A guidance document for setting up a Pulmonary Rehabilitation Programme for Healthcare Professionals

June 2020 Version 4

NATIONAL CLINICAL
PROGRAMME RESPIRATORY

Integrated Care Programme for the Prevention and Management of Chronic Disease

Seirbhís Sláinte Níos Fearr á Forbairt | Building a Better Health Service

National Clinical & Integrated Care Programmes
Person-centred, co-ordinated care

icgp

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Abbreviations

PR	Pulmonary rehabilitation
PRP	Pulmonary rehabilitation Programme
COPD	Chronic Obstructive Pulmonary Disease
AECOPD	Acute exacerbation of COPD
NCP Respiratory	National Clinical Programme Respiratory
KPI	Key performance indicator
VPR	Virtual pulmonary Rehabilitation
CNSp	Clinical Specialist Nurse
MDT	Multidisciplinary team
HCP	Healthcare Professional
AOT	Ambulatory oxygen therapy

1.0 Background and Context

In Ireland it is estimated that 500,000 people are living with COPD yet only 200,000 are diagnosed. As set out in the third National Healthcare Quality Report System (NHQRS) 2019, Ireland has the highest rate of hospital admission with COPD of any country in the OECD. In 2019 there were 15,468, 27 inpatient hospitalisations with a primary diagnosis of COPD with 118,272.5 bed days (HIPE). Furthermore, there is much variation in admission rates between various counties. Likewise, in 2019 amongst patients admitted to hospital with an exacerbation of COPD the average length of stay varied enormously from a high of 11.52 to a low of 5.25 (HIPE). Current estimates suggest that there are approximately 450,000 people with doctor-diagnosed asthma in Ireland (approx. 1 in 10 of population). Hence, obstructive lung disease places a huge burden on Irish Healthcare.

The impact of COPD on healthcare facilities is profound, but it also has wider social and economic effects. For the individual patient, COPD is associated with a significant economic burden in terms of the direct medical costs associated with it and also indirect costs including care provided by family members. Patients with severe disease may suffer frequent exacerbations and debilitating breathlessness requiring medical attendance, potential hospitalisation and severe disruption of their quality-of-life.

Hospital admissions for exacerbations of COPD have significant cost implications for the management of COPD. The opportunity to treat suitable patients at home instead of in the hospital is attractive from both an economic and an organisational perspective.

Many studies including the 2015 Health Technology Assessment by HIQA on self-management services identified Pulmonary Rehabilitation as one of the most cost effective methods of supporting patients to self- manage and improve service user outcomes. It has been associated with 70% reduction in hospital readmission for an exacerbation of COPD in one year and also with a significant shortening effect on the length of stay of people who are readmitted.

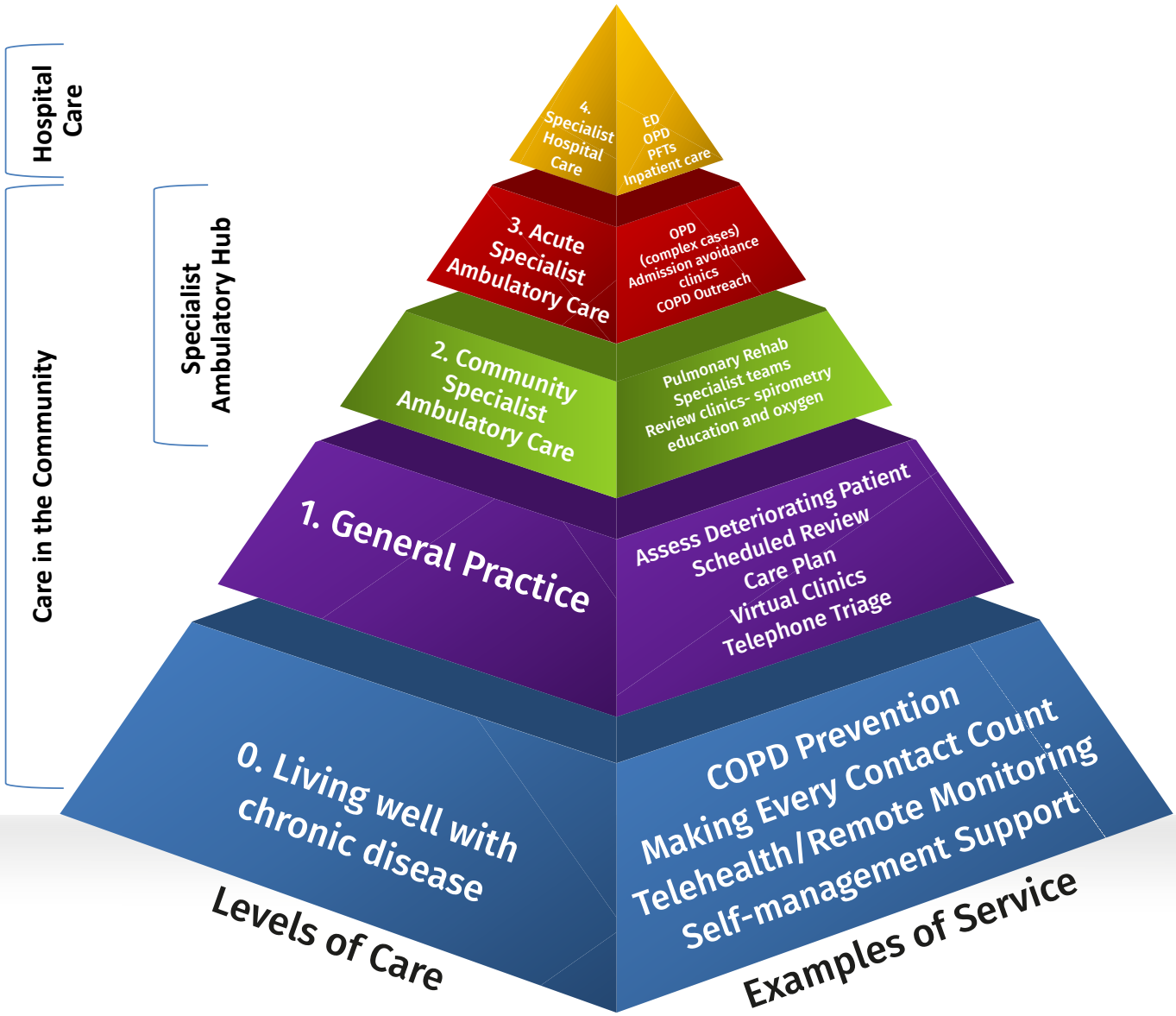
Pulmonary Rehabilitation is an important element in the long-term management of chronic respiratory disease and is part of a wider integrated respiratory pathway including community services and secondary care services, which should support patient flow and care across the healthcare system.

Pulmonary Rehabilitation programmes improve quality of life, mobility and decreases hospital utilization in COPD. For Asthma patients, Pulmonary Rehabilitation has been shown to decrease airway hyper responsiveness, decrease weight and improve patient psychological wellbeing (Osadnik *et al*, 2019).

Pulmonary rehabilitation plays an integral role in the management of patients with obstructive airways disease and in the management of other chronic respiratory conditions where symptoms of breathlessness impact negatively on exercise capacity and quality of life. This PR guidance document follows international best practice and recommends investment in an integrated service to support the effective delivery of PRP.

The HSE “National Framework for integrated prevention and management of chronic disease in Ireland 2020-2025” and the “End to End Model of Care for COPD 2019 ” both support the implementation of an integrated care programme for COPD focusing on community investment to reduce the pressure on acute services and deliver increased quality of care for patients delivered closer to home. This supports the realignment of care towards the community called for in Sláintecare and priorities services in the community. The End to End Model of care for COPD (HSE 2019) showed the progression of an end to end model across the spectrum of care and into the enhanced community setting. This model along with the National Framework for integrated prevention and management of chronic disease in Ireland 2020-2025 support the implementation of services and care pathways that support the development of ambulatory care services for COPD to reduce hospital admission rates and hospital bed usage.

Figure 1. COPD model for Integrated care



One of the common ambulatory care strategies for prevention of admission for Chronic Lung Disease is the facilitation of Community Pulmonary Rehabilitation programs.

Pulmonary rehabilitation is one of the most cost-effective treatments available for lung disease at a cost of 2000-8000 euros per Quality Adjusted Life Year; it is known to be effective at both improving quality of life and reducing the number of hospital admissions. A comprehensive national needs assessment for pulmonary rehabilitation services published in 2017 reported that services were considered well below capacity at national level. Significant gaps in service provision and regional variation were identified. It recommended that at a minimum the capacity for pulmonary rehabilitation needed to be increased by 89% in order to meet the existing requirement for patients discharged following an acute exacerbation.

