Publication reference 1001,
2007, Edition 3 (July 2010)

Diagnosis and management of COPD in primary care

A guide for those working in primary care

Primary Care Respiratory Society UK

This publication is supported by the British Lung Foundation
Registered charity no. 326730

The development of the guide was supported by educational grants from Allen & Hanburys, the specialist respiratory division of GlaxoSmithKline (revised version) and Boehringer Ingelheim Ltd/Pfizer and AstraZeneca UK Ltd (original version)
The sponsors have had no editorial control other than review of scientific accuracy and ABPI code compliance.

Diagnosis and management of COPD in primary care

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Conflicts of Interest

Dr Kevin Gruffydd-Jones is a member of the NICE COPD Guidelines Development Group. He has spoken for, or acted as a consultant, for MSD, Nycomed, GSK, Novartis, AstraZeneca, Chiesi, Pfizer, Boehringer Ingelheim and Galen

Dr John Haughney, Clinical advisor, respiratory, NHS QIS; Director, IPCRG, has no conflicts of interest.

Dr Rupert Jones has provided consultancy and/or lectures for, and/or received travel bursaries for scientific meetings from several pharmaceutical companies including Boehringer Ingelheim/Pfizer Ltd, AstraZeneca, GSK, Chiesi, TEVA and Nutricia.

Dr Noel O'Kelly has no conflicts of interest.

The Primary Care Respiratory Society UK

The Primary Care Respiratory Society UK (PCRS-UK) is a UK-wide professional society committed to improving respiratory care in primary care. Registered as a charity, we are led by our members through a range of committees and faculties dedicated to meeting the vision of "optimal respiratory care for all".

Providing education, policy support and research

We work across all areas of respiratory medicine in primary care, in particular COPD, asthma and respiratory-related allergy, and focus on:

- Offering a wide range of educational services to help you as a health professional – whether you are new to respiratory medicine, simply need to brush up your knowledge or are already an 'expert' – provide quality care to your patients with respiratory disease
- Influencing policy and setting standards in respiratory medicine relevant to primary care, both nationally and locally
- Facilitating the development of primary care research and the generation of evidence needed to support policy and education activities

Our resources and events are written and facilitated by experts who understand both primary care and respiratory care. They provide not only a quick and easy way to keep up to date in respiratory medicine, but also an opportunity to further your own personal development and network with peers similarly interested in respiratory primary care.

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The BLF supports people affected by lung disease through the individual challenges they will face. Support is the focus of many of their activities, including Breathe Easy, their nationwide support network.

The BLF help people to understand their condition. This is done by providing comprehensive and clear information on paper, on the web and by telephone.

The BLF work for positive change in lung health by campaigning, raising awareness and funding world-class research.
Helpline (Mon- Fri, 10am - 6pm): 08458 50 50 20
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Introduction

Chronic obstructive pulmonary disease (COPD) is a major cause of morbidity and mortality in the United Kingdom with over 27,000 deaths per annum. There are an estimated 3 million people suffering from the disease in the UK – 900,000 diagnosed and 2.1 million presumed undiagnosed.

Since the first publication of this booklet in 2007, the National Institute for Health and Clinical Excellence (NICE) has recently published the 2010 update[1] of its original 2004 Guidelines on the management of COPD. This booklet is based on the 2010 update. The new Guidelines reflect:

- Changes in the parameters of airflow limitation used for diagnosing COPD.
- Increasing recognition that COPD is not just a disease of the lungs, but is a multisystem disease requiring a multidimensional assessment and holistic approach to management.
- Increasing evidence that pharmacological and non-pharmacological therapy not only improves current control (symptoms, health status, activity levels) but also can reduce future risk of exacerbations, disease progression and mortality.

This booklet aims to help healthcare professionals implement the 2010 NICE Guidelines on COPD management in primary care in England, but will also be of use to primary healthcare professionals in other parts of the UK.

Presentation and diagnosis of COPD

Dr John Haughney

Chronic obstructive pulmonary disease (COPD) is a chronic respiratory condition with associated systemic features. In the Western world, cigarette smoking is the predominant cause. People from areas with high social deprivation are disproportionately affected. It is a disease characterised by airflow obstruction. Unlike asthma, its symptoms and signs do not vary over time, it is not fully reversible and its severity is progressive.

