Chronic Obstructive Pulmonary Disease Model of Care

Respiratory Health Network

August 2012
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The update of the COPD Model of Care was a collective contribution of a dedicated working group. The time, expertise and willingness to attend meetings around busy schedules and a collaborative approach were invaluable in providing direction and guidance for the update of the Model.

COPD Model of Care Review Working Group members

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<thead>
<tr>
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<tbody>
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</tr>
</tbody>
</table>

Refer to Appendix 1 for a list of those involved in the development of the 2008 COPD Model of Care.
Executive Summary

Chronic Obstructive Pulmonary Disease (COPD) is a combination of several different but related diseases which are primarily characterised by difficulty in breathing\(^1\). COPD has considerable impact on the quality of life of the patient, involving long term medical care, frequent hospital admissions for treatment of exacerbations and, often resulting in premature death\(^2\).

The COPD Model of Care is an articulation of best practice care for those at risk of or with diagnosed COPD across the continuum of care. The Model of Care represents a fundamental shift away from an acute focus which is consistent with the Chronic Lung Condition Model of Care and the WA Chronic Health Conditions Framework 2011-2016\(^3\). The focus is on optimal pathways of care and the management of long-term conditions through self-management, disease and case management.

The Model builds on the knowledge and capacity of the current services provided to people with COPD and evidence-based best practice as documented in the WA Chronic Respiratory Disease Service Improvement Framework (CSIF) November 2005\(^4\). The CSIF sets out the five standards, relating to a stage in the disease continuum, which are covered by this Model of Care including:

- Standard 1: COPD Prevention
- Standard 2: Early diagnosis of COPD
- Standard 3: Management of stable COPD
- Standard 4: Treatment and support during acute exacerbations
- Standard 5: Care and support at the end of life

The objectives of the COPD Model of Care are to:

I. Outline a Model of Care including strategies to facilitate the implementation of the five COPD standards focusing on:
   - Primary prevention particularly to target high risk populations
   - Identification of all smokers and referral to smoking cessation services
   - Optimised access to and use of spirometry
   - Establishment of integrated, community based COPD services including Pulmonary Rehabilitation
   - Management Plans & Service Pathways across the disease continuum.

II. Briefly outline current service delivery and report on the implementation of the five standards for COPD as set out in the CSIF

The Model seeks to improve access to services for people in both metropolitan and rural WA.

The key recommendations of the Model of Care are:

- **Prevention** (CSIF Standard 1) – Develop a coordinated plan to address smoking, particularly amongst target populations including Aboriginal communities, people with mental health issues, pregnant women, low socio-economic populations and prisoners. This can be achieved by improving access to community-based smoking cessation programs population based health awareness campaigns
recommend people seek early medical advice if they have respiratory symptoms, especially smokers.

- **Early diagnosis** (CSIF Standard 2) - Increase access to spirometry for the early diagnosis of respiratory conditions including COPD through identification and training for spirometry providers.

- **Management of stable COPD** (CSIF Standard 3) through access to appropriate services integrated across the continuum of care by primary, secondary and tertiary providers, with a focus on self-management, exercise training and COPD action plans. To achieve this there is a need to expand the range of community-based ambulatory services for COPD and develop integrated referral pathways and protocols.

- **Management of acute exacerbations of COPD** (CSIF Standard 4) through timely access to clinical assessment for all people with COPD who have acute symptoms, particularly in community settings.

- **Care and support during the end stages of life** (CSIF Standard 5) - That a model of service delivery for end of life and palliation for people with COPD be developed in collaboration with relevant stakeholders. This will ensure care is delivered, where possible, at home or in the community and that the use of advance healthcare directives and the appointment of enduring guardians are encouraged.

- **Workforce development** through the expansion of multi-disciplinary teams with clearly defined roles and responsibilities and adequate training in:
  - Brief Intervention for tobacco smoking
  - Chronic disease self-management training
  - Palliative care and its application to chronic conditions
  - Pulmonary rehabilitation
  - Spirometry

- Support the development of information, communication technology to enable multi-disciplinary care planning (ie Telehealth) and ensure all patients with COPD have better access to, and control of their personal and health care information (ie. hand held records and/or e-health records).
1. Introduction

1.1 Definition of Chronic Obstructive Pulmonary Disease

Chronic Obstructive Pulmonary Disease (COPD) is a combination of several different but related diseases, principally chronic bronchitis and emphysema, which are primarily characterised by difficulty in breathing \(^1\).

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

"a preventable and treatable disease with some significant extra pulmonary effects that may contribute to severity in individual patients. Its pulmonary component is characterised by airflow limitation that is not fully reversible. The airflow limitation is usually progressive and associated with an abnormal inflammatory response of the lung to noxious particles or gases".\(^5\).

COPD has considerable impact on the quality of life of the patient, involving long term medical care, frequent hospital admissions for treatment of exacerbations and, often resulting in premature death \(^2\). As with many chronic conditions, COPD not only affects the patient, but also has significant impact on the family and carer \(^6\).

Worldwide, cigarette smoking is the most commonly encountered risk factor for COPD. A nihilistic attitude toward COPD continues among some health care providers, due to the relatively limited success of primary and secondary prevention (i.e. avoidance of factors that cause COPD or its progression) and the prevailing notion that COPD is largely a self-inflicted disease.

Throughout the Model of Care, all references to the severity of COPD are based on the Global Strategy for Diagnosis, Management and Prevention of COPD (Updated 2010)\(^5\) definitions which are outlined below. \(^7\)

<table>
<thead>
<tr>
<th>Classification of severity of airflow limitation in COPD (Based on Post-Bronchodilator FEV(_1))</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In patients with FEV(_1)/FVC &lt; 0.70:</strong></td>
</tr>
<tr>
<td>GOLD 1 Mild FEV(_1) ≥ 80% predicted</td>
</tr>
<tr>
<td>GOLD 2 Moderate 50% ≤ FEV(_1) &lt; 80% predicted</td>
</tr>
<tr>
<td>GOLD 3 Severe 30% ≤ FEV(_1) &lt; 50% predicted</td>
</tr>
<tr>
<td>GOLD 4 Very Severe FEV(_1) &lt; 30% predicted</td>
</tr>
</tbody>
</table>

1.2 Chronic Obstructive Pulmonary Disease and co-morbid conditions

In recent years the presence of co-morbid conditions in patients with COPD has become a focus of research. These patients are at increased risk of Ischaemic Heart Disease (IHD), osteoporosis, depression, diabetes, glaucoma and sleep disorders \(^8\). This increased risk reflects shared risk factors (principally tobacco smoking), ageing,
genetic susceptibility and as yet undetermined factors. COPD itself has extra-pulmonary effects such as weight loss, nutritional abnormalities and skeletal muscle dysfunction, which may lead to co-morbid conditions. More severe COPD is associated with higher cardiovascular morbidity and mortality than less severe forms of the disease. The presence of COPD may also increase the risk for other diseases such as lung cancer.

The 2007 evaluation of the Perth based COPD Community Linkage Program shows that 76% had been diagnosed with other major co-morbidities of the lung or other organs. The top three were hypertension, cardiovascular disease and joint problems. The high level of co-morbidities in people with COPD highlights the critical need for referral pathways, shared care, and integrated service provision to ensure the optimal management, quality of care and efficient use of resources such as specialist clinical review. Case management is suggested as an appropriate model for monitoring of complex patients with co-morbidities. Case management is an important issue for all chronic conditions and is explored further in the WA Chronic Health Conditions Framework 2011-2016.

1.3 Causes of Chronic Obstructive Pulmonary Disease

Smoking as a cause of chronic obstructive pulmonary disease

Tobacco smoking is the most important risk factor in the development of COPD, being responsible for 75-85% of COPD cases. Tobacco smokers have a higher prevalence of respiratory symptoms, lung function abnormalities and higher death rates from COPD than non-smokers.

In 2006, nearly 1,300 deaths were attributed to tobacco smoking in Western Australia, of which 287 (22%) were due to COPD. In terms of overall burden of disease (i.e. life lost due to death or disability, expressed as Disability Adjusted Life Years), tobacco smoking was responsible for 16,290 years of lost life (DALYs) in the WA population in 2006, of which 3,690 (23%) related to COPD. Thus, COPD is associated with a substantial proportion of the tobacco-related disease burden.

Tobacco smoking not only affects smokers; exposure to second-hand smoke has been shown to cause a number of diseases in non-smoking adults, children and newborns by increasing the lungs' total burden of inhaled particles and gases. Smoking during pregnancy may increase the risk for the foetus, in utero, affecting lung growth and development and possibly the priming of the immune system.

For further discussion of the prevalence of smoking in Australia refer to section 8.3 Smoking Prevalence.