The enhancement of community pulmonary rehabilitation services will improve the healthcare offered to people living with chronic respiratory disease. Community pulmonary rehabilitation services will provide timely integrated rehabilitation post-acute event and will compliment other ambulatory services such as COPD Outreach in acute hospitals to enable earlier hospital discharge in a safe manner with better patient outcomes and healthcare experience.

2.0 Community Model

Community Healthcare Networks (CHN) will provide the foundation and organisation structure through which integrated care for COPD will be provided locally within the new Regional Health Areas (RHA). The CHN will support the GP- led chronic disease management framework.

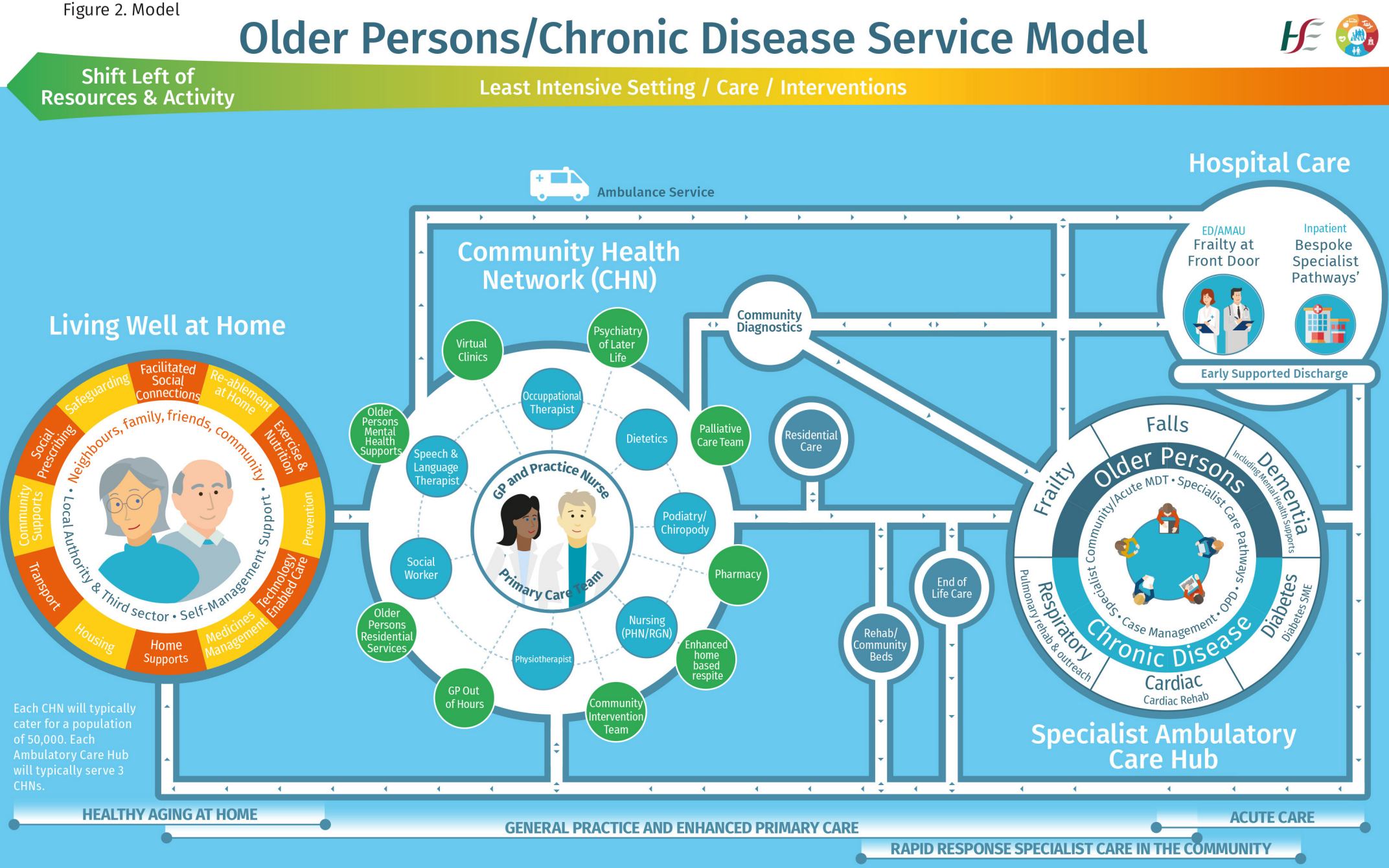
Each CHN will cover a population of 50,000 people. Three geographically adjoined CHNs will act as a point of access to specialist ambulatory care teams (Hubs) within the community. The three networks will total 150,000 populations. The three networks will have direct links to a local acute hospital service.

The CHNs together with the Chronic Disease Management Community Specialist Ambulatory Teams (Hubs) will provide specialist support to the GP in managing COPD in the community and ultimately preventing unnecessary hospital admissions, supporting early discharge and bringing care closer to the patient's home. The full spectrum of services that should be available to patients with chronic disease in any given network is outlined in Fig 2. While level 1 and level 2 services should be specific to that network, self-management support services and levels 3 and 4 services should be available in adequate capacity to the network.

As previously mentioned there is an unmet need for pulmonary rehabilitation at a national level. Extrapolating 2018 figures for individuals discharged with a primary diagnosis of COPD to the proposed model would mean that there were approximately 123 individuals per CHN, 370 per hub, who would not have had their need for PR met based on current facilities.

To improve access to PR the community specialist ambulatory team (hub) will also have a designated Community Pulmonary Rehabilitation team .This team will provide PR services to their 3 mapped networks population. This will facilitate clear pathways to provide a continuum of care for COPD in keeping with the NCP Respiratory End to End model of care.

Figure 2. Model



3.0 Community Pulmonary Rehabilitation Team

The Community Pulmonary Rehabilitation teams will be part of the Community Specialist team (hub). Care pathways will be developed in line with the NCP Respiratory and the “End to End Model of care for COPD”.

The priority is to provide PRP to patients’ with a recent admission for an exacerbation of COPD, to enable them to regain respiratory functionality and the skills and confidence needed to manage their condition in the community.

The team will consist of:

- Respiratory Consultant from acute services who will have oversight over the service (0.2WTE).
- Programme coordinator (1WTE).
- Physiotherapist (1WTE).
- Clinical Nurse Specialist (1WTE).
- Administration (0.5WTE).

3.1 Interdependencies with other services

Pulmonary rehabilitation is part of the Integrated End to End COPD Model of Care, which proposes a spectrum of services for patients with chronic respiratory impairment that is individually tailored and designed to optimise each patient’s physical and social performance and autonomy. The role of various services across the health service continuum and patient care pathway required to achieve targets in both primary and secondary prevention, and effective chronic disease management can be seen in Figure 1. It is envisioned that patients with chronic diseases will be active partners when accessing these services. Pulmonary rehabilitation is co-dependent on other services including ambulatory clinics such as Oxygen Review Clinics and COPD Outreach teams. Together they will provide the ability to support the patient and act promptly in the presence of deterioration or exacerbation and also to facilitate rehabilitation promptly thereby allowing a swift return to baseline.

The Pulmonary Rehabilitation team will work as part of a multi-disciplinary team, thus creating opportunities for interaction and mutual learning between acute and community professionals, successful partnership and working between organisations.

Working together the Pulmonary Rehabilitation team, the COPD Outreach team, Respiratory Integrated team and the diagnostic team can identify “at risk patients” and collaborate with GPs and Consultants and other specialists to ensure pathways are in place for admission avoidance, as well as essential readmission to inpatient care where indicated.

Admission avoidance can be achieved by providing direct access to patients experiencing exacerbations of their respiratory disease through Rapid Response Teams and Rapid Access Clinics (both including respond rapidly to requests for help from GPs) . This will guide the patient through their exacerbation management.

This risk stratification will involve aligning the multidisciplinary teams with local GP practices, allowing interventions agreed at the team meetings to be co-ordinated with GPs across the local area.

Patients with respiratory disease at risk of suboptimal outcomes can be identified proactively and managed by the pulmonary rehabilitation team with other integrated team members to improve outcomes without the need for hospital referral.

Having one integrated respiratory team will also give the GPs a single point of access to seek the advice of multidisciplinary teams and request support from specialist teams who are able to visit patients in their own homes.