Delay in presentation is well recognised: chronic cough is a common symptom but many cigarette smokers do not perceive this as a medical symptom. Some are perhaps reluctant to present because of fears of guilt, feelings of having to admit "self-induced illness", or because they know that the first advice from a clinician will be... 'Stop smoking!' With a greater understanding of the goals of COPD management and newer therapies, including aids to smoking cessation, case-finding of individuals with undiagnosed COPD (whom the British Lung Foundation (BLF) refer to as "the missing millions") is now even more worthwhile. Some health care organisations are planning systematic identification programmes. Individual clinicians should consider the diagnosis of COPD in patients presenting with the features listed in Table 1.

Table 1: Presenting features

Consider a diagnosis of COPD in patients who are:

- Over 35 years
- Smokers or ex-smokers
- Have any of the following symptoms:
  - Breathlessness on exertion
  - Chronic cough
  - Regular sputum production
  - Frequent episodes of "bronchitis" or "chest infections"
  - Wheeze

and who don't have clinical features of other diseases, particularly asthma, and including bronchiectasis, congestive cardiac failure and lung cancer.

Primary care-based studies, for example one from Devon,[2] have highlighted the benefit of scrutinising and reorganising disease registers. Some COPD patients may have found their way onto an asthma register and vice versa.

Diagnosis

There is no single diagnostic test for COPD. The diagnosis is based on a combination of history, the presence of symptoms and signs, and confirmation of the presence of airflow obstruction by spirometry. In the early stages of the disease there may be minimal or no symptoms, and/or there may be little airflow obstruction (forced expiratory volume in one second (FEV_1) > 80% predicted). In primary care, it is usually possible to differentiate COPD from asthma on the basis of the clinical features as displayed in Table 2.

Table 2. Clinical features differentiating COPD and asthma[1]

	COPD	Asthma
Smoker or ex-smoker	Nearly all	Possibly
Symptoms under age 35	Rare	Often
Chronic productive cough	Common	Uncommon
Breathlessness	Persistent and progressive	Variable

On examination, the following signs may be present:

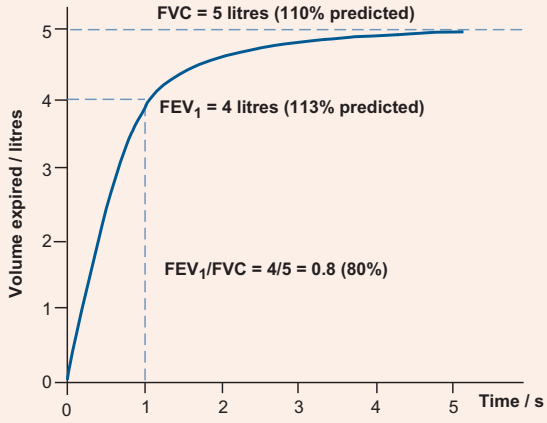
- Hyperinflated chest
- Use of accessory muscles of respiration
- Wheeze or quiet breath sounds
- Peripheral oedema
- Raised JVP
- Cyanosis
- Cachexia

Spirometry, and thus demonstration of airflow obstruction, is crucial to a diagnosis. Proposed standards for diagnostic spirometry in primary care have been published.[3] Airflow obstruction is defined as a reduced post-bronchodilator FEV_1/forced vital capacity (FVC) ratio less than 0.7. Because of potential issues around the accuracy of reference values, clinicians should consider alternative diagnoses or investigations in older people without typical symptoms of COPD where the FEV_1/FVC ratio is < 0.7 and in younger people with symptoms of COPD where the FEV_1/FVC ratio is ≥ 0.7. The introduction of an alternative reference value, the so called "lower limit of normal" (LLN) remains under debate. Standard reference values have not been validated in black and Asian populations.