Other causes of COPD

Other than smoking, the following causes have also been shown to contribute to the development of COPD:

- Occupational dust and fume exposure
- Exposure to outdoor and indoor air pollution including tobacco smoke and poor ventilation with biomass fuel and urban air pollution
- Genetic predisposition, especially in individuals with α1-antitrypsin deficiency
- Recurrent childhood respiratory infections and bronchial hyper-responsiveness.
2. Methodology

2.1 Initial Model of Care development

The WA Chronic Respiratory Disease Service Improvement Framework (CSIF) November 2005\textsuperscript{4} (aligned with the National Chronic Disease Strategy\textsuperscript{15}) was developed by leading WA respiratory clinicians to improve the delivery of services for Western Australians affected by chronic respiratory disease, specifically COPD and asthma.

In November 2006, the Respiratory Health Network Executive Advisory Group identified a review of the CSIF five standards of care for COPD against the initial milestones and targets as a priority and convened the CSIF Working Party. The CSIF Working Party review identified key areas that would contribute most to the implementation of the CSIF five standards for COPD.

In April 2007, the Respiratory Health Network established the State-wide Steering Group (Steering Group). The role of the Steering Group was to facilitate the development of the COPD Model of Care and strategies to support the implementation of the five standards for COPD as set out in the CSIF.

On 7 May 2007, the Respiratory Health Network and the Steering Group held a stakeholder consultation workshop. The Workshop focussed on the development of the Model of Care for COPD with priority given to what should be provided, who should provide it and where it should be provided, for early diagnosis and intervention and the management of established and advanced COPD. This further informed the development of the COPD Model of Care which was finalised and released in July 2008.

2.2 Model of Care 2012 update process

In January 2012, several members of the original COPD Model of Care Working Group along with additional representatives came together to form the Working Group that would oversee the update of the 2008 COPD Model of Care (see Acknowledgements for a list of Working Group members). The purpose of the update was to:

- Ensure the Model of Care is consistent with the current evidence based best practice for the prevention and treatment of COPD
- Review the implementation of the Model of Care recommendations

The updated COPD Model of Care is still written in such a way that it aligns to the five standards for COPD of the WA Chronic Respiratory Disease CSIF\textsuperscript{4}, which include:

1. COPD prevention
2. Early diagnosis of COPD
3. Management of stable COPD
4. Treatment and support during acute exacerbations
5. Care and support at the end of life
Stakeholders were provided with the opportunity to provide feedback electronically at the onset of the update process to report on the implementation of the Model of Care recommendations. The draft document was released for broad consultation to allow for further comments and feedback before it was finalised. The Respiratory Health Network Executive Advisory Group endorsed the final draft of the updated Model of Care.

To ensure a consistent approach to COPD prevention, management and treatment at a state and national level in Australia, the COPD Model of Care is informed by the following key documents:

- WA Chronic Respiratory Disease Clinical Service Improvement Framework (CSIF) November 2005, Western Australian Health Respiratory Reference Group, Department of Health WA
- Draft WA Health Promotion Strategic Framework 2012-2016, Chronic Disease Prevention Directorate, Department of Health
- Kimberley Aboriginal Medical Services Council (KAMSC) and WA Country Health Service (WACHS) Chronic Lung Disease Algorithms
- Global Strategy for Diagnosis, Management and Prevention of COPD (Revised 2011), Global Initiative for Chronic Obstructive Lung Disease
- Framework for the Treatment of Nicotine Addiction, Respiratory Health Network, Department of Health WA
- WA Chronic Health Conditions Framework 2011-2016, Health Networks Branch, Department of Health WA
- WA Primary Health Care Strategy, Health Networks Branch, Department of Health WA
3. Progress since the 2008 COPD Model of Care

What has happened since the 2008 COPD Model of Care?

There have been a number of improvements in the area of smoking cessation including:

- The Framework for the Treatment of Nicotine Addiction was released by the Respiratory Health Network in November 2010 to provide a state wide approach across primary, secondary and tertiary settings to deliver comprehensive and integrated smoking cessation treatment and support services.

- New restrictions outlined by the Tobacco Products Control Amendment Act 2009 (the Amendment Act) commenced on 22 September 2010. The new Act prohibits:
  - display of tobacco products, packages and implements at point of sale
  - smoking “between the flags” at a patrolled swimming area on a beach
  - smoking in outdoor eating areas
  - smoking within 10 metres of playground equipment in a public place
  - smoking in or on vehicles if someone under 17 years old is in or on the vehicle

- The Rockingham Kwinana Division of General Practice Living Well Without Smoking Program and the Goldfields Esperance GP Network Butt Out Nicotine Addiction Program have had over 700 people participate in the programs since May 2008. These 12 week intensive programs, designed to assist clients with nicotine addiction, were initially funded through the Australian Better Health Initiative Nicotine Addiction Treatment Project and achieved approximately 60% abstinence rates at the end of the program. An evaluation report of the program is now available.

- The State Government made a commitment of $6,950,000 over four years (2009-2012) that aims to reduce the harm caused by tobacco in Western Australia’s Aboriginal community as a part of the WA Council of Australian Governments (COAG) Tackling Smoking program.

Other activities include:

- Access to private spirometry services in the south metropolitan area are now available.

- A COPD Action Plan has been produced by the Respiratory Health Network. Refer to the factsheet for health professionals for more information on ordering the plan.

- Rockingham General Hospital commenced a Pulmonary Rehabilitation program to improve access for individuals with COPD in that area.

- Community Physiotherapy Services (CPS) with sub-acute care funding commenced initial (Phase 2) Pulmonary Rehabilitation programs in recreational facilities in Heathridge, Leederville, Forrestfield and North Lake for individuals at a low risk of adverse events.

- Silverchain received funding from the Commonwealth Department of Health and Ageing to conduct a randomised controlled trial (RCT) of telehealth monitoring...
with Silver Chain clients who had a diagnosis of COPD. The results of this trial were very positive with reductions in health service use for the telehealth group resulting in substantial cost savings over the six month period \(^{24}\). Report available.

- Negotiations have begun with Armadale Hospital to provide hospital-based pulmonary rehabilitation and funding from the WA Quality Incentive Program (QuIP) will be used to establish a Respiratory Linkage program in the Joondalup area – to include hospital-based pulmonary rehabilitation.

- The Respiratory Health Network developed the “Would home oxygen help me?” brochure which can be downloaded or ordered from the Department of Health Online Publication Ordering System.

- The Operational Directive “Provision of Domiciliary Oxygen - All Public Health Services In Western Australia” (OD0221/09) was released and includes a prescription form.

- Work in the area of Advance Health Directives (AHD) has progressed with the Acts Amendment (Consent to Medical Treatment) Act 2008 which provides a legislative basis for Advance Health Directives and increased certainty for health professionals in the difficult area of end of life care.

**Areas for improvement**

- There is still a need for ongoing efforts to ensure services link in with more specific chronic disease management programs. Funding for the Chronic Disease Management Teams (CDMT) ceased in 2009 leaving a gap in this area.

- Despite the commencement of community based pulmonary rehabilitation programs by Community Physiotherapy Services (CPS) in metropolitan areas, there has been little increase in access to hospital-based pulmonary rehabilitation programs for higher risk groups or in rural areas.

- Another area for improvement is in the use of COPD Action Plans as they have not been widely promoted and their use is therefore ad hoc.
Celebrating achievements: Case studies

Pulmonary Rehabilitation Programs (PRPs)
Phase 2 (initial) PRPs were commenced in recreational facilities by Community Physiotherapy Services with Sub-acute Care funding. These 8-week programs provide supervised exercise training plus a home exercise program, and self-management education. The aim of these programs is to improve access to PRPs for people with COPD at a low risk of an adverse event. Programs have commenced in Heathridge, North Lake, Forrestfield and Leederville. Following the 8-week program individuals are offered a weekly maintenance exercise class (Phase 3) at the same site.

Below are the outcomes from the Heathridge pilot program.

<table>
<thead>
<tr>
<th>Heathridge PRP</th>
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<tbody>
<tr>
<td>Number of referrals</td>
</tr>
<tr>
<td>Number who entered program</td>
</tr>
<tr>
<td>Number who completed program</td>
</tr>
</tbody>
</table>

Following the program, 6 minute walk distance improved from 358±79 to 420±109m and improvements in health related quality of life exceeded the minimum important difference. These outcomes are consistent with the benefits reported in the international literature.

Nicotine Addiction Treatment Project
Two 12 week intensive programs, designed to assist clients with nicotine addiction, were funded through the Australian Better Health Initiative Nicotine Addiction Treatment Project. The Rockingham Kwinana Division of General Practice Living Well Without Smoking Program and the Goldfields Esperance GP Network Butt Out Nicotine Addiction Program offered clients either face to face or phone support fortnightly of up to 5 hours. At week 7 clients were offered a healthy lifestyle assessment. This was an opportunity to evaluate the clients’ risk of chronic disease and provide referral into appropriate services. At week 12 the client was given an hour session of relapse information and formally graduated from the program. Follow ups were provided to participants by phone at both 3 and 6 months. The table below provides a summary of the results.

