



**National Clinical Programme
for Respiratory**

End to End COPD Model of Care

December 2019



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FOREWORD

Chronic obstructive pulmonary disease (COPD) is a disease of the lungs characterised by airflow obstruction. This airflow obstruction is usually progressive and partially reversible. The disease is associated with increasing dyspnoea or breathlessness and in more severe cases can be associated with exacerbations of the disease, which may necessitate intervention either in general practice, attendance at the hospital or even admission. It is a significant cause of mortality in Ireland, which has shown no major decline over the past number of years, and compared with other European countries, Ireland has one of the highest age standardised death rates from COPD.

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) 2018, Ireland has the highest rate of hospital admission with COPD of any country in the OECD. (1) There were 15,127 inpatient hospitalisations with a primary diagnosis of COPD in 2017 accounting for 3.9% of inpatient discharges (in those over 35). Furthermore, there is much variation in admission rates between various counties within the State.

Tobacco smoking is the most important risk factor for the development of COPD. Tobacco smokers have a higher prevalence of respiratory symptoms, lung function abnormalities and mortality from COPD than non-smokers. However, in most studies up to 10% of patients with COPD are non-smokers and many patients with COPD are ex-smokers. A view of COPD as a smoker's disease is not accurate and can act to prevent COPD patients from getting appropriate resourced care.

Socio-economic status and social deprivation are also risk factors for both the development and progression of COPD. COPD is inversely related to deprivation. However, it is not clear how the components of deprivation exert their effects - whether this pattern reflects exposures to pollutants, infections, poor nutrition or other factors. There is an increasing recognition of the importance of factors in childhood influencing the development of COPD. Such factors include not only deprivation but also low birth weight, recurrent childhood respiratory infections and passive smoking. A comprehensive review of the epidemiology and factors that underlie the morbidity and mortality associated with COPD and other respiratory disorders is contained in The Respiratory Health of the Nation, 2018 written by Dr Máire O'Connor, Ms Eimir Hurley, Ms Suzanne McCormick and Prof Terry O'Connor on behalf of the Irish Thoracic Society.(2)

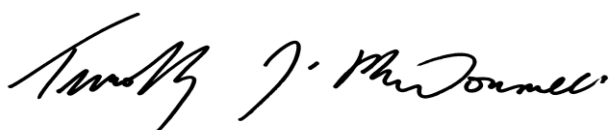
Other factors that may contribute to the development of COPD include; genetic predisposition especially in individuals with α_1 -antitrypsin deficiency, occupational

dust and fume exposure, exposure to outdoor and indoor air pollution including tobacco smoke, and bronchial hyper responsiveness.

The establishment of the National Clinical Programme for COPD, within the HSE's Clinical Strategy and Programmes Division, facilitates an improvement in the care of people at risk of, and those who have COPD. In other jurisdictions, much has been done to describe how improved care for patients with COPD can be delivered. In this Model of Care document, we outline what is required to provide evidence-based care for patients with COPD in Ireland.

While much of what is proposed cannot be delivered in General Practice without new resources, finalisation of the GP contract for a GP Led Community Care model of structured Chronic Disease Prevention and Management will support the delivery of this Model of Care closer to home for patients with COPD (for whom care has been resourced).

We are confident that attention to the deficiencies and standards outlined in this Model of Care will result in a reduction in the variation of care delivered to patients with COPD and an improvement in outcomes.



Prof. Tim McDonnell,

Clinical Lead for the National Clinical Programme for COPD

GLOSSARY OF ACRONYMS

ABG	Arterial Blood Gas
AECOPD	Acute Exacerbation of COPD
AMAU	Acute Medical Assessment Unit
ANP	Advanced Nurse Practitioner
BMI	Body Mass Index
BOLD	Burden of Lung Disease
CAT	COPD Assessment Test
CDM	Chronic Disease Management
CHO	Community Healthcare Organisation
CNSp	Clinical Nurse Specialist
COPD	Chronic Obstructive Pulmonary Disease
DALY	Disability-Adjusted Life Years
ED	Emergency Department
FEV ₁	Forced Expiratory Volume
FVC	Forced Vital Capacity
GBD	Global Burden of Disease
GMS	General Medical Services
GOLD	Global Initiative for Chronic Obstructive Lung Disease
GP	General Practitioner
GP OOH	General Practice Out of Hours Service
HCP	Health Care Professional
HIPE	Hospital Inpatient Enquiry Scheme
HSE	Health Service Executive
ICP	Integrated Care Programme

LTOT	Long Term Oxygen Therapy
MAU	Medical Assessment Unit
MDT	Multi-Disciplinary Team
MECC	Making Every Contact Count
MOC	Model of Care
mMRC	modified Medical Research Council
NCP	National Clinical Programme
NIV	Non-Invasive Ventilation
OECD	Organisation for Economic Co-operation and Development
PCRS	Primary Care Reimbursement Service
PR	Pulmonary Rehabilitation
PRP	Pulmonary Rehabilitation Programme
QOL	Quality of Life
WHO	World Health Organization

1. EXECUTIVE SUMMARY

Purpose and Aim

This Model of Care for COPD has been developed by the National Clinical Programme for COPD in order to define the way health services for people with COPD are delivered. The document outlines the best practice integrated care and services for a person with, or at risk of developing, COPD as they progress through the stages of their condition. Specifically, the key aims of the Model are to:

- prevent or delay the onset of COPD
- improve the delivery of care to people with COPD across all levels of care
- save the lives of people with COPD

Through the implementation of this Model of Care, the Irish health service will be ensuring that the right care is delivered to people with COPD at the right time and in the right place.

Integrated Model of Care

The Model of Care for COPD reflects the full spectrum of care and service provided in hospitals and in the community for people with COPD, which is guided by international best practice. The spectrum of services, ranging from primary prevention to tertiary care, includes:

- Primary prevention and health promotion
- Risk factor identification and management
- Early detection of disease and diagnosis
- Secondary prevention
- GP led Primary care management of disease
- Shared primary and secondary care management of disease
- Secondary care management of chronic disease
- Tertiary care

The spectrum of services is ideally delivered across four Levels of Service delivery /settings which are (Level 1) General Practice, (Level 2) Specialist Support for General Practice, (Level 3) Specialist Ambulatory Care and (Level 4) Hospital Inpatient Specialist Care. The four levels of service are described in detail **Chapter 3**. Chapter 3 also sets out the key elements for each Level of Service such as COPD management in GP led Primary Care and the importance of a structured review for patients (Level 1), Respiratory Integrated Care services (Level 2), COPD Outreach Services (Level 3) and the components of hospital management (Level 4). Chapter 3 also highlights the importance of the COPD Acute Management Bundle (Appendix 4) and the COPD Self-Management Plan (Appendix 7).

In **Chapter 4**, the Management of COPD is addressed across the spectrum of care.

- The strategies to target prevention of COPD and reduce the impact of the disease are discussed in section 4.2.
- Early Diagnosis and the essential role played by spirometry are set out in section 4.3. This section also provides guidance on assessing the severity of COPD (Table 8 and Figure 5) and an overview of additional investigations that may be required (Table 9).
- The management of established COPD is covered in section 4.4 where the overall goals for the treatment of stable COPD are set out (Table 10). The level of care that people with stable COPD require, primarily Level 1 and Level 2, is also discussed.
- Key pharmacotherapy points (Table 11) are also presented in this chapter as pharmacological therapy can prevent and control symptoms, reduce the frequency and severity of exacerbations, improve health status and improve exercise tolerance.
- The role and importance of Self-Management Support in assisting people with COPD to maximise their control over their COPD and thereby maximising their quality of life, leading to fewer exacerbations, reducing attendances at hospital and unscheduled visits to the doctor is set out in section 4.4.4.
- An overview of Pulmonary Rehabilitation is provided in section 4.4.6 including the Pulmonary Rehabilitation Pathway (Figure 7), Inclusion and Exclusion Criteria (Table 13) and a set of recommendations. For a more comprehensive understanding of Pulmonary Rehabilitation, please refer to the updated Model of Care for Pulmonary Rehabilitation developed by the National Clinical Programme for COPD as only key elements are referred to in this section.
- The best practice care for the management of an acute exacerbation of COPD (AECOPD) is contained in section 4.5. A pathway which crosses the 4 Levels of Service is presented in Figure 8.
- Section 4.6 highlights how HCPs looking after patients with COPD need to be alert to the presence of comorbidities and assess and investigate them when appropriate.
- Care and support for patients with advanced COPD is presented in Section 4.7 which includes recommendations for palliative, end-of-life and bereavement care for patients with COPD and their families.

COPD Epidemiology and Costs

Supporting the development of this Model of Care was an analysis of the data and evidence available to the National Clinical Programme for COPD in relation the prevalence and burden of COPD in Ireland. The findings are presented in **Chapter 5**.

Support Materials

Information and tools to support the application of the Model of Care are provided in the Appendices and will be available to download from <https://www.hse.ie/eng/about/who/cspd/ncps/copd/resources/>

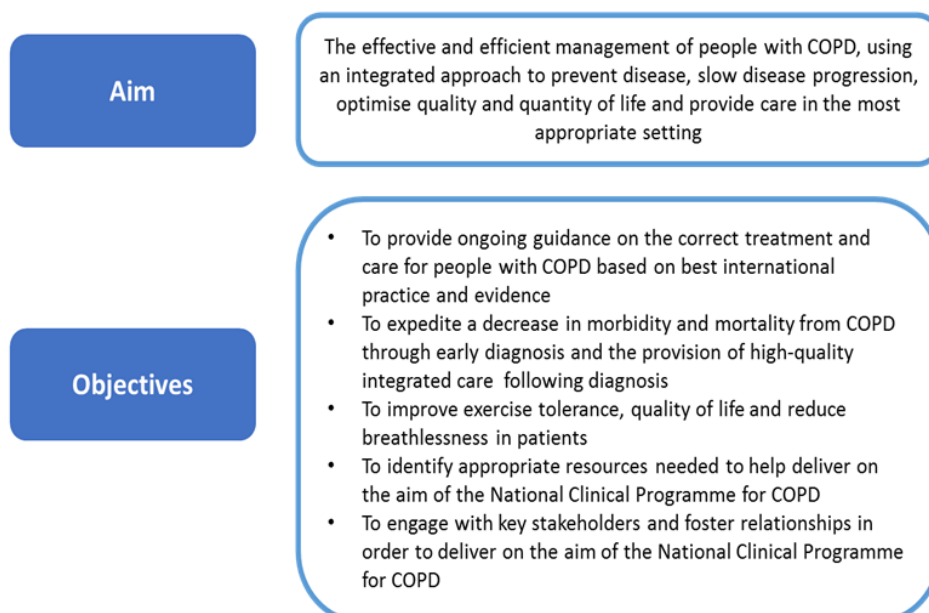
2. RATIONALE FOR AND ROLE OF THE MODEL OF CARE

This document describes the Model of Care (MOC) for the National Clinical Programme for COPD, following international best practice to be delivered within an integrated service approach. It covers the full spectrum of care provided in hospitals and in the community.

The MOC for COPD outlined in this document details how physicians, nurses, and other health care professionals (HCPs) will work with patients to make the clinical decisions most appropriate to their circumstances, to allow empowerment of patients to self-manage where possible and to promote collaboration with and between specialist colleagues in providing optimal care for patients in the Irish healthcare system.

2.1 ROLE OF THE NATIONAL CLINICAL PROGRAMME FOR COPD

The Aim and Objectives of the National Clinical Programme for COPD are set out below:



In addition to guiding the delivery of the above objectives, this Model of Care (MOC) for COPD reflects the key reform themes identified by the HSE to improve the health of the population, and to reshape where and how services are provided:

- Improving population health
- Delivering care closer to home
- Developing specialist hospital care networks
- Improving quality, safety and value

2.2. IMPROVING OUTCOMES FOR PEOPLE WITH COPD

COPD is a major cause of morbidity and mortality for patients in this country. At least 1500 patients die each year of this disease and over 15,000 patients are admitted to hospital with COPD. It has a profound effect on patients but also has a significant strain on the health service. Furthermore, we do know there is considerable variability in the delivery of care for such patients with, for instance, variation in length of stay between various hospitals and in access to Pulmonary Rehabilitation and COPD Outreach.

There are many reasons why COPD management has not received the attention and care it merits. There is considerable confusion about the name itself with patients frequently being told that they have asthma or getting confused about the possibility they have emphysema. There is a long progression for the disease so that symptoms appear gradually as opposed to other chronic diseases such as ischaemic heart disease and cerebral vascular disease, which often have a sudden onset. There has been a degree of therapeutic nihilism surrounding the disorder, which has led to undue pessimism amongst healthcare providers. This has led to a sense of inertia about determining best care for these patients. There may be other social factors at work in that the disease and associated mortality is concentrated in patients from more socio-economic disadvantaged groups which are well recognised to experience inadequate healthcare provision. There may also be a degree of prejudice involved in that the disease is frequently regarded as self-inflicted and this inhibits patients from seeking appropriate levels of healthcare. This is not the case for other chronic diseases, which have lifestyle related risk factors. This is despite the fact that 10% of patients have never been smokers and many patients with COPD have stopped smoking many years previously.

The National Clinical Programme for COPD wants Ireland to overcome these attitudes and defines in this MOC the best care that should be delivered to patients with COPD.

The Model of Care for COPD aims to reflect the spectrum and levels of services outlined by the proposed Integrated Care Programme. The spectrum of services, ranging from primary prevention to tertiary care, includes:

- Primary prevention and health promotion
- Risk factor identification and management (Making Every Contact Count - MECC)
- Early detection of disease and diagnosis
- Secondary prevention: (MECC, Self-Management Support)
- GP Led Primary care management of disease
- Shared primary and secondary care management of disease
- Secondary care management of chronic disease
- Tertiary care

The spectrum of services is ideally delivered across four levels of service delivery /settings.

The MOC takes a holistic, person centred and life course approach to the provision of services. It reflects the principles of integrated care which in essence is to provide patients with the right care at the right time by the right team in the right place.

It reflects the goals of *Healthy Ireland*, which are to increase the proportion of people who are healthy at all stages of life, to reduce health inequalities, to protect the public from threats to health and wellbeing and to create an environment where every individual and sector of society can play their part in achieving a healthy Ireland. (3) *The Healthy Ireland Framework* sets out a whole of government and whole of society approach to address the determinants of health and wellbeing across the life course.

The National Clinical Programme for COPD proposes to change how we deliver care to people with COPD and support a National Model of Integrated Care. The integrated care will be developed with the joint involvement of primary, secondary and tertiary sectors.

The aim of the Model of Integrated Care is to:

- prevent or delay the onset of COPD
- improve the delivery of care to people with COPD across all four levels of care i.e. specialist inpatient, specialist ambulatory care, specialist support to General Practice and chronic disease prevention and management in Primary Care, all supported by patient self-management.
- save the lives of people with COPD
- ensure care is in line with the objectives of the National Clinical Programme for COPD

The aims in turn reflect many of the actions outlined in the Sláintecare Implementation Strategy which continues the cross-government focus on health and wellbeing initiatives under the Healthy Ireland Framework. (3,4)

2.3 INTRODUCTION

2.3.1 Definition

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) defines Chronic Obstructive Pulmonary Disease (COPD) as (5):

“a common preventable and treatable disease that is characterised by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases”.

The disease is pathologically made up of two components; obstructive bronchiolitis with chronic bronchitis and parenchymal destruction (emphysema). The relative contribution of each component varies from patient to patient.

COPD has considerable impact on the quality of life of the patient, families and carers, involving on-going medical care, frequent hospital admissions for treatment of exacerbations and often resulting in premature death.

At least 1500 patients die each year of this disease and over 15,000 patients are admitted to hospital with COPD. It has a profound effect on patients but also has a significant strain on the health service.

Tobacco smoking is the most important risk factor for the development of COPD. Tobacco smokers have a higher prevalence of respiratory symptoms, lung function abnormalities and mortality from COPD than non-smokers. However, in most studies up to 10% of patients with COPD are non-smokers and many patients with COPD are ex-smokers. A view of COPD as a smoker's disease is not accurate and can act to prevent COPD patients from getting appropriate resourced care.

Chapter 5 provides a comprehensive overview of the epidemiology and costs of COPD.

2.3.2 COPD and Comorbid Conditions

There is increased recognition that other comorbidities may complicate the management of patients with COPD and can have a major impact on quality of life and survival. Such conditions include lung cancer, ischaemic heart disease, osteoporosis, depression, diabetes, glaucoma and sleep disorders (Figures 1 and 9). (6,7) While some of these conditions may share common risk factors, COPD itself may promote the development of these comorbidities.(8) So, for instance, a patient who smokes and develops COPD may be more likely to develop lung cancer or ischaemic heart disease than a patient who smokes and does not develop COPD. Furthermore, patients with COPD who develop ischaemic heart disease or lung

cancer for instance fare significantly worse than patients who do not have COPD. In addition patients who have COPD frequently are older and frail.

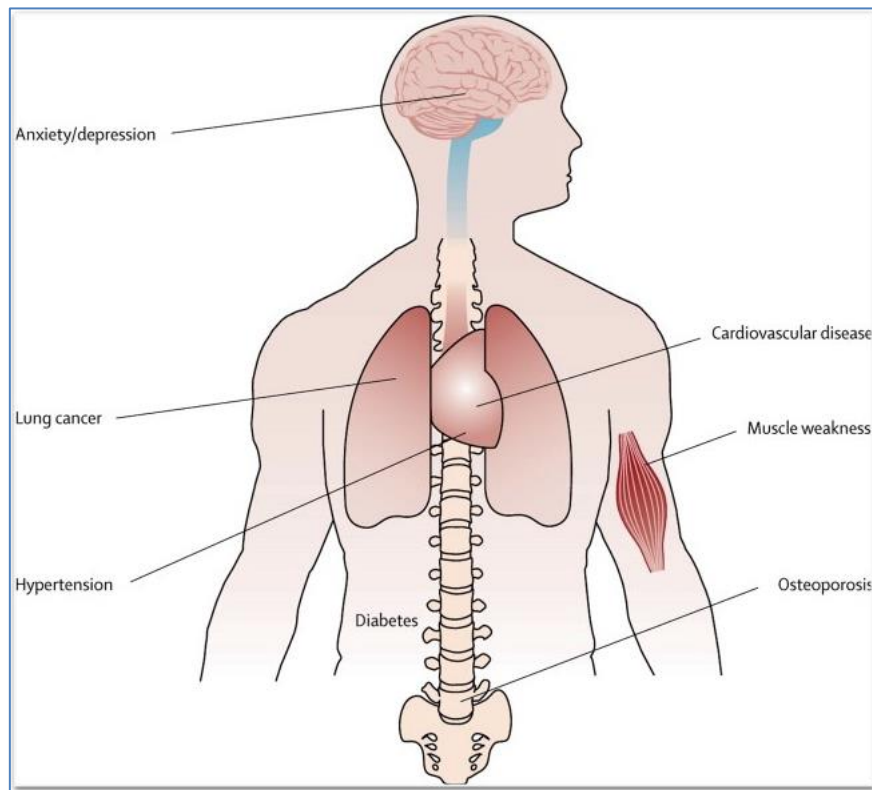


Figure 1 Comorbidities in COPD (Decramer et al. 2012)

3. PROPOSED MODEL OF INTEGRATED CARE

The **Integrated Care Programme for the Prevention and Management of Chronic Disease** proposes a continuum of preventive, diagnostic, care and support services based on the following:

Guiding principles:

- Actively engaging people in prevention, improving their health behaviours and encouraging self-management
- Most care for people with chronic diseases will be provided by the GP and practice nurse
- Patients will have access to diagnostic services and multidisciplinary teams to support their care

- Specialist knowledge and services will be available in the community with links between local hospital specialists and clusters of GP practices ¹
- Standard clinical pathways will be implemented through the local clinical networks
- The person's information will be shared (with their consent) to support decision making at the point of care

People at risk of or living with a chronic disease, such as COPD, will be able to receive a spectrum of services /care according to their needs. Figure 2.