A diagnosis of COPD can usually be made without formal spirometry reversibility testing, although this remains an option where diagnostic doubt persists. The degree of reversibility of airflow limitation (e.g., the change in FEV_1 after bronchodilator or glucocorticosteroids) does not predict the response to long-term treatment with these therapies – which may have other beneficial clinical outcomes. Similarly, although spirometry indicates the severity of airflow obstruction (FEV_1), and can be used to guide treatment interventions (see page 13) and predict prognosis, it may under- or over-estimate the severity of the impact of the disease on the individual.

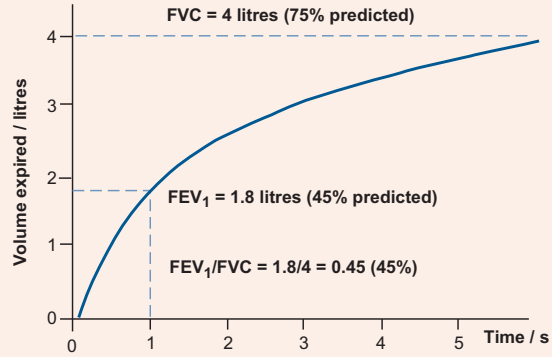
The use of routine peak expiratory flow (PEF) measurements is not recommended as these can significantly underestimate the severity of airflow obstruction. However, twice-daily PEF over a period of two weeks remains a useful option in helping to show reversibility and thus assisting in making a diagnosis of asthma.

Figure 1A - Spirometry tracing of a patient with normal airways



A forced expiratory manoeuvre. The predicted values are derived from age, gender and height and taken from standard reference tables; currently the European Community for Steel and Coal are used in the UK. These may lead to under diagnosis in the elderly and need adjustment in black and Asian populations. Here, the FVC is 5 litres and the FEV_1 is 4 litres. The ratio is therefore 0.8, which is normal.

Figure 1B - Spirometry tracing of a patient with COPD: an obstructive picture



Again, a forced expiratory manoeuvre. In this case the FVC is 4 litres and the FEV_1 is 1.8 litres. The ratio is therefore 0.45, an obstructive picture, consistent with COPD (but also with asthma).

A typical spirometry tracing from a patient with COPD is shown in Figure 1B. A diagnosis of airflow obstruction can be made if the FEV_1/FVC ratio is <0.7 (i.e. $<70\%$).*

* Symptoms should be present to diagnose COPD in people with mild airflow obstruction ($FEV_1 \geq 80\%$)

As part of an initial assessment, at the time of initial diagnosis, patients should also have

- A chest X-ray to exclude other pathology
- A full blood count to exclude anaemia or polycythaemia
- A calculation of their body mass index (BMI)

COPD is a systemic disease. Primary care clinicians should aim to identify the possible extra-pulmonary effects such as:

- Weight loss
- Muscle wasting
- Normochromic anaemia or polycythaemia
- Anxiety and depression
- Pulmonary hypertension and *cor pulmonale* (right heart failure secondary to lung disease)
- Osteoporosis

Hypoxia with COPD leads to pulmonary hypertension which in turn may lead to *cor pulmonale*. Signs of *cor pulmonale*, such as fluid retention, peripheral oedema and raised venous pressure should be sought on examination. ECG and echocardiography are appropriate primary care-requested investigations. The development of right heart failure and cor pulmonale in patients with COPD has important negative implications for prognosis.

Finally, in this group of patients there are often significant co-morbidities, for example arthritis, dementia, depression, and heart diseases. As always, we need to manage the patient, not the individual diseases.

Assessment of COPD in primary care

Dr Kevin Gruffydd-Jones

Assessment of COPD severity should be carried out regularly (at least annually, and more frequently for severe disease) to monitor disease progression, help determine prognosis and inform management strategies.

Traditionally, assessment of severity of COPD has been based on the degree of airflow limitation, but this correlates poorly with the impact of the disease upon the patient.

Table 3. NICE guidelines 2010[1] grading of severity of airflow obstruction.