<table>
<thead>
<tr>
<th></th>
<th>Living Well Without Smoking Program</th>
<th>Butt Out Smoking Cessation Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of referrals</td>
<td>595</td>
<td>680</td>
</tr>
<tr>
<td>Main source of referrals</td>
<td>GP (78%)</td>
<td>Promotions &amp; pit stops (54%)</td>
</tr>
<tr>
<td>Number of participants</td>
<td>426</td>
<td>269</td>
</tr>
<tr>
<td>Quit rate by participants</td>
<td>61%</td>
<td>49%</td>
</tr>
</tbody>
</table>
4. **COPD Model of care**

The COPD Model of Care takes a holistic, consumer-centred, lifespan approach to the provision of services for patients with COPD. It builds on the knowledge, best practice, service delivery models and capacity of existing programs and services. It outlines best practice through the application of a set of service principles across identified clinical streams and patient flow continuums.

It aligns with the Chronic Lung Condition Model of Care which describes the common core service components of the existing respiratory Models of Care, and thus sits hierarchically above the Asthma, COPD and Cystic Fibrosis Models of Care. The generic nature of the Chronic Lung Condition Model of Care provides a blueprint for implementing consumer-focussed health services for addressing more than one chronic lung condition and implementing more than one Model of Care however it does not replace the detail provided by the condition-specific Models of Care.

The COPD Model of Care aims to ensure patients receive:

> “The right care, at the right time, by the right team, in the right place”

All of the Respiratory Health Network Models of Care are underpinned by four guiding principles as outlined by the Chronic Lung Condition Model of Care and the WA Chronic Health Conditions Framework 2011-2016. The principles are:

1. **Integration and service coordination**
2. **Interdisciplinary care planning and case management**
3. **Evidence-based, consumer-centred care**
4. **Health literacy and self-management for chronic health conditions**

In WA health, system wide reform and improved health outcomes is dependent on a number of key enablers including:

- Quality and safety
- Financing and system performance
- Infrastructure including clinical service planning and strategic partnerships
- Information technology including eHealth
- Skilled workforce and capacity including education and professional development
- Research and innovation

An important aspect of workforce capacity specific to COPD is the involvement of **General Practitioners (GP) and practice nurses** as primary health providers. They have a number of key roles including the prevention, early identification and diagnosis of COPD. For those with COPD, the GP (assisted by the practice nurse) has three key roles:

- to meet general health needs
- to conduct regular monitoring and surveillance of the disease and ensuring the completion of a **COPD Action Plan** for each patient
- case management, coordination and referral to specialist services as appropriate
For a more detailed exploration of the guiding principles and system enablers refer to the *draft* Chronic Lung Condition Model of Care and the WA Chronic Health Conditions Framework 2011-2016.

### 4.1 The CSIF Five Standards for Services

The CSIF defines five standards and service provision for the prevention, diagnosis and management of COPD. They are summarised below:

<table>
<thead>
<tr>
<th>CSIF five standards for COPD</th>
<th>Evidence-based recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prevention of COPD</td>
<td>Smoking prevention and cessation.</td>
</tr>
<tr>
<td>2. Early diagnosis</td>
<td>Appropriate access to spirometry undertaken by trained and competent staff to ensure quality testing, interpretation and validity of results.</td>
</tr>
<tr>
<td>3. Management of stable COPD</td>
<td>Co-ordinated management planning and care that is community based and includes pulmonary rehabilitation for all people with COPD.</td>
</tr>
<tr>
<td>4. Treatment and support during acute exacerbations</td>
<td>Access to appropriate levels of support in the community including triage by trained health professional. Referral to emergency services based on severity of exacerbation.</td>
</tr>
<tr>
<td>5. Care and support at end of life</td>
<td>End of life management in the community where possible.</td>
</tr>
</tbody>
</table>

#### 4.1.1 Prevention of Chronic Obstructive Pulmonary Disease (CSIF Standard 1)

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 are:

- **Primary Prevention** – reduce the uptake of smoking in the population, minimise exposure to environmental respiratory hazards and maintain air quality.
- **Secondary prevention and intervention** – support for at risk population ie. smokers and people with chronic disease to quit smoking through the provision of evidence-based treatment and smoking cessation programs.

A holistic approach targeting the general and at risk populations, tobacco legislation and regulation, taxation and restrictions on smoking in public and assessment of smokers in hospitals is needed. Population based efforts to reduce the uptake and prevalence of smoking and reduce exposure to environmental smoke are supported by this Model of Care. Such efforts are outlined in the *draft* WA Health Promotion Strategic Framework 2011-2016 and the WA Tobacco Action Plan 2007-2011. This Model of Care also supports the view that smoking is an addiction which requires support and treatment to overcome in many cases. Learnings from the evaluation of the Australian Better Health Initiative (ABHI) Nicotine Addiction Treatment Program should be promoted in an endeavour to adopt a similar model of smoking cessation program delivery by Medicare Locals across WA. A detailed exploration of the treatment of nicotine addiction is out of scope for this Model of Care as it is covered by the Respiratory Health Network’s Framework for the Treatment of Nicotine Addiction. Primary prevention in terms of minimising exposure to environmental respiratory hazards and maintain air quality are out of the scope of this Model of Care as further information is available from the Department of Environment and...
There are five key strategies for the early diagnosis of COPD. They are:

- Access to spirometry
- Assessment of severity
- Further investigations
- Specialist referral (where appropriate)
- Advice for patients regarding self management

**Access to spirometry** is essential for early diagnosis and management of COPD. This service is provided by General Practitioners (GPs) and respiratory specialists in private practice. At secondary and tertiary hospitals, respiratory laboratories are predominantly for those already diagnosed with COPD. Early diagnosis of COPD is an opportunity for secondary prevention and early intervention to minimise the impact of the disease process.

All health professionals managing patients with COPD should have access to spirometry and be competent in the interpretation of the results. Any health care worker who has undergone appropriate training and who maintains skill can perform spirometry. Quality control processes should support spirometry services. The identification of at risk populations – smokers, ex-smokers, people with other smoking related diseases and people with respiratory symptoms (cough, sputum production, shortness of breath, recurrent chest infections) – and referral for spirometry are the critical factors in primary intervention and the early diagnosis of COPD.

Improved identification of smokers in primary care, occupational health and other opportunistic settings is necessary to improve outcomes in COPD. GPs, community and occupational health staff and health staff in secondary and tertiary settings all require resources, information and education for the identification, assessment and treatment of smokers.

To overcome the limited access to spirometry, an expansion of the number and type of service providers is proposed. This will be a collaboration with primary care providers, private providers and State Health to provide an easy referral process for GPs for diagnostic spirometry and utilise the existing infrastructure and workforce. This service will ensure a trained and competent workforce and improve the quality of interpretation of results, reporting and maintenance of the equipment. To ensure a high quality service is provided, access to training, refresher training and clinical support from respiratory scientists and physicians will be developed.

Optimum and effective management of COPD requires access to a general practitioner and possibly a specialist in respiratory medicine, and nursing. Specialist referral is valuable to establish the diagnosis, to exclude other pathology, to reassure the patient, to reinforce the need to stop smoking, to optimise treatment, or to assess the need for the more complex and expensive therapies appropriate to severe COPD. Indications for which consultation with a respiratory medicine...
specialist may be considered are outlined by the COPD-X Plan – Australian and New Zealand Guidelines for the Management of Chronic Obstructive Pulmonary Disease 2010. Referrals should also involve access to a multi-disciplinary team approach to assist overall management of COPD. This will improve the identification and management of co-morbid conditions.

Technologies such as telemedicine for case conferencing and review will improve access to specialist care for rural and remote patients and provide clinical support to general practitioners and health professionals working in these areas.

All people with COPD should be informed of the availability of peer support groups as a routine part of care at diagnosis.

4.1.3. Management of Stable Chronic Obstructive Pulmonary Disease (CSIF Standard 3)

Ambulatory care services

The Department of Health WA states “Ambulatory care is effective, efficient care for routine patients that have predictable needs and outcomes.” Primarily, but not exclusively, ambulatory care occurs outside the hospital walls in the community. Many acute and chronic medical conditions can be efficiently managed by a combination of hospital or clinic based services and home visits by doctors, nurses and allied health staff. Examples of distinctive ambulatory care services include Healthy@Home, Hospital in the Home Services (HITH), Rehabilitation in the Home Service (RITH), Post Acute Care Services (PAC), Home Palliation or Home Hospice, Telehealth services and outpatient services.

In WA Health, the shift in focus from acute settings to ambulatory care provided in community settings is identified as appropriate for people with COPD and can result in a reduced reliance on hospital bed days, as highlighted by the case study below.

Case study - Community Physiotherapy Services Pulmonary Rehabilitation Maintenance Program (Phase 3)

An evaluation of the Community Physiotherapy Services Pulmonary Rehabilitation Maintenance Program from 2004 – 2008 demonstrates the positive benefit of ambulatory care services. A trend towards a reduction in COPD related hospital admissions, bed days and emergency department presentations was observed in the 12 months following participation in Pulmonary Rehabilitation (initial hospital-based Pulmonary Rehabilitation followed by community-based maintenance Pulmonary Rehabilitation). For example, in the year prior to participation in Pulmonary Rehabilitation, one cohort had 18 admissions totalling 108 bed days and a year later had only 7 admissions totalling 55 bed days.

