Guidance for setting up a Virtual Pulmonary Rehabilitation Service for patients following Covid 19

National Clinical Programme Respiratory

May 2020 Version 3
As there are still many uncertainties with Covid 19 this is a living document and input from our peers and experts are welcome. The authors will aim to provide an update regularly as more and more evidence comes to light. 04/06/20 Draft
Glossary of Terms and Definitions

Covid 19: Covid-19 is an illness caused by the virus Sars-Cov-2 which is rapidly spreading internationally through a virus naïve population.

Virtual Pulmonary Rehabilitation: Virtual Pulmonary Rehabilitation (VPR) is a live and interactive class which allows patients to exercise in the comfort of their own home under the guidance of a senior physiotherapist and clinical nurse specialist.

COPD: Chronic Obstructive Pulmonary Disease is a preventable and treatable disease which is characterised by airflow limitation that is not fully reversible. This airflow limitation is usually progressive and associated with increased breathlessness (GOLD, 2014). COPD can be described as an illness that makes it hard to empty air out of your lungs. This can lead to shortness of breath and feeling tired because you are working harder to breathe.

SpO₂: The peripheral capillary oxygen saturation, an estimate of the amount of oxygen in the blood.
1.0 Introduction

It is important that people who have had Covid 19 are supported with the rehabilitation they need to make a full recovery. Most people infected with COVID-19 virus have mild disease and recover. Approximately 80% of laboratory confirmed patients have had mild to moderate disease, which includes non-pneumonia and pneumonia cases, 14% have severe disease) and 6% are critical.\(^1\)

Approximately 20-25% of the hospitalized COVID-19 patients ultimately need care in the ICU, typically for a prolonged period with acute respiratory distress syndrome (ARDS 67%) \(^2\).

For patients with ARDS, prolonged stay in the ICU (mostly including prolonged mechanical ventilation) is known to have significant impact on lung function, and physical functioning (including loss of muscle mass and function, neuropathy and/or myopathy labelled ICU-acquired muscle weakness) and emotional well-being.\(^3\)

Patients with Covid-19 present with different recovery trajectories and have different levels of rehabilitation need. Assessment will help determine the most suitable rehabilitation pathway. On-going rehabilitation is important to support physical, psychological and emotional recovery following a period of critical illness\(^4\). The importance of a prompt response from physical medicine and rehabilitation (PMR) specialists is seen as being crucial to reduce Covid-19 related disability.\(^5\)

In uncertain times and with the need for social distancing, implementation of telerehabilitation services is increasing in Ireland. Remote delivery of rehabilitation for Covid 19 patients including pulmonary rehabilitation is one of the strategies being developed to support on-going services during this period. This would enable continued access/prevent service interruption for those who are situated in rural and remote settings, as well as for those in quarantine or where social distancing measures have been enacted or recommended.

Benefits to the patient include being able to participate in the programme in their own environment without the added risk and inconvenience of attending a busy hospital environment while maintaining the support of the multidisciplinary team members providing the service.

It is important to make an informed decision to offer telerehabilitation; practitioners should ensure that they know and comply with related practice requirements, per their local regulator, and have the appropriate technological capability to ensure patient safety and privacy. Patient’s privacy and consent are of primary importance when offering telerehabilitation services.

We strongly recommend that expert opinion is sought and that guidelines proposed by the HSE, colleges and relevant associations are read prior to launching this delivery model. We also advise using the checklist in Appendix 1 prior to commencing services.

Covid-19 patients may experience on-going health concerns such as: respiratory; central nervous system and cognitive; deconditioning; critical-illness–related myopathy and neuropathy; dysphagia; joint stiffness and pain; and psychiatric problems\(^6\).

Practical guidance on the implementation of telerehabilitation is available from the World Confederation for Physical Therapy\(^7\), the UK’s Chartered Society of Physiotherapists\(^8\), British Thoracic Society \(^9\) and the American Thoracic Society \(^10\). The European Respiratory Society has also developed an expert-based opinion on early and short-term rehabilitative interventions (after the acute hospital setting) in COVID-19 patients which are being continuously updated\(^11\). A variety of tools have been

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described as facilitators of telerehabilitation, including instructional videos, videoconferencing, live streaming and online guidance.

The limitations of telerehabilitation are also important, such as: availability of equipment; technical malfunctions; potential for inadvertent personal data disclosure; limited scope for physical examination; and the reliance on patients to be able to attend, communicate and interact, which may not be possible for all patients.

The care pathway of those with diagnosed Covid-19 as the virus moves through the stages of transmission may differ depending on the location where care will be delivered. This will not be a unidirectional pathway in that it will be influenced by the patient’s clinical condition, their environment and the psychosocial circumstances of individual patients and their immediate carers.