Severity	Post-bronchodilator FEV_1 % predicted
Mild – Stage 1	$\geq$ 80%*
Moderate – Stage 2	50-79%
Severe – Stage 3	30-49%
Very Severe – Stage 4	<30%**

*only in the presence of symptoms ** or $\leq$50% with respiratory failure

Patients should be assessed using a multidimensional assessment, which includes the degree of airflow limitation (Table 3) but also includes the following:

- Severity of cough (including purulence and viscosity of sputum)
- Degree of breathlessness using the MRC Dyspnoea Score[4] (reflects exercise tolerance and functional limitation) – (see Table 4)
- Smoking status
- Body Mass Index (BMI) weight (kg)/height (m^2). If the BMI is < 20, this reflects a poor prognosis
- Frequency of exacerbations in the previous year (mild exacerbation = needing an increase in treatment, severe exacerbation = needing oral steroids/hospitalisation)
- Oxygen saturation should be measured using pulse oximetry (especially where FEV_1 < 50% predicted). Oxygen saturations of $\leq$92% (measured when the patient is at rest, in a stable state and breathing air) may be suggestive of a "failing lung" and necessitate referral for further assessment
- Health status. The health impact of the disease upon the life of the patient can be measured by short self-completed health status questionnaires. The COPD Assessment Tool (CAT),[5] and Clinical COPD Questionnaire (CCQ),[6] are easy to use in primary care
- Assessment of co-morbidities

- In patients with exacerbations/failing lung:
  - Screen for depression/anxiety e.g.
    - During the last month have you often been bothered by feeling down, depressed or hopeless?
    - During the last month have you been bothered by having little interest or pleasure in doing things?
    - Do you feel upset or frightened by your attacks of breathlessness?

  A positive answer should prompt more formal assessment of the depression
  - Consider screening for osteoporosis
  - Summarise other co-morbidities (e.g. heart problems, osteoarthritis)
- Multidimensional assessment tools have been developed to assess disease severity and reflect prognosis. These include measurement of:
  - **B**ody Mass Index, **O**bstruction (Fev-1% predicted), **D**yspnoea (MRC score), **E**xercise (as measured by 6- minute walking test) BODE index[7]
  - Of more practical use in primary care is the DOSE[8] score:
    - Dyspnoea (MRC Score)
    - Obstruction (FEV_1 % predicted)
    - Smoking status
    - Exacerbation frequency
- Social needs. Record social support and needs (including carers and allowances)

Table 4. Medical Research Council (MRC) Dyspnoea Score.[4]

Grade	Degree of breathlessness related to activities
1	Not troubled by breathlessness except on strenuous exercise
2	Short of breath when hurrying or walking up a slight hill
3	Walks slower than contemporaries on level ground because of breathlessness, or has to stop for breath when walking at own pace
4	Stops for breath after walking about 100m or after a few minutes on level ground
5	Too breathless to leave the house, or breathless when dressing or undressing

Management of COPD in primary care

Dr Kevin Gruffydd-Jones

Pages 12 and 13 of this booklet show a patient-centred approach to COPD management based on multidimensional assessment (see previous section) and incorporating the NICE 2010 pharmacotherapy algorithm.[1]

The goals of COPD management

- Improve current control (symptoms, health status, everyday activities, improve lung function)
- Prevent future risk (reduce exacerbations, slow disease progression, reduce mortality)

All patients should receive the following:

1. **Smoking Cessation Advice** (where applicable)
   - Smoking cessation can halt disease progression and improve (and possibly reduce) mortality
   - Refer to practice- or locality-based smoking cessation services
   - Nicotine replacement therapy, oral bupropion or varenicline can improve smoking cessations rates

2. Offer a single dose of **pneumococcal and annual influenza vaccination** to reduce the risk of exacerbations

3. **Exercise Advice**
   - All patients with COPD should be encouraged to exercise within the limits of any co-morbidity
   - Consider referring patients with mild disease to local exercise promotion schemes
   - Offer pulmonary rehabilitation to patients with functional limitation (see below)

4. **Dietary Advice**
   - Overweight patients (BMI>25) should be advised to lose weight
   - Underweight patients (BMI<20) should be referred to a dietician

5. **Patient disease education**
   This should include information about the disease and its treatment with an emphasis on encouragement of self-management, including COPD action plans where appropriate.

Symptomatic patients

a) Managing breathlessness

Inhaled pharmacotherapy is the mainstay of symptomatic management but advice about breathing techniques can be useful, especially for patients with frequent exacerbations.