Ideally, ambulatory care services focus on improved integration and coordination between General Practice and members of the multi-disciplinary team, to ensure the roles complement and enhance the quality of service delivery.

The service components for the treatment and support of stable COPD are differentiated for those with mild to moderate or severe to very severe COPD. The services for those with mild to moderate COPD can be summarised as the avoidance of risk factors to prevent disease progression and pulmonary rehabilitation and pharmacotherapy as needed to control symptoms. Services for those with severe
COPD include those for mild/moderate COPD as well as access to a health professional for specific case management including intensive support and disease specific monitoring.

**Self-management**

Self-management is a critical component for the effective management of chronic health conditions. A comprehensive approach that is consistent with the [WA Chronic Conditions Self-Management Strategic Framework 2011–2015](#) should be adopted.

The COPD Model of Care supports collaborative care and self-management education for patients. The self-management approach emphasises: the consumer’s central role in managing their health; links them to personal and community resources; and includes strategies of assessment, goal-setting, problem-solving and follow-up.

Self-management education programs can be delivered in a variety of ways, often in a range of settings and mediums. The educator may be a health professional, peer leader or another patient. In addition to self-management programs, the principles of self-management need to be imbedded in the delivery of the full range of support services including pulmonary rehabilitation. Advice regarding self-management and self help support groups needs to be provided to the patient on diagnosis and continually reinforced. All patients should be informed of self-management and peer support programs on diagnosis.

**Multi-disciplinary team**

Optimising the health and quality of life for people with stable COPD requires access to a multi-disciplinary team that includes a general practitioner, respiratory specialist or general physician (as available), respiratory nurse, respiratory physiotherapist, social worker, dietician, occupational therapist and clinical psychologist to deliver an integrated comprehensive suite of services, as appropriate. The key roles of the multi-disciplinary team include formal communication protocols that link primary, secondary and tertiary clinical professionals. An example of this is a multi-disciplinary case conference to facilitate communication between health providers and the patient to ensure consistency in plans for ongoing care and treatment.²

The following functions should be considered when defining the activity of the multi-disciplinary team³:

- Assessing patients (including performing spirometry, reviewing the ongoing need for oxygen, the need for aids for daily living and the appropriateness of delivery systems for inhaled therapy)
- Managing patients (including non-invasive ventilation, pulmonary rehabilitation, hospital in the home/ early discharge schemes), providing palliative care, identifying and managing anxiety and depression
- Advising patients on relaxation techniques, airways clearance techniques, continence problems, social security benefits and travel
- Providing patients with nutritional advice
- Advising patients on self-management strategies, including smoking cessation
- Advising patients on effective and safe exercise
- Identifying and monitoring patients at high risk of exacerbations and undertaking activities which aim to avoid emergency admissions
- Educating patients and other health professionals

There is increasing evidence to indicate a high proportion of people with COPD have other co-morbid conditions, particularly related to cardiovascular and endocrine problems. This further highlights the need for comprehensive assessment and ongoing management by a multi-disciplinary team preferably with a case management approach. People with advancing COPD would also benefit from access to clinical psychology to develop strategies to cope with dyspnoea and access to social and health support services outside of the primary and public health system.

There are a number of Chronic Disease Management (CDM) plan Medicare Items that support multi-disciplinary care.

Pharmacotherapy
Pharmacotherapy has a critical role in managing COPD. The general principles for pharmacotherapy in the management of COPD are:

1. A stepwise increase in treatment depending on severity
2. Maintenance of regular treatment for long periods of time unless significant side effects occur or the disease worsens
3. Close monitoring of treatment response with appropriate adjustment in drug prescription to account for individual variability of treatment
4. Response in the management of extra pulmonary manifestations of COPD

Patient held medical records and Home Medicine Review support optimal management of pharmacotherapy and the communication across all service providers.

Management and Action Plan
The COPD action plan (see Appendix 2) should be completed by clinicians in consultation with the person with COPD and their family or carers. It aims to provide information and instruction to facilitate self monitoring and management of symptoms, including instruction on when to seek advice from the multi-disciplinary team.

Protocols and systems to ensure people with COPD can access appropriate medical assessment and intervention to manage acute situations will be achieved through clear pathways for timely referral and access to clinical support, particularly for rural consumers.

Pulmonary Rehabilitation
Pulmonary rehabilitation is an evidence-based multi-disciplinary intervention for patients with chronic lung disease who are symptomatic, and often have decreased daily life activities. The aims of pulmonary rehabilitation are to reduce the symptoms and disability for people with lung disease with the overall goal of optimising function. A comprehensive pulmonary rehabilitation program includes patient assessment, exercise training, self-management, education, nutritional intervention and psychological support. Exercise training is the component with the
strongest level of evidence for benefit. The evidence for benefit in COPD is compelling and include a reduction in symptoms (breathlessness and fatigue), improvements in exercise capacity and health-related quality of life, and a reduction in health care utilisation.

The benefits of pulmonary rehabilitation can decline over a twelve to eighteen month period on cessation of a supervised program. Post-rehabilitation strategies such as a community-based maintenance exercise program has been shown to maintain the benefits gained from an initial program.

Pulmonary Rehabilitation programs can be conducted in a hospital or community setting. Patients can be stratified according to the risk of an adverse event during exercise and the complexity of their condition to determine the most appropriate setting. See Appendix 3: Criteria for inclusion in pulmonary rehabilitation and Appendix 4: Pulmonary rehabilitation pathway for more information.

Pulmonary rehabilitation can be divided into phases:

- **Phase 1**: Inpatient based rehabilitation during acute exacerbation (including RITH).
- **Phase 2**: Initial pulmonary rehabilitation program – 8-week outpatient program comprising twice weekly supervised exercise training plus a home exercise program and self-management education. Can be hospital or community-based.
- **Phase 3**: Maintenance – ongoing weekly supervised exercise training and home exercise program following a phase 2 program. Can be hospital or community-based.

**Oxygen therapy**

Home oxygen therapy is recommended for COPD patients when the resting PAO₂ falls below 7.5 kPa (PAO₂ <55mmHg) when the patient is well, or at slightly higher levels when cor pulmonale or secondary polycythaemia supervene. The Thoracic Society of Australia and New Zealand Adult Domiciliary Oxygen Therapy Position Statement state that usage for 14-16 hours (minimum) per day prolongs life. Some patients with COPD also become transiently hypoxaemic on exercise, and oxygen has been used to try to improve exercise capacity and reduce disability in these individuals. This may indicate a need to formally assess ambulatory oxygen requirements.

**Sleep disorders as a co-morbid condition in COPD**

Sleep quality may be adversely affected in people with COPD. Nocturnal hypoxaemia and hypercapnia may develop and adversely affect morbidity and mortality. In addition, obstructive sleep apnoea may be present in up to 20% of patients with COPD (the so called “overlap syndrome”). Access to overnight oximetry and Sleep Physician review with full overnight polysomnography in selected patients is essential and specifically, in all patients with cor pulmonale. More information about the treatment and management of sleep disorders is addressed by the WA Respiratory Health Network’s Sleep Disorders Model of Care.
Non-Invasive Ventilation

Non-invasive ventilation (NIV) is most commonly used to treat acute respiratory failure during exacerbations of COPD in hospital. However, it is also used in the treatment of chronic hypercapnic ventilatory failure in selected patients and may benefit patients with stable COPD in the ambulatory setting.

Some hospitals in the metropolitan area currently provide NIV. There is a need to address and designate the hospital sites in the metropolitan and rural areas with the expertise and resources to provide NIV. Workforce education and training of clinicians at non tertiary hospitals in the management of NIV and clinical support from respiratory physicians across health sites would increase the capacity of hospitals to manage acute inpatient episodes.

Surgical management and treatment

Selected patients should be assessed concerning their suitability for referral for surgical management and treatment. Bullectomy, lung volume reduction surgery and lung transplantation have all been used to treat patients with COPD.

Lung transplantation is usually only considered in advanced disease that is unresponsive to medical therapy and appropriate selection of patients is vital. Lung transplantation will continue to be provided by the Lung Transplantation Service and the service model is beyond the scope of this Model of Care.
Figure 1. Management of stable COPD

The diagram above sets out the proposed management of stable COPD. The multi-disciplinary team provides care regardless of severity of the disease. There is an emphasis on self-management and monitoring of symptoms coupled with a GP led multi-disciplinary team approach to the ongoing management of COPD. People with COPD will access specialist services, such as a respiratory specialist and pulmonary rehabilitation, as required and other services are provided by generic community based COPD services.

The Model of Care allows for a more specialist focus, increased monitoring and surveillance and more intensive program components due to severity of or complex nature of the disease process particularly those with co-morbidities.
4.1.4 Treatment and support during acute exacerbations (CSIF Standard 4)

Most patients with an exacerbation of COPD can be managed by their GP and stay at home but some need hospital management. 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 the need for specialist interventions such as NIV.\(^3\)

While current practice indicates that presentation to an emergency department (ED) has been frequently used for assessment of acute exacerbations, in the first instance assessment should be undertaken in the community by the GP and/or member of multi-disciplinary team or case manager in consultation with the consumer and their families. Based on this assessment, referral to ED is the second line of assessment and if appropriate may result in referral home with extra supports: e.g. HITH.