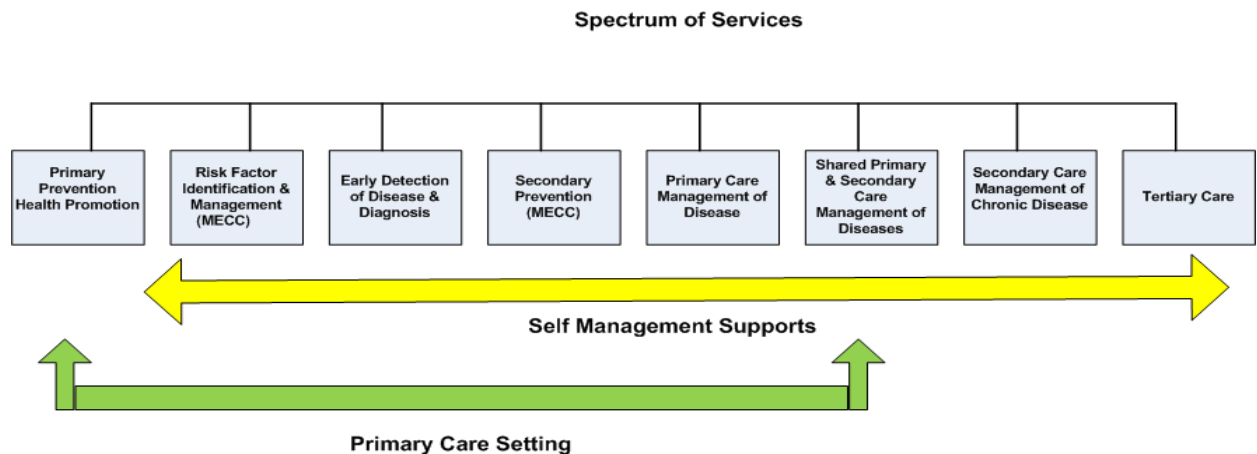


Figure 2 Spectrum of Services

This figure highlights the role of various services across the health service continuum and patient care pathway required to achieve, both primary and secondary prevention, and effective chronic disease management. It is envisioned that patients with chronic diseases will be active partners when accessing these services.

3.1. KEY ELEMENTS OF THE MODEL OF CARE

An effective COPD Model of Care defines the way in which health care services are delivered. It describes the care/service required, it details who should provide it and outlines where the service or care should be delivered. See Table 1

The actual clinical management of diseases is described in clinical guidelines which will be referred to throughout this document with particular elements included as appendices. The **Draft National Clinical Guideline for the Management of COPD** will aim to assist HCPs in all healthcare settings in assessing and making decisions on the management of COPD and to assist policy makers and those planning services for COPD patients. Draft recommendations are included in Appendix 3.

¹ 96 Community Healthcare networks

Elements of COPD Model of Care	
Care / service required	Prevention and Reduction of Risk Factors Diagnosis and Assessment of Disease Management of Stable COPD Management of Acute Exacerbations Self-Management Support Care and support during the end stages of life
Care provided by	Multi-disciplinary Team (MDT): Team members in Appendix 1
Where care will / should be provided? ²	Level 1: General Practice CDM Level 2: General Practice with Specialist Support Level 3: Specialist Ambulatory Care Level 4: Hospital Inpatient Specialist Care

Table 1 Elements of Model of Care

Management of COPD at all stages involves the avoidance of risk factors to slow disease progression and therapy as needed to control symptoms.

Severe and very severe COPD require the integration of several different disciplines, a variety of treatment approaches and a commitment to the continued support of the patient as the illness progresses.

In addition to patient education, health advice and pharmacotherapy, patients with COPD may require specific counselling about smoking cessation, instruction and support in physical exercise, nutritional advice and continued health care support. Not all approaches are needed for every patient. Assessing the potential benefit of each approach at each stage of the illness is a crucial aspect of effective disease management.

The delivery of this Model of Care requires the collaboration of hospital and community services working together to maintain health and prevent hospital admissions. The spectrum of services in Figure 2 will support people at risk of, or living with, a chronic disease such as COPD. The pyramid (Figure 3) below, developed by the HSE's Integrated Care Programme for Chronic Disease, depicts

² The pyramid (Figure 3) four levels of service aligned to local clinical networks, Community Health Organisations (CHOs) and hospitals

this approach with four levels of service aligned to local clinical networks, Community Health Organisations (CHOs) and hospitals

The patient can move back and forwards between the four levels of service as clinical need dictates, with the GP and the Primary Care Team having a lead role in supporting and managing patients with chronic disease and referring to a specialist when appropriate.

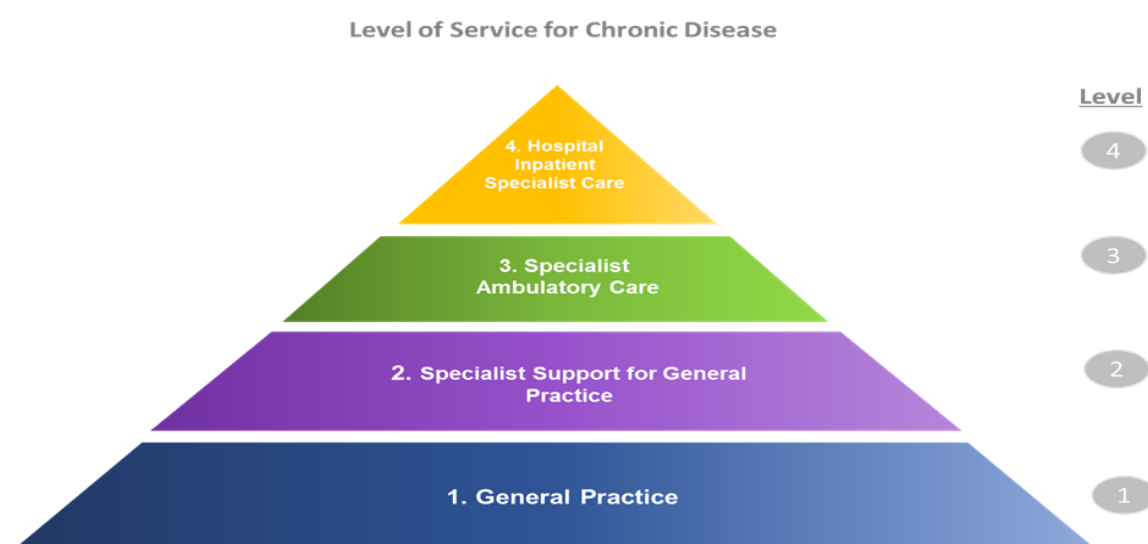
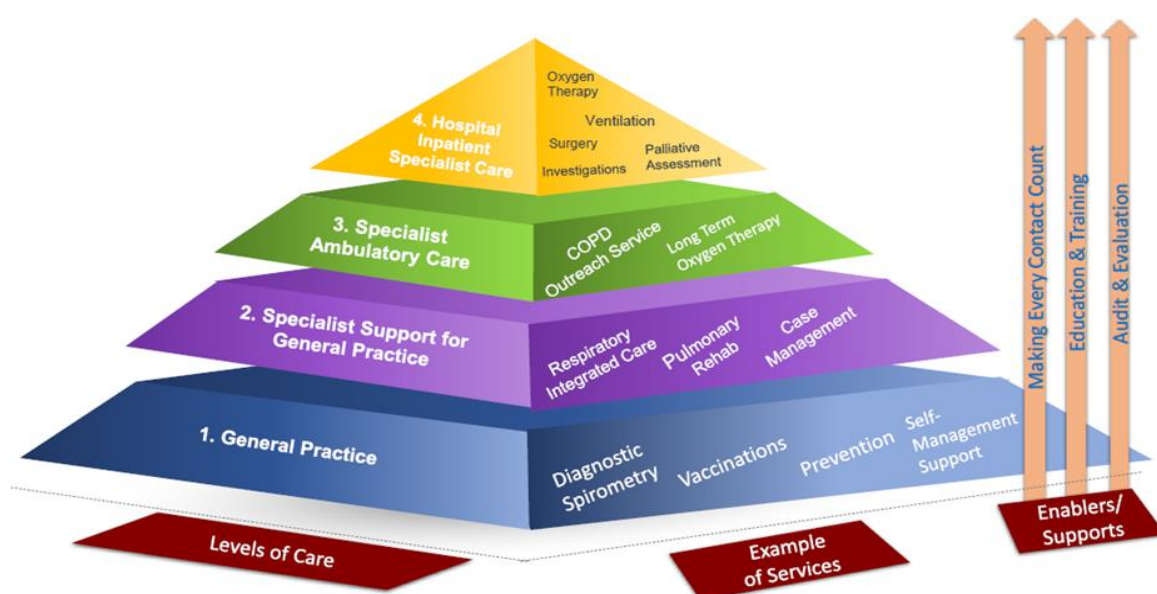


Figure 3 Levels of Service

- GP led Primary Care (Interface): Level 1 and Level 2
- Level 3: Specialist Ambulatory Care (ED, AMU, AMAU)
- Level 4: Hospital Inpatient Specialist Care



The figure above sets out the **Integrated Care Pathway for COPD** allowing patients to receive a high standard respiratory care and maintain as normal a life as possible. It reflects the four levels of a seamless service using clinical networks and care pathways where appropriate,

- The GP and the practice team within Primary Care are the key HCPs and setting for those with COPD
- Optimising the health and quality of life (QOL) of people with COPD requires access to a MDT
- The MDT provides care across the spectrum of all stages of disease
- Appropriate and timely cross referral guidelines must be agreed to ensure integrated care, which focuses on the patient, between health professionals and across settings
- There is an emphasis on self-management and monitoring of symptoms coupled with a HCP/GP led MDT approach to the on-going management of COPD
- People with COPD will access specialist services, such as respiratory specialists (nurse/physician/physiotherapist/spirometry) as required
- All patients, but especially those with significant dyspnoea, should be referred to pulmonary rehabilitation.

3.1.1. Roles of Health Care Professionals in Delivering Model of Care

Patients with COPD will require care in different contexts as their severity differs and as they progress through their illness. Care will be delivered by different members of the COPD multidisciplinary team depending on the stage and stability of the patient's disease.

Assisting people with stable COPD to build confidence in self-management should be a key function of all HCPs.

HCPs in both Secondary and Primary Care have a key role in education and empowerment of patients.

The General Practitioner and the practice team within Primary Care are the key HCPs and setting for those with COPD.

The various members of the COPD MDT (for all levels of care) and description of roles are available in Appendix 1.

3.1.2. Level 1: Primary Care Chronic Disease Management

Most patients with COPD will present initially to Primary Care (Level 1). GPs provide the clinical lead with the diagnosis, assessment, treatment and on-going monitoring for the majority of patients with COPD. GPs and GP practices have a central role to play in ensuring an integrated, patient-centred approach to support patients to self-manage their own condition and to keep the patient where possible in a stable state and prevent acute exacerbations.

Elements of Care Provided
<ul style="list-style-type: none">• Opportunistic case finding, risk factor management, structured reviews and joint care planning.• Diagnosis, assessment, treatment and on-going monitoring• Referral for specialist respiratory services when required• Immunisation• Instruction in inhaler technique• Instruction in self-management• Implementation of MECC• Structured review• Diagnostic spirometry ³• Advice on smoking cessation

Table 2 Primary Care Level 1

In the management of **stable COPD**, it is envisaged that care will be primarily delivered in **Level 1** (Table 2) and **Level 2** (Table 4) of the proposed model with rapid access to respiratory specialist expertise ambulatory care and /or specialist in patient care where further diagnostic investigations or respiratory specialist advice may be necessary (Levels 3 and 4). Reasons for specialist referral are listed in Table 5.

The patient may need to access these services on an intermittent basis or for on-going care. Once the patient's condition has stabilised and management plans are in place, the level at which continuing care will be delivered will reflect the recommendations in the COPD discharge bundles.

Patients who present in the community with **acute exacerbations of COPD** (AECOPD) will be managed as per National Guidelines in GP practices and outside clinic hours in GP out of Hours (OOH) services. See Figure 6.

³ Performed by HCP suitably skilled and fully trained to an accredited National Standard.

Structured Review

At different stages of their disease and for various reasons patients may need to attend the health services especially General Practice. However, in addition to these ad hoc needs, they should also have a structured review, the frequency of which should be guided by their level of disease severity. Close clinical follow-up is required by the GP and practice nurse to ensure achievement of control and adherence to the written COPD management plan. Those with mild or moderate COPD should be reviewed annually to help maintain COPD control. Those with very severe COPD should be reviewed at least every 6 months. See Table 3.

For the majority of patients structured review should occur in General Practice (Level 1).

Structured Review (6 monthly or annually)		
Symptom assessment: <ul style="list-style-type: none"> Dyspnoea Frequency of exacerbations 	Risk reduction <ul style="list-style-type: none"> Smoking cessation Weight management Nutrition advice Physical activity Vaccination Motivational support 	Medication: <ul style="list-style-type: none"> Appropriate medication Inhaler technique Adherence/Concordance Side effects Oxygen assessment
Comorbidities (including mental health): <ul style="list-style-type: none"> Management Drug interactions Mental health and wellbeing 	Need for specialist referral /review <ul style="list-style-type: none"> Long Term Oxygen Therapy (LTOT) Non-Invasive Ventilation (NIV) 	Pulmonary rehabilitation <ul style="list-style-type: none"> Suitability Participation
COPD Management Plan <ul style="list-style-type: none"> Review Update Update COPD Communication Card (Appendix 5) 		

Table 3 Structured Review

3.1.3. Level 2: Specialist Support for General Practice

Level 2 of the Service Level Pyramid (Figure 3) addresses the supports required at Primary Care for the prevention and management of chronic disease. The HSE is intending to develop 96 Community Healthcare Networks based on a population of approximately 50,000. The care provided at this level comprises standard GP led primary care chronic disease management (Table 4) with the addition of specialist support provided by a Respiratory Integrated Care Clinical Nurse Specialist (CNSp) and an Integrated Care Senior Physiotherapist.

Respiratory Integrated Care (RIC)

The RIC team comprises a Respiratory Integrated Care Clinical Nurse Specialist (CNSp) and an Integrated Care Senior Physiotherapist. These clinicians can provide a diagnostic service with spirometry, advice on inhaler technique, instruction in the use of inhalers and also facilitate the formulation of an individual self-management plan for patients with evidence of poorly controlled disease. In addition, the Integrated Care Senior Physiotherapist can organise the delivery of pulmonary rehabilitation in the community.

Elements of Care Provided
Patient assessment, spirometry, disease education, evidenced based self-management, smoking cessation, health promotion and lifestyle, inhaler therapy, exercise and referral to a Pulmonary Rehabilitation Programme (PRP) as required
Rapid access to specialist opinion if required
Identification of patients with poorly controlled disease for CNSp review, for specialist referral and for Pulmonary Rehabilitation
Pulmonary rehabilitation in community for patients who meet the agreed inclusion criteria

Table 4 Primary Care Level 2

Those on specialist interventions such as LTOT, NIV etc. in addition to review in Primary Care will need regular review by respiratory specialist services (Level 2 and 3), which may include respiratory nurse led clinics.

3.1.4. Level 3 Specialist Ambulatory Care

Specialist ambulatory care comprises care provided in Emergency Departments (ED), Acute Medical Units (AMU), Acute Medical Assessment Units (AMAU) and respiratory specialist outpatient clinics and also encompasses COPD Outreach care.

While most patients with an exacerbation of COPD can be managed at home but because of the severity of the exacerbation, the need for therapies that are not

available to that patient at home (such as oxygen or nebulised bronchodilators), or the need for specialist interventions such as NIV, some will need access to specialist assessment / opinion either in home or in hospital, assessment in an ED, AMU, AMAU (Level 3) or in-patient admission (Level of Service 4). Reasons for specialist referral are described in Table 5. Access to appropriate and timely respiratory expertise will be required for patients and their Primary Care HCPs. This should also apply to those referred from other services. The roles of the various members of the MDT are described in Appendix 1.

Once a COPD diagnosis is confirmed, investigations completed, and the patient is stabilised on treatment, he/she should be discharged back to care of the GP. Patients with difficult to control or poorly controlled COPD may require on-going regular joint specialist-GP managed care the frequency of which should be agreed on a case by case basis. As a priority, patients who may be suitable for COPD Outreach services should be referred to such a service where available (Level 3).

Otherwise if the responsible clinician decides the patient is suitable for discharge home from ED or AMU/ AMAU, patients should be advised to consult a community HCP / for review and on-going management if indicated. Figure 8 schematically describes the pathway of care at Level 3. **The COPD acute management / admission bundle provides an aide-memoire to ensure the necessary interventions take place Appendix 4.**

COPD Outreach services (if available) should be consulted on potential candidates using COPD Outreach referral criteria (Level 3). **An agreed written COPD management plan will be initiated with each patient or where he/she already has one this will be reviewed and adapted as necessary. See Appendix 7.**

Reasons for such referral may include (adapted from NICE, 2010)

- Diagnostic uncertainty
- Suspected severe COPD including history of severe life threatening exacerbation
- Patients with uncontrolled COPD despite optimisation of care by the GP
- Poor response to treatment
- Suspected comorbidity such as a component of heart failure, cor pulmonale, suspected malignancy
- Assessment for oxygen therapy, long term nebuliser therapy or oral corticosteroid therapy
- Bullous lung disease
- Rapid decline in FEV₁
- Assessment for Pulmonary Rehabilitation
- Assessment for suitability for other treatments e.g. lung volume reduction surgery or transplant
- Dysfunctional breathing
- Requirement for specialist palliative care input
- Onset of symptoms under 40 years or a family history of α 1-Antitrypsin
- Frequent infections
- Haemoptysis
- Person requests second opinion.