The choice of a particular therapy depends on cost and the patient's choice of a particular inhaler device. Most patients will manage a hand-held inhaler device and will rarely need nebuliser therapy. A portable spacer device may help drug delivery via a pressurised metered dose inhaler (pMDI) especially during an exacerbation. It is important to check inhaler technique and compliance when the patient is reviewed.

b) Intermittent breathlessness

- Use a short-acting β_2-agonist bronchodilator (e.g salbutamol, terbutaline) for relief of symptoms irrespective of their effect on lung function. They have an onset of action within five minutes and duration of action of 4-6 hours
- Alternatively a short-acting muscarinic* agent (ipratropium) can be used; onset of action is within 30 minutes and duration of action 4-6 hours

** NICE use the term "anti-muscarinic agent". This is synonymous with the term "anti-cholinergic agent".*

c) Persistent breathlessness

Daily treatment with long-acting bronchodilators can:

- Improve lung function (FEV_1, FVC)
- Reduce dynamic hyperinflation of the lungs and hence reduce the work of breathing, improving breathlessness and exercise capacity
- Improve health status
- Reduce exacerbations and hospitalisations

Treatment can be provided by:

- The long-acting anti-muscarinic agent (LAMA) tiotropium. Once-daily tiotropium is more cost-effective than (and should be used in preference to) regular four times-daily therapy with ipratropium. The main side effect is a dry mouth

OR

- Long-acting β_2-agonists (LABA) (e.g. salmeterol, formoterol). The main side effects are palpitations and tremor

For patients with an $FEV_1 < 50\%$ predicted, the NICE Guidelines recommend the use of inhaled corticosteroid/long-acting β_2-agonist (ICS/LABA) combination therapy in preference to LABA alone.

- Formoterol 12mcg/budesonide 400mcg (Symbicort™) and salmeterol 50mcg/fluticasone 500mg (Seretide™) are licensed to be given twice daily via dry powder devices
- Patients should be advised of the side effects of the ICS component including dry mouth, oral candidiasis, dysphonia and the possible increased risk of non-fatal pneumonia – though the latter is contentious. The NICE Guidelines state that a meta-analysis was carried out (unpublished) of studies involving ICS/LABA and that there was an increased risk of non-fatal pneumonia due to the ICS component, although the absolute risk of this was low[1]

It should be noted that ICS are not licensed to be used in COPD except in combination with a LABA.

d) **Managing cough**
   - Patients with distressing, viscid sputum may be helped by a mucolytic agent; carbocisteine (Mucodyne™) or mecysteine (Visclair™). Patients with a positive symptomatic response to a 4-week trial of either agent should continue treatment long-term
   - Physiotherapy may be of benefit
   - Consider a diagnosis of bronchiectasis in patients with recurrent or chronic purulent cough

e) **Managing functional disability in patients with COPD**
   Patients who have a restriction in their daily activities due to COPD (usually with MRC score ≥ 3) should:
   - Have optimisation of pharmacotherapy (see pharmacotherapy algorithm page 13)
   - Be offered pulmonary rehabilitation
   - Be screened for depression and anxiety and treated with pharmacotherapy or cognitive behavioral therapy where indicated

f) **Patients with exacerbations of COPD**
   - Optimise pharmacotherapy (see algorithm page 13) and non-drug therapy (e.g. pulmonary rehabilitation)
   - Treat co-morbidities e.g. depression, osteoporosis
   - Self-management action plans should be discussed including the provision of standby oral antibiotics / oral steroids

See page 16 for more information on managing exacerbations of COPD.

g) **Patients with hypoxia**

Refer patients for consideration of long-term oxygen therapy if:

- Oxygen saturations $\leq$ 92% in air, at rest, during a period of clinical stability, irrespective of level of severity
- FEV_1 < 30% predicted.
- *Cor pulmonale* (ankle oedema and raised JVP)

See page 19 for more information on oxygen therapy.

h) **Holistic care**

For all patients this involves an awareness of, and appropriate treatment /referral for, co-morbidities and psychosocial needs.

