive, active assisted, active or resisted joint range of movement (ROM) exercises, bed mobility, sitting balance, sitting out of bed, sit to stand, walking, tilt table, standing hoists, upper limb or lower limb ergometry, exercise programmes and neuromuscular electrical stimulation (Thomas et al, 2020).
- The use of equipment should be carefully considered and discussed with local infection prevention and control teams prior to being used for patients with COVID-19 to ensure it can be properly decontaminated.
- As patients progress to phase 3, the usual principles of rehabilitation will apply. There is an additional need to be cognisant of the limitations with which patients with COVID-19 may present and the difficulties these pose in relation to treatment.

Monitoring and when to stop rehabilitation

- Heart rate, respiratory rate and oxygen saturation (SpO_2) should be monitored throughout rehabilitation to identify early clinical deterioration (Carda et al, 2020).
- Fatigue is present in 40% of cases and this should be taken into account in rehabilitation (Wang et al, 2020).
- Patients with severe and critical COVID-19 frequently show hypercoagulability (Carda et al, 2020) and so are at risk of thromboembolic events – monitor for signs of CVA, DVT and / or PE throughout rehabilitation. Alongside the inflammatory process of the COVID-19 infection, hypoxaemia and immobility may also predispose patients to thromboembolic complications. Abnormalities in coagulation appear to be common and are associated with poorer outcomes (BTS, 2020).
- Rehabilitation should be discontinued in cases of high temperatures, worsening dyspnoea, SpO_2 <93% or if a 4-point drop during exercise is seen (desaturation), chest tightness, belching, dizziness, headache, unclear vision, palpitations, sweating, inability to keep balance, increased need for Oxygen (O_2) or Non-invasive ventilation (NIV) support, evidence of radiological lesions' progression (>50%) within 24-48 hours (Vitacca et al, 2020).

Outcome measures

- Consider the selection of validated outcome measures which will be informative to track patient progress but will not require a large amount of equipment.
  In phase 1, Chelsea Critical Care Physical Assessment Tool (CPAX) (Corner et al, 2016), Manchester Mobility score (MMS) (McWilliams et al, 2015) or manual muscle strength testing are useful.
  As patient's functional ability improves, consider the Short Physical Performance Battery (SPPB) or 30 Seconds Sit-to-Stand test (Spruit et al, 2020). Hand grip dynamometry is one outcome measure that could be used across the continuum of care to track recovery.

COVID-19 Respiratory Scale (ITS/NCP)

Category	
A	No Oxygen requirement or Nasal cannula ≤3L min SpO_2 >94%, Respiratory rate (RR)<20
B	Nasal cannula >3 L min / Venturi mask 24-60% SpO_2 <94%, RR>20 but responds well to nasal cannula
C	C1: High Flow Nasal O_2 (HFNO) (Airvo) SpO_2 <94%, RR>20, poor response to Venturi mask C2: Non-invasive ventilation (NIV – CPAP preferred mode) SpO_2 <94%, RR>20, poor response to venture mask
D	Intubated SpO_2 <94%, RR>20 but poor response to HFNO / NIV

Phase 1: ICU (Category D)

ICU patients are at risk of developing ICU acquired neuromuscular weakness (ICUAW) due to prolonged periods of protective lung ventilation, sedation and use of neuromuscular blocking agents (Kress, 2014). ICUAW is seen in more than 25% of ICU survivors (Fan et al, 2014) and is associated with impairments in patients' long-term survival, physical functioning and quality of life (Devlin et al, 2018). Early

rehabilitation has been shown to have a positive impact in preventing long-term functional disabilities associated with post intensive care syndrome (PICS) (Balas et al, 2014) and has a significant effect on the functional status, muscle strength, mechanical ventilation duration, walking ability at discharge, and health quality of life (Arias-Fernandez et al, 2018). Patients with COVID-19 may be at high risk due to prolonged exposure to such risk factors in the ICU (Category D). Rehabilitation will be a key role for physiotherapists in the management of patients with COVID-19.