Table 5 Reasons for Specialist Referral

COPD Outreach Service

The principle aim of a COPD Outreach Service is to improve services offered to people living with COPD in a quality safe manner. An outreach programme facilitates early discharge from hospital and enables people to build confidence in effectively managing their chronic condition. As services are established, they may, over time, accept patients directly (admission avoidance) dependent on service capacity and appropriate governance structures being in place.

COPD Outreach should be available in all acute hospitals, which accept COPD admissions.

The model currently implemented in Ireland is based on UK practices and provides a “Hospital at Home” Programme for a select group of COPD patients that would otherwise require acute inpatient care within 72hrs of admission. (9)

The Programmes are consultant led and driven by an Outreach field team (specialist respiratory nurse and senior physiotherapist) in collaboration with a MDT across Primary and Secondary care.

Patients eligible for referral are enrolled in an early supported discharge programme remain under the care of the lead consultant for the first fourteen days following discharge when they revert back to the care of their GP with appropriate and timely

discharge documentation to enable them to do so. (Table 6). A COPD Outreach Model of Care (2011) provides detail on the delivery of COPD Outreach services.

Inclusion Criteria	Exclusion criteria
<ul style="list-style-type: none"> • FEV₁ < 80% predicted, • FEV₁ / FVC < 70% predicted, • MMSE >7, • Systolic B/P > 100 mmHg, • ABGs ph > 7.35, PO₂ > 7.3 kPa, PCO₂ < 8 kPa, (on room air unless on oxygen therapy) • Total WCC 4 – 20 * 10⁹/l, • 0 – 72 hours of presenting to hospital. • Access to telephone • Adequate social support 	<ul style="list-style-type: none"> • Suspected malignancy, • Pneumothorax, Pneumonia, • Uncontrolled LVF, • Acute ECG changes, • Requires full time care, • Insufficient home care, • Requires I.V. therapy, • Type I Diabetes

Table 6 Selection Criteria for COPD Outreach

A member of the Outreach team visits each patient daily for the first three days, again at two weeks and finally at six weeks. They receive oral antibiotics ± steroids, nebulised bronchodilators if necessary and a nebuliser, if required.

At each visit a team member performs a clinical assessment including vital signs, chest auscultation, and records answers to questions on symptom perception and quality of life using specified questionnaires. The patient also receives education on medication management, disease management and vaccinations as guided by the guidelines for home management. Patients are also provided with information on self-management supports which can help them manage portions of their chronic condition through education, training and practical supports. (8)

Other functions of COPD Outreach include:

- Improve links between Primary and Secondary care for patients with COPD
- Improve supports in place for General Practitioners for the diagnosis of patients together with monitoring and appropriate medication management
- Support development of pulmonary rehabilitation
- Provision of patient information
- Assistance in the development of patient support groups

3.1.5. Level 4 Hospital Inpatient Specialist Care

In-patient COPD care – within an acute hospital (Level of Service 4) – is a consultant lead service providing guideline concordant care delivered by a multidisciplinary team (MDT) Appendix 1. The COPD Acute Management / Admission Bundle (Appendix 4) provide an aide-memoire to ensuring necessary interventions take

place. The bundle includes a recommendation to consider COPD Outreach (Level of Service 3) referral if such as service is available.

All patients admitted with COPD should be reviewed and assessed by a respiratory physician, respiratory nurse (Clinical Nurse Specialist or Advanced Nurse Practitioner) ⁴ or physiotherapist to:

- Clarify diagnosis
- Clarify and review treatment and written management plan.

In addition, access to interdisciplinary services should be available including smoking cessation services, dietetics, social work, psychology, cardiology, geriatrics and other respective MDTs. See Table 7.

Components of hospital management include
<ul style="list-style-type: none"> • Pharmacological treatment • Respiratory support: <ul style="list-style-type: none"> ○ Assessment of oxygenation ○ Oxygen therapy ○ Ventilatory support ○ Non-invasive ventilation ○ Invasive ventilation • Other therapies such as: <ul style="list-style-type: none"> ○ Respiratory physiotherapy and treatment of comorbidities ○ A Specialist Palliative Consult Service may be appropriate during acute exacerbations of COPD for those with advance disease. • Investigations should be available as determined necessary by the COPD lead physician or designate. These might include: <ul style="list-style-type: none"> • Comprehensive pulmonary function testing • Bronchoscopy • High-resolution CT scans • Involvement of a senior respiratory physiotherapist • Assessment for suitability for other treatments e.g. lung volume reduction surgery • Assessment for palliative care • Reassurance and support

Table 7 Elements of Hospital Management

⁴ This may vary across hospitals and depends on staffing levels

4. MANAGEMENT OF COPD

4.1. INTRODUCTION

The optimal management of COPD requires an integrated approach for all stages of disease and as patients move from stable to acute exacerbations and back to a stable condition the care provided will need to follow an integrated pathway which is clear and easy to navigate for both the patient and family/ carers and HCPs (Figure 2).

The Model of Care describes what care is required, who should provide it and where it should be provided for this chronic, complex illness with multiple systemic effects and comorbidities.

The actual clinical management of diseases is described in clinical guidelines which will be referred to throughout this document with particular elements included as appendices. (See Appendix 3 for draft recommendations)

Care will be delivered by different members of the COPD MDT. See Appendix 1. The skills and expertise of the different members will vary and their input and time commitment will also vary depending on the stage and stability of the patient's illness.

While patients with COPD will require care in different contexts as their severity differs and as they progress through their illness there are elements of care which are appropriate for all stages of disease.

Smoking cessation, self-care and self-management support provided through MECC etc are relevant for all stages of disease. Appendix 2.

SPECTRUM OF CARE IN THE MANAGEMENT OF COPD

- Prevention of COPD and Reduction of Risk Factors
- COPD Early Diagnosis and Assessment
- Management of Established COPD
 - Stable COPD
 - Acute exacerbations
 - Management of Advanced COPD

4.2. PREVENTION OF COPD AND REDUCTION OF RISK FACTORS

Strategies to target the prevention of COPD and reduce the impact of the disease require effective action across the continuum of care. The key strategies include those aimed at the general population (Primary Prevention) and those targeting those with symptoms suggestive of COPD (Secondary Prevention) and those with established disease (Tertiary Prevention). *Healthy Ireland a Framework for Improved Health and Wellbeing* and *Healthy Ireland in the Health Services National Implementation Plan* have provided a blue print on how prevention should be addressed.(3, 10) An essential element in addressing both primary and secondary prevention is engaging health professionals in prevention activities as part of their routine clinical consultations.

4.2.1. Risk stratification

The identification of at-risk populations – smokers, ex-smokers, people with other smoking related diseases and people with respiratory symptoms – and access to spirometry are the critical factors in the primary prevention and early diagnosis of COPD.

Currently certain clinical characteristics such as: the occurrence of exacerbations, increased dyspnoea, continued smoking and of course more impaired lung function identifies patients who may be at more risk of requiring intervention.

Risk stratification intends to apply predictive algorithms to routinely collected data and aims to identify those who are most likely to be high users of healthcare in the future - and who are therefore amenable to intervention - rather than those who are currently at the height of their usage.

Using risk stratification, it should be possible to segment people with COPD in a given catchment area (e.g. a community health network) according to risk (e.g. their risk of requiring an emergency admission over the coming year) (see Figure 4 below). Typically, patient groups are stratified into three or four levels of risk, with those in each level being provided with different levels of intervention in order to keep them well.



Figure 4 Risk Stratification

Prevention

Primary prevention – involves the elimination or reduction of modifiable risk factors in those who do not yet have COPD. It involves actions aimed at the general population and those known to be at high risk of developing the disease. Examples include reducing the uptake of smoking in the population, minimising exposure to environmental respiratory hazards and maintaining air quality.

Secondary prevention – involves early detection and intervention - support for at-risk population, i.e. smokers and people with chronic disease to quit smoking through the provision of evidence-based diagnosis and treatment and provision of smoking cessation programmes

Tertiary prevention – effective management of those with established disease to maximise quality of life together with reduction in morbidity and mortality. This includes smoking cessation, limiting exposure to second-hand smoke, dusts, fumes, gases and other risk factors, patient education and collaborative self-management, therapeutic monitoring, annual influenza vaccination, age appropriate pneumococcal vaccination, pharmacological treatment and therapeutic monitoring including inhaler technique and medication compliance and oxygen if required.

At all stages of prevention smoking cessation is the single most effective way to prevent COPD and slow its progression. This COPD Model of Care supports the paradigm shift from viewing smoking as a lifestyle issue to smoking as an addiction, for which there are psychosocial and pharmacotherapy treatment options. Stopping smoking can prevent and delay the development of airflow limitation, reduce its progression, and can have a substantial effect on subsequent mortality.

The Integrated Care Programme envisions that all HCPs will implement “Making Every Contact Count (MECC)” for prevention i.e. they will discuss lifestyle risk factors with each patient and provide a brief intervention as appropriate (Appendix 2). (11) MECC includes the five-step programme for quitting (Ask, Advise, Assess, Assist, Arrange) which emphasises that tobacco dependence is a chronic disease, that relapse is common and reflects the chronic nature of dependence and addiction. Counselling delivered by physicians and other health professionals significantly increases quit rates over self-initiated strategies. Even a brief (3-minute) period of counselling to urge a smoker to quit results in smoking cessation rates of 5-10%.

4.3 COPD: EARLY DIAGNOSIS AND ASSESSMENT

Diagnosing COPD is based on a combination of history, physical examination, functional assessment and confirmation of the presence of airflow obstruction using spirometry. The diagnosis of COPD should be considered in any patient who has dyspnoea, chronic cough or sputum production, and/or a history of exposure to risk factors for the disease, especially cigarette smoking. Educating patients, HCPs and the public that cough, sputum production, and especially breathlessness are not trivial symptoms is an essential aspect of the public health care of the disease.

Physical examination is not diagnostic in COPD, but it is an important part of patient care. Absence of physical signs does not exclude a diagnosis of COPD. Spirometry is essential to establish the diagnosis.

The early diagnosis and assessment of COPD require:

- Access to spirometry
- Assessment of severity (Table 8 and Figure 5)
- Additional investigations (Table 9)
- Specialist referral - where appropriate (Table 5)
- Advice for patients regarding self-management (Appendix 7)

Spirometry

Access to spirometry is essential for early diagnosis and management of COPD. Early diagnosis is an opportunity for secondary prevention and early intervention to minimise the impact of the disease process.

Spirometry is an objective measure of how an individual inhales and exhales air as a function of time. The Forced Expiratory Volume in the first second of maximal expiration after a maximal inspiration (FEV₁) is used to make the diagnosis. The degree of airflow limitation, i.e. severity of the spirometric abnormality, is used to classify the disease severity.

Assessment of severity is based on the following:

- Degree of airflow limitation i.e. severity of the spirometric abnormality (Mild, Moderate, Severe, Very Severe)
- Patient's level of dyspnoea which can be assessed by the modified Medical Research Council (mMRC) Dyspnoea Scale
- Patient's quality of life as measured by COPD Assessment Test (CAT) score or other measures
- Frequency of exacerbations
- Presence of comorbidities and
- Complications such as respiratory failure, right heart failure, lung cancer, osteoporosis and weight loss etc.

Classification of severity of airflow limitation in COPD ⁵

(Based on post-bronchodilator FEV₁)

GOLD 1	Mild	FEV ₁ ≥ 80% predicted
GOLD 2	Moderate	50% ≤ FEV ₁ < 80% predicted
GOLD 3	Severe	30% ≤ FEV ₁ < 50% predicted
GOLD 4	Very severe	FEV ₁ < 30% predicted

Modified Medical Research Council (mMRC) Dyspnoea Scale

Grade 0: "I only get breathless with strenuous exercise"

Grade 1: "I get short of breath when hurrying on the level or walking up a slight hill"

Grade 2: "I walk slower than people of the same age on the level because of breathlessness or have to stop for breath when walking at my own pace on the level"

Grade 3: "I stop for breath after walking about 100 yards or after a few minutes on the level"

Grade 4: "I am too breathless to leave the house" or "I am breathless when dressing"

Table 8 Assessment of Severity

The assessment of COPD severity as recommended by the GOLD consortium is based on a combination of symptoms and exacerbation history as illustrated in Figure 5. (5)

⁵ The levels of severity are based on the Global Initiative for Chronic Obstructive Disease (GOLD) 2019.

THE REFINED ABCD ASSESSMENT TOOL

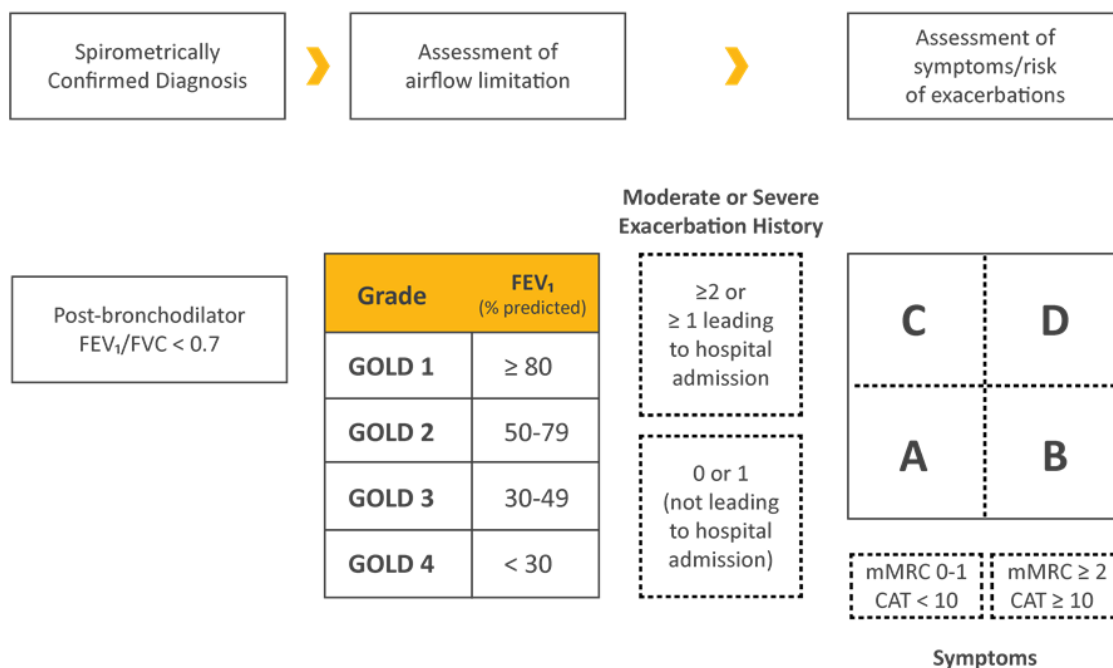


FIGURE 2.4

Figure 5 The refined ABCD Assessment Tool (GOLD 2019)

Additional Investigations

Additional investigations may be necessary for some patients or in some situations. Initially COPD and asthma may be indistinguishable on the basis of history and examination in patients presenting for the first time.

Additional investigations may include:

- Bronchodilator reversibility testing: To rule out a diagnosis of asthma
- Chest X-ray: To exclude alternative diagnoses, and identify comorbidities such as cardiac failure
- CT Scan to evaluate for bronchiectasis and to assess for lung volume reduction surgery
- Pulse Oximetry
- Arterial blood gas measurement
- α₁-Antitrypsin Deficiency screening

Table 9 Additional Investigations

Referral may be appropriate at any stage – to a respiratory specialist outpatient clinic (Level of Service 3, Specialist Ambulatory Care) or to services in the community (see Table 6).⁶

4.4 MANAGEMENT OF ESTABLISHED COPD

In the management of stable COPD, it is envisaged that care will be primarily delivered in Levels 1 and 2 of the proposed model with rapid access to respiratory specialist expertise ambulatory care and /or specialist in patient care where further diagnostic investigations or respiratory specialist advice may be necessary (Levels 3 and 4). Reasons for specialist referral are listed in Table 5 above.

The patient may need to access these services on an intermittent basis or for on-going care. Once the patient's condition has stabilised and management plans are in place, the level at which continuing care will be delivered will reflect the recommendations in the COPD Discharge Bundle (Appendix 6).

Implementation of the ICP Model of Care for Chronic Disease proposes that care being provided for patients in their community is coordinated with hospital services.

Once COPD has been diagnosed, effective management should be based on an individualised assessment of current symptoms and future risks with a focus on symptom relief and reducing risk of exacerbation and disease progression. The optimal management of patients with COPD aims on improving the quality of life irrespective of the disease stage.

People with stable COPD have the potential to manage their condition and optimise their quality of life with minimum acute health care interventions.

COPD management involves a partnership between the patient and the relevant HCPs with the aim of supporting patients to self-manage their own condition. See Table 2.

Goals of Management

The overall goals of management of stable COPD are listed in Table 10 below. (5) These include the avoidance of risk factors to prevent disease progression and pulmonary rehabilitation and pharmacotherapy as needed to control symptoms. The management of those with more severe disease include the above as well as access to specialist care for specific case management including intensive support and disease specific monitoring.

⁶ The management of such co morbidities is beyond the scope of this MOC. However the clinician looking after patients with COPD is encouraged to be aware of such co morbidities, anticipate them developing and provide appropriate management.

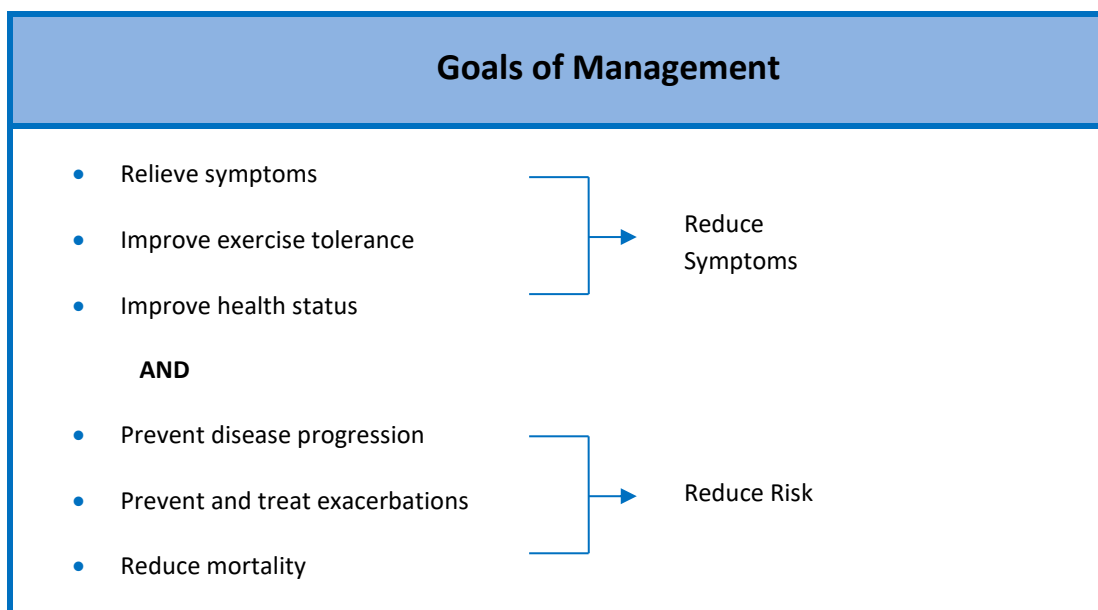


Table 10 Goals for the treatment of stable COPD (Gold 2019)

4.4.1. Care Provision

In the management of stable COPD, it is envisaged that care will be primarily delivered in Levels 1 and 2 of the proposed model with access when required to ambulatory care and /or specialist care (Levels 3 and 4).