Coraci et al (2020) emphasise the importance of tailoring rehabilitation in the post-acute phase to meet the specific needs of each patient, for example if the pulmonary damage is associated with neurological impairment, the programs usually developed for pure respiratory diseases would not be sufficient for the patient’s recovery. The overall needs of the individual therefore need to be assessed to select rehabilitation pathway that is most appropriate for the patients’ symptoms. Other forms of rehabilitation also need to be considered including one to one consultations with appropriate infection control measures.

This document is intended to serve as guidance for Virtual Pulmonary rehabilitation for Covid 19 patients where this has been deemed the most suitable form of rehabilitation.

**Pulmonary Rehabilitation can be defined as an interdisciplinary program of care for patients with chronic respiratory impairment that is individually tailored and designed to optimise each patients social and physical performance and autonomy.**

Virtual Pulmonary Rehabilitation (VPR) will provide an alternate pulmonary rehabilitation platform for patients following an inpatient stay with Covid-19. This will enable provision of a valuable service, through virtual means, from a patient’s own home at a time when attendance at a hospital setting poses risk. COVID-19 patients may remain contagious for weeks after being infected and might still have the coronavirus after symptoms disappear.

Due to the COVID-19 pandemic, restrictions have been in place in response to public health policy in relation to social distancing and cocooning.

The potential benefits of this form of rehabilitation to the patient include being able to participate in the programme in their own environment, without the added risk and inconvenience of attending a busy hospital setting. They will have the support of the multidisciplinary team members providing the service.

The impact of Covid-19 not only on healthcare facilities but additionally its wider social and economic impact has been profound. Landry et al, (2020) suggest that multidisciplinary rehabilitation teams, inclusive of physiotherapy, should be more fully incorporated along the disease trajectory from acute and inpatient care, through to the ambulatory settings and onwards into the community. The magnitude and long term impact of physical, mental and emotional decline post Covid-19 is an important consideration. With this increased demand on acute hospital space a shift in the model of
care from acute hospital to primary care is essential. The opportunity to treat suitable patients at home instead of in hospital is attractive from an economic and organisation perspective.

Carda et al 2020\(^5\) strongly advise implementing teleconsultation and telerehabilitation devices, minimizing exposure risk and implementing communication technologies to help patients and families reduce the barriers imposed by isolation. This is supported by the CSP document COVID-19: guide for rapid implementation of remote consultations.

VPR is a programme designed to facilitate the recovery of patients following Covid-19. VPR is a dynamic process where the patient can be assessed and accepted onto the programme under the care of trained health care professionals following a hospital admission and in patient stay for this debilitating condition.

The aim of the VPR programme is to optimise functional status, reduce symptoms, increase participation and reduce health care costs. It includes strategies for on-going, lifelong, patient self-management.\(^7\)

The HSE library has provided a summary to date of evidence related to Covid 19 (see resources pack). However, evidence on rehabilitation following Covid -19 remains limited at this time. It is known that outpatient exercise training improves physical capacity, ability to exercise and readiness to exercise, compared to usual care in patients discharged from hospital following a critical illness.\(^18\)

The regular exercise training principles that are normally used in patients with chronic lung diseases maybe considered in people recovering from COVID-19.\(^19\)

It is known that people recovering from COVID-19 may experience significant loss of muscle mass with subsequent deconditioning. They may also suffer chronic lung changes, resulting in increased breathlessness, which in turn can lead to fear of exertion and avoidance of activity.\(^20, 21\)

It is also known that one year post ICU discharge, a majority of people recovering from H1N1 associated ARDS had psychological impairment and worse health related quality of life than a sex and age matched general population group.\(^22\)

Exercise capacity and quality of life improved significantly following an 8 week pulmonary rehabilitation programme in people recovering from ARDs due to severe Influenza A (H1N1) pneumonitis programme.\(^23\)

Each patient will be invited to attend an 8 week pulmonary rehabilitation programme following an assessment, this may be virtual or face to face depending on current Public Health Guidelines and local policies.

The introduction of a VPR programme would be expected to improve recovery and promote independence and return to normal function in patients post Covid-19.
2.0 Aims

The aim of the VPR programme is to optimise functional status, reduce symptoms, increase participation and reduce health care costs. It includes strategies for on-going, lifelong, patient self-management. A virtual pulmonary rehabilitation service is designed to provide the following:

- A structured and supervised exercise programme.
- Patient education and behavioural programme.
- Patient assessment and outcome measures.
- Recommendations for home based physical activity.

The aim of this document is to guide clinicians in the development of respiratory rehabilitation programmes for COVID-19 patients. This document aims to outline the virtual VPR programme to be provided by Respiratory teams to people recovering from Covid-19. This will include the roles and responsibilities of the members of the team, the inclusion/exclusion criteria and will outline the patients’ pathway through the programme.