The basic principles of patient centred, evidence-based rehabilitation for patients with COVID-19 are the same as for those of the general ICU population. All decisions about rehabilitation must be based on clinical need and presenting signs and symptoms. The World Health Organization recommends active mobilisation of patients with COVID-19 early in the course of illness when it is safe to do so. However, it should not be commenced until the patient has reached a minimum clinical stability, e.g. stable respiratory and haemodynamic function (Green et al, 2016; Hodgson et al, 2014). This will require frequent liaison with intensive care and medical teams to ensure clinical stability to exercise.

The aims of rehabilitation in the intensive care setting are to minimise disability and optimise functional capabilities in the form of aerobic exercises, strength training and static/dynamic balance training. Consider using an outcome measure which is validated and reliable for the general ICU population. Hand grip dynamometry may provide a feasible diagnostic and prognostic assessment of ICUAW (Braganca et al, 2019).

Due to the prevalence of fatigue, caution is required when patients are being weaned from the ventilator so as not to overload the respiratory system. Equally, once patients with COVID-19 are extubated, pacing of various therapies is vital. Inspiratory muscle training can reduce ventilator weaning time (Vorona et al, 2018) and improve inspiratory muscle strength (Hodgson and Tipping 2016).

Common barriers to rehabilitation in the usual ICU setting may be more apparent during this pandemic due to changes in level of staff experience, unanticipated leave due to isolation or sick leave, general operation of the ICU as well as PPE/isolation requirements. Strong physiotherapy leadership, robust planning (including provision of education and support to less experienced physiotherapists) and wider communication with the multidisciplinary team will be required for safe, effective and timely rehabilitation of patients with COVID-19 in intensive care.

Phase 2: Ward based management (Category B/C)

Phase 2 of rehabilitation looks at those who may have been discharged from ICU (Category D) to the ward or those who did not require escalation to ICU (Category B/C). These patients may have high O_2 requirements and/or be dependent on NIV. It is expected that recovering from severe respiratory illness and the secondary effects from intensive care treatments such as Critical Illness Polyneuropathy and Critical Illness Myopathy will have an impact on patients' rehabilitation (Stem et al, 2020).
Patients with severe and critical COVID-19 are potentially very unstable and have low exercise tolerance, therefore physical rehabilitation may be limited (Carda et al, 2020). Comorbidities, like hypertension, diabetes and coronary heart disease are common in hospitalised patients with COVID-19 (Zhou et al, 2020) which may impact on their rehabilitation and, as previously mentioned, fatigue is also highly prevalent in this patient cohort (Wang et al, 2020).

In the acute phase, the physiotherapist will play a role in the weaning of non-invasive ventilator supports and oxygen therapy (Vitacca et al, 2020) and airway clearance techniques may also be beneficial to those who are unable to clear their secretions independently (Thomas et al, 2020). A guide to the Respiratory Physiotherapy management of these patients has been documented elsewhere (Thomas et al, 2020).

From a physical rehabilitation perspective, similar to the ICU setting, the physiotherapist will be aiming for disability prevention through the use of range of motion exercises to maintain or improve joint integrity and strength as well as utilising functional activities (Thomas et al, 2020). However, these patients may be dependent on oxygen or NIV, therefore the physiotherapist must prescribe exercises individualised to the patient without overloading the respiratory or cardiovascular systems. These patients will require close monitoring and exercise prescriptions may need to be adjusted accordingly.

Phase 3: Post-Acute Phase

Phase 3 may consist of patients who have progressed from a critical care stay to sub-acute wards or a rehabilitation unit, and therefore present with many of the problems described in the previous sections or those admitted directly to an acute medical ward

for medical management of COVID-19 or co-infections e.g. community acquired pneumonia. It also includes patients who may have had de-escalation of care or never progressed to Category D (ITS/NCP Respiratory Scale).