Patients with stable COPD require access to:

- A General Practitioner and a practice nurse
- A Clinical Nurse Specialist (respiratory - integrated care)
- A Pulmonary Rehabilitation Programme
- Intermittent access as needed to a respiratory specialist, more complex pulmonary function assessment and the broader multi-disciplinary team.

Integration and co-ordination between the GP led Primary Care Team (Level of Service 1) and members of the broader multidisciplinary team (Levels of Service 2, 3 and 4) is essential to ensure a cohesive approach to the care of people with COPD many of whom frequently have comorbidities.

Key components of all consultations should reflect *Making Every Contact Count* (Appendix 2) and include discussions and intervention as appropriate on:

- Smoking cessation
- Nutritional advice
- Safe and effective exercise
- An understanding of the treatment plan and the importance of medication adherence
- The correct use of appropriate medication delivery devices
- Coping strategies for living with COPD including preparation for end of life
- Recognising and managing anxiety and depression
- Early recognition of exacerbation signs and symptoms and knowing when to make the decision to seek medical advice as appropriate.
- Nutrition screening, early detection of malnutrition and referral to a dietician for targeted nutrition advice and monitoring of nutritional status
- Assessing and recognising the palliative care needs as appropriate
- Supports and resources available

Figure 6 below sets out the stepwise approach with a focus on self-management and monitoring of symptoms coupled with a GP led MDT approach to the on-going management of COPD. It includes the preventive measures discussed above.

Management of Stable COPD

Individual Management

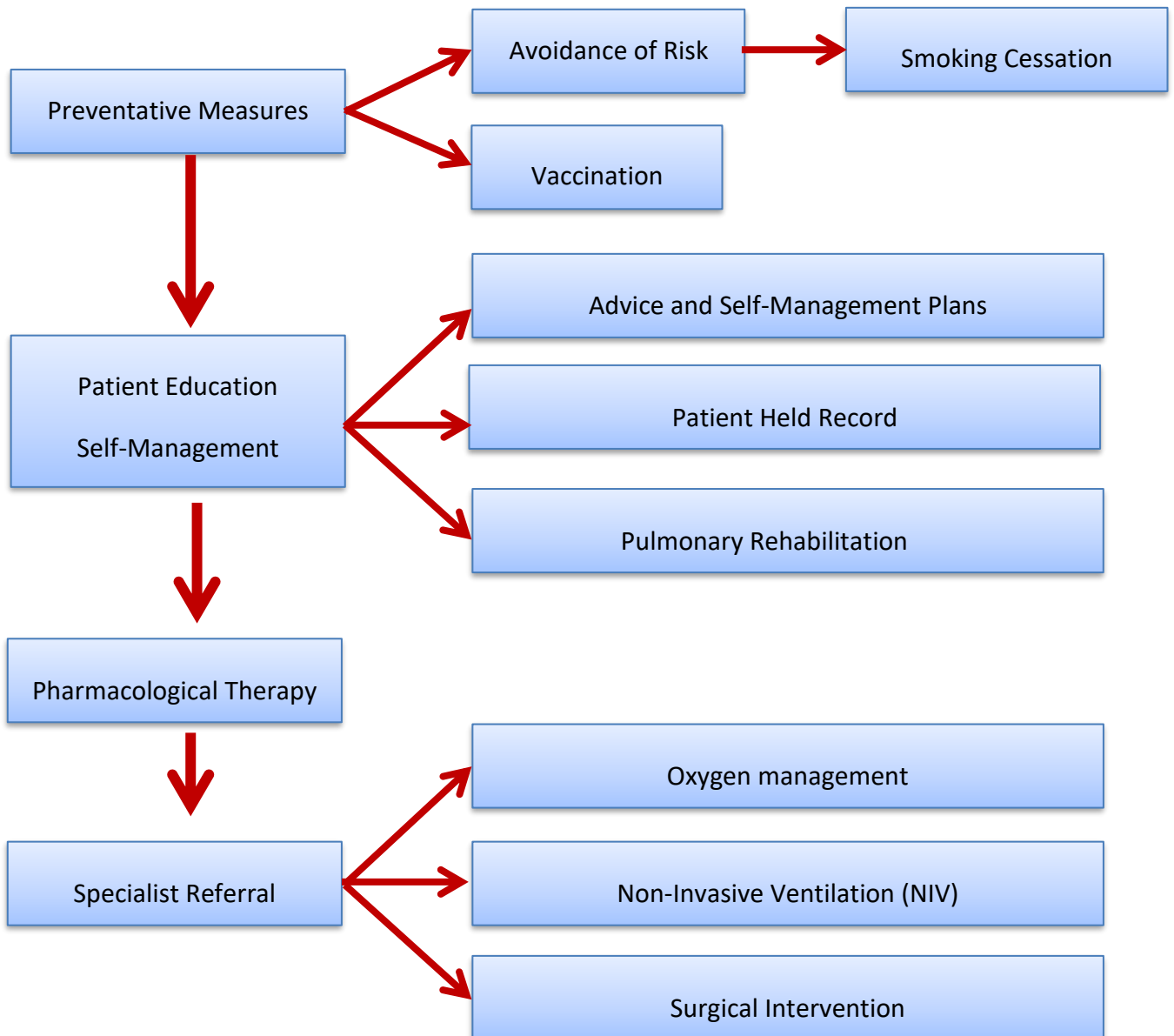


Figure 6 Management of Stable COPD

4.4.3. Pharmacological Treatment

Pharmacologic therapy can prevent and control symptoms, reduce the frequency and severity of exacerbations, improve health status and improve exercise tolerance. None of the existing medications for COPD modify the long-term decline in lung function. Key points from the Draft National Clinical Guidelines for COPD include recommendations on the types of medication required in the management of stable COPD (Appendix 3).

Each treatment regimen needs to be patient-specific as the relationship between severity of symptoms and airflow limitation is influenced by factors such as frequency and severity of exacerbations, development of respiratory failure, comorbidities (cardiovascular disease, sleep-related disorders, etc.) and general health status.

Differentiation of asthma from COPD is important because each disease requires a different therapeutic approach. Some patients may have features suggestive of both asthma and COPD and the differentiation may not be easy. Spirometry is clearly key in making a more certain diagnosis. Occasionally an asthmatic component cannot be ruled out and in those circumstances a short therapeutic trial of corticosteroids may be indicated.

Key Points

- The cornerstone of pharmacological management is inhaled medications. The choice of inhaler device should be based on the skills and ability of the patient which should be regularly reviewed
- Bronchodilator medications - beta2-agonists, anticholinergics - used singly or in combination should be given on an as-needed basis or on a regular basis⁷
- A trial of the addition of inhaled corticosteroid to bronchodilator treatment can be considered for symptomatic COPD patients with an FEV₁ < 50% predicted (COPD with spirometrically severe or very severe COPD) and with repeated exacerbations, or high CAT or mMRC scores
- A1-Antitrypsin Deficiency replacement therapy for appropriate highly selected patients.
- Antibiotics: The routine use of antibiotics, other than for treating infectious exacerbations of COPD and other bacterial infections, is currently not indicated
- Opioids may be useful in highly selected patients but must only be recommended under specialist supervision

Table 11 Key pharmacotherapy points from National Clinical Guidelines

⁷ The choice within each class depends on the availability of medication and the patient's response.

4.4.4. Patient Education, Self-Management and Support

Assisting people with **stable COPD** to build confidence in self-management skills should be a key function of all HCPs at all levels of service delivery. Self-management helps those with COPD comply with the therapeutic, behavioural and environmental adjustments required to maximise their control over their COPD and thereby maximise their quality of life, have fewer exacerbations, attendances at hospital, and unscheduled visits to the doctor.(8) Written COPD self-management plans (Appendix 7) are recommended and should contain three key action points advising the person:

- When to increase their usual therapy so as avoid or reduce the severity of an exacerbation
- When to commence steroid tablets and antibiotics
- When to seek urgent medical attention

The plan requires regular discussion with the patient, review and adaptation. The plan should be developed at diagnosis. Exacerbation or hospital admissions also provide opportunities to review self-management plans and COPD Communication Card (Appendix 5).

4.4.5. STRUCTURED REVIEW

<p>Patients should have a structured review of their COPD control, the frequency and the content of which are guided by their level of severity. Structured reviews which should occur in General Practice (Level of Service 1) focus on the following: Structured Review (6 monthly or annually)</p>		
<p>Symptom assessment:</p> <ul style="list-style-type: none"> • Dyspnoea • Frequency of exacerbations 	<p>Risk reduction</p> <ul style="list-style-type: none"> • Smoking cessation • Weight management • Nutrition advice • Physical activity • Vaccination • Motivational support 	<p>Medication:</p> <ul style="list-style-type: none"> • Appropriate medication • Inhaler technique • Adherence /Concordance • Side effects • Oxygen assessment
<p>Comorbidities (including mental health):</p> <ul style="list-style-type: none"> • Management • Drug interactions • Mental health and wellbeing 	<p>Need for specialist referral /review</p> <ul style="list-style-type: none"> • LTOT • NIV 	<p>Pulmonary rehabilitation</p> <ul style="list-style-type: none"> • Suitability • Participation
<p>COPD Management Plan</p> <ul style="list-style-type: none"> • Review • Update • Update COPD Communication Card (Appendix 5) 		

Table 12 Structured Review

4.4.6. PULMONARY REHABILITATION

The principal goals of pulmonary rehabilitation are to reduce symptoms, improve quality of life, and increase physical and emotional participation in everyday activities. Pulmonary rehabilitation should be considered at the time of diagnosis or as soon as possible thereafter.

Pulmonary rehabilitation is a multidisciplinary time-limited programme of care for patients with chronic respiratory impairment that is individually tailored and designed to optimise each patient's physical and social performance and autonomy. It is a key evidence-based component of international guidelines for COPD and the draft National Clinical Guidelines for the Management of COPD. Pulmonary rehabilitation incorporates exercise, education, self-management and behaviour change. All patients with significant dyspnoea mMRC level 2 or worse should be referred for pulmonary rehabilitation (Figure 7).

As an Implementation Guide “The Implementation of Pulmonary Rehabilitation” is being developed only key elements are referred to in this section. (9) It is an integral part of the management of all patients with COPD.

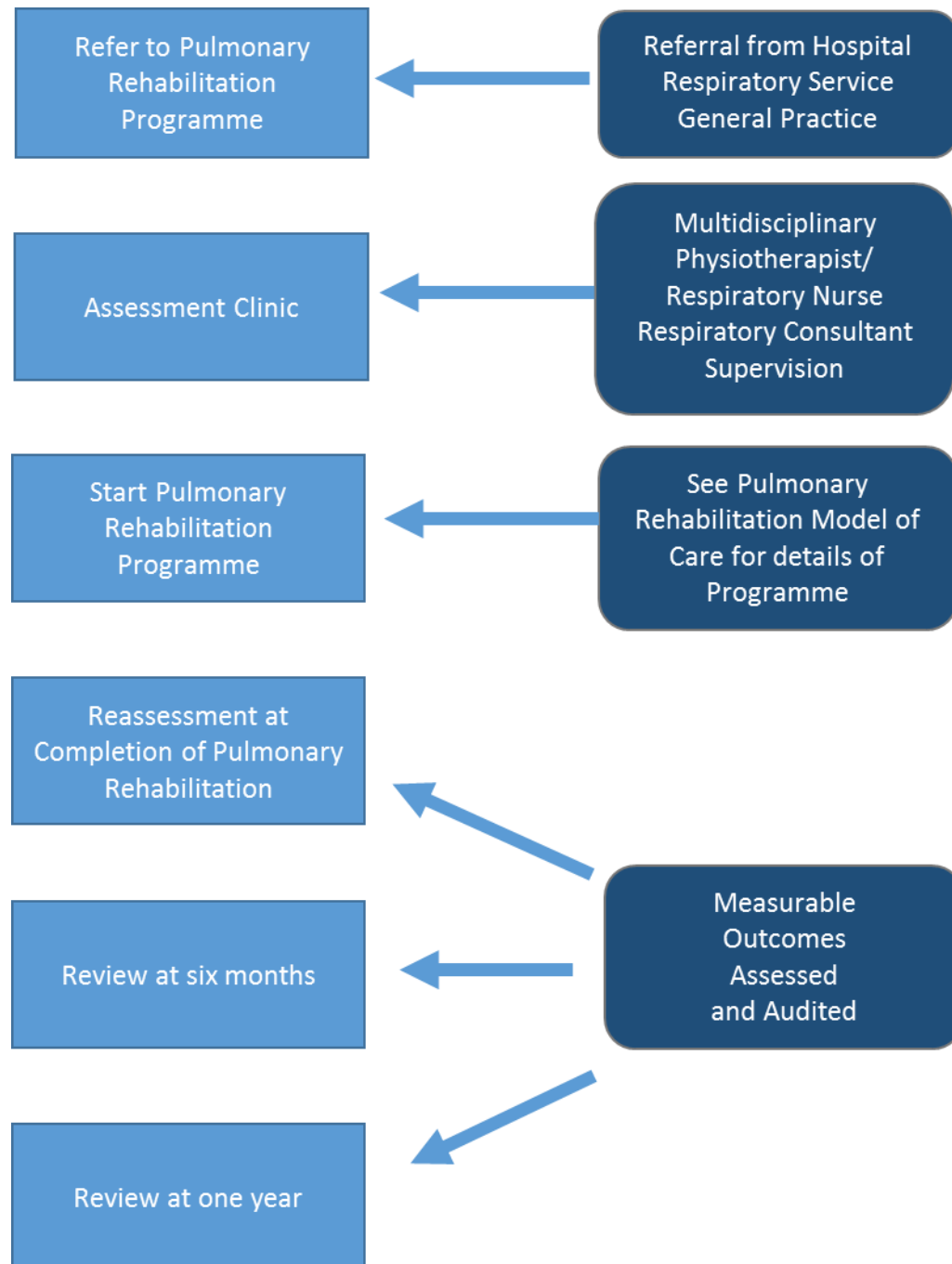


Figure 7 Pulmonary Rehabilitation Pathway

Recommendations

- Pulmonary rehabilitation should be an integral part of the management of people with COPD
- All patients with a diagnosis of COPD and mMRC level of dyspnoea of >2 should be referred to pulmonary rehabilitation
- All patients following a hospital admission with an exacerbation of COPD should be referred to a pulmonary rehabilitation programme – regardless of when they last completed such a programme
- People should be referred using the National Standardised Referral Form
- Those who satisfy the inclusion criteria should commence on a programme (Table 13)
- Programmes should be of at least 6 to 8 weeks duration with a minimum of 12 supervised exercise sessions
- Pulmonary rehabilitation programmes components should be as per evidence-based practice i.e. include multi-components, multidisciplinary interventions, tailored to the individual patient's needs and incorporate a programme of physical training, disease education, nutritional, psychological and behavioural intervention. Pulmonary rehabilitation programmes should be easily accessible to all patients with COPD i.e. timely availability, held at times that suit patients, in locations that are easily accessible for patients and with facilities to meet their needs
- All COPD patients benefit from exercise training programmes, and should have access to same, even if they are not suitable for a formal Pulmonary Rehabilitation Programme

Inclusion Criteria	Exclusion criteria
<ul style="list-style-type: none">• Confirmed diagnosis of chronic respiratory disease by spirometry• Functionally limited by dyspnoea despite optimal management• Able to travel to venue• Motivated to participate and change lifestyle• Ability to exercise independently	<ul style="list-style-type: none">• Uncontrolled cardiovascular conditions limiting participation in an exercise programme• Significant orthopaedic, psychological or neurological conditions that reduce mobility or cooperation with physical training

Table 13 Criteria for pulmonary rehabilitation

4.5 MANAGEMENT OF ACUTE EXACERBATIONS OF COPD

An Acute Exacerbation of COPD (AECOPD)

- A change in the patient's baseline dyspnoea, cough, and/or sputum that is beyond normal day-to-day variations
- The patient typically experiences increased shortness of breath, increased sputum volume and increased sputum purulence
- It is acute in onset and may warrant a change in regular medication

The most important risk factors associated with repeated exacerbations of COPD are the occurrence of previous exacerbations and continued smoking. It should be possible to reduce both frequency and severity of exacerbations by reducing exposure to risk factors and supporting patient education and self-management. The elements which are of vital importance in both the prevention and /or amelioration of exacerbations include: patient education, smoking cessation support, vaccination (influenza and pneumococcal), appropriate medications, and pulmonary rehabilitation which can be beneficial at all stages of disease including for patients recovering from an exacerbation. Likewise, self-management plans for those with more severe illness may help COPD patients deal with exacerbations at home often without requiring medical input. The points below are provided in Figure 8.

Level 1 and 2 Primary Care

Based on their self-management plan, the first call by the patient is usually to the GP who will assess and treat the patient in the surgery or at home, unless or until there are characteristics of a severe exacerbation at which stage the GP will refer the patient to the hospital for further treatment as per Algorithms C.

Most patients with an exacerbation of COPD can be assessed and treated at home and managed in the community by GP practices and outside clinic hours in GP OOH services (Level 1) where they will be managed based on National Clinical Guidelines.

Level 3

If indicated, patients will be referred to ED, AMU, and AMAU for assessment. For all patients presenting to ED/AMU/MAU with an exacerbation of COPD, the COPD admission bundle should be followed. This is an aide-memoire to ensuring necessary interventions take place (Appendix 4). The National Clinical Programme

for COPD recognises that local services may alter the contents of this Acute Management Bundle to fit with local need.

The bundle includes a recommendation to consider COPD Outreach (Level of Service 3) referral if such a service is available. See Referral Criteria Table 6.

Likewise, the proposed National Discharge Bundle specifies how patients are managed post discharge. See Appendix 6.