3.0 Objectives

The following objectives are required to standardise the process:

- To address any unmet rehabilitation needs post discharge (European Task force) – ERS19.
- Put systems in place that will ensure the safe and effective delivery of a service.
- The VPR platforms will provide a facility for the exercise and the educational component of PR, the core components of rehabilitation.
- Identify outcome measures which are safe and easy to collect via virtual technology.
- Outline the role of each key stakeholder in the programme.
- Ensure standards of practice are maintained in line with national and international guidelines.
- Ensure evidence based practice.
- Facilitate the sharing of information for future service development.
- Comply with GDPR (technology and information sharing and consent.)

4.0 Scope

This guidance applies to:

- Medical, nursing and health and social care professionals involved in the care of patients referred into the Covid-19 VPR programme.
- Physiotherapy and Nursing management.
- Pulmonary rehabilitation team members providing the VRP programme.
- Patients referred into the Covid-19 VRP programme.
- Patient Mpower.
This policy serves to ensure that the most appropriate patients are selected for the programme. There should be a clear pathway of referral, process for selection and clear communication.

5.0 Patient Population

This VPR programmes are designed for patients with diagnosed Covid-19 who meet the inclusion criteria as outlined below (section 7.3).

6.0 Roles and Responsibilities

Lead Consultant Respiratory Physician
- Maintain clinical responsibility and support to the VPR programme team.
- Maintain clinical governance over the VPR programme.
- The respiratory consultant is responsible for the decisions made by the team and for the performance of the service.
- Identify and refer patients who are appropriate for VPR to be assessed by a member of the VPR Team.
- Provide relevant clinical information to the VPR team.
- To promote and engage in the future development of the service.

Senior Respiratory Physiotherapist
- To Co-ordinate the service.
- To undertake an individual assessment of rehabilitation needs which should be documented, including immediate needs (e.g., safe mobility, symptom control (dyspnoea, fatigue, pain), need for supplemental oxygen, adequate nutrition, sufficient psychological/social support) and short term/medium needs (e.g., improved physical and emotional functioning, return to work) (ERS Task Force)19.
- To screen for cardiac involvement during hospital stay and follow-up as required if there is an unexpected finding during functional exercise testing (ERS task force)19.
- To work within the hospital or Community settings as part of the hospital or community multidisciplinary team. Working remotely may be feasible depending on local arrangements.
- To develop the structure, processes and functions of the VPR programme.
- Responsible for patient well-being and keeping management informed of progress.
- Delivering care as per the VPR programme guidelines.
- Recording datasets for patients, reporting on agreed targets and managing and mitigating risks.
- Escalating any issues of patient care and safety to the lead consultant.

Physiotherapy Manager
- To be the direct line manager for the VPR Senior Physiotherapist coordinating the programme.
- To support both the VPR team and the VPR programme.

Respiratory Clinical Nurse Specialist
- To work within the hospital or other relevant settings as part of the multidisciplinary team.
  Working remotely may be feasible depending on local arrangements.
- To develop the structure, processes and functions of the VPR programme.
- To assist and support assessment of patients referred for VPR and further referral to MDT members as required.
- Responsible for patient well-being.
- Keeping management informed of progress.
- Delivering care as per the VPR programme guidelines.
- Recording datasets for patients, reporting on agreed targets and managing and mitigating risks.
- Escalate any issues of patient care and safety to the lead consultant.

**Director of Nursing/Assistant Director of Nursing**
- To be the direct line manager of the VPR Clinical Nurse Specialist.
- To support both the VPR team and the VPR programme.

**All Staff Referring to the Programme**
- To be familiar with the referral process.
- To be familiar with the specific inclusion/exclusion criteria.
- To refer patients to the VPR service in a timely manner.

### 7.0 Procedure

#### 7.1

Appropriate patients for inclusion on the programme are identified according to the inclusion and exclusion criteria documented below. This service caters primarily for the patient who has completed a period of in-hospital treatment and is discharged home. This service can be adapted at a local level to also cater for patients who never get admitted to hospital, but who still have on-going needs for rehabilitation support 1-3 months after recovering from Covid-19. In addition to the physical recovery from Covid-19, the psychological impact also needs to be addressed. Recovery is a deeply personal unique process of changing one’s attitudes, values, feelings, goals, skills and or roles. It is a way of living a satisfying, hopeful and contributing life even with limitations caused by illness. Recovery from Covid needs to incorporate what is meaningful and achievable for each individual. Rehabilitation needs to be tailored to each individual’s physical and psychological needs.

People who have had Covid-19 are thought to be suitable for a low intensity (≤3 on the BORG Score) (ERS – task force) pulmonary rehabilitation programme 6-8 weeks following discharge home from hospital. There is no clear pathway as to the required progression for patients but the experienced pulmonary rehabilitation physiotherapist will need to individualize the progression of intensity.