As well as admission avoidance another pathway in the Integrated Respiratory Service is the Active Recovery Pathway. Patients needing rehabilitation support after discharge from the acute hospital or recovering at home are referred into an active recovery pathway. This service is collaborative with interdisciplinary referral and delivered by the pulmonary rehabilitation team.

A further aspect of the Integrated Respiratory service is the ability to collaborate between services in relation to discharge planning, on-going patient education and self-management planning when appropriate.

The COPD Outreach team can collaborate with the Pulmonary Rehabilitation team to identify patients post exacerbation for fast tracking for rehabilitation in line with International guidance.

A pathway to refer to smoking cessation advice and for health and wellbeing advice will be in place. This will ensure that patient care and flow is not fragmented.

The Integrated Respiratory Service also allows for shared learning interorganisationally, between primary and secondary care, and interdisciplinary within the multidisciplinary teams. It will also facilitate case conferences and MDT meetings.

The PR Guideline identifies essential elements to ensure delivery of a high quality, patient-centered integrated service. As a supplement to this material with regards to setting up a pulmonary rehabilitation programme readers are directed to an article by Jenkins et al. (2010).

Spruit et al. (2013) described pulmonary rehabilitation as a

"...comprehensive intervention based on a thorough patient assessment, followed by patient tailored therapies that include, but are not limited to, exercise training, education, and behaviour change, designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long-term adherence to health-enhancing behaviours."

4.0 Purpose

4.1 Aims

The aim of a pulmonary rehabilitation service is 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.

This guidance document aims to provide support and guidance to healthcare professionals to assist in setting up and developing standards for PRP services, and to ensure a continuum of audit and improvement in the quality of services. This will include:

- The referral pathway for the programme.
- Assessment and outcome measures.
- Outlining the structure of the PRP.

4.2 Objectives

The following objectives are required to assist the Pulmonary Rehabilitation Programme achieve the above aims:

- Put systems in place that will ensure the safe and effective delivery of a service that meets the specific medical and rehabilitation needs of the client.
- Identify appropriate setting for PRP including virtual components if appropriate.
- Identify outcome measures which are safe and easy to collect.
- 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).

4.3 Scope

The guidance contained is this document is intended for line managers and clinicians working to establish PRP services including:

- Respiratory Consultant Leads.
- Pulmonary Rehabilitation Co-ordinators.
- Senior Respiratory Physiotherapists.
- Respiratory Clinical Nurse Specialists (CNSp).
- Physiotherapy line managers.
- Nurse line managers.
- Members of the MDT who deliver the educational components of PR.

4.4 Patient Population

PRP programmes are designed for patients with chronic respiratory disease who are currently on pulmonary rehabilitation waiting lists or are suitable for a new referral and meet the inclusion criteria as outlined below (Table 1 Section 7.1).

4.5 Governance and leadership

Pulmonary rehabilitation is a Consultant –led service involving a multidisciplinary team of health care professionals. The design and implementation of a PRP requires clear leadership, management, governance and accountability to ensure the quality and delivery of a safe patient focused service. The National Framework for Chronic Disease describes the delivery of services through an integrated service model, with services being provided in the community but governed as an integrated service between hospital and community teams.

The National Clinical Programme for Respiratory "End to End Model of Care for COPD" combines these services under an integrated governance arrangement with common standards, improved access for patients and of the aim of achieving good clinical outcomes.

4.5.1 Operational Governance for the overall service

The operational governance of each service lies with the CHN Manager/Network manager. The Network Manager will coordinate the integration of community healthcare services within the Network in response to the needs and requirements of the population.

4.5.2 Clinical Governance of service

Lead consultants in the area of COPD and asthma will have a specific remit to support the pulmonary rehabilitation service design, implementation and clinical governance and aligning with the hub model, whilst also ensuring service design in key pathways is aligned with deliverables. The lead consultants will cover the three CHNs served by their Chronic Disease Management Community Hub.

4.5.3 Operational governance

The Hub Operational Lead/Head of Primary Care for integrated clinical care services for CDM will have a remit to support the delivery of key enablers including workforce recruitment, data to drive service improvement, operational function and reporting role to relevant heads of care in their CHO. This individual will also be tasked with overseeing the operational function of the local steering group. The Hub Operational Lead/Head of Primary Care will ensure an interdisciplinary approach, whilst also monitoring case load and will have a reporting function to the Primary Care Service Manager (General Manager) in the Community.

4.5.4 Professional Governance

All nursing and health care professionals who work in the CDM Community Hub continue to report to respective professional line managers based within the community for the purposes of professional registration and scope of practice requirements. Individual professional governance is per discipline.

5.0 The Evidence Base for Pulmonary Rehabilitation

The National Audit Survey for PR service needs in Ireland (Petty-Saphon, 2016) as part of the National Framework and Implementation Plan for Self-management Support for Chronic Conditions: COPD, Asthma, Diabetes and Cardiovascular Disease (HSE Working Group, 2017) confirmed that there was a considerable lack of PR provision in Ireland, with the capacity to meet only 11% of need for patients following an admission with an acute exacerbation of COPD (AECOPD). It concluded that if other internationally recognised eligibility criteria for referral to PR (e.g. patients with stable COPD) were included in the needs assessment, the deficits in the provision of PRPs would be even greater. Some of the recommendations were:

- PR programmes should be an integral part of the management of people with COPD.
- The expansion of capacity of PR programmes.
- Improvement of access.
- A reduction in inequities in service provision together with improvement in the quality of programmes being delivered.
- The strongest evidence suggests that standardized and increased provision of PR for early intervention will likely have maximum beneficial impact.

Robust evidence has repeatedly demonstrated improved exercise capacity and health related quality of life measures including decreased breathlessness, fatigue and healthcare utilisation for patients following a PRP. In 2015 the Cochrane Airways Board made a decision to no longer update reviews comparing pulmonary rehabilitation to conventional intervention due to consistent beneficial findings (Lacasse *et al*., 2015).

One factor identified as having an impact on PRP outcomes is the skillset of the person delivering the programme. Ongoing training is required for staff delivering such programmes in order that they remain up-to date with the best evidence in this area to ensure quality evidence is shared for the ongoing development of services.

As part of PRP it is expected that the following will be reviewed as part of ongoing research;

- To review to what degree supervision of the PRP impacts on outcomes.
- To explore which intensity of training produces the best results.
- To determine how long the treatment effect persists.
- To determine which component of the programme (i.e. exercise versus education/self-management) produces the desired changes in selected outcome measures.
- To comparing the different programme settings i.e. Community versus hospital setting; virtual rehab versus other settings.
- To explore outcomes and adherence to maintenance PRP's

(McCathy *et al*., 2015; Spruit *et al*, 2013; BTS, 2013; Ries et al. 2007; Connor *et al*, 2001; Griffiths *et al*, 2000).

6.0 Clinical considerations

6.1 Points to consider when setting up a PRP:

1. Programme provision by suitably qualified members of the multidisciplinary team, paying attention to the individual needs of patients and carers.
2. Defined role of individuals running the programme.
3. Inclusion of individualized physical training, disease education, self-management, nutritional management, psychological, social and behavioural intervention.
4. Development/adoption of Quality Standards for PR and review.
5. Development of standardised education and training of workforce.
6. Continuous audit of effectiveness in terms clinical outcome measures, and both clinical and cost effectiveness.
7. The programme should be patient centric and accessible to all that need it.
8. Prioritize investment in PR services to include virtual technology.
9. To explore new opportunities for research.

6.2 Risk assessment

It is recommended that a full risk assessment of venue (to include medical gases i.e. oxygen) be undertaken and be an integral part of the local guideline. For guidance on completing the Risk Assessment Matrix please see the 2008 HSE Document 'Risk Assessment Tool and Guidance (Reference # OQR012) (HSE 2008).

6.3 Medical emergency

Readers are referred to local guidelines and policies on infection control and Basic or Advanced Life Support (ALS). In the case of an emergency dial 999 for an ambulance.

Special considerations:

- All staff must be qualified and up to date with Basic Life Support training.
- A first aid kit with a CPR mask, gloves and rescue medications is recommended.
- All staff must be up to date with their anaphylaxis training.
- A Volumatic should be kept on site.[1]
- Clients with Type II Diabetes Mellitus should be advised to bring a small carbohydrate drink with them if one is not kept onsite.
- All clients should bring water to exercise classes to avoid dehydration.
- Appropriate dress required: i.e. wearing of cotton layers and comfortable walking or gym shoes.