For those transferring from more acute wards, a formal documented handover of care which includes the individualised, structured rehabilitation programme ensures that the general ward team understands the person's specific physical and non-physical rehabilitation needs (NICE 2017). For new ward referrals follow local guidelines in relation to generating and accepting referrals.

As with the critical care cohort early mobilisation is encouraged. Early mobilisation reduces length of stay in adults hospitalised with pneumonia (Larsen et al 2019) and an 8-day period of inpatient rehabilitation improves functional capacity, peripheral muscle strength and quality of life in patients with community-acquired pneumonia (Jose & Dal Corso, 2016). Patients can be initially encouraged to sit out of bed (Mundy et al, 2003) and perform simple activities of daily living. The CPRC Patient Information Leaflet "*Exercise Advice in Isolation"* can act as a guide for intervention at this stage. Mobilisation and exercise prescription should involve careful consideration of patient's state e.g. stable clinical presentation with stable respiratory and haemodynamic function (Thomas et al 2020). The usual principles of rehabilitation will apply in this phase, keeping in mind the limitations with which patients with COVID-19 may present.

Patients should have an individualised assessment in order to document immediate needs (including muscle strength, mobility, balance, symptom control (dyspnoea, fatigue, pain), need for supplemental oxygen, adequate nutrition, sufficient psychologic/social support) and short/medium term needs (including improved physical and emotional functioning, return to work) (NICE 2017, Spruit et at, 2020). The assessment should also include a neurological assessment to assess for critical illness neuropathy. Based on the functional assessment, create and/or update and agree rehabilitation goals with the patient. The family/caregiver should be involved once the patient agrees (NICE 2017). In the first year after ARDS, two-thirds of survivors report clinically significant fatigue (Neufeld et al, 2020).

Before hospital discharge patients should receive verbal information from an MDT about their experience in hospital, as well as physical and psychological symptoms that may be experienced later, explanation of causes of these symptoms, and MDT recommendations to enhance rehabilitation and recovery (British Psychological Society, 2020). The CPRC Patient Information Leaflet "*Physiotherapy Advice for Patients with COVID-19 after Discharge from Hospital"* can be issued at this stage.

Patients recovering from a critical care stay should have an assessment at 2–3 months to further assess functional and rehabilitative needs (NICE, 2009). Residual pulmonary function defects have been found in half of the patients who recovered from SARS three months after hospital discharge, though impairment was mild, and 41% of patients had impaired exercise capacity (Ong at al. 2004). A 6-week pulmonary rehabilitation course has been shown to improve function, quality of life and anxiety in elderly patients recovering from COVID-19 (Kai Liu et al, 2020) and a 6-week exercise training programme was effective in improving both the cardiorespiratory and musculoskeletal fitness in patients recovering from SARS (Lau et al, 2005). Pulmonary rehabilitation concepts may be engaged at this stage, though formal lung function and exercise testing may not yet be feasible (Spruit et al, 2020).

Conclusion

There is limited evidence available in relation to rehabilitation for this patient cohort. The general principles of rehabilitation in critical care and on general wards will still apply; however there are specific considerations in relation to hypercoagulability and symptom management. Validated outcome measures should be selected that will not require a large amount of additional equipment. This document should be read in conjunction with local policies and guidelines in relation to infection prevention and control and patient care.

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Working Group	CPRC
Approved by WG	April 2020, May 2020 with minor edits and inclusion of COVID-19 Respiratory scale ITS/NCP
Approved by Board	6th May 2020 – by e-mail
For Review	TBC
Other Documents superseded by this one	None
Access to Document	All members
Location of Inventory of Documents	Inventory of Documents (Clinical Section)
Related Documents	• Rules of Professional Conduct incorporating the Code of Ethics and Guidelines for Professional Behaviour • Quality Assurance Standards of Physiotherapy Practice and Delivery ER-WCPT 2018 • ISCP Policy on Consent (current) • ISCP Scope of Practice (current) • NCP/ITS COVID-19 Guidelines https://hse.drsteevenslibrary.ie/Covid19V2/respiratory

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