Monitoring of pre-existing comorbid conditions in people recovering from COVID-19 during rehabilitation is necessary to maximise the safety of the rehabilitative interventions, and to optimize health of these patients. This may require availability of a multidisciplinary team of medical specialists.
7.2 Wainwright et al 2020 emphasise the importance of collaborative self-management strategies and an inter-disciplinary approach to Covid-19 patients to support longer-term rehabilitation. The authors suggest that: “patients will need specific advice on activity pacing, and managing the fatigue associated with recovery from acute viral illness, and associated complications”.

7.3 Patients who are enrolled in the programme will remain under the care of their referring physician throughout the programme; however the programme will run under the governance of the respiratory medicine team.

7.4 Inclusion/Exclusion Criteria for Covid-19 Patients:

7.4.1 Inclusion Criteria:

- Confirmed Covid-19 diagnosis.
- Access to a smart device or laptop/desktop + email.
- Access to a telephone.
- Adequate social support.
- Fully alert and consented.
- Previous admission to hospital with a diagnosis of Covid-19 and functionally limited by dyspnoea despite optimal therapy.
- Community patients who were not admitted to hospital, but who have on-going needs for rehabilitation support 1-2 months after recovering from Covid-19.
- Deemed stable and suitable for inclusion on the programme by treating physician.
- Stable RR and SpO2 i.e. Resting SpO₂ ≥94% on RA (if COPD SpO2 ≥90%), RR <20.
- Balance ABC score >67%
- Motivated to participate and change lifestyle.
- ≥7 days from diagnosis of COVID-19.
- At least 72 hr with no fever and no fever-reducing medication.
- Clinical and or radiological evidence of stability (CT-scan or lung ultrasonography).

7.4.2 Relative Exclusion Criteria:

- No confirmed Covid-19 diagnosis.
- No telephone /smart device access.
- Uncontrolled cardiovascular conditions limiting participation in an exercise programme.
- Significant orthopaedic, psychological or neurological conditions that reduce mobility or cooperation with physical training.
- Non-resolution of pneumonia
- Interstitial Pulmonary Fibrosis.
7.4.3 Precaution:
- Requiring LTOT (Discuss with VPR Team).
- Exercise termination criteria: Patients who experience (1) temperature fluctuation (>37.2°C), (2) exacerbation of respiratory symptoms and fatigue that are not alleviated with rest should discontinue exercises immediately.
- The physician should be consulted if the following symptoms occur: chest tightness, chest pain, dyspnoea, severe cough, dizziness, headache, blurred vision, heart palpitations, profuse sweating, and unstable gait. Rehabilitation needs to be discontinued immediately if any of these symptoms exist. The above criteria intended as guidance only, and individual referrals should be discussed with the VPR Team for suitability.

7.5 Referrals to the Covid-19 VPR Programme:

Referrals to VPR programme can be made by:
- Respiratory Consultant or registrar,
- A member of the MDT team
- GP referral

Referrals can be made by completing a referral form and contacting the most appropriate VPR team relevant to the patient address to discuss a patient’s suitability for inclusion on the VPR programme.

7.6 Patient selection for Covid-19 VPR:

All patients must meet the inclusion/exclusion criteria detailed above. Each patient will be screened by the VPR Team for suitability for recruitment onto the programme. All patients will receive the contact details for the VPR Team, currently implementing the programme.

6.6 Hours of Operation:

VPR rehab will take place on two scheduled times per week to be decided at local level by the VPR team. There will be designated times twice a week, 1hr exercise 2 x weekly and 1hr allocated to education once a week.

6.7 Procedure:

- A patient is identified by the referrer as suitable for VPR and meets the inclusion criteria outlined above.
- With patients consent the referrer discusses the patients’ suitability with the VPR team and sends a completed referral form to the VPR team. Appendix 2
- The referrer should inform the patient that the referral is being processed.
- The VPR team will contact the patient and consent the patient for VPR over the phone.
- Following telephone consent the patient will also be emailed the following:
  - A disclaimer, Appendix 3.
  - A consent form, Appendix 3.
  - A safe home exercise checklist, Appendix 4.
  - The Activities Specific Balance Confidence Scale (ABC), (resource pack).
  - Borg Scale, resource pack.
  - Fatigue measure using the VAS.
The patient will need to reply by email stating that they have read the disclaimer and that they consent to participation in the VPR programme.