As a priority, patients who may be suitable for COPD Outreach services should be referred to such a service where available (Level of Service 3). Otherwise if the responsible clinician decides the patient is suitable for discharge home from ED or AMU/ AMAU, patients should be advised to attend their General Practice service (Level of Service 1) for COPD review within 2 working days of discharge. The discharge letter should be forwarded to the GP practice from the ED/AMU/ AMAU.

In locations where there is an Integrated Respiratory Clinical Nurse Specialist (CNSp) service (Level of Service 2), these patients will be prioritised for referral. Likewise for those discharged after attending ED or referred to MAU. On discharge a patient admitted with AECOPD should have a follow up review with a CNSp in the patient's general practice where available.

This may be because of the severity of the exacerbation, the need for therapies that are not available to that patient at home (such as oxygen or nebulised bronchodilators), or the need for specialist interventions such as non-invasive ventilation. COPD Outreach services (if available) should be consulted on potential candidates using COPD Outreach referral criteria (Level of Service 3).

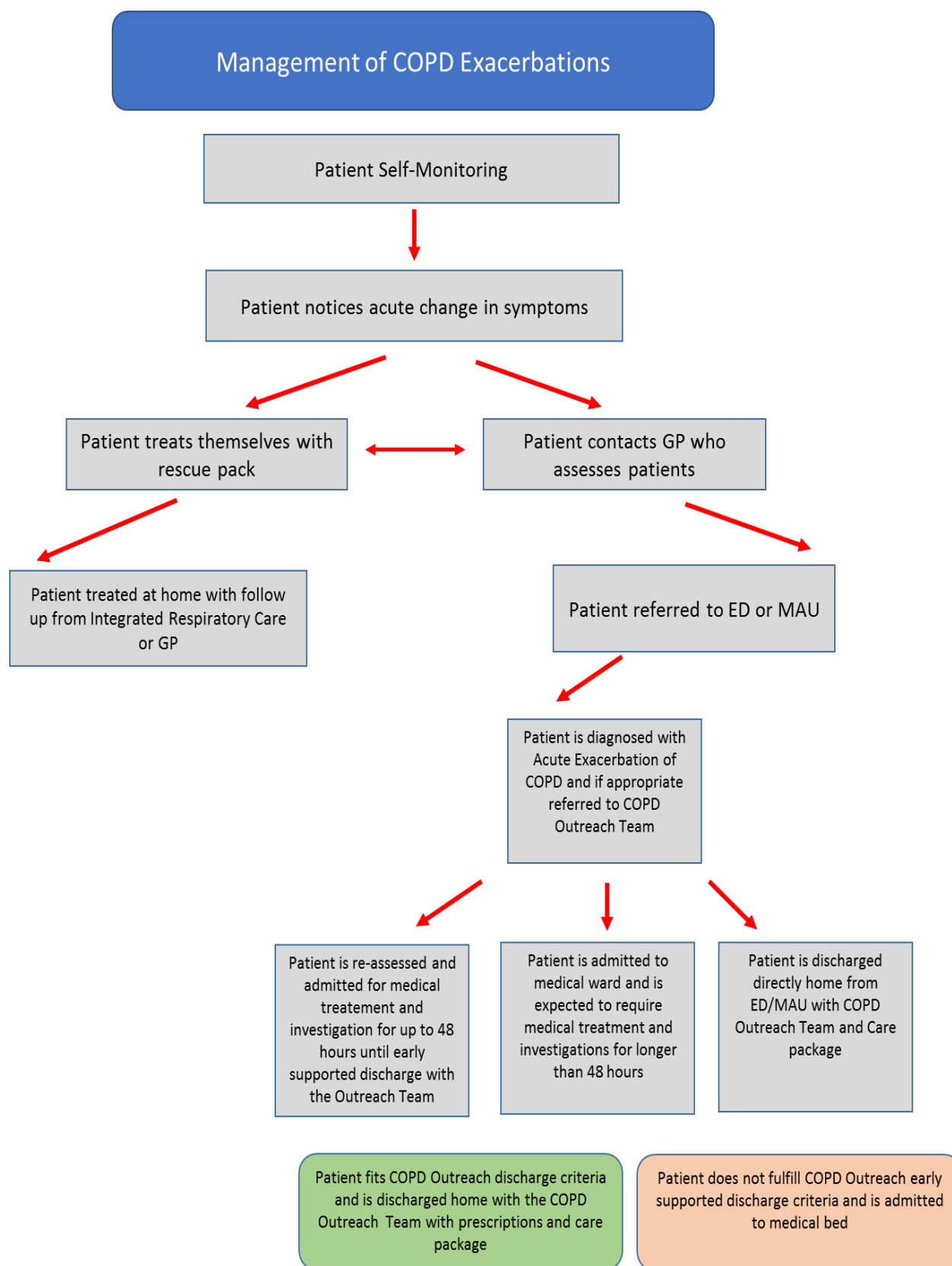
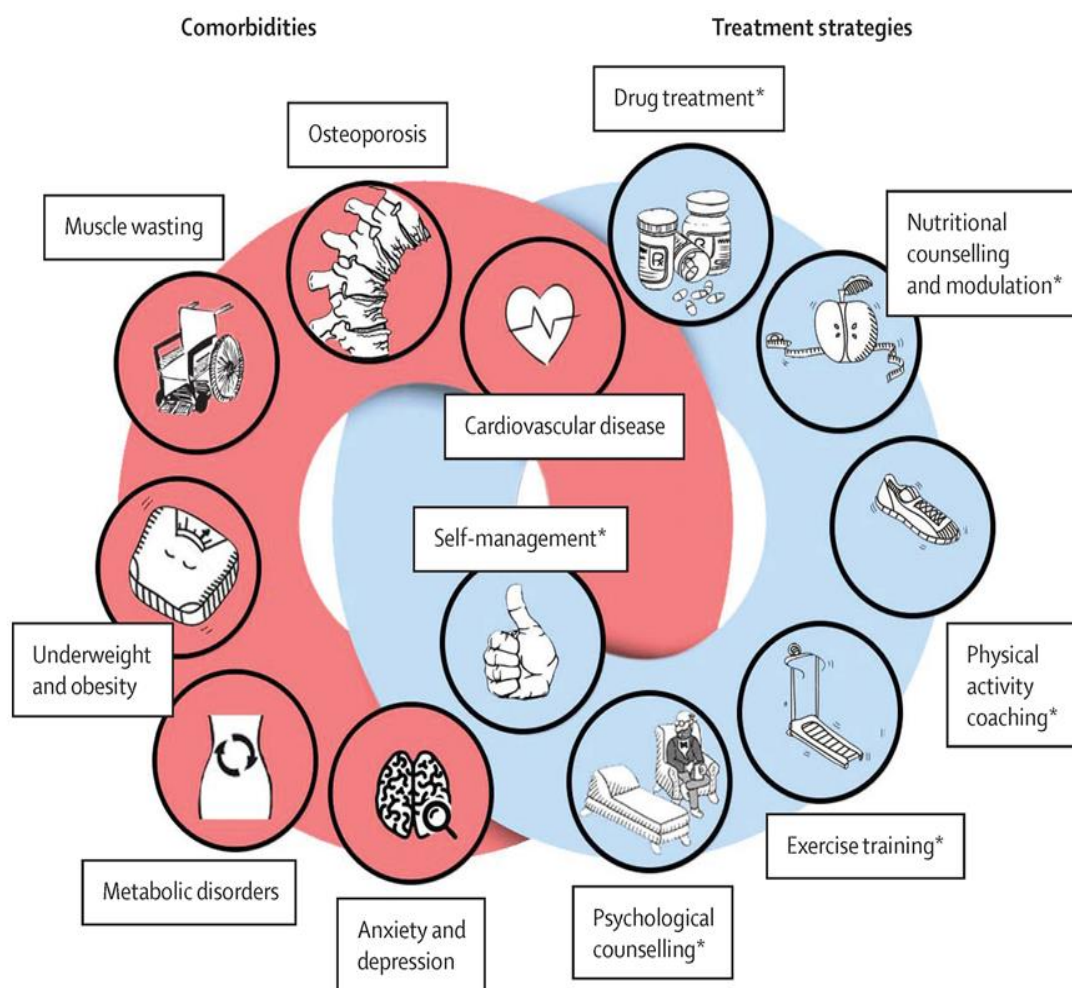


Figure 8 Management of Acute Exacerbation of COPD

4.6 MANAGEMENT OF COMORBIDITIES IN COPD

Comorbidities are common in patients with COPD and add to the complexity of managing such patients. Clinicians looking after patients with COPD need to be alert to the presence of such comorbidities and assess and investigate them when appropriate. Issues such as frailty which are common in the frequently older population with COPD also need to be addressed. Comprehensive advice and management of these common abilities is beyond the scope of this model of care (Figure 9) but relatively simple interventions can lead to improved quality-of-life and prognosis in patients with COPD. (7)



(12)

Figure 9 Management of COPD comorbidities (Vanfleteren et al. 2016)

4.7 CARE AND SUPPORT FOR PATIENTS WITH ADVANCED COPD

COPD is a chronic progressive incurable disease. As such, many patients will develop physical, psychosocial or spiritual distress related to their illness and experience reduced quality of life. Palliative care needs may arise at any point in an

individual's illness journey, but they often become more severe and burdensome as the disease advances.

The goal of palliative care is to improve quality of life by reducing symptom burden, providing psychosocial and spiritual support, supporting communication and care planning and by extending supports to family and carers.

Reflecting the current scope and practice of palliative care, palliative care is not dependent on prognosis and can be delivered at the same time as curative treatment.

National Eligibility Criteria for Palliative Care	
<ul style="list-style-type: none">• An advanced, progressive, life-limiting condition and• Current or anticipated complexities relating to symptom control end of life care-planning or other physical, psychosocial or spiritual needs that cannot reasonably be managed by the current care provider(s).	

Recommendations for palliative, end-of-life and bereavement care for patients with COPD and their families:

- Patients with COPD should be able to easily access a level of palliative care appropriate to their needs, regardless of care setting or diagnosis.
- All healthcare staff should have the training and education to ensure competence in the identification, assessment of patients with palliative care needs and all patients with COPD will have regular, standardised assessment of their needs.
- Discussions around End-of-Life care and decisions among appropriate patients about the health care provision they would feel appropriate should be encouraged.
- Communication and shared decision-making should be supported and discussions about advanced care planning and end-of-life decision making should be encouraged.⁸

⁸ It should be noted that work is currently being undertaken by the Quality Improvement Division in the HSE on advance care planning and the use of advanced care directives. Once completed, this Model of Care will be updated to link and align with HSE recommendations regarding advance care planning practice

- The use of Advanced Directives or living wills and the specification of the patient's designated healthcare representative should be promoted with patients by HCPs.
- The palliative care issues identified in the *Palliative Care for All* document (HSE and Irish Hospital Foundation, 2008) for those with COPD should be addressed.

5. COPD EPIDEMIOLOGY AND COSTS

5.1. COPD Prevalence

COPD is the most prevalent respiratory disease in adults. As COPD prevalence in Ireland has never been measured at a national level, exact figures for its prevalence and burden in Ireland are not known. The lowest estimates of prevalence are those based on self-reporting of a doctor diagnosis of COPD or equivalent condition. For example, most national data show that less than 6% of the adult population has been told that they have COPD. (5) Many with COPD may be undiagnosed, especially those with milder disease, but diagnosed at a late stage, COPD health interventions are both less effective and more expensive. All studies show an increase with age; in people aged >70 years, the prevalence maybe 20% in men and 15% in women. (14) Most studies confirm an increased prevalence in men. Probably in part due to different age distribution and varying environmental exposures, prevalence varies considerably between European countries. (15) The global international, population-based Burden of Lung Disease (BOLD) studies, which use standardised survey methods and a spirometric criterion for COPD, report a prevalence of moderate – severe COPD (i.e. excludes mild disease) in Europe of 10%. (14) Given the mortality and relatively high rate of hospitalisations for COPD in Ireland, Irish prevalence figures may well be as high. Extrapolating from studies done elsewhere in Europe suggests a prevalence of 275,000 cases based on a doctor made diagnosis, to 500,000 cases based on cross-sectional surveys. (15)

The population aged >35 years in Ireland could increase by a factor of 51%-94% by 2036. This ageing Irish population together with current and historical smoking prevalence means that the health burden of COPD in Ireland will continue to increase and be a significant burden to people, health services and society for the foreseeable future. With the increasing convergence in smoking rates between males and females, the prevalence rate for COPD in women may in the future equal or even surpass that of men.(16) Projected estimates by the Institute for Public Health for 2020 suggest that in Ireland there is likely to be a 23% increase in the number of adults with clinically diagnosed chronic airway obstruction, with one third of this increase due to increases in the size of the population and two thirds due to population ageing. (17)

5.1.1. RISK FACTORS

Risk factor identification is important both for prevention and treatment of COPD. (5, 17–19)

Host Factors	Environmental Factors
Genes (C)	Inhalational particles
Gender (A)	Outdoor air pollution (C if heavy)
Age (A)	Indoor air pollution (C if heavy)
Growth and development of the lung (A)	Occupational exposures (C if heavy)
Oxidative stress	Tobacco smoke (C)
Respiratory airway hypersensitivity (A)	Social and economic level* (A)
Comorbidities (A)	Respiratory Infections (A)

(A) Additive, (C) causal adapted from The Australian Lung Foundation (2001)

Table 14 Risk factors for COPD

*Social and economic factors are proxies for nutritional status, crowding, exposure to pollutants including work exposures and smoking exposure, access to health care and early respiratory infections

Smoking Prevalence

Smoking is a factor in 85% of those with COPD. The prevalence of COPD is directly related to the prevalence of cigarette smoking but not all people with the same smoking history will develop COPD. Most of those affected have smoked over 20 pack years (20 per day for 20 years). (20–22) Up to 50% of lifelong smokers develop COPD. Genetic and other factors modify an individual's risk from smoking. (23) The proportion of the risk of COPD attributable to smoking is estimated at 40–60%, depending on how many risk factors are taken into account. Although never-smokers are less likely to have COPD, never-smokers comprise about one-quarter of those classified with moderate-severe disease (GOLD stage II+ COPD). (14) Individuals highly exposed to passive smoking (>40hr/week for >5 years) are 48% more likely to present with COPD than are unexposed individuals. (24,25)

The results of Healthy Ireland survey published in 2015 found that 19% of the population (aged 15 and over) smoke on a daily basis. (26) A further 4% identify themselves as occasional smokers. Figures from the Irish National Tobacco Control

Office in December 2012 reported a smoking rate of 21.7% (22.6% of men, 20.9% of women). Smoking rates were highest among young adults (18-34 years), reaching 29.4% in the 25-34 year old age group. The highest cigarette smoking prevalence rates were in the lower income groups – 25.5% of those in C2 (skilled manual workers and those manual workers with responsibility for other people) and 26% of those in DE (**D** Semi skilled and unskilled manual workers, **E** Those entirely dependent on the state long-term plus those unemployed for period exceeding 6 months) categories. The rate amongst those in C1 was 18.7%. The lowest smoking rates (16.1% and 14%) were among farmers (F) and higher socio-economic groups (AB). Given that the adverse effects of cigarettes in terms of COPD can have a lag period of 15-20 years; these rates have significant health implications for the medium and long term.

Social and Economic Factors

COPD is inversely associated with socio-economic status. The association between COPD and socio-economic factors relates not just to an individual's lifestyle and genetic determinants but also to socio-economic public policies such as housing standards, air pollution, and nutrition and service provision. The effects are reflected in risk factors for COPD – the smoking rates in Ireland among those in more deprived social groups as reported above are high compared with the national rate. Among homeless men in Dublin the smoking prevalence was 78%. (27) These social and economic gradients are reflected not just in the prevalence of smoking but also in the prevalence of COPD and the outcome for those with COPD in terms of morbidity and mortality.

Other Contributing Factors

A serious, but often unrecognised, risk factor for COPD is lack of awareness among HCPs and the public. Lack of awareness is a risk factor in terms of delayed diagnosis and delayed effective intervention to slow progression of the disease. People with COPD often delay seeking medical help.

Polymorphisms of many genes or combinations of genes may increase (or decrease) the risk of an individual developing COPD. The best documented genetic risk factor for COPD is hereditary α_1 -Antitrypsin Deficiency. The incidence of severe (ZZ homozygotes) α_1 -Antitrypsin Deficiency in the Irish population is estimated to be 1 in 2,100. (28)

Early Life Environmental factors such as mothers who smoke, frequent respiratory infections and asthma in childhood and bronchial hyper-reactivity are increasingly recognised as important risk factors for COPD. The proportion of the risk of COPD attributable to these early childhood events may be as great as that attributable to smoking. There is an overlap of up to 30% between people with a diagnosis of COPD and asthma.(29,30)

The World Health Organization (WHO) estimates that urban air pollution causes 1% of COPD cases in high-income countries such as Ireland. (31) It also plays a role in the exacerbation of COPD in those with the disease. In Dublin, in the year following the banning of bituminous coal there were approximately 116 fewer respiratory deaths.(32) The relevance of short-term, high peak exposures compared with long-term, low-level exposures is not yet known.

Occupational dust, chemicals and vapours can both cause and increase the risk of COPD independently of cigarette smoking but they also increase the risk of the disease in the presence of those exposed to smoke.(24) Among adults aged 30-75 years the percentage portion of COPD attributable to work is estimated at 19.2% overall. In never-smokers, the percentage portion of COPD attributable to occupational exposure is estimated to be 30%.(33)

While current understanding of risk factors for COPD is incomplete, it is sufficient for action.

5.1.2. BURDEN OF DISEASE IN IRELAND

COPD has considerable impact on the quality of life of the patient, involving long term medical care, frequent hospital admissions for many and often resulting in premature death. As with many chronic conditions, COPD not only affects the patient, but also has significant impact on the carer and family as well as the health services and wider society.

The burden of COPD, as for other chronic diseases, is expressed in terms of disability-adjusted life years (DALYs), which are a composite of life lost due to premature death from COPD (YLL), and years lived with disability due to COPD (YLD). The Global Burden of Disease (GBD) Study compared the contribution of major diseases worldwide in 2010. Among leading causes of death, COPD ranked 3rd, while for years lived with disability (YLD), it ranked 5th.(14, 34) When death and disability are combined as disability-adjusted life years (DALYs), globally COPD ranked 9th in 2010. In the same study, COPD was the 4th highest cause of DALYs in Ireland.