6.4 Infection control

Universal Infection Control precautions should be written into the local guideline. Local guidelines with regards to the disinfectant/sterilizing agent to be used, the strength of the solution, safety wear when mixing solutions, storage and mixing area for chemicals, and individual equipment requirements.

All staff and patients should be aware of HSE cough etiquette and hand washing instructions. For further information please see the HSE website *Hand Washing* and *Cough Etiquette.* Clinical staff should have completed mandatory HSELand online training in this area.

No patient should be participating in a class with a suspected or diagnoses viral infection or bacterial infection. Due to the emergence of the COVID 19, clinicians will need to keep themselves up-to-date with signs and symptoms, residual physiological and psychological effects, along with social distancing and social isolation indicators. Please refer to the Health Protection Surveillance Centre (HPSC) website for up to date guidance.

6.5 Medication

Ideally, all patients must be optimized for medication four weeks prior to enrolling on a pulmonary rehabilitation programme. As these guidelines change annually, please refer to the latest *GOLD* Guidelines for COPD and *GINA* Guidelines for Asthma for the most up-to-date recommendations.[2]

If a patient is medically optimized but nevertheless continues to experience multiple exacerbations, the HCP should screen patients for suitability for a review by either an Occupational Therapy for a cognitive review or Speech and Language Therapy for a swallow assessment and discussion with consultant or primary physician.

1 For links to Hand Hygiene and Respiratory Etiquette please see https://www2.hse.ie/wellbeing/how-to-wash-your-hands.html. and https://www.hse.ie/eng/about/who/healthwellbeing/our-priority-programmes/hcai/resources/dental/sop-2-respiratory-hygiene-and-cough-etiquette.pdf

2 For a quick guide to the exercise response to cardiac medications, please see Heart online Heart Education Assessment Rehabilitation Toolkit

6.6 Oxygen Therapy

Patients who are prescribed long-term oxygen therapy and/or ambulatory oxygen should have this continued during exercise training. Local guidelines need to be established in the event of an unexpected finding of hypoxia during the Exercise Field Testing; for example, the patient is referred into an oxygen clinic for optimization of long-term and ambulatory oxygen therapy needs.

Ambulatory Oxygen Therapy (AOT) should be offered to patients for use during exercise in a pulmonary rehabilitation programme or during an exercise programme following a formal assessment demonstrating improvement in exercise endurance (Hardinge et al. 2015).[1]

7.0 Guiding Principles

7.1 Referral criteria for PRP

Patients who have had a recent exacerbation of COPD should be referred to a pulmonary rehabilitation programme and be enrolled within one month of discharge from hospital (IMPRESS 2011).

Patients with stable COPD should be referred to PR if their exercise capacity is limited by breathlessness, i.e. MRC 3-5 (mMRC 2-4) (see resource pack). Also, those who have significant disability or have been discharged from hospital with an MRC score of 2 (mMRC score of 1) should be offered a place if suitable. It is recommended that all patients are offered a place within three months of receipt of referral (BTS Quality Standards, 2014) .

Where capacity and skill-set allows, PR programmes should accept other chronic respiratory disease patients with a functional limitation due to breathlessness e.g. MRC 2 (mMRC 1) if referred.

The inclusion and exclusion criteria for PRP are displayed in Table 1. Locally agreed inclusion/exclusion criteria, together with a clear group understanding of the contraindications to exercise is vital and should be clearly documented in local departmental guidelines.

1 For Irish Guidelines on oxygen therapy please see the attached link (https://irishthoracicsociety.com/wp-content/uploads/2017/12/O2-Guidelines-Final.pdf)

Table 1. Criteria for PRP Inclusion and Exclusion

Inclusion Criteria	Exclusion Criteria
• Confirmed diagnosis of chronic lung disease by Spirometry and functionally limited by dyspnoea despite optimal management (mMRC2). • Motivated to participate and change lifestyle. • Ability to exercise independently and safely. • Able to travel to venue or access to appropriate equipment if virtual PRP	• Uncontrolled cardiovascular conditions limiting participation in an exercise programme • Significant orthopaedic, psychological or neurological conditions that reduce mobility or cooperation with physical training. • Suspected underlying malignancy

Where patients do not meet the referral criteria they may be suitable for another exercise programme on offer i.e.: no transport suitable for home exercise programme or virtual pulmonary rehabilitation (vPRP).

Where more than one PR service is operating in a community health area (CHO) the PR coordinator should triage to programmes appropriately. This will depend on the level of need and services available and clinical decisions will be based on the individuals' stage of disease or severity of respiratory symptoms which limit physical activity.

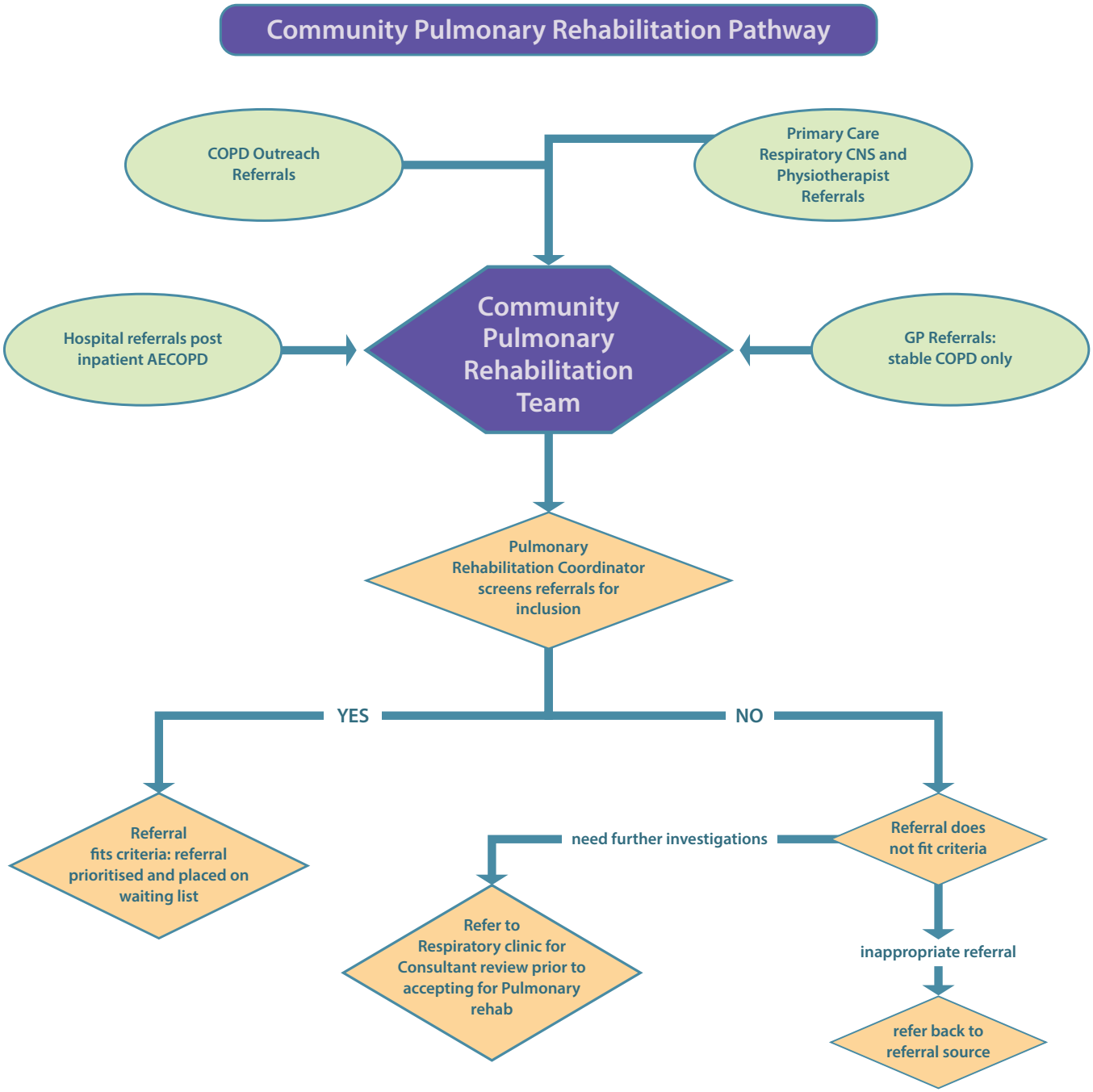
7.2 Referral Sources

The referral source will be determined locally as hospital and community sources may differ. These include

- Respiratory specialists including physicians, surgeons, physiotherapists and nurses.
- General practitioners via Healthlink.
- General physicians.
- Other Health and Social Care professionals.
- Community health professionals.