In patients with severe disease, consideration should be given to initiating palliative care. This may range from use of opiates in resistant breathlessness to referral to palliative care services for end-stage disease (see page 20 for more information on end-of-life care).

Figure 2: Algorithm for Patient-Centred Management of Stable COPD in Primary Care.

ALL PATIENTS

- Smoking cessation advice
- Patient education / self management
- Assess co-morbidity
- BMI: Dietary advice if >25, specialist dietary referral if <20
- Exercise promotion
- Pneumococcal vaccination
- Annual influenza vaccination

SYMPTOMS?

Breathlessness
Short-acting bronchodilators (β-agonist/anticholinergic) for relief of symptoms

Persistent symptoms
See pharmacotherapy algorithm (page 13)

Productive cough
Consider mucolytics

FUNCTIONAL LIMITATION?

MRC score ≥3

Optimise pharmacotherapy
See pharmacotherapy algorithm (page 13)

Offer pulmonary rehabilitation

Screen for anxiety/depression

EXACERBATIONS

(Oral steroids/ antibiotics/ hospital admissions)

Optimise pharmacotherapy

Discuss action plans including use of standby oral steroids and antibiotics

HYPOXIA?

Oxygen saturation ≤92% at rest in air

FEV_1 <30% predicted

Refer for oxygen assessment

HOLISTIC CARE

Check social support (e.g. carers and benefits)

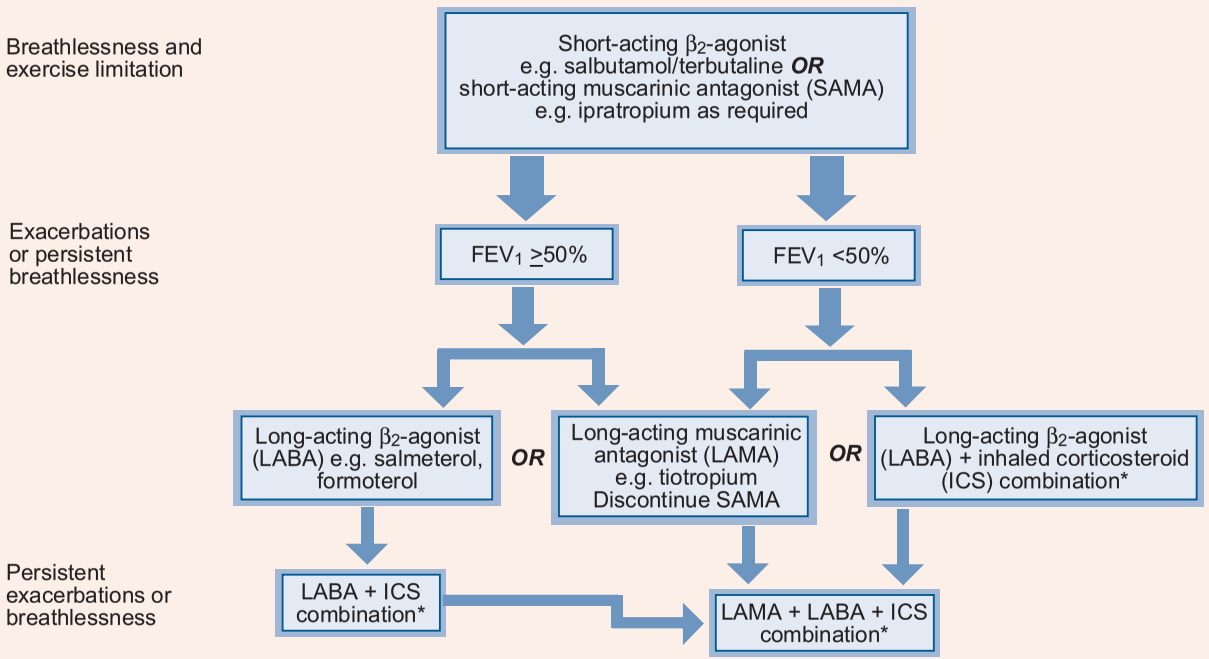
Treat co-morbidities

Consider palliative therapy or secondary care referral for resistant symptoms

Refer to specialist palliative care teams for end-of-life care

Figure 3: Inhaled pharmacotherapy algorithm.[1]
Adapted from NICE 2010 Guidelines

Choose a drug based on the person's response and preference (including choice of device, side-effects and cost)



**Consider LAMA + LABA if ICS declined or not tolerated*

Pulmonary rehabilitation

Dr Rupert Jones

Definition

Pulmonary rehabilitation (PR) is a multi-disciplinary programme of care for patients with chronic lung disease. It is individually tailored and designed to optimise physical and social performance and functional independence. It is usually performed in groups. The programme consists of exercise, education and psychosocial support.