Morbidity

It is difficult to get a measure of the prevalence of the burden of COPD in Ireland and estimates vary widely. The 2015 Irish Health Survey conducted by the CSO asked survey respondents about whether they had suffered from chronic bronchitis, chronic obstructive pulmonary disease, or emphysema in the previous 12 months CSO (2017) Personal communication.(35) From this, they estimated the prevalence of same to be 3% in those aged 45 to 54; 7% in those aged 55 to 64 yrs., 7% in those aged 65 to 74, and 8% in those aged 75 and above. The link between socio-

economic status and prevalence of COPD is clear; with 2% of those in the 'very affluent' category reporting on a diagnosis of COPD (and related), and 6% of those in the 'very disadvantaged' category reporting same. The majority of those with COPD are managed in General Practice and GP presentation data would provide an excellent account of the burden of COPD in Irish Society. However, data on the number of COPD consultations in General Practice are not available. It is estimated that approximately 14.5% of all GP consultations are for respiratory disease. (36)

Mortality

The Global Burden of Disease (GBD) Study reported COPD as the 3rd leading cause of death globally in 2010 (34). The age standardised (to the European Standard Population) death rate for COPD, as reported in 2011, was 27.87 for Ireland compared with 18 per 100,000 inhabitants for the WHO European region. Only three countries (Denmark, Moldova, and Hungary) had rates higher than Ireland. (14)

In 2013, the most recent year for which comparable EU data are available, rates of mortality from respiratory diseases (incl. cancer of trachea, bronchus and lung) were 40% higher in Ireland than the EU-28 average (193.1/100,000 vs. 137.1/100,000). (37)

In Ireland in 2016, there were 3,856 deaths registered as respiratory disease (excluding lung cancer). Deaths due to chronic lower respiratory disease (n = 1,711) and deaths due to pneumonia (n = 1049) account for 72% of these deaths. When cancer of the larynx/trachea/bronchus/lung are included (a further 1,928 deaths), respiratory diseases accounted for 19% of all registered deaths in 2016.

Deaths registered as due to chronic lower respiratory disease are under-estimates, as people with COPD often succumb to other COPD comorbidities especially pneumonia, or non-respiratory causes in particular cardio-vascular disease. While the size of this under-estimation is unknown in Ireland, the literature would suggest that for more than 60% of people with COPD, a comorbidity other than COPD may be listed as the primary cause of their death. Under recognition and under diagnosis of COPD affect the accuracy of mortality data. While COPD is frequently the primary cause of death it may be listed as a contributory cause of death or omitted from that certificate entirely. An Irish audit showed that the in-hospital mortality for those with COPD was 3.3% and the 90-day mortality was 8.3%. (38)

In Ireland, almost 70% of excess winter mortality from respiratory disease arises in the poorest three socio-economic groups.(39) An Irish study which looked from respiratory disease was greater than 200% between the lowest and highest occupational class.(40) More recent data for the period 2007-2012, shows a difference in COPD mortality in the order of 303%, in the lower classes compared with the upper classes for males aged 15+. For the age group, 15-64 years, the

excess is even higher at 366%. In other words, deaths from COPD in the period 2007-2012 were three times higher in the lower social class compared with the upper social class, implying a much greater mortality for lower social classes from COPD (CSO, 2014). Such data show that the greatest burden in terms of COPD mortality is borne by those in the lower social classes.

5.1.3. Burden on Health Services plus wider Economic and Social Burden of COPD

Associated with the disease burden of COPD evidenced in the above section, is a significant economic and social cost. 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.

5.1.4. Hospital Utilisation

Patients with severe disease may suffer frequent exacerbations requiring medical attendance, potential hospitalisation and severe disruption of their quality-of-life. Data for admissions to acute public hospitals are of use as proxy measures of disease burden especially for those at the more severe end of the COPD spectrum. Of those hospitalised in Ireland with COPD, over 90% have additional co-morbidities while 6.5% require ventilation. (36)

Ireland has the highest rate of hospitalisation for COPD of all OECD countries. In 2013 (the latest year for which OECD data are currently available), the age-standardised hospitalisation rate in Ireland based on OECD age standardisation was 424/100,000 population for males and 354/100,000 for females which equates to an age-sex standardised rate of 395/100,000, almost double the OECD average of 201 hospitalisations per 100,000 population. In 2017, this age standardised hospitalisation rate was relatively unchanged - a slightly lower rate of 342/100,000 for males and 394/100,000 for females (age-sex standardised rate 368/100,000 population) (Figure 10). (41)

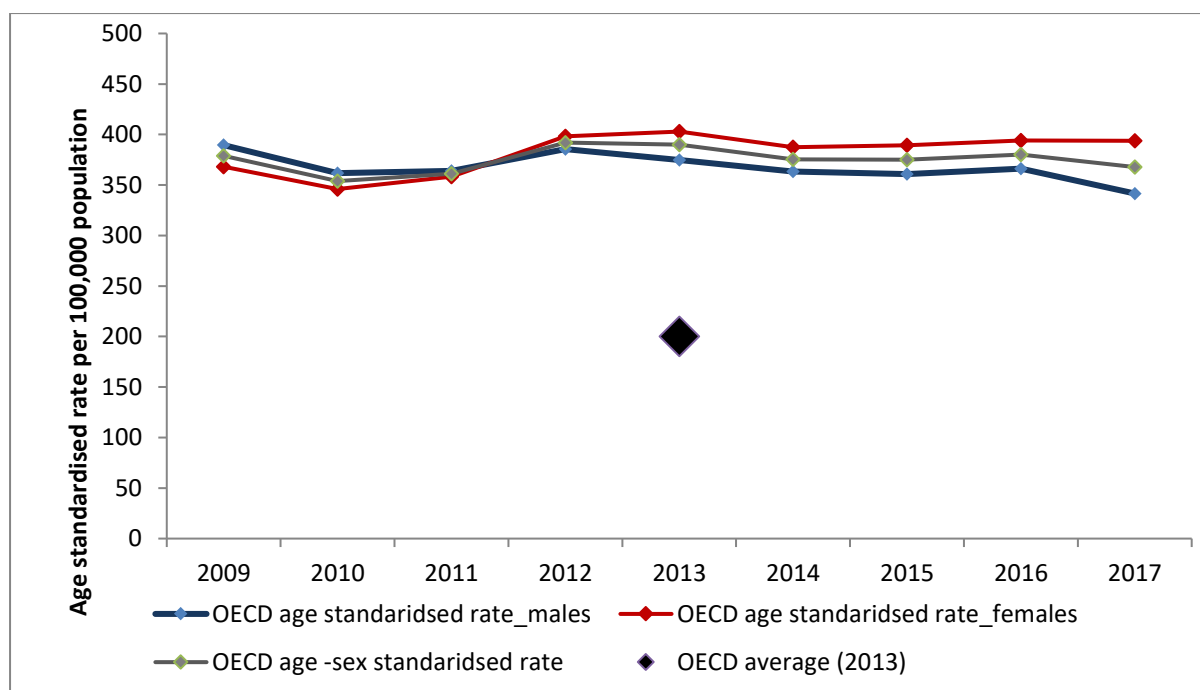


Figure 10 Age-standardised overnight hospitalisation rates for COPD per 100,000 population by sex, 2009-2017

Source: HIPE 2009 to 2017 includes all in-patient episodes for adults aged 15 years and older, with a primary diagnosis of COPD in adult acute hospitals. Excludes: episodes of care with same day discharges, and transfers from another acute hospital using the methodology from the National Healthcare Quality Reporting System (42)

CSO census data 2011 & 2006; CSO population estimates for other years. OECD population 2010 for standardisation.

This discrepancy may be due – in part - to differences in how countries code their hospitalisation data; Ireland uses the ICD-10-AM/ACHI coding system and other countries that use this system were also above the OECD average, suggesting that comparability across the OECD as a whole may be inappropriate. This caveat notwithstanding however, differences in coding alone cannot explain why hospitalisation rates in Ireland are the highest among all of the countries listed.

The hospitalisation figures for episodes of care for patients with a diagnosis of COPD discharged from adult acute public hospitals are shown in Table 15 below. Also presented are the numbers of inpatient bed days used (BDU) and mean and median length of stay (LOS) over this time period. Across acute hospitals in 2017, COPD accounted for 3.9% of all discharges and 4.4% of all bed days used (in adults aged 35 years and older). In addition to the 15,127 discharges with a primary diagnosis of COPD from these hospitals, there were a further 14,514 episodes of care where COPD was recorded as a secondary diagnosis implying that for 7.6% of inpatient discharges (in adults aged 35 years and older) in adult acute hospitals, COPD was a factor. Episodes of care with a primary or secondary diagnosis of COPD accounted

for almost 12% of in-patient bed days in adult acute hospitals in 2016, again amongst adults aged 35 years and older (see Table 16).

Day case activity for COPD was considerably lower: - 1,914 episodes in 2016 across all hospitals reporting to HIPE.

Year	Discharges COPD*	% of all in-patient discharges	Rate/100,000 population	Bed days used ^{&} COPD*	% of all in-patient bed days used	Mean & LOS (SD)	Median ^{&} LOS (IQR)
2009	11,026	3.6%	507	102,907	4.1%	9.3 (13.5)	6 (3-10)
2010	10,615	3.5%	478	98,718	4.0%	9.3 (15.4)	6 (3-10)
2011	11,364	3.7%	500	99,269	4.1%	8.7 (13.2)	6 (3-10)
2012	13,059	3.9%	567	105,132	4.3%	8.0 (13.2)	5 (3-9)
2013	13,830	4.0%	590	109,048	4.4%	7.8 (13.5)	5 (2-9)
2014	14,140	3.9%	591	111,349	4.4%	7.8 (11.7)	5 (2-9)
2015	14,489	4.0%	592	115,593	4.4%	7.9 (12.1)	5 (2-9)
2016	15,460	4.1%	614	119,787	4.5%	7.7 (11.8)	5 (2-9)
2017	15,127	3.9%	591	119,845	4.4%	7.8 (12.7)	5 (2-9)

Table 15 In-patient discharges with a primary diagnosis of COPD* in adult acute public hospitals, 2009-2017 (adults aged 35 years and older)

Source: HIPE 2009-2017. In-patient activity in adult acute public hospitals only. Denominator is all in-patient discharges in those hospitals in adults aged 35 years and older. CSO census data (2011, 2016) and CSO population estimates for other years provide denominator data for rate of discharges per 100,000 population. *ICD-10 codes of J40, J41, J42, J43, J44, J47 used as diagnosis of COPD. [&]In-patients with same day discharge (example those admitted and discharged from an Acute Medical Assessment Unit) are given a length of stay of 0.5 in the calculation of average length of stay (LOS), and a bed days used of one.

Year	Discharges COPD*	% of all in-patient discharges	Rate/100,000 population	Bed days used ^{&} COPD*	% of all in-patient bed days used
2009	22,445	7.2%	1033	268,947	10.8%
2010	23,422	7.6%	1056	282,243	11.5%
2011	24,218	7.9%	1065	279,596	11.7%
2012	26,876	7.9%	1167	283,969	11.5%
2013	27,924	8.0%	1191	290,307	11.8%
2014	28,007	7.8%	1171	291,325	11.5%
2015	28,133	7.7%	1150	307,555	11.7%
2016	29,780	7.8%	1182	317,993	11.9%
2017	29,641	7.6%	1158	317,075	11.6%

Table 16 In-patient discharges with a primary or secondary diagnosis of COPD* in adult acute public hospitals, 2009-2017 (adults aged 35 years and older)

Source: HIPE 2009-2016. In-patient activity in adult acute public hospitals only. Denominator is all in-patient discharges in those hospitals in adults aged 35 years and older. CSO census data (2011, 2016) and CSO population estimates for other years provide denominator data for rate of discharges per 100,000 population. *ICD-10 codes of J40, J41, J42, J43, J44, J47 used as diagnosis of COPD. [&]In-patients with same day discharge (example those admitted and discharged from an Acute Medical Assessment Unit) are given a length of stay of 0.5 in the calculation of average length of stay (LOS), and a bed day used of one

Putting respiratory in-patient admissions in context, in 2016, lung disease (including cancer of the trachea, bronchus and the lung) accounted for 14.0% of all discharges from Irish hospitals (across all categories and age groups) and 15.8% of bed days used. COPD, pneumonia and other acute lower respiratory tract infections (as primary diagnoses) were collectively responsible for 7.0% of in-patient discharges and 9.7% of bed days used in 2016 (Figure 11). (41)

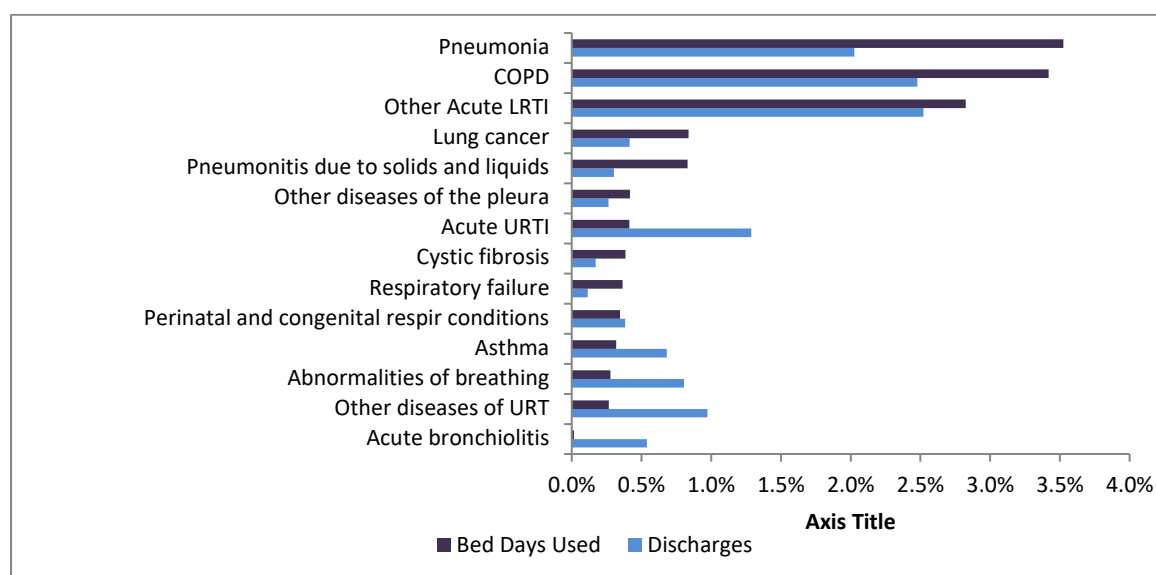


Figure 11 Percentage of in-patient discharges and bed days used by respiratory conditions

Source: HIPE data 2016. Denominator is all in-patient admissions discharged from all hospitals reporting data to HIPE (all ages).

An analysis of emergency in-patient admissions discharged from hospitals in 2016 reveals that 19% of in-patient emergency admissions (across all ages) were due to lung disease and related cancers (as defined above) and these admissions were responsible for 20% of bed days used by all emergency admissions to hospital. COPD, pneumonia and other acute lower respiratory tract infections (again as primary diagnoses) were collectively responsible for 10.5% of emergency in-patient admissions and 13.7% of bed days used. (Figure 12). (41)

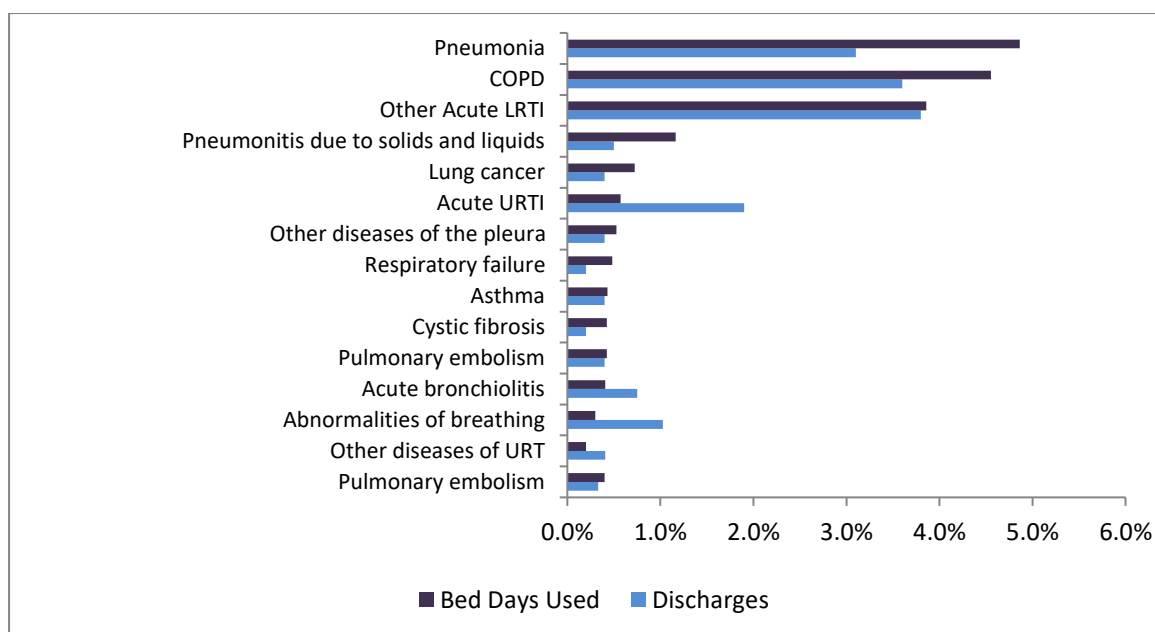


Figure 12 Percentage of emergency admissions and bed days used by respiratory conditions, 2016

Source: HIPE data 2016. Denominator is all in-patient emergency admissions discharged from all hospitals reporting data to HIPE (all ages).