- Carda et al 2020\(^2\) state that during rehabilitation, respiratory rate and oxygen saturation in COVID-19 patients should be monitored on a regular basis, to quickly identify clinical degradation.
- Following consent, if choosing to use the patient Mpower application, the patients’ details will be uploaded to the patient Mpower portal and the VPR team will arrange for delivery of an oximeter to the patient. They will be delivered directly to the patient and need to be ordered in advance. A review of patient HR and Oxygen Saturation vitals is recommended over a few days prior to rehabilitation commencing.
- When patient details are uploaded onto the mPower portal, this triggers an e-mail to be sent to the patient prompting them to download the mPower App to their smart device. Data will include SpO\(_2\), HR and Borg score. If the oximeter has Bluetooth connectivity this data will upload automatically when Bluetooth is connected and devices sync. This can be inputted manually by the patient or VPR team if Bluetooth enabled device is not available.
- If a patient does not have the means to input the data the assessor will manually input data should it be required.
- It is not essential to use the patient Mpower App. VPR can be provided without this.
- The patient will be sent an email with instructions on how to access the chosen platform, e.g. Microsoft Teams, WebEx, Salaso. A pre assessment time is provided.

Pre Assessment, class structure, education and post assessment are carried out through the chosen platform as per the document ‘Guidance for setting up Virtual Pulmonary Rehabilitation during the Covid-19 Pandemic’, National Clinical Programme Respiratory, 2020.\(^{26}\) The detail, from this document is outlined below and can be adapted locally. As Covid-19 is a new phenomenon, the evidence base supporting rehabilitation in this cohort is very limited. The principles of pulmonary rehabilitation shown to be effective for other populations are applied here with the hope and assumption, in the absence of evidence, that they will have a positive effect on the post Covid-19 patient.

6.7.1 Pre Assessment:

Assessment is holistic and includes consideration of risk, co-morbidities, prognosis and what is currently known about Covid-19\(^4\).

- The assessment includes:
  - A review of past medical history with special regard for respiratory history and co-morbid conditions such as orthopaedic, neurology and cardiovascular conditions that may affect participation in programme.
  - Documentation of pulmonary function tests if available. The guidance has been against performing pulmonary function tests on the Covid 19 positive patient. As a result, this may not be available.
  - A review of inhaled medications (if prescribed) to ensure they are optimal for the patient and a review of their inhaler technique to ensure it is adequate.
  - Subjective assessment including respiratory symptoms.
  - Measurement of dyspnoea at rest and during activity using the BORG and MRC.
  - Measurement of exercise capacity: 1min Sit to Stand Test
- Measurement of Fatigue using a relevant approved scale or a Fatigue Visual Analogue Scale.

- One or more measurement of health status using the most appropriate for the individual from the following list: Hospital Anxiety and Depression scale (HADS) (licence required), PHQ-7 and GAD-7; IPAQ and the SGRQ, ADL’s.

- Agreed goals (when appropriate).

- Review of the Safe Home Exercise Checklist.

- Emergency contact and phone number.

- Discussion and advice on position and placement of patient’s I.T. device during the exercise class to avoid the disclosure of personal information and for optimal viewing.

- Patients enrolled in VPR will be posted a copy of the exercise programme and a class schedule.

### 6.7.2 VPR Exercise Class structure

- Patients log into the live class from their home twice weekly for between 6-12 weeks (timeline decided locally).

- Class participants must check their symptoms prior to each class and be advised not to exercise if they have a fever or systemic illness or have become suddenly unwell. The patient must be made aware that they have a responsibility to monitor their own symptoms prior to attending classes and to seek medical advice when appropriate. If medical intervention is required, the individual will be able to recommence the programme upon receipt of a medical clearance note from GP or medical team.

- Patients are also encouraged to walk daily if possible and, where possible, use pedometers to measure their daily steps 5 days a week excluding weekends.

- Exercise classes involve aerobic and endurance training. Intensity for aerobic training is monitored using the BORG score with the aim of moderate and somewhat severe intensity (BORG 3-4 = moderate to somewhat severe) level of dyspnoea. Interval training is used (for example, 30sec exercise – 30sec rest progressing to 1min exercise 1min rest with between 8 – 10 stations). For endurance training the patients are asked to use a standard can of food e.g. tin of beans. Classes include a warm-up and cool-down session with stretches and balance exercises.

- There are a number of platforms from which VPR can be performed. Some platforms only allow for 5 attendees at a time while others cater for larger groups. The senior physiotherapist to patient maximum ratio recommended is for VPR is 1:8 for exercise training. A second person for IT and emergency support may be required.

- During rehabilitation the patient’s clinical presentation (e.g. respiratory and haemodynamic function) requires monitoring (CSP2020)². If a patient has an oximeter they will be prompted by staff to record their SpO₂ and HR before, at intervals during, and after the class. If an abnormal HR <50, >125, Low SpO₂ <90 or Borg Score > 4 is noted prior to commencement of the class, patients participation in the class should be delayed until this has improved. Patient will be triaged as appropriate.
- A patient BORG of 5 or greater during the exercise programme would indicate a need to modify the training the intensity downwards.

- Patients are advised to stop exercise immediately if they experience air hunger, if chest pain develops or dizziness, nausea, extreme shortness of breath, excessive wheezing or coughing up blood occurs. Patients are advised to have their reliever inhaler nearby and a glass of water.