COPD patients with breathlessness often avoid exercise and become unfit and de-motivated. They become anxious, depressed and socially isolated. PR addresses all these issues.

Indication

PR should be offered to any patient who considers himself/herself to be functionally disabled by COPD (usually MRC dyspnoea scale 3 or above) irrespective of lung function. It is not suitable for patients who are unable to exercise.

PR is effective in improving:

- Quality of life
- Exercise capacity
- Dyspnoea

In a controlled study, it halved the number of bed days and reduced overall healthcare consumption.[9] There is strong evidence that it is cost-effective. Access to PR has improved dramatically, and is available in 90% of UK hospitals according to the National COPD audit of 2008, with the PR programmes being either in hospital or community-based.[10]

Components

PR exercise

- Individually tailored and increased exercise during the programme
- Involves supervised exercises preferably twice-weekly
- Upper- and lower-limb exercises
- Usually group exercise with a regime to be followed at home

Education

Main topics include:

- Relaxation
- Breathing control
- Pathophysiology

- Drug treatment
- Self-management
- Benefits, social services

Setting

In the past PR was mainly hospital based, but increasingly it is performed in the community. This has advantages for patients in terms of access, but it is important that location and the programme are risk-assessed (http://www.pcrs-uk.org/resources/gpiag_pul_rehab_bestpract_200306.pdf). Newer concepts with limited evidence base include:

(i) Post exacerbation/admission programmes, and
(ii) Generic rehabilitation programmes for patients with a range of different chronic disorders including respiratory, cardiac and neurological disorders

PR should now be considered for some patients after a hospital admission.

Assessment

It is important that formal assessment of health status and exercise capacity is measured before and after PR.

Examples of assessment methods include:

- The Incremental and/or Endurance Shuttle Walking Test[11,12]
- Questionnaires such as the St. Georges Respiratory questionnaire,[13] Chronic Respiratory Disease questionnaire,[14] the Hospital Anxiety and Depression scale,[15] and the Lung Information Needs Questionnaire[16]

Follow-up

It is important to offer a means of continuing the exercise programme. Some patients have regular follow-up sessions, some go on to prescription-based exercise schemes, and some to the local patient support groups – e.g. Breathe Easy groups run by the British Lung Foundation (www.lunguk.org).

Exacerbations of COPD

Dr Rupert Jones

Definition

An exacerbation of COPD is:

- A sustained worsening of the patient's symptoms from their usual stable state
- Beyond normal day-to-day variations
- Acute in onset
- Requires treatment change

The main symptoms are increased

- Breathlessness
- Cough
- Sputum volume
- Sputum purulence
- General malaise/fatigue

Costs of exacerbations

Unscheduled care accounts for 60% of the UK NHS costs for COPD, mainly from hospital admissions. COPD exacerbations are the second most common cause of acute medical admissions. Hospital admission is also a marker of worsening prognosis – in one study, within three months of an admission, 34% were re-admitted and 14% had died.[8] Costs of exacerbations are dependent on where they are managed, with self- or community-managed episodes costing £15-£100 each, and hospital admissions over £1000. The human costs are also high. Exacerbations compromise quality of life which can then take up to six months to recover fully. With frequent exacerbations, patients could re-exacerbate before they have recovered from the previous one. This pattern is associated with rapid decline in lung function and quality of life.

Management

In an exacerbation, the earlier treatment is started the better. The recommended steps are:

1. Take maximal bronchodilator therapy
2. Oral steroids (30mg prednisolone daily for 7-14 days) if symptoms persist despite adequate bronchodilators
3. Antibiotics if sputum goes yellow or green (see action plan sample – Figure 4, Page 17).