Critical to the optimal management of the patient post acute exacerbation, is discharge planning and development of management plans involving ongoing monitoring and review by the GP and/or specialist as part of the designated multi-disciplinary team.

Symptoms of depression and/or anxiety should be noted when documenting clinical history as they are common in COPD\(^3\) and are associated with increased risk of exacerbations and poorer health status. COPD and depression and/or anxiety should be treated according to usual guidelines as there is no evidence to suggest they should be treated differently when both present\(^5\).

**Figure 2. Management of acute exacerbations of COPD**

The diagram above maps the process for the management of acute exacerbations delivered by the multi-disciplinary team involved in the care.
4.1.5 Care and support at end of life (CSIF Standard 5)

Palliative care is care provided for a person with active, progressive advanced disease, who has little or no prospect for cure and for whom the primary treatment goal is quality of life.\(^{38}\) In chronic conditions, this process may be appropriate for a longer period of time than for malignant conditions. Palliative care is inter-disciplinary care, delivered by coordinated medical, nursing, allied health and social services and integrating the physical, psychological, social and spiritual aspects of care. It recognises the patient and family as the unit of care, and respects the right of each patient to make informed choices about the care they receive.

Terminally ill patients with COPD are usually elderly and have already experienced one or more decades of increasingly frustrating functional restriction, punctuated by hospital admissions. They often have several co-morbidities and are frequently dependent on the care of others. Most people with end-stage COPD wish to participate in end-of-life management decisions and would prefer to do so in a non-acute setting.

Determining prognosis in end-stage COPD is difficult, although guides to shortened survival include an FEV1 < 25 percent predicted, weight loss (body mass index below 18), respiratory failure (PaCO2 > 50mmHg, or 6.7 kPa) and right heart failure. The major ethical issues are deciding whether to offer invasive or non-invasive ventilatory support or, alternatively, to withhold, limit or withdraw such support. These decisions are often complex but as in other areas of medicine, they are ultimately constrained by the standard ethical principles of respect for patient autonomy and ensuring that good is achieved.

The Palliative Care Model of Care developed by the WA Cancer and Palliative Care Network will inform the development of an appropriate palliative care pathway for people with COPD and their families. The use of Advance Health Directives in end-of-life planning for people with COPD should be promoted. People with COPD should also be encouraged to appoint enduring guardians to make health and care decisions when they are unable to. The Liverpool Care Pathway is a quality framework which supports a high standard for care of the dying and was piloted in WA.
5. Recommendations

Recommendation 1: Prevention (CSIF Standard 1)

That a Statewide coordinated plan is developed for implementation to reduce the prevalence of smoking aimed at meeting the outcomes set out in the draft WA Health Promotion Strategic Framework 2011 -2016. This will focus on primary and secondary prevention including the evidence based smoking cessation services that are accessible across the State. The plan will target at risk populations including Aboriginal communities, people with mental health issues, pregnant women, low socio-economic populations and prisoners. The plan will include strategies to:

- Improve access to evidence based smoking cessation programs in community settings and create links with these programs in inpatient settings. The learnings from the evaluation of the Nicotine Addiction Treatment Program should be promoted in an endeavour to adopt a similar model of smoking cessation program delivery by Medicare Locals across WA.
- Develop culturally appropriate resources and support services for Aboriginal populations
- Ensure population based health awareness campaigns recommend people seek early medical advice if they have respiratory symptoms, especially smokers.

Recommendation 2: Early Diagnosis (CSIF Standard 2)

Increase access to spirometry for the early diagnosis of respiratory disease including COPD through:

- Identification and support of health service providers to establish spirometry diagnostic services in community settings.
- Training and ongoing clinical support to all spirometry providers to ensure the highest quality of testing and interpretation of results is achieved and maintenance of equipment.

Recommendation 3: Management of Stable COPD (CSIF Standard 3)

From diagnosis, it is recommended that all people with COPD have access to appropriate services integrated across the continuum of care by primary, secondary and tertiary providers, with a focus on self-management, exercise training and COPD action plans. To achieve this there is a need to:

- Expand the range of community-based ambulatory services for COPD including smoking cessation, pulmonary rehabilitation and case management to improve the quality of life for consumers and reduce the demand for hospital admissions.
- Develop formalised partnerships and links between Area Health Services, private and non government service providers to develop integrated referral pathways and protocols to guide access to appropriate service delivery based on the severity of disease.
Recommendation 4: Management of Acute Exacerbations of COPD (CSIF Standard 4)

That there is timely access to clinical assessment for all people with COPD who have acute symptoms. The referral pathway and protocols for the management of COPD will include the management of acute exacerbations through enhanced ambulatory care services in community settings.

Recommendation 5: Care and support during the end stages of life (CSIF Standard 5).

That a model of service delivery for end of life and palliation for people with COPD be developed in collaboration with GPs, Palliative Care Network and other relevant groups to ensure it respects the rights and decisions of the consumer and their family/carers.

- The services will be delivered where possible at home or in community based facilities.
- Promote the use of advance healthcare directives (or ‘living will’) amongst appropriate patients to assist and inform the health care decision-making process and encourage people with COPD to appoint enduring guardians to make health and care decisions when they are unable to.

Recommendation 6: Workforce development

That the capacity of the community based health workforce be enhanced through the expansion of multi-disciplinary teams with clearly defined roles and responsibilities. The team members will have targeted education and training in:

- Brief Intervention for tobacco smoking
- Chronic disease self-management training
- Palliative care and its application to chronic conditions
- Pulmonary rehabilitation
- Spirometry

Links to health professionals caring for people with COPD are strengthened by:

- Upskilling General Physicians, GPs, nursing and allied health professionals in all aspects of COPD care including self-management training, and supporting consumers with severe COPD or suffering exacerbations.
- Engaging educational institutions to develop and offer appropriate courses and/or qualifications in respiratory diseases e.g. COPD.
- The recruitment and training of COPD nurse practitioners, COPD assistants, GP, General Physician, COPD specialists and extended scope/advance practitioners (Allied Health).

That access to information and resources is provided to support best practice such as referral pathways, protocols and clinical support for health workers across the continuum of care especially in rural and remote areas.
Recommendation 7: Information, communication and technology requirements

- That Metropolitan Area Health Services establish dedicated clinical support services and explore Telehealth options to improve support for country health professionals in primary care and WACHS staff in health services.

- Support the development of Information and Communication Technology to enable multi-disciplinary care planning, supported by evidence-based guidelines and patient pathways, to be integrated across hospital and community public health services and facilitate appropriate data exchange with external health care providers. This would enable the provision of seamless high quality care in the most appropriate setting and urgently needs to be addressed.

- That all patients with COPD have better access to, and control of their personal and health care information. This should include consumer hand held records and/or e-health records and shared databases for patient and service provider management.
5.1 Strategy for implementation

The COPD Model of Care Working Group understands these recommendations require different resource and time allocations for implementation. Given this, a strategy for the phased implementation of recommendations is proposed below:

- **Phase 1**: Achievable within existing resources and current service provision.
- **Phase 2**: Require further planning and development.
- **Phase 3**: Require additional human resources, funding and endorsement.

**Phase 1: Achievable within current service delivery model and existing resources**

**Recommendation 1: Prevention (CSIF Standard 1)**

- Those involved in the delivery of the ABHI funded Nicotine Addiction Treatment Project disseminate the results of the program evaluation and promote the adoption of this model of community based smoking cessation program delivery across all Medicare Locals in WA.
- Area Health Services have a responsibility to continue to support the implementation of the Smoke Free WA Health Policy to ensure patients, staff and visitors are protected from the harmful effects of second hand smoke. Focus areas for the immediate future include providing a consistent and appropriate level of support for nicotine dependent patients whilst in hospital and creating referral pathways to ensure this support is continued upon discharge. This can be achieved through the implementation of the Clinical Guidelines and Procedures for the Management of Nicotine Dependent Inpatients.
- A Statewide COAG Tackling Smoking Coordinator has been appointed in WA to oversee the implementation of the Tackling Smoking Initiative and support the local Tackling Smoking Coordinators. Current aspects of this project include the development of a service directory and also a framework for smoking cessation amongst Aboriginal people.
- Encourage further promotion and uptake of the Online Brief Tobacco Intervention Training Program developed by the National Drug Research Institute for Smoke Free WA Health. This includes liaising with the universities of WA to incorporate the training as a mandatory component of relevant courses.