- For patients experiencing post COVID-19 Fatigue intermittent training is recommended.

- If patients are prescribed Glyceryl Trinitrate spray they are advised to have it nearby during the class.

- Diabetic patients are advised to have a glucose supplement nearby in-case of a hypoglycaemic events occurs.

- In the case of an emergency event during the class:
  - The class is stopped.
  - All patients except for the unwell patient exit the platform.
  - The person in the house with the patient is advised on how to deal with the patient OR the patient’s emergency contact person is notified by the senior physiotherapist or CNS.
  - If an ambulance is required the senior physiotherapist/CNS will contact it.
  - The senior physiotherapist will remain in contact with the patient via video-link until they are stable and/or have received medical attention.
  - Local areas may adopt their own local safety/emergency policy.

6.7.3 VPR Education

Education is a core component of PR. Patients may be emailed a link to videos of the talks during the programme or alternatively members of the MDT may be able to deliver live interactive educational sessions. Examples of education sessions are as follows:

- Breathlessness Management, (breathlessness affects 5-65% of patients with Covid-19).
- Fatigue Management.
- Medications and inhalers (as required).
- Breathing re-education and cough management (as required)(Cough affects 70%-80% of patients with covid-19).
- Exercise.
- Diet.
- Swallow and Voice.
- Aids and Appliances/Energy Conservation Strategies.
- Anxiety and stress management.
- Lifestyle changes, smoking cessation.
6.7.4 VPR Post-Assessment

- At the end of the programme patients will video-link via the platform for a post assessment where the measurements of exercise capacity, breathlessness at rest and during activity and health status are repeated.
- A discharge summary is sent to the patient’s Consultant, G.P. and/or referrer.
- The patient’s pre and post outcome measures are inputted on the VPR database.
- Patients may be posted a Satisfaction Survey and Stamp Addressed Envelope to return anonymously.
- Patients will be advised that they may be contacted up to 12 months in the future to check their progress/recovery.
- If using the patient Mpower app, the patient will be archived and oximeter return will be arranged.

6.8 Patient Confidentiality:

The VPR team will adhere to the standard GDPR guidelines. All documentation that is in digital format, will be password protected. The virtual data on the third party app remains the property of the HSE. The patient will however be asked, through the app, if they would like to consent to their data being used by the third party company. The patient is entitled to decline same. Appendix 7

All patients and VPR team members will be informed that no recording of the VPR class is permitted.

6.9 Documentation:

Once a patient has consented and is accepted onto the VPR programme most documentation will be in digital format and password protected.

Physical documentation will be stored in keeping with the HSE guidelines.

A discharge summary letter will be sent to the consultant and GP and filed in the correspondence section of the patient’s medical records chart.

7.0 Monitoring Audit and Evaluation

Health care professionals have a clear responsibility to the patients in their care and should ensure that the standard and delivery of that care is adequately meeting the need of patients. Health care professionals have responsibilities not only in planning care but also in evaluating patient outcomes, and demonstrating the ability to change current practices and interventions to effectively respond to the identified need of the individual patient. This service will be monitored and audited at a local level through regular reports to the physiotherapy and nurse manager and respiratory consultant lead, to assess the performance of the programme.

Patients’ pre and post PRP outcome measures will be collected. Patients’ exacerbation rates pre and post PRP may also be reviewed.
Acknowledgements
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HSE Summary of evidence: Produced by the members of the National Health Library and Knowledge Service Evidence Team. Current as at 15/05/2020. This evidence summary collates the best available evidence at the time of writing and does not replace clinical judgement or guidance. Emerging literature or subsequent developments in respect of COVID-19 may require amendment to the information or sources listed in the document. Although all reasonable care has been taken in the compilation of content, the National Health Library and Knowledge Service Evidence Team makes no representations or warranties expressed or implied as to the accuracy or suitability of the information or sources listed in the document. This evidence summary is the property of the National Health Library and Knowledge Service and subsequent-use or distribution in whole or in part should include acknowledgement of the service.
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Appendix 1 Checklist before implementation telerehabilitation

Stop, and ask yourself these questions prior to implementing telerehabilitation services:

1. Is telerehabilitation appropriate for this client?
2. Do I have the skills and training to provide remote pulmonary rehabilitation to my clients?
3. Am I providing evidence-based informed remotely delivered pulmonary rehabilitation?
4. Does this client have the required technology to support remote delivery?
5. Does this client need technical support or in-home support to facilitate your session?
6. What is your “big picture” goal for this remote session; consultation? Education? Assessment? Treatment?
7. Which platform will allow you to provide the same quality care as face-to-face?
8. Is the setting on the client’s end a safe, secure, and confidential environment?
9. Is my environment appropriate for this delivery model (high speed internet, confidential setting, consent, and compliant platform, etc.)?
10. Am I following all of the required guidelines from the HSE? (CPA 2020)