In all cases a standard PRP referral form should be completed (See Resource Folder).

Figure 3. Pathways for Community PRP



7.3 Assessment

A comprehensive initial assessment is performed after the patient is deemed suitable for pulmonary rehabilitation. An example of a standardized assessment sheet with a list of current tools of assessment is provided (See Resource pack).

The clinical assessment should cover the components of the WHO categories (WHO 2001) of Body function, Activity and Participation, and Health (resource pack). In addition to the minimum standards and outcome measures required by the NCP, the assessment should help to determine levels of frailty, coordination, adherence to respiratory inhalers and identify ambulatory oxygen therapy needs. All clients should ideally be medically optimized four weeks prior to commencing the exercise part of the programme.

The following need to be completed as a minimum, and where possible a measure of quadriceps muscle strength is highly recommended. After this other outcomes may be chosen for individual patient needs and specific research purposes.

- **Physiological baseline measures:**

Heart rate, blood pressure, respiratory rate, oxygen saturations, height and weight and estimate body mass index (BMI). The results of these outcomes pre and post exercise field testing will guide the lead physiotherapist in determining patient suitability for inclusion onto the PRP.

- Measures of Dyspnoea.
- Modified BORG Score.
- Modified Medical Research Council Score for Breathlessness (mMRC).
- Measure of Balance:
- A Static Balance Test.
- Example: Four Point Balance Test.
  (Rossiter-Fornoff et al. 1995).
- Activity and Participation.
- Exercise Field Tests.
- 6Minute Walk Test.

OR

- Shuttle Walk Test.
  (Holland et al. 2014, Singh et al. 1992).

For exercise testing, at least one measure is required from measures of functional exercise capacity such as the Six-Minute Walk Test (6MWT) or the Incremental Shuttle Walk Test (ISWT) (15-21). Each test should be **repeated twice** with appropriate rest period in-between to rule out a learning effect.

Where space is a premium the following may be considered bearing in mind that the precent predicted formulas will no longer apply (Beekman 2013).

- 4MWT.
- 10m 6MWT.

Alternatively the 1min Sit to stand may be considered (Vaidya et al. 2016).

Using a Rate of Perceived Breathlessness (RPE) scale (Borg 1998) during exercise and exercise testing may be an alternative to the mBORG score.

- HEALTH.
- Agreed goals.
- One disease specific quality of life questionnaire.

  The COPD Assessment Test (CAT) (Recommended by the NCP Respiratory for COPD patients).
  (Jones et al. 2009).

  Asthma Quality of Life Questionnaire (AQLQ for Asthma).
  (Everhart et al. 2010).

  Bronchiectasis health Questionnaire (BHQ) for Bronchiectasis.
  (Spinou et al. 2017).

- One generic QOL questionnaire.

  The EuroQol 5D-5L (EQ-5D-5L).
  (Herdman et al. 2011).

- Psychiatric Questionnaires.

  The Hospital Anxiety and Depression scale (HADs).
  (Zigmond and Snaith 1983).

  General Anxiety Disorder 7-item (GAD-7).

  The Patient Health Questionnaire (PHQ-9).
  (Schwaighofer *et al.*, 2014).

N.B. It is the responsibility of each service to obtain licenses for use where applicable

7.4 Pre-screening Procedures/Inductions:

The initial face to face session for each participant will include:

- Check patient details.
- Assessment of motivation and commitment to the exercise programme.
- Discussion about expectations for the programme and realistic, achievable individual goal setting.
- Education about the Borg Scale (Resource Folder).
- Setting of a realistic target outcomes.
- Provision of general information materials i.e. smoking cessation hand-out.
- Explanation of the structure of the sessions.
- Information including use of changing facilities and contact numbers for queries.

A patient information resource pack should be considered which should include the following items:

- Participant Pre-Exercise Check List.
- Breathing techniques.
- Advised on how to avoid the Valsalva manoeuvre during lifting of weights.
- Explanation on warning signs to guide on the need to decrease intensity of exercise.

7.5 Exercise Prescription

Exertional dyspnoea experienced by COPD patients is multifactorial in origin, partly reflecting peripheral muscle dysfunction, the consequences of dynamic hyperinflation, increased respiratory load or defective gas exchange. These limitations are aggravated by an age-related decline in function, the effects of physical deconditioning and compounded by the presence of co-morbidities (Spruit et al. 2013). The physiotherapist, taking the above into consideration, may need to either modify an individual's prescribed exercise programme as required throughout the programme or, if the limitation to exercise is outside the scope of practice, discuss with the lead respiratory consultant and/or referring GP.

Individual exercise prescription is required to address findings such as:

- Muscle atrophy
- A reduction in peripheral muscle mass compared to normal subjects predominantly in the quadriceps and distal lower limbs with the upper limbs relatively preserved from these structural changes in patients with COPD (Maltais et al. 2014; Whittom et a 1998).
- Sarcopenia
- A muscle disease that can occur over a lifetime [readers are referred to the revised European Definition and Diagnosis paper (2019)].[1]
- Cachexia
- Results in altered metabolism and muscle maintenance [readers are referred to the pathophysiology of Cachexia in COPD (2009)].[2]

For any patient considering pulmonary rehabilitation with a BMI less than 19, it is vital that they be referred to a Dietician for a one on one assessment prior to commencing rehabilitation. This is in order to avoid negative energy expenditure as a result of participating in the class.

The exercise dosage should increase over time (the overload principle) to facilitate improvements and can be modulated by increasing the resistance, the repetitions per set, increasing the number of sets per exercise and/or the rest period between sets or exercises (FITT principle - frequency, intensity, time and type). The following also needs to be considered:

- Optimize medical management- progressed over time.
- Bronchodilator therapy and oxygen therapy.
- Optimal management of co-morbidities.
- Individualized exercise programme.
- To include aerobic and resisted training.
- Two supervised exercise sessions of 1 hour duration plus one unsupervised session.
- Home exercise programme (HEP)
- A HEP for an addition 30mins x 3 days is prescribed in order to achieve the required 150 minutes (2hrs and 30min) of moderate intensity physical activity (PA) per week during the PR programme (US Department of Health and Human Services 2018).

1 Cruz-Jentoft A et al. Sarcopenia: Revised European Consensus on Definition and Diagnosis. Age Ageing 2019:48(1):16-31

2 Schols A and Gosker H. The Pathophysiology of Cachexia in Chronic Obstructive Pulmonary Disease Curr Opin Support Palliat Care. 2009;3(4):282-7

Measures of heart rate, oxygen saturations and dyspnoea at rest scores should be recorded at baseline and during exercise-the field exercise test (Jenkins et al. 2010). During testing consider stopping or resting if:

- Increased heart rate such that it approaches age predicted maximum (Age-220) or 80% of the Karvonen predicted Heart Rate (Ignaszewski et al. 2017).
- A deterioration of <4%or SpO2<90% may indicate a need for ambulatory oxygen therapy (Hardinge et al. 2015).
- Marked wheeze or inability to finish a sentence.

Patients should be advised regarding the following:

AOT: check the battery and/or level of oxygen gas left in their ambulatory oxygen therapy device.

Bring short-acting bronchodilators and also Glycerol Trinitrate spray to the assessment/classes if prescribed.

- If diabetic, patients should be advised to bring their glucometers and a glucose supplement to encourage independent management of any hypoglycemic events.
- If allergic patients are carrying hypodermic needles they should advise their therapist/CNS.
- Increased heart rate such that it approaches age predicted maximum or 80% of the Karvonen predicted HR.
- SaO2 < 80% or as per local Respiratory Leads' clinical recommendation.
- Marked wheeze or inability to finish a sentence.

7.6 Contraindications to Exercise

Both the Pulmonary Rehabilitation coordinator physiotherapist and CNS screen referrals for suitability for the Programme. It is the overall clinical responsibility of the physiotherapist to ensure all clients are exercised safely and triaged appropriately. For an in-depth discussion on the contraindications to exercise testing and training see Piepoli et al. (2011).

Class participants should be symptom checked prior to each class and 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.