**Recommendation 2: Early diagnosis (CSIF Standard 2)**

- There are a number of potential initiatives and actions that support the establishment of new spirometry services that should be explored. Particularly those around training and clinical support for health professionals and maintenance of equipment.
- The implementation of the ABHI Nicotine Addiction Program in Rockingham/Kwinana and the Goldfields region creates an opportunity to establish new spirometry service providers as the service will be supported by the collaboration with Divisions of General Practice, Area Health Services, Occupational Health clinics and other community service providers.
Recommendation 7: Information, Communication and Technology Requirements

- The WACHS Telehealth Development Group could be requested to assist in the development of access for WACHS and primary care providers, who are providing services to people with COPD and their carers and families in rural areas, to a metropolitan based specialist clinical support service.

- Support from the existing WA Health Information and Communication Technology groups to develop solutions to overcome current barriers to communication and data sharing across health sites and health providers.

Phase 2: Require further planning and development

Recommendation 3: Management of Stable COPD (CSIF Standard 3) and Recommendation 4: Management of Acute Exacerbations of COPD (CSIF Standard 4)

- Build on the Australian Better Health Initiative programs for self-management and healthy lifestyles to provide some opportunities to improve access to support services for people with COPD.

- The development of integrated referral pathways and protocols to guide access to appropriate service delivery based on the severity of disease.

Recommendation 5: Care and support during the end stages of life (CSIF Standard 5).

- The Respiratory Health Network will convene a meeting with the Palliative Care Network to develop an appropriate pathway during the end stages of life for COPD. This will take into account the often unpredictable nature of the final stages of COPD. This may be developed as appropriate in collaboration with other Models of Care for chronic conditions and will build on work that has already been done.

Phase 3: Require additional human resources, funding and endorsement

Recommendation 3: Management of Stable COPD (CSIF Standard 3) and Recommendation 4: Management of Acute Exacerbations of COPD (CSIF Standard 4)

- Additional human resources and funding are required to ensure equitable access to an appropriate range of services delivered by multi-disciplinary teams.
6. Current services for COPD and gaps in service provision

This section provides a brief overview of each of the CSIF 5 Standards for COPD and information on the current service provision and gaps which substantiate the COPD MOC.

6.1 Prevention of COPD (CSIF Standard One)

Current service provision for prevention of COPD

Current activities that target smoking, which is a major risk factor for COPD, include:

- The Framework for the Treatment of Nicotine Addiction by the Respiratory Health Network provides a state wide approach across settings to deliver comprehensive and integrated smoking cessation treatment and support services.

- New restrictions outlined by the Tobacco Products Control Amendment Act 2009 (the Amendment Act) commenced on 22 September 2010.

- Limited smoking cessation support services including the Cancer Council Fresh Start Course and the 12 week intensive nicotine addiction programs, Rockingham Kwinana Division of General Practice Living Well Without Smoking Program and the Goldfields Esperance GP Network Butt Out Nicotine Addiction Program, which have had over 700 people complete the courses since May 2008.

- The Smoke Free WA Health Policy has been in place since January 2008 and states that smoking is not permitted on Department of Health grounds.

- The COAG Tackling Smoking Initiative is being rolled out across Australia.

Gaps in prevention of COPD

There is a need to develop strategies to change the paradigm of smoking as a lifestyle issue to nicotine addiction for which there are psycho-social and pharmacological treatment options.

A further gap in service provision is the ad hoc identification of smokers in all health settings, coupled with limited access to secondary and tertiary prevention strategies, such as evidence based community smoking cessation strategies and programs.
6.2 Early Diagnosis of COPD (CSIF Standard Two)

Current services for early diagnosis of COPD

- Many GP practices have spirometry equipment, are trained in its use and provide this diagnostic service as an integral part of their practice. The current Medicare rebate for spirometry can be viewed at MBS Online (Item 11506) 39.

- The tertiary hospitals have well-established spirometry services attached to the respiratory units, though the emphasis is on people with established disease rather than early diagnosis. In addition, there are five private providers of spirometry services. A mobile spirometry service is provided on a private basis to some metropolitan secondary hospitals and at selected country locations. These services are available for direct referral by GPs but most referrals are from medical specialists involving people with established COPD.

Gaps in early diagnosis of COPD

While many GPs are trained and undertake spirometry within general practice it is reported that as a diagnostic tool it is time consuming. Other issues raised include the interpretation of the results that can affect the validity and quality of the results and maintenance of equipment.

Access to spirometry in tertiary and private health sector is more generally for those with a diagnosis of COPD rather than for screening and new diagnosis of COPD. This may limit access and lead to under-utilisation of spirometry as a diagnostic tool for at risk populations.

There was a need to improve access to diagnostic spirometry in community settings however private spirometry is now more readily available.
6.3 Management of stable COPD (CSIF Standard Three)

Current services for the management of COPD

- It is becoming more common for services for people with COPD to be provided in the community via ambulatory care. Although funding for Chronic Disease Management Teams was ceased in 2009.

- The COPD Community Linkage Service operates within the Royal Perth Hospital metropolitan catchment area and the Canning and Perth Primary Care Network Divisions of General Practice. The COPD Community Linkage Service provides ongoing support services. Patients are drawn from these areas and include patients who may have been admitted to RPH are linked to the service by the Chronic Disease Discharge Nurse who prepares a Case Management Plan.

- Access to initial pulmonary rehabilitation programs in secondary and tertiary hospitals is variable with some geographical areas poorly serviced. Access to community based-initial pulmonary rehabilitation through the Community Physiotherapy Services (CPS) is also limited.

- A number of respiratory disease and COPD specific peer led support services have been established including two in rural areas. The Australian Lung Foundation (ALF) support the implementation of patient support groups and have the contact details of existing groups in WA on their website. In Australia there are three online groups for people with COPD and other respiratory diseases. These groups offer information, education, friendship and support and in some cases newsletters and updates on health related issues. There are also online groups based in the USA with which Australians with COPD can link.

- Self-management strategies are increasingly used to encourage active participation by consumers in their health care.

Gaps in the management of COPD

Services for people with COPD have traditionally been managed from the tertiary hospital setting. This has resulted in secondary hospitals being poorly equipped and resourced to manage acute exacerbations.

The lack of, or limited access to, pulmonary rehabilitation in some metropolitan and many country areas results in a less than optimal service delivery and compromises the health outcomes of people with COPD. Home-based pulmonary rehabilitation for people too breathless to leave the home is poorly serviced, with Rehabilitation in the Home (RITH) only able to service patients upon early discharge from hospital. Improvements in case management need to be made.

The limitations of the current Hospital in the Home (HITH) service results in increased reliance on hospital based assessment inevitably resulting in admission.

There is a need to address and designate the hospital sites in the metropolitan and rural areas with the expertise and resources to provide Non Invasive Ventilation (NIV) for the most severe exacerbations.

There is limited access to sleep disorders services and facilities in outer metropolitan and country areas.
Access to self-management programs is not universal, although there has been some improvement with the allocation of additional resources through the Australian Better Health Initiative Self-management Program. There is a need to improve consistency in the content of self-management education and ensure the principles are embedded across all interventions, particularly in the primary sector. Information and education on management of COPD is required to be delivered by all multi-disciplinary team members to all consumers on a regular and frequent basis.

### 6.4 Treatment and support during acute exacerbations of COPD (CSIF Standard Four)

<table>
<thead>
<tr>
<th>Current service provision during acute exacerbations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where COPD or chronic disease community based services have been established the majority of mild to moderate acute exacerbations are managed in the home environment. Those who cannot be stabilised are admitted to hospital.</td>
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<table>
<thead>
<tr>
<th>Gaps in service provision for acute exacerbations</th>
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<tr>
<td>It is still common for people experiencing acute exacerbations to present directly to the ED rather than being assessed in the community by the GP and/or member of multi-disciplinary team or case manager. The issue of panic attacks with exacerbations needs to be addressed with an appropriate strategy.</td>
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6.5 Care and support at the end of life (CSIF Standard Five)

Palliative Care has much broader implications in COPD. It is clear that community based support, for example in clinical psychology, has a positive impact, in this case for coping with severe dyspnoea. Although difficult to define precisely, in general terms people with “very severe” COPD (Gold Criteria) are likely to benefit from aspects of palliative care.

**Gaps in care and support at end of life**

The current palliative care services tend to focus on patients with cancer and a short life expectancy. There is a need to become more focused on chronic diseases and the use of Palliative Care in a more holistic sense, particularly for improvement in the quality of life significantly prior to an “end stage”.

6.6 Other gaps in service delivery

There are a number of other areas including integration of service delivery, workforce and information and communication technology where gaps are common across chronic conditions. These areas and their role as system enablers are discussed in more detail in the [WA Chronic Health Conditions Framework 2011-2016](https://www.doh.wa.gov.au/healthplan/chronic-health-conditions/framework).
7. COPD: Epidemiology and costs

7.1 COPD Prevalence

COPD and other chronic respiratory conditions adversely affect a large number of people in the community. However, there is considerable variation in reported prevalence estimates for COPD specifically. True prevalence is difficult to ascertain as affected individuals tend to delay reporting symptoms that result in a COPD diagnosis. A Global Burden of Disease Study conducted in 1990 by the World Health Organization and the World Bank, estimated the worldwide prevalence of COPD at 9.34 per 1,000 men and 7.33 per 1,000 women. In countries where it has been rigorously measured though, the overall COPD prevalence in adults is considered to be much higher, ranging between 4% and 10%.