Appendix 2 VPR referral form

**Pulmonary Rehabilitation post Covid-19**

**Program Referral Form**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Degree of Breathlessness Related to Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not troubled by breathlessness except on strenuous activity</td>
</tr>
<tr>
<td>2</td>
<td>Short of Breath when hurrying on level ground or walking up a slight hill.</td>
</tr>
<tr>
<td>3</td>
<td>Walks slower than most people on the level, stops after a mile or so, or stops after 15 minutes walking at own pace.</td>
</tr>
<tr>
<td>4</td>
<td>Stops for breath after walking about 100 yards or after a few minutes on level ground.</td>
</tr>
<tr>
<td>5</td>
<td>Too breathless to leave the house, or breathless when undressing</td>
</tr>
</tbody>
</table>

**Inclusion Criteria (Please tick):**

- Diagnosis of Covid-19 in past 6 months
- MRC score 2-5
- No evidence of unstable asthma, ischaemic heart disease, decompensated/unstable heart failure, severe or uncontrolled systemic arterial hypertension, neuromuscular or musculoskeletal disorders or other disabling diseases that could affect exercise training.
- No suspected underlying malignancy
- Motivated to attend a 6-8-week outpatient exercise and education program in a group setting.
- Safe and independent with or without mobility aid and has the ability to exercise independently without supervision

Optimisation of Respiratory Medications: □ Yes □ No
Please List Medications: ____________________________________________

Have you discussed Pulmonary Rehabilitation with the patient? □ Yes □ No
Smoking Status: □ Current Smoker □ Ex-Smoker □ Never Smoked
If Smoker, has patient been referred to Smoking Cessation Officer? □ Yes □ No
Home Oxygen: □ Yes □ No _____L/min______hrs/day
Portable Oxygen: □ Yes □ No _____L/min______device

NB: It is essential that each patient has also been screened for the above criteria by their Consultant/Registrar/Respiratory CNS/ANP /Respiratory Physiotherapist and signed below.

__________________________
Signature

__________________________
PRINT NAME and Bleep Number

As there are still many uncertainties with Covid 19 this is a living document and input from our peers and experts are welcome. The authors will aim to provide an update regularly as more and more evidence comes to light. 04/06/20 Draft
Appendix 3
Disclaimer and Consent

Discretion and Consent
I agree and consent to the following:
I am voluntarily participating in an 8 week Virtual Home-Based Pulmonary Rehabilitation programme. I understand that this is a new initiative and the background and benefits of the programme have been explained to me.
I understand that the evidence supporting pulmonary rehabilitation in covid-19 survivors is limited and that this programme is based on principles shown to be effective in similar but different populations.
I understand that when participating in any exercise there is a risk of injury.
I am taking part at my own risk and assume all risk of injury to myself.
The HSE and physiotherapists on this programme accept no liability.
I have read and will adhere to the Safe Home Exercise Checklist.
My data may be used anonymously in any post project reporting.

Name (in print)
____________________________
Signature
____________________________
Date
Appendix 4
Safe Home Checklist

<table>
<thead>
<tr>
<th>Safe Home Exercise Checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) A stable surface to put your computer device on and ensure no personnel items e.g.: photos, letters etc. are in visible view of the camera</td>
</tr>
<tr>
<td>2) Ample Safe Space to do the demonstrated exercises.</td>
</tr>
<tr>
<td>3) A family member, friend or carer if advised.</td>
</tr>
<tr>
<td>4) A supportive chair for doing exercises from and resting on.</td>
</tr>
<tr>
<td>5) Avoid any rugs or mats that may be a trip risk.</td>
</tr>
<tr>
<td>6) A glass or bottle of water</td>
</tr>
<tr>
<td>7) No pets present that may cause you to trip or fall.</td>
</tr>
<tr>
<td>8) Stop exercising immediately if you experience any of the following: chest pain, dizziness or feeling faint, extreme shortness of breath, excessive wheezing or coughing up blood.</td>
</tr>
</tbody>
</table>

As there are still many uncertainties with Covid 19 this is a living document and input from our peers and experts are welcome. The authors will aim to provide an update regularly as more and more evidence comes to light. 04/06/20 Draft
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**Appendix 5 VPR Assessment Form**

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date of Assessment: <strong>/</strong>/__</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOB:  <strong>/</strong>/__</td>
<td>MRN:</td>
</tr>
<tr>
<td>Address:</td>
<td>Medical card no.:</td>
</tr>
<tr>
<td>EIRCODE:</td>
<td>Phone no.:</td>
</tr>
<tr>
<td>Email address:</td>
<td>Emergency Contact no.:</td>
</tr>
<tr>
<td>Consultant:</td>
<td>GP:</td>
</tr>
</tbody>
</table>