8.0 Structure of the PRP

8.1 PRP sessions

The PRP sessions should adhere to the published recommendations and guidelines (Piepoli et al. 2011, McCreery et al. 2013). Each session should contain components of a gradual warm up to accommodate those with stable Chronic Cardiac Failure, gentle stretching of major muscle groups, cardio and strength training, and a cool down. A minimum of two supervised training sessions per week for a minimum of six weeks with the goal of on-going engagement by the client. An example is as follows:

- 10-15 minute warm up period.
- 30 minute programme of activity (moderate to somewhat severe intensity) guided by the Borg Score or RPE.
- 10-15 minute cool down period.

A relaxation/socialisation period should be incorporated into the programme that participants should be encouraged to partake in, as part of the session, before going home.

The PRP should run with the following format but the individual classes will not be identical due to the style of the individual instructor. The content should comply with the following format.

At the start of each class the following will be checked:

- All members of the MDT involved in the exercise component of the class will familiarise themselves with the participant's medical history and risk assessment.
- That all members of the class are well and have no new symptoms (pre exercise check list - displayed on wall of studio).
- Participants are reminded about working at a safe and therapeutically effective intensity (Borg Scale or RPE displayed on wall of studio) .
- Check that the venue is in a safe and appropriate condition for the session to commence.
- Check oxygen saturations and or blood pressure if indicated.

8.2 Warm Up

The warm up (which includes pulse raising, mobility and preparatory stretching) should be a minimum of 15 minutes in duration.

8.3 Conditioning Component

The conditioning component can be either a circuit style session or a fitness suite style session however both sessions should comprise of the following elements:

- Have multiple cardiovascular workstations which use the major muscle groups of the upper and lower limbs.
- Programmes should be individualised to ensure that participants work at their own individually prescribed exercise training zone.

This will be achieved through the use of the following variables and follow the training guidelines for strength training (Piepoli *et al.*, 2011) and the BORG breathlessness score or Rate of Perceived Exertion for cardio sessions . Many patients will not be able to perform a 1 repetition max (1RM), therefore, this will be calculated using the Oddvar Holten Diagram and formula which is used with pregnant women and athletes alike (Oostdam et al. 2009, Demey and Willington 2010) .

- Intensity of the activity / resistance of the individual piece of equipment.
- Duration spent at individual stations.
- The speed /range of the movement.
- The overall duration of the conditioning components.
- The number and frequency of rest periods.

The clients Heart Rate and Systolic Blood pressure will be spot monitored during strength training if this is the chosen modality. The Target Heart Rate (THR) will be estimated using the Karvonen formula (Max HR – Resting Heart rate (RHR)) x target intensity i.e. 60% + RHR = training HR). A check during continuous/endurance exercise to ensure the clients are not over exerting will be the 'talk test' (Reed and Pipe 2014); for all training programmes clients should not have a feeling of 'air hunger' which would indicate the inflection point of cardiovascular response and muscle oxygenation during exercise (Ofir et al. 2008, Dubé al 2011).

8.4 Interval Training versus Continuous Training

Interval and continuous training are safe and equally effective modes of training to improve endurance performance in patients with COPD (Vogiatzis et al. 2002). Interval training is a modification of endurance training. Interval training may be useful in promoting higher levels of exercise training in the more symptomatic patients. This is recommended as it allows smaller bouts of high intensity work rate to be achieved with lower symptoms i.e. smaller bouts (typically lasting 30s – 180s) of high-intensity exercise (80-120% peak capacity) separated by lower-intensity exercise bouts (50-80% peak capacity) (Maltais et al. 2014, Elliot et al. 2004, Troosters et al. 2005, Vogiatzis I 2004).

Moderate intensity interval training will be the training method of choice for those who experience increased ventilatory limitation during the 6MWT. For those participants familiar with this training method, they will be commenced at a 1minute exercise at moderate intensity followed by 1minute passive rest for a total of 20mins. For those not use to exercising, training time will be of 30sec duration at moderate intensity followed by a 30sec passive rest for a total of 10 minutes.

Endurance training should be avoided in patients who are severely limited from a respiratory perspective during exercise and for those who fit the criteria on Spirometry for Asthma. A nasal breathing pattern will be encourage to avoid dehydration and damage of the of the airway epithelium (Kortianou et al. 2010; Ross et al. 2016).

8.5 Treadmill walking

Treadmill walking will commence at 80% of the average 6MWT speed (converted to kph) and increase to 100% over time. Those individuals new to the treadmill walking will have their speed reduced by an additional 0.5kph for the first time (Chandrasekaran and Reddy 2018).

8.6 Ground Walking

When possible endurance ground walking will be facilitated as the specificity of this activity will carry over well to daily life at an intensity of a BORG score of between 4 and 5. For the more severely breathless patient intervals of 1-2 minutes with a break of 1 minute may be more tolerated (Gloeckl et al. 2013).

8.7 Exercise Bike

Moderate interval training and endurance training on the bike will be determined based on levels of dyspnoea using the BORG score. Where the appropriate equipment is available, one legged cycling will be offered to those with severe ventilatory limitation (Evans et al. 2015).

8.8 Cool Down:

A gradual 10 minute cool down that encourages the maintenance of venous return with a gradual decrease in workload and gentle stretches.

8.9 Flexibility and Stretches

Brief periods (5-10 minutes) of upper and lower body flexibility exercises are recommended to maintain muscle length and prevent injury and soreness (Jenkins et al. 2010). Flexibility training should also focus on improving thoracic mobility and posture to help increase the vital capacity in patients with chronic respiratory disease (Spruit et al. 2013).

8.10 Inspiratory Muscle Training (IMT)

IMT may be considered as an adjunct to the exercise training component of PR in patients with poor baseline inspiratory muscle strength as measured by inspiratory muscle testing protocols. The reported frequency and intensity of IMT training range from 30% to 80% of baseline PiMax making it difficult to make recommendations (Beaumont et al. 2017).

9.0 Multidisciplinary Education

Patient education is a core component of a comprehensive pulmonary rehabilitation programme and where available MDT members with the appropriate expertise to address these issues contribute to the success of PR. Education can be provided in a variety of mediums, face to face sessions- for e.g.: either before or after exercise class, literature or online resources. Key topics recommended include:

- Respiratory anatomy, physiology and disease education.
- Nutritional advice.
- Chest clearance and breathing control techniques.
- Role of medication and inhaler therapy.
- Self-management knowledge and skills.
- Psychological and behavioral intervention, anxiety management and goal setting.
- Symptoms control and exacerbation management.
- Smoking cessation.
- Incontinence management.
- Relaxation and energy conservations.
- Advance care planning and planning for the future.

Education sessions should be supported were available by approved written information, videos or online programmes with consideration for literacy, language or vision issues.

Evidence of knowledge gained should be measured using a validated outcome measure tool.

In line with the British Pulmonary Rehabilitation Accreditation Standards (2015) (Singh and Johnston 2015), the NCP for respiratory recommend that six hours of learning be provided by members of the MDT and that patients are provided with materials, which may include documentation/videos/booklets, to support independent at home.

10.0 Self-management and Behaviour Change

Self-management 'refers to an individual's ability to manage symptoms, treatment, physical and psychological consequences and lifestyle changes inherent in living with a chronic condition (Meis et al. 2014). On completion of the PRP all patients should be provided with information regarding existing voluntary groups/networks which they can contact for ongoing support and social interaction, e.g. COPD Support Ireland/ Asthma Society of Ireland. Support groups allow the patient to take an active role in their health management. Patients also need information on local venues where they can continue to exercise.

11.0 Setting and resources

In general, respiratory teams provide PRP in either a hospital or community/primary care settings and patients attending PR are at varying stages of the disease in terms of severity and symptoms. Pulmonary Rehabilitation can be delivered safely in a variety of settings for example hospital and community settings, virtual classes, and other partnerships developed with external providers may be required depending on circumstances and local resources. The location of PRP should be easily accessible for patients.

An objective of the National Health Promotion Strategy 2000/2001 in relation to the community is to adapt and develop community-based programmes to meet the needs of groups within the population. It also states that it is important to identify the evidence based community approaches, including partnership models (Department of Health 2000).

11.1 Facility and Equipment

The PRP venue should have a suitable space in relation to the number of people being treated and the interventions being performed including space of either a level corridor or walking track suitable to carry out a field walking test (Holland et al. 2014, Singh et al. 2014). Table 3 on the next page outlines the minimum required equipment for PRP.