5.2. AGE SPECIFIC TRENDS IN HOSPITALISATION

Hospitalisations for COPD clearly increase with age. In 2016, across all age categories there were almost 16,000 in-patient discharges with a primary diagnosis of COPD, with higher numbers seen in those over 60 years. Putting this in context of all hospital in-patient activity, 6.5% of in-patient activity (across all hospitals reporting data to HIPE) in the 65 to 74-year age bracket was for episodes with a primary diagnosis of COPD, and 5.4% in the 75 plus age group. (Figures 13 and 14). (41)

If we look at those with a primary diagnosis of COPD, pneumonia or other acute LRTI as is commonly reported in the UK, the figures are even more startling. (43) In total there were over 45,000 in-patient discharges with a primary diagnosis of COPD, pneumonia or other acute LRTI in 2016, again heavily skewed to the older age groups (Figure 13, darker red). In those aged 65 to 74 years, 12.5% of all in-patient hospital episodes had a primary diagnosis of COPD, pneumonia or other acute LRTI. This number rises to 15.4% in those aged 75 and above (Figure 13 darker red). (41)

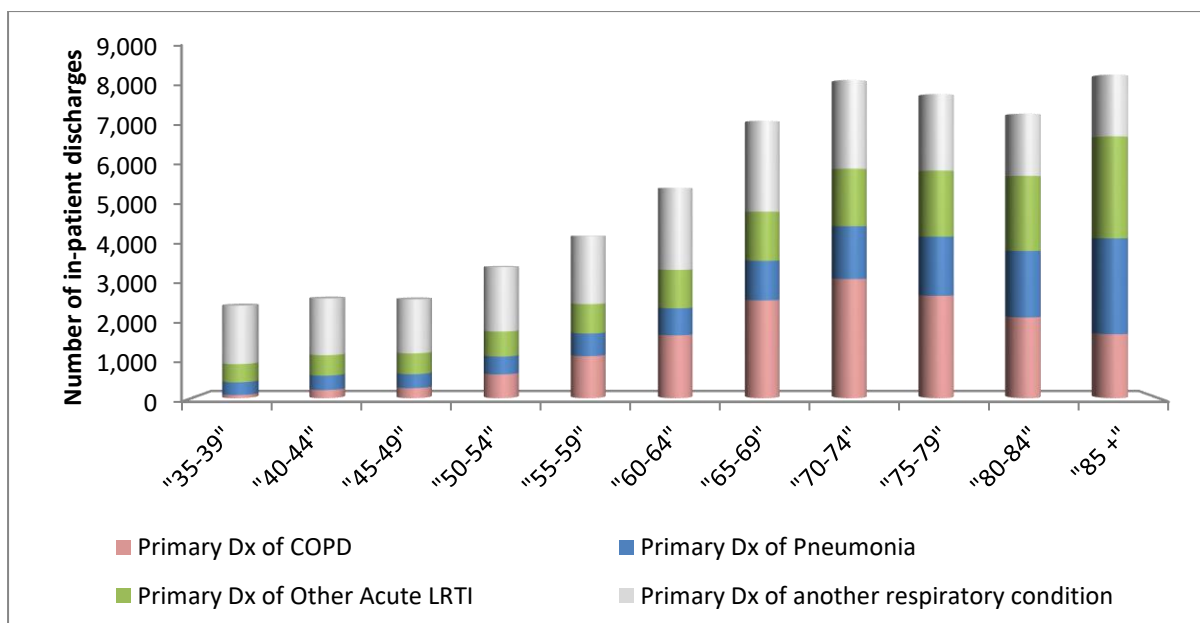


Figure 13 In-patient respiratory discharges, and discharges with a primary diagnosis of COPD, pneumonia or other acute respiratory tract infection (LRTI), 2016

Source: HIPE data 2016. Includes all hospitals reporting data to HIPE

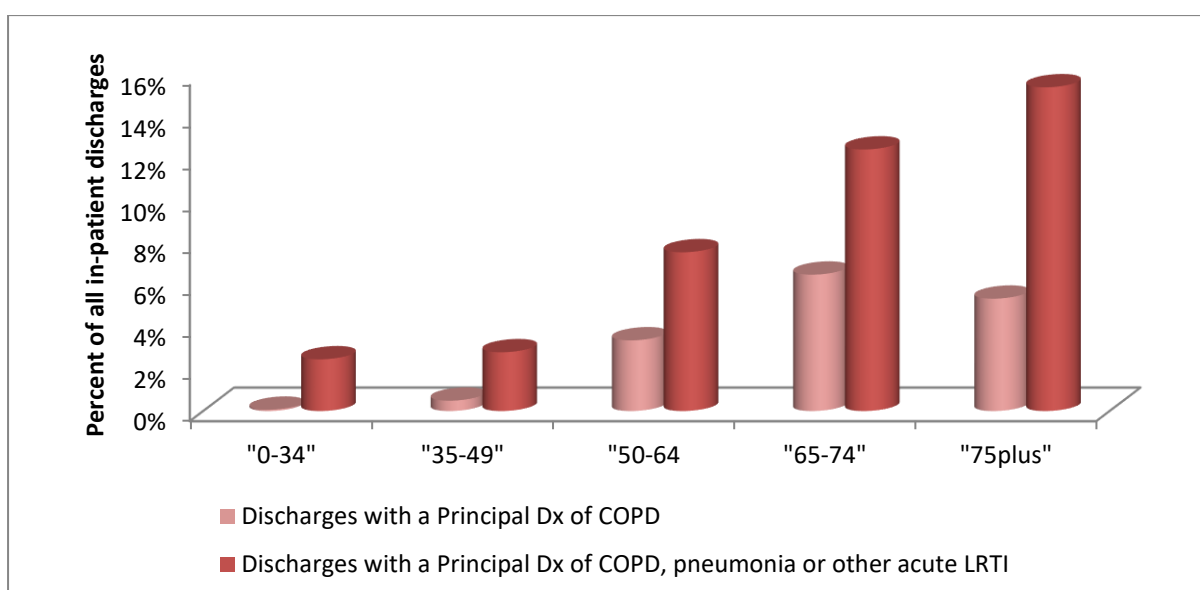


Figure 14 Proportion of in-patient discharges with a primary diagnosis of COPD or a primary diagnosis of COPD/ pneumonia/other acute LRTI 2016

Source: HIPE data 2016. Includes all hospitals reporting to HIPE. Denominator is all in-patient admissions discharged from all hospitals reporting data to HIPE in that age category.

5.3. MEDICATION USE FOR MANAGING COPD

Amongst patients with GMS eligibility for the entire 2016, (approximately 1.53 million individuals), 19.3% of males and 20.6% of females filled at least one prescription for a respiratory medication. Rates were highest in the early and later years of life. In the 0 to 4yr age category, almost 26% of boys received a respiratory medication; this rate declined quickly to a low of 12% in the middle age categories (25 to 45 yrs.), and rose steeply above 55 years to a high of 28% in those aged over 75yrs. Females show a similar trajectory, but with slightly lower rates than males until the age of 16 years, from which age the rate of medication use among females remains consistently higher until very old age, when the rate again is higher amongst males (Table 17). (44)

Age category	Estimate of prevalence of respiratory medication use in the GMS population (%)			
	Male%	95% CI	Female%	95% CI
All ages	19.3%	19.2 to 19.4	20.6%	20.5 to 20.7
0-4yrs	26.4%	26.0 to 26.8	21.4%	21.0 to 21.8
5-11yrs	22.6%	22.3 to 22.8	17.2%	17.0 to 17.5
12-15yrs	21.7%	21.3 to 22.1	17.3%	16.9 to 17.7
16-24yrs	14.3%	14.1 to 14.6	15.2%	14.9 to 15.5
25-34yrs	11.6%	11.3 to 11.8	14.6%	14.3 to 14.9
35-44yrs	11.8%	11.6 to 12.0	15.5%	15.3 to 15.8
45-54yrs	14.3%	14.0 to 14.5	20.2%	19.9 to 20.4
55-64yrs	19.2%	18.8 to 19.5	26.1%	25.8 to 26.4
65-69yrs	23.5%	23.9 to 23.9	26.6%	26.2 to 27.0
70-74yrs	25.1%	24.7 to 25.5	26.6%	26.2 to 27.0
75yrs & over	28.0%	27.7 to 28.3	26.3%	26.0 to 26.6

Source: PCRS GMS dataset for 2016. Accessed 31 January 2018. GMS Eligibility figures provided by Primary Care Reimbursement Service (personal communication).

Table 17 Proportion of the population with full GMS eligibility for 2016 that were dispensed at least one respiratory medication

Limiting the analysis to those drug combinations frequently prescribed for COPD* an estimate of prevalence of COPD in males in the GMS population increases from 7.5% in those ages 45-54 years to 21.7% in those aged over 75 years. (Table 19) In females, prevalence estimates increase from 10.1% in the 45-54 year age group, to 18.9 % in those aged over 75 years. (44)

Age category	Estimate of prevalence of COPD medication use %			
	Male	95% CI	Female	95% CI
45-54yrs	7.5%	7.3 to 7.6	10.1%	9.9 to 10.3
55-64yrs	12.9%	12.7 to 13.1	16.4%	16.2 to 16.7
65-69yrs	17.2%	16.8 to 17.6	17.9%	17.5 to 18.2
70-74yrs	19.0%	18.6 to 19.3	18.6%	18.2 to 18.9
75yrs & over	21.7%	21.4 to 21.9	18.9%	18.7 to 19.2

Table 18 Proportion of the population with full GMS eligibility for 2016 that were dispensed at least one respiratory medication indicative of COPD*

Source: PCRS GMS dataset for 2016. Accessed 31 January 2018. GMS Eligibility figures provided by Primary Care Reimbursement Service (personal communication). *Dispensed at least one prescription for an ICS & LABA combination, OR a LAMA (with or without a LABA), OR a SAMA (with or without a SABA) in 2016.

The prevalence estimates in those aged over 70 years are very similar to those found in the BOLD study (20%, (m), 15 % (f)), and are broadly representative of the wider Irish population, given that approximately 75% of adults aged over 70 years have GMS eligibility. It is not recommended to extrapolate prevalence estimates in the other age groups to the entire population, as GMS eligibility is considerably lower (approximately 50% of the Irish population over the age of 50 years are not in the GMS cohort) . Given the association between socio-deprivation and COPD, it is likely that prevalence of COPD is considerably higher in the population with GMS eligibility than those without.

5.4 SPEND ON PHARMACEUTICALS

In Ireland in 2016, government reimbursement for respiratory medications in the GMS population was 113.7 million (11% of the GMS budget) and 10.7 million (12% of the DPS budget). Of that, expenditure on medications prescribed for COPD (R03AK - adrenergic in combination with corticosteroids or other drugs for obstructive airway disease airway, and R03BB - anticholinergics, and R03AL- adrenergics in combination with anticholinergics) accounted for approximately 67.6 million in the GMS population. (44,45)

These costs do not include additional drugs such as antibiotics or steroids nor long term oxygen therapy (LTOT), supply of nebulisers, vaccines etc., or the supply of medication in hospitals. Neither do they account for the out-of-pocket costs by patients who pay privately for their medication (i.e., those not eligible for a GMS card, or whose monthly medication costs fall below the 144 euro threshold). Hence these figures grossly underestimate the spend on pharmaceuticals for the management of COPD in Ireland.

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6. APPENDICES

APPENDIX 1 COPD MULTIDISCIPLINARY TEAM

Appendix 1 COPD Multidisciplinary Team : The Levels refer to the levels of Service Figure 3	
General Practitioner (GP)	<p>Primary Care Service Level 1 and 2</p> <p>Key health professional for the majority of patients with COPD. They provide assessment, diagnosis, treatment and on-going monitoring of patients with COPD. Referral for specialist respiratory services when required</p>
Practice Nurse	<p>Primary Care Service Level 1 and 2</p> <p>Works with GP, providing regular structured review, performs spirometry⁹ for diagnosis, education, support and advice on life style changes including smoking cessation, provision of vaccination, instruction in inhaler technique and self-management.</p>
Respiratory - Integrated Care Nurse (CNSp)	<p>Primary Care / Hospital (Service Level 2)</p> <p>Provides specialist support to general practice in review of COPD patients, providing direct clinical care, information, education and support¹⁰.</p> <p>Facilitates evidenced based diagnosis and management of patients with COPD, providing spirometry testing, assessment and advice on management, review of inhaler therapy and technique, supporting self-management, lifestyle changes including smoking cessation, exercise and breathing control techniques, oxygen assessment and care of NIV, and supporting/providing symptom control management and provide or refer to the Pulmonary Rehabilitation Programme.</p> <p>Provides education with, patients, their families/carers and the wider MDT in, disease education evidenced based management the prevention of disease progression and self-management support.</p> <p>Provides an integrated link to secondary care specialist support</p>
Senior Physiotherapist – Integrated Care	<p>Community Service Level 2</p> <p>Works within the community setting with the main focus to support the development of the Pulmonary Rehabilitation Programme in the community. Also provides spirometry testing, assessment and review of inhaler therapy and technique and education in self-management strategies. Focuses on developing patient knowledge and skills in airway clearance, breathing control and exercise.</p> <p>Provides education with, patients, their families/carers and the wider MDT in, disease education evidenced based management the prevention of disease progression and self-management support.</p> <p>Provides an integrated link to secondary care specialist support</p>
Community Pharmacist	<p>Service Level 1 and 2</p> <p>Plays a key role in helping COPD patients manage the disease. Provides information on medication and medication review, inhaler technique training together with an explanation of self-management plans if suitably skilled.</p>

⁹ Is suitably skilled

	They can also provide assistance in education in smoking cessation and general health and wellbeing.
COPD Outreach team Senior Physiotherapist and Respiratory Clinical Nurse Specialist	Hospital based (Service Level 3) Provides early supported and assisted discharge from hospital for patients with COPD. ¹¹ Providing follow up for 2 weeks post discharge, monitoring clinical condition, providing education on disease, airway clearance, breathlessness management, inhaler technique, self-management plans and supporting lifestyle changes including smoking cessation. Provides or is involved in the delivery of the Pulmonary Rehabilitation Programme, oxygen assessment and COPD clinics. Provides education for patients, their families/carers and the wider MDT in, disease education evidenced based management the prevention of disease progression and self-management support
Respiratory Clinical Nurse Specialist (CNSp)	Hospital based (Service Level 3 and 4) The hospital based respiratory nurse cares for patients and their families/carers with COPD by providing direct clinical care, information, education and support. Facilitates evidenced based diagnosis and management of patients with COPD, providing spirometry testing, assessment and advice on management, review of inhaler therapy and technique, supporting self-management, lifestyle changes including smoking cessation, exercise and breathing control techniques, oxygen assessment and care of NIV, and supporting/providing symptom control management and pulmonary rehabilitation programme. Provides education for patients, their families/carers and the wider MDT in, disease education evidenced based management the prevention of disease progression and self-management support
Advanced Nurse Practitioner (ANP)	Hospital based (Service Level 4) Works autonomously to provide care for patients and their families/carers with COPD by providing direct clinical care, information, education and support. Provides independent nurse led clinics for COPD patients, facilitating evidenced based diagnosis and management and oxygen assessment clinics including assessment and prescribing. Provides case management and support for the on-going care of specific patients in collaboration with GP, Consultants and the wider MDT. Provides education for patients, their families/carers and the wider MDT in, disease education evidenced based management the prevention of disease progression and self-management support
Respiratory Physiotherapist	Hospital based (Service Level 3 and 4) The hospital based respiratory physiotherapist manages patients with COPD, and provides care through breathlessness management, use of NIV, exercise prescription, oxygen assessment, supporting self-management and airway clearance where applicable.
Advanced Practice Physiotherapists	Hospital based Service Level 4 Provides and interprets spirometry. Takes and interprets ABGs, prescribes LTOT and Ambulatory Oxygen and assessment and management of a consultant caseload. COPD Outreach and Respiratory Integrated Care Physiotherapists are involved in these clinical activities
Respiratory Physiologist	Hospital based Service Level 4 Provides pulmonary function testing in both the hospital and community

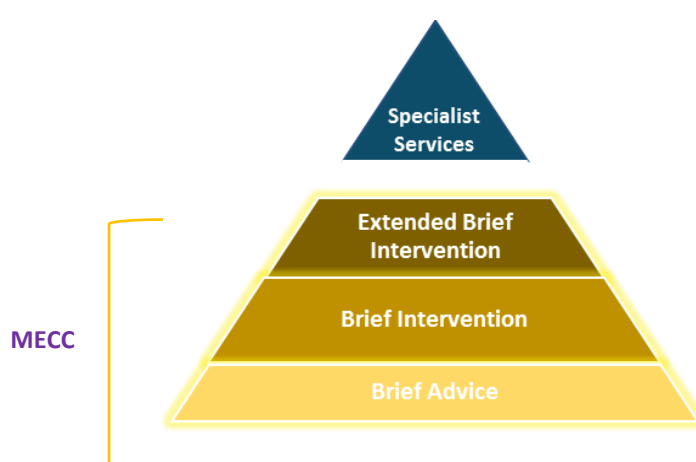
¹¹ See eligibility criteria

	setting for the diagnosis of COPD. Provides a resource and training for staff in the provision of quality assured community based spirometry testing.
Consultant Respiratory Physician	<p>Hospital based (Service Level 3 and 4)</p> <p>Provides a point of reference for specialist advice and support on the management of COPD patients to members of the MDT looking after such patients in primary and secondary care. Responsible for the development of integrated care to encompass appropriate inpatient care including supervision of oxygen assessment and non-invasive ventilation. Supervises the provision of diagnostic facilities in the community as well as in hospital. Facilitates the development of Pulmonary Rehabilitation both in hospital and in the community.</p> <p>Provides support and advice to the secondary care and integrated care respiratory nurses and physiotherapist and cANP.</p>
Hospital Pharmacist	<p>Hospital based (Service Level 3 and 4)</p> <p>Provides and supports medicine reconciliation on admission, during the inpatient stay and discharge. Assists the nursing and medical team in providing medicine advice and the education and training of patients in the correct use of medications.</p>
Dietitian	<p>Secondary and community settings</p> <p>Assesses the individual's nutritional status and risk of malnutrition</p> <p>Develops evidence-based nutrition care plans based on the individual's need.</p> <p>Provides education for wider MDT, including nutrition screening tools</p> <p>Provides advice regarding the use of therapeutic artificial nutrition support in line with best practice guidelines</p>
Administrative Support	Provides support to staff for administrative functions, including communicating with patients in specific service areas, but also across the continuum of services. The role supports the COPD team to maintain patient local registers, scheduling appointments and collecting /collating minimum data sets.
Palliative Care	<p>Provides care and support to patients and their families to maintain the best possible quality of life and end of life care for appropriate patients.</p> <p>Assists in the management of symptoms such as pain, breathlessness or fatigue.</p> <p>Gives patients and their family psychological support to assist and adapt to the progression of disease and help patients plan for the future.</p>
Psychologist	Provides support to clients, either in a group or in one to one sessions, with long term health conditions by validating the impact of their condition on their mental and physical wellbeing (a bidirectional relationship). Works with clients to foster a range of skills to assist them to self-manage their condition and in turn using these self-management skills helps clients to break their symptom cycle giving them confidence to positively impact their mental and physical wellbeing.
Smoking Cessation Team	<p>Provides one to one or group sessions to support people through their quit smoking process, providing:</p> <ul style="list-style-type: none"> • Assessment of quit history coping strategies • Information on available drug treatments • Measurement of carbon monoxide levels • Advise on general health and wellbeing

APPENDIX 2 MAKING EVERY CONTACT COUNT

Appendix 3 Making Every Contact Count

The Making Every Contact Count (MECC) programme is a key action in supporting the implementation of *Healthy Ireland, a National Framework for Improved Health and Wellbeing*. (3, 11) MECC is about health professionals using their routine consultations to empower and support people to make healthier choices to achieve positive long-term behaviour change.