**Respiratory diagnosis:**

**Date of Covid-19 Diagnosis:**

**Other past medical Hx:**

**Social Hx:**
- Lives alone / with ________
- Stairs into or in dwelling
- Mobility: ________________
- Transportation: ________________
- Occupation: ________________

**Medications:**

**Baseline Respiratory function:**
- Mobility distance: ________________
- Cough: ________________
- Sputum: ________________
- Wheeze: ________________
- Other: ________________

**Vaccines:** Flu □ Pneumonia □

**Home Nebs:** Yes □ No □ ________________

**Home O2:** No □
- Yes □ ____ L/min ____ hrs/day

**Portable O2:** No □
- Yes □ Device Setting ________________

**BiPAP:** Yes □ No □
- Settings: IPAP: __________ EPAP: __________

**Smoking Hx:** Never/Ex/Current Pack year Hx: ________________

<table>
<thead>
<tr>
<th>Previous Spirometry (If available)</th>
<th>Date <strong>/</strong>/__</th>
<th>Heath post Covid-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEV1</td>
<td></td>
<td>No. of GP/Medical visits since Δ:</td>
</tr>
<tr>
<td>FVC</td>
<td></td>
<td>Main complaint/symptom post Δ:</td>
</tr>
<tr>
<td>Ratio</td>
<td></td>
<td>Recent: weight loss/gain/Stable weight __________</td>
</tr>
<tr>
<td>% predicted</td>
<td></td>
<td>Height: ______ Weight: ______</td>
</tr>
<tr>
<td>DLCO</td>
<td></td>
<td>Poor appetite: Y/N</td>
</tr>
<tr>
<td>TLC</td>
<td></td>
<td>Dry mouth: Y/N</td>
</tr>
<tr>
<td>Reversibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-min STS</td>
<td>Pre-rehab Ax Date: <strong>/</strong>/__</td>
<td>Post-rehab Ax Date: <strong>/</strong>/__</td>
</tr>
<tr>
<td>Pre-test BORG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. Reps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test BORG</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fatigue

MRC

HADS

Falls History

ABC Questionnaire

Safe to exercise

Alone

Yes □ No □

Patient’s personal goal (SMART):

Plan:
Patient Safe to Exercise alone and suitable for VPR □ →
Commence VPR on ________________
Patient unsafe to exercise alone but will have person present and suitable for VPR □ → Commence VPR on ________________
*Home Walking Programme discussed and agreed: Yes □ No □
Pedometer measured Steps if available

<table>
<thead>
<tr>
<th>Pre Average Daily Steps (Monday to Friday)</th>
<th>Post Average Daily Steps (Monday to Friday)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

Guide to Increase by 10% per week
If pedometer not available there is the option of using a physical activity questionnaire e.g. ‘International Physical Activity Questionnaire’ to guide Physical Activity discussion.

*May not be suitable for those needing to Cocoon, instead, aim to reach an additional goal of exercising 3 days unsupervised for 30 minutes at moderate intensity.
Appendix 6 Discharge Summary

Re:

Address:

D.O.B: ___________________________ Date:

Dear Dr.________________________,

The above named has recently completed a x week post COVID-19 virtual pulmonary rehabilitation programme. He/She attended__ out of a possible x classes. The following tables present the results of testing at initial and final assessment:

<table>
<thead>
<tr>
<th></th>
<th>Initial Assessment Date</th>
<th>Final Assessment Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Minute Sit to Stand</td>
<td>Number of Reps</td>
<td>Number of Reps</td>
</tr>
<tr>
<td>1</td>
<td>End test SaO₂ (%)</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Borg score(0-10 scale)</td>
<td>Borg score(0-10 scale)</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

5.1.1

<table>
<thead>
<tr>
<th>Hospital Anxiety and Depression Scale (HADS) Score</th>
<th>Initial Assessment Date</th>
<th>Final Assessment Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety:</td>
<td></td>
<td>Anxiety:</td>
</tr>
<tr>
<td>Depression:</td>
<td></td>
<td>Depression:</td>
</tr>
</tbody>
</table>

Fatigue Score

Medical Research Council Breathlessness Scale. 
*Scored 0 – 4. Lower score indicates less breathlessness*

Other issues addressed during the programme:
He/She was advised to continue exercising at home in order to maintain the benefits of the programme, and was provided with written information regarding a home exercise programme.

If you require any further information regarding the programme or the results please do not hesitate to contact us.

Yours sincerely,

__________________________

__________________________Senior Physiotherapist, Phn:

__________________________Clinical Nurse Specialist Phn:
Appendix 7

patientMpower data policy

The privacy policy is a complete statement on patientMpower's policy on storage, use and protection of data for any of its services. See: https://info.patientmpower.com/privacy-policy