In Australia, around 490,000 people (2.4% of the population) suffer from bronchitis or emphysema, according to the 2007/2008 National Health Survey. The prevalence increases with age from 1.0% in 0-14 year olds to 7.8% in those aged 75 years and over, and is slightly more common in females (2.6%) than males (2.2%). These figures give an idea of COPD prevalence but are considered underestimated. Nationwide, about 20,000 new cases of COPD are diagnosed every year.

In Western Australia, the overall prevalence of adults (16 years and over) currently suffering from a respiratory problem other than asthma (e.g. chronic bronchitis, emphysema or chronic lung disease) that has lasted at least six months was 2.1% in 2009. Contrary to similar national figures, the prevalence among WA adult females (1.7%) was slightly lower than among males (2.5%), although not significantly so.

7.2 Mortality and burden of disease measures

COPD and other chronic respiratory diseases are a leading cause of mortality. The World Health Organisation quantifies the five main respiratory diseases as representing 17.4% of all global deaths, with COPD related deaths projected to increase worldwide.

In Australia, COPD was reported as the underlying cause of 5,152 deaths (4% of all deaths) in 2007 and as an associated cause for another 7,336. The COPD death rate (as an underlying cause) was almost double in males compared to females (31 vs. 16 deaths per 100,000). Although male rates are high, they have fallen fairly consistently in the last three decades and are nearly only a third of the peak rate of 85 per 100,000 in 1982. By comparison, female rates peaked at 23 per 100,000 in 1996 following a steady rise but appear to be on a downward slope since. These trends predominantly reflect changes in cigarette smoking patterns over time.

In Western Australia, COPD is the sixth leading cause of avoidable mortality among males aged 0-74 years and the seventh in females, accounting for 870 male deaths and 496 female deaths in that age range during the period 1997-2006. These figures represent around 3% of all WA deaths in 0-74 year olds. During this period, COPD death rates (all ages) declined in WA, falling from 46 to 27 deaths per 100,000 (6.0% average reduction per year) among males and from 19 to 15 deaths per 100,000 (1.9% per year) among females. Given their high smoking prevalence, it is not surprising that COPD deaths are more common among Indigenous people. In 2006,
the COPD mortality rate for Indigenous Western Australians was 4.5 times the rate in
the non-Indigenous population (86 vs. 19 deaths per 100,000, respectively).47

A review of major international studies has shown that people with mild COPD mainly
die from cancer and cardiovascular disease. However, as the severity of COPD
increases, deaths due to non-malignant respiratory disease become more common.48

The “Disability Adjusted Life Year” (DALY) is a defined burden of disease unit used to
attribute years of healthy life “lost” in a population due to premature death, prolonged
illness and disability. It is a measure of the overall impact of disease in the
community, giving proper weight to health problems that cause considerable illness
or disability without being fatal, and to conditions that have low mortality rates but
predominantly cause death in younger people. In Australia, projections estimate that
85,000 years of healthy life (i.e. DALYs) were lost due to COPD in 2010, which
represents 3.0% of the Australian burden of disease for that year. COPD is thus
considered the seventh leading cause of disease burden within this context.43

In Western Australia, it is estimated that COPD was responsible for the loss of 6,875
years of healthy life (DALYs) in 2010, of which 56% were attributed to death and 44%
to illness and disability. As such, COPD was the seventh leading cause of disease
burden in WA, accounting for 2.6% of the healthy years of life lost that year. More
than 80% of the overall burden from COPD was experienced in people aged 50
years and over. Although most of the mortality burden involved this age group (97%),
a third of the disability component also affected younger people.49

7.3 Smoking prevalence

As previously mentioned, smoking is an important contributing factor in the
development or aggravation of COPD. Western Australia has been relatively
successful in reducing the prevalence of tobacco smoking over the years through
legislation, mass marketing and primary prevention/health promotion. According to
the WA Health and Wellbeing Surveillance System, in 2010, 11.5% of Western
Australians aged 16 years and above are daily smokers 50.

Of greater concern, smoking prevalence levels have been shown to be several times
that of the wider adult population in certain high risk groups. For instance, in the
Western Australian Indigenous population, the smoking rate is around 55% among
those aged 25-44 years 51. In 2005, an audit of WA public hospitals revealed that
67% of mental health inpatients aged 14 years and over were current smokers 52.
Additionally, smoking rates among WA prisoners are estimated to be around 80% 53.
High rates of smoking have also been found in groups of low socio-economic status.
The National Health Survey 2007/2008 estimated the prevalence of current daily
smokers among Australians in the highest tier of socio-economic disadvantage to be
27.8%, which is 2.5 times the 11.0% reported among the least disadvantaged
Australians 42.

Hence, further efforts to reduce smoking prevalence, especially in these high risk
groups, should help lessen the burden of COPD and other respiratory conditions in
the community over time.
7.4 Impact on health services

People with COPD require long-term medical management through the use of health care services and incur disability-related costs.\textsuperscript{54, 55} When the condition worsens COPD patients may also require hospital care. In the financial year 2004/2005, the Australian health expenditure allocated to COPD was $548.7 million, 61\% of which related to hospitalisation.\textsuperscript{13, 43} Due to the high morbidity and protracted nature of the disease, it is estimated that COPD costs the Australian health care system nearly three times as much as lung cancer.\textsuperscript{25}

Based on Australian General Practice activity surveillance for 2009/2010, less than 1\% of problems managed in General Practice pertained to COPD per se. However, a further 1.6\% involved acute bronchitis and bronchiolitis, which are closely related.\textsuperscript{56}

In terms of hospital care, 59,427 hospitalisations in Australia (1\% of all hospital stays) had COPD as the principal diagnosis in 2007/2008. Of these, 86\% involved an emergency admission. The average length of stay for COPD hospitalisations (6.9 days) was more than double the overall average length of stay (3.3 days) for that year. Three-quarters of these hospital stays affected people aged 65 years and over, as COPD predominantly occurs in older Australians with a smoking history.\textsuperscript{43}

In Western Australia, 4,710 hospital separations with a principal diagnosis of COPD were recorded during the financial year 2009/2010, 2,501 (53.1\%) of which involved male patients. As per Australian hospitalisation patterns, nearly three-quarters of the WA COPD hospital stays related to patients aged 65 years and over. Only 5.6\% affected patients aged less than 50 years. COPD hospitalisation rates increased exponentially with age, attaining 2,976.1 per 100,000 in WA males aged at least 85 years. Among females, the equivalent rates peaked at 1,714.3 per 100,000 in those aged 80-84 years, before declining slightly in women aged 85 years and over.
Overall, the Western Australian age-standardised rate of hospitalisation due to COPD has declined significantly in the last decade from 282.8 to 213.9 per 100,000 between 1999/2000 and 2009/2010 (an average annual reduction of 3.2%). This fall
was more apparent among males, for whom the rate dropped from 371.9 to 250.2 per 100,000 during that period (average 4.5% per year) compared with a decrease from 221.1 to 187.4 per 100,000 (average 2.0% annual fall) among females. Although changes in clinical coding practices (e.g. preference for coding to pneumonia in some circumstances from mid-2004) may have affected the rates to some extent, a real decrease in the incidence of COPD, as well as improved disease management mechanisms likely account for most of the downward trends.

In 2009/2010, COPD inpatients accounted for 29,609 hospital bed-days, of which 15,440 (52.1%) involved males. Like hospital separations, rates of hospital bed-days due to COPD have fallen significantly in the last decade, from 2,265.1 per 100,000 in 1999/2000 to 1,347.0 per 100,000 in 2009/2010 (an average annual reduction of 5.8% overall). Male COPD patients continue to have higher hospital bed-day rates than females (1,575.6 vs. 1,191.7 per 100,000 in 2009/2010).

The average length of hospital stay for COPD patients has also declined gradually in the last few years from a high of 8.6 days in 2002/2003 to 6.3 days in 2009/2010. In 2009/2010, average lengths of stay for male and female COPD patients were fairly similar (6.2 vs. 6.4 days).

Graph 3.  Age-standardised rates of hospital bed-days due to COPD by Indigenous status, Western Australia

Source: Hospital Morbidity Data System, Department of Health, Western Australia; ICD-10-AM codes J40-J44 as principal diagnosis
Graph 4. Average length of stay for hospitalisation due to COPD by Indigenous status, Western Australia

Source: Hospital Morbidity Data System, Department of Health, Western Australia; ICD-10-AM codes J40-J44 as principal diagnosis

Graph 5. Age-standardised rates of hospital bed-days due to COPD by place of residence, Western Australia

Source: Hospital Morbidity Data System, Department of Health, Western Australia; ICD-10-AM codes J40-J44 as principal diagnosis
In 2009/2010, Western Australian rates of hospitalisation due to COPD remained considerably higher among Indigenous people compared to non-Indigenous people (1,207.7 vs. 200.0 per 100,000). However, Indigenous people with COPD tended to stay in hospital for shorter durations than their non-Indigenous counterparts (4.0 vs. 6.5 days on average). Despite their shorter stays, Indigenous COPD patients used hospital beds at a rate four times that of non-Indigenous people (5,364.3 vs. 1,294.7 per 100,000).