The lifestyle risk factors which are the focus of attention in the MECC Programme include tobacco, alcohol, physical activity and obesity. The model for MECC is presented as a pyramid with each level representing an intervention of increasing intensity with the low intensity interventions at the bottom of the pyramid and the specialised services at the top. Implementing the *Making Every Contact Count* approach seeks to begin the process at the basic level of **brief advice and brief intervention**. In practice this will mean that all health professionals and healthcare assistants will be trained to a level that enables them to conduct a brief intervention with their patients when appropriate. It is envisaged that **extended brief intervention** will be conducted by health professionals with greater capacity to carry out this more lengthy intervention, because of their specialist role or due to the specific service that they work in. This intervention should be delivered to patients requiring more intensive support in their behaviour change efforts and/or who may be self-managing an existing chronic disease such as COPD.

The **specialist services** are delivered by practitioners who use specialised or advanced approaches to support patients to change behaviour. These services include smoking cessation and dietetic services, along with services delivered by staff with in-depth counselling skills in the wider arena of supporting people to change.

To implement Making Every Contact Count within all sectors of the health service, actions need to happen in four key areas:

- Organisational level which will involve a culture and environment that supports continuous health improvement and has systems in place to embed MECC in all services and divisions
- Staff engagement, learning, training and skills development is crucial to the integration of MECC within the health service
- Patient empowerment is essential if they are to engage with their health professional about making a behaviour change
- Partnership working with key external affiliates such as Higher Educational Institutes; Professional Associations and Health Professionals not employed within the HSE is central to the success of MECC.

APPENDIX 3 CLINICAL GUIDELINE RECOMMENDATIONS

Draft Clinical Guideline on the Management of COPD

Pharmacological Management of COPD	
<p>Recommendation 1</p> <p><i>Short acting bronchodilators</i></p>	<p>Inhaled short acting beta 2 agonists (SABAs) should be prescribed to patients with confirmed COPD where rescue therapy is needed. (Grade A) (GOLD)</p>
<p>Recommendation 2</p> <p><i>Long acting bronchodilators</i></p>	<p>Long acting bronchodilators should be offered to patients with confirmed stable COPD who continue to have respiratory symptoms (e.g. dyspnoea or cough). (Grade A) (GOLD)</p> <p>Inhaled long acting muscarinic agents (LAMAs) should be offered to patients as first line maintenance therapy in patients with confirmed stable COPD who have continued respiratory symptoms (e.g. dyspnoea, cough) or who have a history of exacerbations with COPD. (Grade A) (GOLD)</p> <p>In patients with confirmed stable COPD who are on inhaled LAMAs or inhaled LABAs alone and have persistent dyspnoea on mono therapy combination therapy with both LAMAs and LABAs is recommended. (Grade A) (GOLD)</p>
<p>Recommendation 3</p> <p>Inhaled corticosteroids</p>	<p>Offering an inhaled corticosteroid (ICS) in symptomatic patients with confirmed stable COPD as first line therapy is not recommended. (Grade A) (Department of Veteran Affairs) (Implied in GOLD)</p> <p>In patients with confirmed COPD who are on combination therapy with LAMAs and LABAs and have persistent dyspnoea or frequent COPD exacerbations, it is suggested that the addition of an ICS may be reasonable. (Grade B) (GOLD)</p>
<p>Recommendation 4</p> <p><i>Inhaler technique</i></p>	<p>It is recommended that each patient commenced on an inhaler device would be provided with instructions and a demonstration of proper inhalation technique prior to using the device and</p>

	that such technique is checked on a regular basis subsequently. Inhaler technique and adherence to therapy should be assessed before concluding that current therapy is insufficient and a change in therapy considered. <i>(Expert Opinion) (GOLD)</i>
<p>Recommendation 5</p> <p><i>Roflumilast</i></p>	In selected patients with the chronic bronchitic phenotype of COPD with severe to very severe air flow obstruction and history of exacerbations, a phosphodiesterase-4 (PDE-4) inhibitor may be reasonable add on to therapy with a LAMA and LABA and possibly ICS. This recommendation is dependent on reimbursement approval by HSE. <i>(Grade B) (GOLD)</i>
<p>Recommendation 6</p> <p><i>Theophyllines</i></p>	In certain selected patients, the addition of a theophylline may be reasonable. <i>(Grade B) (GOLD)</i>
<p>Recommendation 7</p> <p><i>Prophylactic use of Macrolide Antibiotics</i></p>	In patients who have severe COPD with two treated exacerbations and are non-smokers, the addition of azithromycin may be considered for one year <i>(Grade A). (GOLD)</i> This needs to be done in conjunction with Respiratory Specialist advice with surveillance for bacterial resistance and side effects such as impaired hearing and cardiac arrhythmias.
<p>Recommendation 8</p> <p><i>Antioxidants and mucolytics</i></p>	The use of mucolytic and antioxidants in routine practice for management of patients with COPD is not recommended. <i>(GOLD)</i>
<p>Recommendation 9</p> <p><i>Leukotriene antagonists</i></p>	A role for leukotriene receptor antagonists in the management of patients with COPD is not recommended. <i>(GOLD)</i>
<p>Recommendation 10</p> <p><i>Alpha One Anti-trypsin (AATD) Augmentation Therapy</i></p>	It is recommended that AATD augmentation therapy might be considered in young patients who are never or ex-smokers with an FEV ₁ of 35-60% predicted with continued and progressive disease. This recommendation is dependent on reimbursement approval by HSE. <i>(Grade B) (GOLD)</i>

Non-Pharmacological Management of COPD	
Recommendation 11 <i>Smoking cessation</i>	<p>Smoking cessation measures are recommended for the prevention of COPD, to include advice on smoking cessation, nicotine replacement therapy and pharmacotherapy. (Grade A) (GOLD)</p> <p>At the moment, the effectiveness and safety of E. cigarettes as a smoking cessation aid is uncertain.</p>
Recommendation 12 <i>Influenza vaccination</i>	<p>The provision of annual influenza vaccination is recommended. (Grade A) (GOLD)</p>
Recommendation 13 <i>Pneumococcal vaccination</i>	<p>The provision of the pneumococcal vaccination is recommended. (Grade B) (GOLD)</p>
Recommendation 14 <i>Pulmonary rehabilitation</i>	<p>The provision of pulmonary rehabilitation to stable patients with exercise limitation despite pharmacological treatment is recommended. (Grade A) (GOLD)</p> <p>The provision of pulmonary rehabilitation to patients who have recently been hospitalised for an acute exacerbation of COPD is recommended. (Grade B) (GOLD)</p>
Recommendation 15 <i>Oxygen Therapy</i>	<p>The provision of long-term oxygen therapy to patients with chronic stable hypoxemia with a PaO₂ less than 7.3 Kpa or a PaO₂ between 7.3 and 8Kpa with signs of tissue hypoxia (haematocrit greater than 55%, pulmonary hypertension or cor pulmonale) is recommended. (Grade A) (GOLD)</p> <p>The provision of oxygen for patients with moderate hypoxemia, nocturnal de-saturation, nocturnal of exercise induced de-saturation in patients with COPD is not recommended. (Grade A) (GOLD)</p>
Recommendation 16 <i>Nutritional support</i>	<p>Nutritional support should be considered in all malnourished patients with COPD (Grade B) (GOLD)</p>
Recommendation 17	<p>Lung volume reduction surgery is recommended for carefully selected patients with upper lobe</p>

<i>Lung volume reduction surgery</i>	emphysema and low post rehabilitation exercise capacity. (Grade A) (GOLD) In selected patients, bullectomy can also be recommended. (Grade C) (GOLD)
Recommendation 18 <i>Lung transplantation</i>	It is recommended that appropriately selected patients with very severe COPD be considered for lung transplantation surgery. (Grade C) (GOLD)
Recommendation 19 <i>Monitoring of Spirometry</i>	In stable diagnosed COPD patients, decline in FEV 1 need not be tracked by spirometry more frequently than every two years. (Expert Opinion) (Guideline Development Group)
Recommendation 20 <i>Role of Palliative Care</i>	For advanced COPD care and palliation, patients should be referred to a palliative care specialist as appropriate. (Expert Opinion) (Guideline Development Group)
<i>* While Recommendation 11, 12 and 13 are considered non-pharmacological recommendations for the management of COPD, the Guideline Development Group recognises a pharmacological component features in each intervention.</i>	
Management of Exacerbations in COPD	
Recommendation 21 <i>Bronchodilator therapy</i>	The initiation of short acting acute bronchodilator therapy (salbutamol plus or minus ipratropium) is recommended for patients with an exacerbation of COPD (Grade C) (GOLD)
Recommendation 22 <i>Steroids</i>	A course of systemic steroids (prednisone equivalent of 40mgs for five days) to be administered orally to all patients is recommended. Therapy should not be administrated for more than this. (Grade A) (GOLD)
Recommendation 23 <i>Antibiotics</i>	Antibiotic use for patients with exacerbations of COPD associated with increased dyspnoea and associated increased sputum purulent or volume is recommended. First line antibiotic choices should include doxycycline, amoxicillin or a macrolide. Reserving broader spectrum antibiotics such as quinolones for specific indications is recommended.

	(Grade B) (GOLD/Expert Opinion)
Recommendation 24 <i>Non-invasive ventilation</i>	The use of non-invasive ventilation in patients with acute exacerbations of COPD who develop acute respiratory failure associated with respiratory acidosis i.e. a PaCO ₂ greater than 6KPa and an arterial PH less than 7.35. is recommended. (Grade A) (GOLD)
Recommendation 25 <i>COPD outreach service</i>	The involvement of the COPD outreach team at the earliest possible time during a COPD exacerbation when it is being treated in hospital is recommended (Expert Opinion) (Guideline Development Group)
Recommendation 26 Respiratory physiotherapy	It is recommended that respiratory physiotherapists are key in delivering COPD outreach, NIV, oxygen assessment and pulmonary rehabilitation to patients who have exacerbations of COPD (Expert Opinion) (Guideline Development Group)
Recommendation 27 <i>Theophyllines</i>	The use of theophylline in acute exacerbations of COPD is not recommended. (Grade B) (GOLD)
Oxygen therapy prescribing and monitoring in COPD	
Recommendation 28	<p><i>Oxygen therapy prescribing and monitoring in COPD</i></p> <p>Patients discharged home from hospitalisation on oxygen therapy should be evaluated for the need for long term oxygen therapy 30-90 days after discharge. Long term oxygen therapy should not be continued if patients do not meet the criteria. (Expert Opinion) (Guideline Development Group)</p> <p>Routinely offering ambulatory ambulatory LTOT for patients with chronic stable isolated exercise hypoxemia is not recommended. (Grade A) (GOLD)</p> <p>Once the causes of nocturnal hypoxia have been evaluated, routinely offering oxygen therapy for the treatment of isolated nocturnal hypoxia is not recommended. (Grade A) (GOLD)</p>

Pathways, Bundles and Checklists for Managing Acute Exacerbation of COPD

Recommendation 29

It is recommended that an admission and discharge bundle be applied to all patients admitted acutely with an exacerbation of COPD. **(Expert Opinion)**
(Guideline Development Group)

APPENDIX 4 COPD ACUTE MANAGEMENT BUNDLE

COPD Acute Management Bundle		
Patient presents to ED/ AMU/MAU		
Patient assessed by EM/AMU/MAU Clinician and appropriate investigations ordered CXR ECG ABGs Blood Tests FBC, U+E, LFTS, CRP (if available)		
Action	Time completed or reason for Variation	Signed
<input type="checkbox"/> Administration of O2 (FiO2 2L via nasal cannula or 28% via mask) Maintain Sao2 of >88% < 92%	On presentation	
<input type="checkbox"/> Check arterial blood gas and repeat if FiO2 increase is required or hypercapnia. If in respiratory failure with pH < 7.35 consider initiation of non- invasive ventilation/ transfer to appropriate unit.	Within 30 minutes of presentation	
<input type="checkbox"/> Administer nebulised Beta 2 agonists and/or anticholinergics	Within 30 minutes of presentation	
<input type="checkbox"/> Oral prednisone 40 mg (30 mg if 60kg or less)	Within 2 hours of presentation	
<input type="checkbox"/> Review laboratory results	Within 2 hours of presentation	
<input type="checkbox"/> Review Chest x-ray	Within 2 hours of presentation	
<input type="checkbox"/> Administer antibiotics po amoxicillin or clarithromycin or doxycycline <input type="checkbox"/> If new infiltrate treat as pneumonia	Within 4 hours of presentation	
<input type="checkbox"/> Consider COPD Outreach where available (complete inclusion/exclusion criteria)	Within 4 hours of presentation	
<input type="checkbox"/> Ted stockings or LMWH for prophylaxis (if admitted)	Within 8 hours of admission	
<input type="checkbox"/> Refer to Respiratory Team/Nurse <input type="checkbox"/> If patient is currently smoking or an ex-smoker < 3 months refer to Smoking Cessation service <input type="checkbox"/> If appropriate refer to AHP (Physio, OT, Dietetics, SW, etc.)	Within 24 hours of admission	

The National Clinical Programme for COPD recognises that local services may alter the contents of this Acute Management Bundle to fit with local need.

APPENDIX 5 COPD COMMUNICATION CARD

Useful Contacts

GP:

Respiratory Nurse/Physiotherapist:

Pharmacy:

Local Health Centre/Public Health Nurse:

HSE Counselling Service:

COPD Support Ireland Advice Line
Free Phone: 1800 832146
Visit: www.copdle.com

Smoking QUIT line:
1800 201 203 or www.quit.ie

If you have any questions please talk to your nurse, doctor, physiotherapist or pharmacist.

2018

COPD Self –Management Advice

For discussion with your Healthcare Professional

GOOD DAY You are able to carry out your usual activities Your phlegm is a normal colour and amount for you	GREEN ZONE Continue with your medications as prescribed and continue your day as normal. Keep as active as possible
BAD DAY Your COPD may be bothering you. For example, you are more breathless than usual	YELLOW ZONE Use chest clearance techniques. Use your reliever inhaler. Use breathing control exercises, if no relief you may be unwell. Move on to Orange section for guidance.
FEELING UNWELL You are more wheezy, breathless. You have more phlegm which is yellow or green in colour	ORANGE ZONE Take your normal medications and inhalers. Take your reliever medication every 4 to 6 hours, if you have been prescribed rescue antibiotics and steroids by your GP start these. Contact your GP or Out of Hours GP service for advice. Call your COPD Outreach Team or COPD Support Ireland Advice Line for advice.
VERY UNWELL If your reliever and rescue prescription are not helpful or you feel worse	RED ZONE You should urgently contact your GP or Out of Hours GP services. If not able to attend GP then go to the hospital Emergency Department. If you are short of breath at rest, have chest pain or confusion this is an emergency. Call 112 or 999 and ask for an ambulance.



COPD Communication Card



Bring this card with you to all hospital/GP appointments.

Name:

Date of Birth:

GP Name:

Respiratory Consultant Name:

Hospital Name:

Medical Record Number (MRN):

Next of Kin Contact Details:







Back of Card

Home Oxygen: Yes ☐ _____ L/min
No ☐

PCO₂ Retainer: Yes ☐ No ☐

Please aim to keep this patient's oxygen level >88% and ≤92%

Baseline Arterial Blood Gas

Date	pH	PCO ₂	PO ₂	HCO ₃	SAO ₂	FI _O ₂

Home NIV

Date	IPAP	EPAP	O ₂ L/Min

Oxygen/NIV supplier:

Nebuliser: Yes ☐ No ☐
Details:

Spirometry	Date
FEV ₁ % predicted	
FEV ₁ /FVC (%)	
GOLD classification	
DLCO (% Predicted)	

Past Medical History

Smoking: Yes No Ex

Pack Year History: ☐ ☐ ☐

Respiratory Medication List

Date	
Date	
Date	
Date	
Date	
Date	

Ensure that this medication list is up to date before transcribing into medical record

Vaccinations	Date	Date
Flu		
Pneumococcal		

Record of Exacerbations/ Flare ups

Date:	
Antibiotics:	
Steroids:	
Date:	
Antibiotics:	
Steroids:	
Date:	
Antibiotics:	
Steroids:	

Notes:

For completion by your Healthcare Professional

2018

APPENDIX 6 DISCHARGE BUNDLE

COPD Discharge Bundle	
<div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; padding: 5px; width: 40%;"> Affix Patient Label: </div> <div style="text-align: right; font-size: small;"> <i>Must be completed prior to discharge by a Healthcare Professional</i> </div> </div>	
Medication	Medication review <input type="checkbox"/>
	Inhaler technique checked <input type="checkbox"/>
	Inhaler technique adequate <input type="checkbox"/>
Referral to COPD Outreach Service	Yes <input type="checkbox"/> N/A <input type="checkbox"/>
Self-Management Plan	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
Rescue Pack	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
Referral to Pulmonary Rehabilitation Programme	Yes <input type="checkbox"/> N/A <input type="checkbox"/>
	Declined <input type="checkbox"/> Already completed <input type="checkbox"/>
Referral to Smoking Cessation Service	Yes <input type="checkbox"/> No <input type="checkbox"/> Declined <input type="checkbox"/> N/A <input type="checkbox"/>
Follow up for review arranged	Yes <input type="checkbox"/> N/A <input type="checkbox"/>
	Please State: _____ (Consultant, Advanced Nurse Practitioner, GP, Clinical Nurse Specialist)
Print Name: _____ Registration Number: _____ Signature: _____ Date: _____	





The National Clinical Programme for COPD recognises that local services may alter the contents of this Acute Management Bundle to fit with local need

National Clinical Programme for COPD



APPENDIX 7 SELF MANAGEMENT PLAN

COPD Self-Management Plan

	Symptoms	Advice
FEELING WELL 	<ul style="list-style-type: none"> I am able to carry out my usual activities My phlegm is a normal colour and amount for me 	<ul style="list-style-type: none"> Continue with my medication as prescribed and continue my day as normal Keep as active as possible
BAD DAY 	<ul style="list-style-type: none"> My COPD may be bothering me. For example, I am more breathless than usual 	<ul style="list-style-type: none"> Use chest clearance techniques Use my reliever inhaler Use breathing control exercises If no relief I may be unwell. Move on to Orange section for guidance
FEELING UNWELL 	<ul style="list-style-type: none"> I am more wheezy, breathless I have more phlegm which is yellow or green in colour 	<ul style="list-style-type: none"> Take my normal medications and inhalers Take my reliever medication every 4 to 6 hours If I have been prescribed rescue antibiotics and steroids by my GP start them Contact my GP or Out of Hours GP service for advice Call my COPD Outreach Team or COPD Support Ireland advice line for advice
VERY UNWELL 	<ul style="list-style-type: none"> If my reliever and rescue prescription are not helpful or I feel worse 	<ul style="list-style-type: none"> I should urgently contact my GP or Out of Hours GP service. If not able to attend myr GP then go to the hospital Emergency Department If I am short of breath at rest, have chest pain or confusion this is an emergency. Call 112 or 999 and ask for an ambulance

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