Table 2. Equipment for PR Programme

Minimum Required	Exclusion Criteria
Pulse Oximetry, Blood Pressure Monitor, Weight scale, Height Measure, BMI chart	Music system and cones
Stopwatch (for assessments and exercise sessions)	Chairs
Aerobic Equipment (Walking track and Trundle for 6MWT/ ISWT)	Emergency Equipment i.e. access to a telephone and AED/First Aid equipment as discussed under safety
Grip Strength Dynometer	Individual egg times or Tabata timer app if circuit based class.
Stairs/Chair	Computer/printer/paper for patient handouts and Virtual PR option. Overhead projector for educational component
Weights and resistance equipment that can be progressed.	Portable oxygen, nasal prongs (may not be required in the community setting).

Equipment used should be appropriately checked and serviced as recommended by the manufacturer guidelines.

Information technology systems and platforms need to be considered and meet GDPR requirements.

11.2 Group Size

There is no recognized limit to the number of participants in an exercise session so class size will depend upon a number of factors i.e. the venue, staff available, and the profile of the class members. This will depend on the participants' risk stratification and the level of supervision required based on their cardiac status and/or co-pathologies - e.g. orthopaedic/neurological limitations.

Staff to patient ratios recommended are:

Exercise

- 1:8 (UK)
- 1:4 (US)

- A maintenance programme ratio should be 1:15. In all cases two qualified persons should be present (29).

Education

- 1:16 (UK)
- 1:8 (US)

The Chartered Society of Physiotherapy (CSP) developed a 'Recommendations for COPD Model' (2017) which specifies that physiotherapists are uniquely qualified to individually prescribe and progress the training regimen, and to teach appropriate breathing techniques to enable exercise in those with altered lung pathology and/ or respiratory mechanics. This is particularly important in the complex breathless patient and for those with co-morbidities requiring exercise modification (CSP 2017). One senior member of staff must be present at all times (Spruit *et al*). Cohort or rolling programmes are acceptable forms of delivery depending on local considerations.

11.3 Duration

The minimum duration of exercise training in PR has been extensively investigated and longer programmes yield larger, more reliable training effects. The recommendation of the National Clinical Programme Respiratory is that programmes (i.e. the exercise and education component) are of at least 6 weeks duration, with the pre and post programme assessments as additional to this. Programmes should include a minimum of twice-weekly supervised sessions (at least 12 sessions). A third session per week of prescribed exercise is recommended and can be unsupervised.

11.4 Repeat PRP

Repeat PRP's may be considered in patients who have completed a course of PR more than 1 year previously (BTS Guidelines 2013). Increasing patient's access to repeated courses where clinically indicated (e.g. post acute COPD exacerbation) has the potential to improve patient's health over the course of their lives and to reduce healthcare costs (Holland et al. 2014, Griffiths et al. 2001).

12.0 Patient Satisfaction & Experience

A measurement of patient satisfaction (both exercise and educational) after completion of the programme facilitates service user feedback regarding what was found to be useful. This feedback will help guide the future development of the programme. An example of a patient satisfaction questionnaire can be found on the Lung Foundation Australia Pulmonary Rehabilitation Toolkit (2016). A friendly time out after class that encourages patients to discuss their own circumstances with others in a similar position and a certificate of completion can have a positive effect on satisfaction with the service and instill a sense of achievement.

13.1 Maintenance PRP

Benefits of a six to eight week PR programme are short-lived and may not effect long-term change in behaviour although participation is better than non-participation at maintaining the number of daily steps compared to no intervention at all (Deering et al. 2011). Research has shown that benefits achieved during a short-term exercise intervention diminish after three months and that an improvement in form does not necessarily carry over to an improvement in function, i.e. an improved exercise capacity does not necessarily lead to increased activity levels after a 6-8week based programme(Egan and Deering et al. 2012).[1] However, more recently a 3-year maintenance programme has demonstrated no deterioration in the 6MWT and the BODE prognostic score at 2 years (Güell *et al*., 2016).

The short-term improvement in 'form' translating to long term maintenance of 'function' in terms of physical activity and lifestyle changes are the ultimate goals of future pulmonary rehabilitation programmes. Available evidence suggests that both short-term and long-term strategies must be employed for maintaining benefits. While it is recognised that continuing exercise is the responsibility of the patient, part of the health professional's role in the maintenance programmes is to assist the patient with their choice of long-term exercise (Meis *et al*., 2014). A lack of on-going tutoring support and care has been cited as one reason for the failure to remain physically active. It is thought that this lack of support makes it difficult for individuals to successfully transfer the exercise behaviour they learned in the short-term rehab sessions into their everyday life.

The established model of pulmonary rehabilitation has inherent problems in reaching the attended population for PRP; for example:

- Lack of client transportation,
- Staffing levels.
- Capacity barriers.

The NCP Respiratory is hoping to overcome these barriers with new community partnerships which are being developed and the Irish Health Service is investing in new technologies which it is hoped will transform how we provide healthcare into the future.

With the gap in services for on-going exercise programmes, those wishing to re-enroll onto a programme are placed back on the waiting list, with a normal cut-off of 1-2 programme re-enrolments in a lifetime. This is an over utilization of the PR programmes by a few and is not based on best practice. A consequence of this may be an increase in waiting times for new referrals.

A solution for some who wish to remain linked into healthcare services are maintenance pulmonary rehabilitation programmes (mPRP). These programmes may function alongside existing secondary and primary care services. To be considered for mPRPs, individuals should have completed either a hospital or community based PRP.

Until such time as the Respiratory Pulmonary Rehabilitation equivalent of the British Association of Cardiovascular Prevention and Rehabilitation (BACPR) certificate is available for the delivery of mPRP's, a designated PRP team member should maintain clinical responsibility for:

1. Policy and Procedure Guideline development.

2. Appropriate triage of patients.

3. Development and on-going support for the service in partnership with the service provider.

4. Audit and Research.

5. Competency training for student and other physiotherapists who cover the service to ensure sustainability of the service and thus continuity of care.

14.0 Virtual Pulmonary Rehabilitation (VPR) Programmes

The NCP Respiratory (2020) has developed a guidance document with regards to the setting up of Virtual Programmes. https://www.hse.ie/eng/about/who/cspd/ncps/copd/resources/ncp-respiratory-guidance-on-setting-up-virtual-pulmonary-rehabilitation-for-asthma-and-copd.pdf

These programmes should be incorporated alongside existing programmes. More recently it has been identified that VRP's would be especially beneficial for patients recovering from COVID-19 (Vitacca et al. 2020) due to the similarity in exercise training principles used for chronic lung disease.

Both the uptake of places and resources, i.e. human and equipment, impact negatively on attendance rates in conventional PR programmes. The goal of setting up PR services in the right place at the right time is being hampered by the distances required to travel by both staff and patients to venues and results in gaps in service. VPR programmes which compliment conventional programmes are the next stage in the evolution of PR programmes in Ireland.

15.0 Measurable Outcomes

The collection of data will help to track and plan care, identify additional care, facilitate performance monitoring and quality improvement efforts.

At a minimum, measures of exercise capacity, dyspnoea and health status are assessed. The PR teams should also ensure that measurements to assess other elements of PR are accommodated if possible.

The aim of the PRP is that the majority of people are expected to achieve the MCID in the chosen exercise test, dyspnoea score and health status score (see resource pack).

A summary of the pre assessment should be forwarded to the GP/consultant before the programmes commences. On completion of the programme, the post assessment results should also be forwarded to the referral source and offered to the patient.

The NCP Respiratory (COPD and Asthma) KPIs are in appendix 1. These KPIs are the suggested KPIs to be collected by all PRP.

16.0 Quality Standards

In 2018, the Royal College of Physicians in England, in partnership with the National Asthma and COPD Audit Programme, developed the Pulmonary Rehabilitation Services Accreditation Scheme (PRSAS) with the aim of assuring a quality assurance process in the delivery of pulmonary rehabilitation services in England. To support this process, a document was developed which identified eight standards to guide the scheme. These standards were since updated and a toolkit developed . Readers are referred to this document for audit of their own service standards (Singh et al. 2015).

The NCP Respiratory (COPD & Asthma) recommends the adoption of the BTS 10 Quality Standards (Appendix II) with the minimum recommendation being that:

1. There is clear leadership and accountability for the service.

- At a minimum the involvement of a respiratory consultant for governance and a respiratory physiotherapist to co-ordinate referrals and have clinical responsibility for the assessment, prescription and progression of therapeutic exercises.

2. People with COPD fulfilling the inclusion criteria, if accepted, be offered pulmonary rehabilitation and enrolled within 3 months of receipt of referral.