Similarly, WA COPD hospitalisation rates were higher for country residents compared to those living in Perth North and South Metro in 2009/2010 (285.9 vs. 182.2 and 201.1 per 100,000, respectively). The hospital bed utilisation rate for COPD patients was also higher among country people than among North and South Metro residents (1,695.5 vs. 1,301.6 and 1,177.6 per 100,000, respectively), although proportionately the difference was not as pronounced as for hospital separation rates. Over the years, hospital stays for COPD country patients have been shorter than for city dwellers. However, due to a greater decrease over time in the average length of hospital stay for COPD patients living in the Perth South Metro area, country residents with COPD had very similar average lengths of stays as their South Metro counterparts in 2009/2010 (5.8 vs. 5.9 days). Hospital stays for North Metro COPD patients remained longer than for other WA residents though (7.1 days on average).

**Horizon scanning**

It is acknowledged that Models of Care are time limited and will need to be dynamic given the changing health environment.

The results of research into the prevention, detection and management of COPD will inform the development of future iterations of the COPD Model of Care, evidence-based guidelines and service plans.
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ABHI</td>
<td>Australian Better Health Initiative</td>
</tr>
<tr>
<td>AIHW</td>
<td>Australian Institute of Health and Welfare</td>
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<tr>
<td>CPS</td>
<td>Community Physiotherapy Service</td>
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<tr>
<td>COPD</td>
<td>Chronic Obstructive Pulmonary Disease</td>
</tr>
<tr>
<td>CSIF</td>
<td>Clinical Service Improvement Framework</td>
</tr>
<tr>
<td>DALY</td>
<td>Disability adjusted life years</td>
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<tr>
<td>ED</td>
<td>Emergency Department</td>
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<tr>
<td>FEV</td>
<td>Forced expiratory volume</td>
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<tr>
<td>GOLD</td>
<td>Global Initiative for Chronic Obstructive Lung Disease</td>
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<tr>
<td>HITH</td>
<td>Hospital in the Home</td>
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<tr>
<td>ICT</td>
<td>Information, communication and technology</td>
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<tr>
<td>KAMS</td>
<td>Kimberley Aboriginal Medical Service</td>
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<tr>
<td>NIV</td>
<td>Non-invasive ventilation</td>
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<tr>
<td>PAC</td>
<td>Post acute care services</td>
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<tr>
<td>RHN</td>
<td>Respiratory Health Network</td>
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<tr>
<td>RITH</td>
<td>Rehabilitation in the Home</td>
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<tr>
<td>RPH</td>
<td>Royal Perth Hospital</td>
</tr>
<tr>
<td>SpO2</td>
<td>Pulse Oximeter Oxygen Saturation</td>
</tr>
<tr>
<td>WACHS</td>
<td>WA Country Health Service</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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</tbody>
</table>
References


38. Western Australian Cancer & Palliative Care Network. Palliative Care Model of Care. Perth: Department of Health, Western Australia; 2008.
52. Mental Health Division, Department of Health, Western Australia. Smoking and Mental Health Factsheet. Perth: Department of Health, Western Australia; 2007.
Appendices

Appendix 1: 2008 COPD Model of Care Working Party members

The 2008 COPD Model of Care was developed in consultation with clinicians, key stakeholder groups, consumers and carers. The Clinical Service Improvement Framework (CSIF) Working Party members involved were:

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
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<tbody>
<tr>
<td>Dr Peter Kendall</td>
<td>Clinical Lead, Respiratory Health Network, Head of Respiratory Medicine, Fremantle Hospital and Health Service</td>
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<td>Dr Peter Kendall</td>
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<tr>
<td>Dr Jacquie Garton-Smith</td>
<td>Hospital Liaison General Practitioner, Royal Perth Hospital</td>
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<td>Dr Jacquie Garton-Smith</td>
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<td>Ms Carol Watson</td>
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<tr>
<td>Dr Grant Waterer</td>
<td>Respiratory Physician, Royal Perth Hospital</td>
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<tr>
<td>Ms Shauna Gaebler</td>
<td>Formerly Deputy Chief Executive Officer, Perth &amp; Hills Division of General Practice</td>
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<td>Dr Martin Phillips</td>
<td>Respiratory Physician, Sir Charles Gairdner Hospital</td>
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<tr>
<td>Dr Fiona Lake</td>
<td>Respiratory Physician (corresponding member), Royal Perth Hospital</td>
</tr>
<tr>
<td>Ms Ailsa Mylotte</td>
<td>Respiratory Clinical Nurse Consultant, Fremantle Hospital and Health Service</td>
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</table>

Other contributors include the Statewide Steering Group COPD (referred to as the Steering Group) and the participants at the COPD community consultation workshop including consumers and carers.

The following people are acknowledged for their contribution in the development of the final draft of the 2008 COPD Model of Care.

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
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<tbody>
<tr>
<td>Dr Helen Bell</td>
<td>Respiratory Physician, North Metropolitan Area Health Service</td>
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<td>Ms Kathryn Devereaux</td>
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<td>Ms Kim Goodman</td>
<td>Development Officer, Health Networks Branch, Department of Health WA</td>
</tr>
<tr>
<td>Dr Jenni Ibrahim</td>
<td>Consumer representative</td>
</tr>
<tr>
<td>Ms Bronwyn Middleton</td>
<td>Acting Coordinator, Community Physiotherapy Service, North Metropolitan Area Health Service</td>
</tr>
<tr>
<td>Assoc. Professor Sue Jenkins</td>
<td>School of Physiotherapy Curtin University of Technology &amp; Sir Charles Gairdner Hospital, North Metropolitan Area Health Service</td>
</tr>
<tr>
<td>Ms Jo Cockram</td>
<td>Physiotherapist &amp; Ambulatory Care Consultant, North Metropolitan Area Health Service</td>
</tr>
<tr>
<td>Mr Matt Tweedie</td>
<td>Chief Executive Officer, Canning Division of General Practice</td>
</tr>
<tr>
<td>Ms Belinda Whitworth</td>
<td>Development Officer, Health Networks Branch, Department of Health WA</td>
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Appendix 2: COPD management action plan

The Respiratory Health Network COPD Action Plan is for people with COPD. The goal is for all patients to be provided with a COPD Action Plan from their GP, medical specialist or health care coordinator.

For more information or instructions on ordering the cards view the health professional fact sheet or patient fact sheet.
Appendix 3: Criteria for inclusion in pulmonary rehabilitation

**Phase 1 -**
- Inpatient with exacerbation of a chronic respiratory condition
- Rehabilitation in the home (RITH) – short-term rehabilitation to facilitate early discharge or to prevent readmission

**Phase 2 – Initial 8-week pulmonary rehabilitation program**

<table>
<thead>
<tr>
<th>Hospital-based outpatient</th>
<th>Community-based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe disease +/- complex comorbidities</td>
<td>Mild to moderate disease without complex comorbidities</td>
</tr>
<tr>
<td>SpO2 &lt; 85% on 6 minute walk test (MWT) +/- newly prescribed oxygen therapy</td>
<td>Resting SpO2 ≥ 92% and ≥ 85% on 6 minute walk test (MWT)</td>
</tr>
<tr>
<td>Moderate / high cardiovascular risk</td>
<td></td>
</tr>
<tr>
<td>Pre/post-op (eg Lung volume reduction procedure, transplant)</td>
<td></td>
</tr>
</tbody>
</table>

**Phase 3 – Maintenance PR**

<table>
<thead>
<tr>
<th>Hospital-based outpatient</th>
<th>Community-based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to maintain SpO2 ≥ 85% during endurance walk</td>
<td>Stable cardiovascular and pulmonary status in initial 8-week pulmonary rehabilitation program</td>
</tr>
<tr>
<td>High oxygen therapy requirements</td>
<td>Resting SpO2 ≥ 92% and ≥ 85% on endurance walk</td>
</tr>
<tr>
<td>Moderate / high cardiovascular risk</td>
<td>Low cardiovascular risk</td>
</tr>
<tr>
<td>Complex co-morbid conditions</td>
<td>If on oxygen therapy – stable, safe and independent during ex</td>
</tr>
<tr>
<td>History of multiple hospital admissions (&gt;2 in 12/12)</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 4: Pulmonary rehabilitation pathway

Phase 1
Pulmonary Rehabilitation
Inpatient

Rehabilitation in the home
(RITH)

Community-based
Phase 2 PRP

Hospital-based
Phase 2 PRP

Phase 2
Pulmonary Rehabilitation Program
Initial 8-week program

Screening

• Mild-moderate disease
• No serious co-morbidities
• Low risk of an adverse event

• Very severe disease
• +/- complex co-morbidities
• High risk of adverse events

Community-based
Phase 3 PRP

Hospital-based
Phase 3 PRP

Phase 3
Pulmonary rehabilitation program
(maintenance)