3. Offer at a minimum a structured and supervised exercise programme of at least 6 weeks in duration and include at least twice-weekly supervised sessions per week.

4. Development and delivery of disease specific patient self-management programs.

- It is recommended that members of the MDT be involved in the development and delivery of educational components. If any member of the MDT is not available to support this then carefully selected educational videos are viewed as a second option.

5. Pre and post assessment to include outcomes of exercise capacity, dyspnoea and quality of life.

6. Provision of recommendations for ongoing maintenance exercise.

7. Audit of services annually on individual outcomes and measured against agreed standards.

17.0 Acknowledgements

This document was approved by the Respiratory CAG and NCAGL Dr Orlaith O Reilly

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Dr Miriam Owens, Specialist in Public Health Medicine

Susan Curtis, Programme Manager

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The specialist respiratory and pulmonary rehabilitation experts within the Health and Social Care Professional Bodies, Nursing and Medicine who gave valuable input and feedback.

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18.0 Appendices

Appendix 1 Service review of NCP respiratory PRP 2019

8 Respiratory Integrated Sites current running and inputting statistics to NCP via BIU

KPIs Totals for 8 sites 2019	Totals
Number of patients for whom an intervention ('hands-on') occurred by the Respiratory Integrated Care Senior Physiotherapist in the reporting month - Pulmonary Rehabilitation Programme	1103
Number of new patients who commenced a Respiratory Integrated Care Senior Physiotherapist delivered Pulmonary Rehabilitation Programme in the reporting month	421
Number of patients seen for a first time individual assessment for Pulmonary Rehabilitation Programme by the Respiratory Integrated Care Senior Physiotherapist	547
Number of patients seen for a first time individual assessment for Pulmonary Rehabilitation Programme by the Respiratory Integrated Care Senior Physiotherapist 0 ≤ 1 weeks	37
Number of patients seen for a first time individual assessment for Pulmonary Rehabilitation Programme by the Respiratory Integrated Care Senior Physiotherapist >1 ≤ 4 weeks	124
Number of patients seen for a first time individual assessment for Pulmonary Rehabilitation Programme by the Respiratory Integrated Care Senior Physiotherapist > 4 ≤ 8 weeks	92
Number of patients seen for a first time individual assessment for Pulmonary Rehabilitation Programme by the Respiratory Integrated Care Senior Physiotherapist > 8 ≤ 12 weeks	39
Number of patients seen for a first time individual assessment for Pulmonary Rehabilitation Programme by the Respiratory Integrated Care Senior Physiotherapist > 12 weeks ≤ 26 weeks	76
Number of patients seen for a first time individual assessment for Pulmonary Rehabilitation Programme by the Respiratory Integrated Care Senior Physiotherapist > 26 weeks ≤ 39 weeks	102
Number of patients seen for a first time individual assessment for Pulmonary Rehabilitation Programme by the Respiratory Integrated Care Senior Physiotherapist > 39 weeks ≤ 52 weeks	57
Number of patients seen for a first time individual assessment for Pulmonary Rehabilitation Programme by the Respiratory Integrated Care Senior Physiotherapist > 52 weeks	20
Number of patients who completed a Respiratory Integrated Care Senior Physiotherapist delivered Pulmonary Rehabilitation Programme and show improved quality of life based on a respiratory specific outcome measure	202
Number of patients who completed a Respiratory Integrated Care Senior Physiotherapist delivered Pulmonary Rehabilitation Programme and show improved respiratory health based on the Six Minute Walk Test (6MWT)	173
Number of patients who completed a Respiratory Integrated Care Senior Physiotherapist delivered Pulmonary Rehabilitation Programme who have a reduction in exacerbations within 6 months	95
Number of patients who completed a Respiratory Integrated Care Senior Physiotherapist delivered Pulmonary Rehabilitation Programme who have a reduction in exacerbations within 12 months	85
Number of patients who completed a Respiratory Integrated Care Senior Physiotherapist delivered Pulmonary Rehabilitation Programme who show improved respiratory health based on the incremental shuttle walk test (ISWT)	75
Number of Physiotherapy Patients completing a Respiratory Integrated Care Senior Physiotherapist delivered Pulmonary Rehabilitation Programme in the reporting month	386
Number of Pulmonary Rehabilitation Programme patients referred and accepted by the Respiratory Integrated Care Senior Physiotherapist in the reporting month by referral source - GP	79

KPIs Totals for 8 sites 2019	Totals
Number of Pulmonary Rehabilitation Programme patients 18-64yrs waiting for assessment by the Respiratory Integrated Care Senior Physiotherapist 0 ≤ 12 weeks	606
Number of Pulmonary Rehabilitation Programme patients 18-64yrs waiting for assessment by the Respiratory Integrated Care Senior Physiotherapist > 12 weeks ≤ 26 weeks	450
Number of Pulmonary Rehabilitation Programme patients 18-64yrs waiting for assessment by the Respiratory Integrated Care Senior Physiotherapist > 26 weeks ≤ 39 weeks	292
Number of Pulmonary Rehabilitation Programme patients 18-64yrs waiting for assessment by the Respiratory Integrated Care Senior Physiotherapist > 39 weeks ≤ 52 weeks	125
Number of Pulmonary Rehabilitation Programme patients 18-64yrs waiting for assessment by the Respiratory Integrated Care Senior Physiotherapist > 52 weeks	122
Number of Pulmonary Rehabilitation Programme patients 65yrs and over waiting for assessment by the Respiratory Integrated Care Senior Physiotherapist 0 ≤ 12 weeks	2060
Number of Pulmonary Rehabilitation Programme patients 65yrs and over waiting for assessment by the Respiratory Integrated Care Senior Physiotherapist > 12 weeks ≤ 26 weeks	1160
Number of Pulmonary Rehabilitation Programme patients 65yrs and over waiting for assessment by the Respiratory Integrated Care Senior Physiotherapist > 26 weeks ≤ 39 weeks	646
Number of Pulmonary Rehabilitation Programme patients 65yrs and over waiting for assessment by the Respiratory Integrated Care Senior Physiotherapist > 39 weeks ≤ 52 weeks	341
Number of Pulmonary Rehabilitation Programme patients 65yrs and over waiting for assessment by the Respiratory Integrated Care Senior Physiotherapist > 52 weeks	474
Number of Pulmonary Rehabilitation Programme patients referred and accepted by the Respiratory Integrated Care Senior Physiotherapist in the reporting month by age category - 18 to 64 yrs	234
Number of Pulmonary Rehabilitation Programme patients referred and accepted by the Respiratory Integrated Care Senior Physiotherapist in the reporting month by age category - 65 years and over	578
Number of Pulmonary Rehabilitation Programme patients referred and accepted by the Respiratory Integrated Care Senior Physiotherapist in the reporting month by referral source- Other	19
Number of Pulmonary Rehabilitation Programme patients referred and accepted by the Respiratory Integrated Care Senior Physiotherapist in the reporting month by referral source - Acute Hospital	576
Number of Pulmonary Rehabilitation Programme patients referred and accepted by the Respiratory Integrated Care Senior Physiotherapist in the reporting month by referral source - Respiratory Integrated Care Clinical Nurse Specialist	101
Number of Pulmonary Rehabilitation Programme patients referred and accepted by the Respiratory Integrated Care Senior Physiotherapist in the reporting month by referral source - Respiratory Integrated Care Senior Physiotherapist	37
Number of Pulmonary Rehabilitation Programme sessions delivered by the Respiratory Integrated Care Senior Physiotherapist in the reporting month	983
Number of Respiratory Integrated Care Senior Physiotherapist delivered Pulmonary Rehabilitation Programme appointments not attended (Did Not Attend DNA)	540
Number of Respiratory Integrated Care Senior Physiotherapist delivered Pulmonary Rehabilitation Programme Could Not Attend (CNA) appointments	879
Number of Respiratory Integrated Care Senior Physiotherapist delivered Pulmonary Rehabilitation Programme patients who dropped out of the programme in the reporting month	104
Number of Respiratory Integrated Care Senior Physiotherapist face to face patient contacts / visits / appointments that took place in the reporting month Pulmonary Rehabilitation Programme	5476

COPD Outreach Pulmonary Rehabilitation services 2019

Nine out of 11 COPD outreach sites provide a PRP intermittently.

Pulmonary Rehabilitation	Totals for the 9 sites
Number of patients assessed for Pulmonary Rehab	517
Number of Pulmonary Rehab classes	743
Number of patients who attended Pulmonary Rehab class	3018

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