Figure 4: COPD Action Plan

WHAT ACTION TO TAKE IF YOUR SYMPTOMS GET WORSE

1. **RELIEVER TREATMENT**
   Via inhaler or nebuliser
   Maximum dose _____ / _____ times per day

2. **Check the colour of your sputum:**
   Cough sputum onto a white tissue
   If your sputum colour has changed from clear or pale to a darker shade e.g. yellow or green: **start ANTIBIOTICS**:
   Please take your home supply
   or obtain a prescription without delay from the surgery

3. **PREDNISOLONE**
   If breathlessness is not relieved by bronchodilators, take 30mg once daily (6 x 5mg tablets) for 7-14 days.

Patients should be taught how to recognise an exacerbation and should be provided with easy access to drug treatment. Often home supplies are provided. They should also be warned to seek help if their self-management is not working.

In influenza outbreaks, when alerted by the local Public Health Laboratory, antiviral drugs (such as oseltamivir) should be used within 48 hours of the onset of an influenza-like illness.

Those with severe dyspnoea or failure to respond should be assessed urgently, and this includes the measurement of oxygen saturation with pulse oximetry. The clinician will need to be sure that the symptoms are due to COPD and needs to exclude alternative causes such as pneumonia, pneumothorax, pulmonary embolism or cardiac failure.

Indications for in-patient assessment

Indications for in-patient assessment including chest X-ray, blood gases and ECG are:

- Worsening hypoxaemia
- Unremitting severe breathless
- Confusion, drowsiness (may indicate hypercapnia)
- New onset of peripheral oedema or cyanosis
- Chest pain and fever (may indicate other pathology e.g. pneumonia.)

Other treatment

During an exacerbation, nebulisers are sometimes needed to deliver bronchodilator therapy but they hold few advantages over metered dose inhalers delivered by a spacer device.[16]

Emergency oxygen may be given to hypoxic patients pending transfer to hospital, with the aim of raising the oxygen saturations to a target range of usually 88-92% (but no higher – since excess oxygen may cause carbon dioxide retention).

After an exacerbation, a thorough review is indicated including:

- Optimal drug treatment (see management section pages 8-13)
- Self-management advice
- Pulmonary rehabilitation and/or assessment for oxygen as appropriate

Oxygen therapy

Dr Rupert Jones

Oxygen is a widely misunderstood and over-prescribed drug with major potential for toxicity. Home oxygen costs £110m and much of it is wasted. Oxygen has little or no place in the management of dyspnoea, and oxygen should normally be prescribed after a formal assessment by a specialist. If it is overused, it can reduce respiratory drive and cause dangerous carbon dioxide retention.

Classification

1. **Short-burst oxygen therapy (SBOT)**
   There is no evidence to support SBOT and it should not be used except in palliative care in the presence of hypoxia. It is relatively safe in stable disease but can cause dangerous carbon dioxide retention, especially in bad exacerbations.
2. **Long-term oxygen therapy (LTOT)**
   Oxygen provided for more than 15 hours/day can prolong life in patients with persistent hypoxia in a stable condition. Currently it is under-prescribed, and poorly adhered to by patients, despite its proven benefits.
3. **Ambulatory oxygen therapy**
   This is suitable for those needing LTOT who wish to get out, and a few other patients who meet the following criteria:
   (i) Severe breathlessness
   (ii) Oxygen desaturation with exercise, and
   (iii) Improved exercise capacity when ambulatory oxygen is provided.

Who should be assessed?

Patients with any of these features, in stable COPD, require pulse oximetry (SaO_2):

- FEV_1 < 30% predicted
- Cyanosis
- Polycythaemia
- *Cor pulmonale*

Pulse oximetry should be considered in patients with an FEV_1 of 30%-49% predicted.

If the SaO_2 is less than or equal to 92% breathing air on two occasions, they should be referred for specialist assessment including arterial blood gas analysis.

End-of-life issues in the management of COPD

Dr Noel O'Kelly

It is important to establish the point at which a patient fulfils the criteria for end-of-life care as this can alter dramatically the subsequent management plan for the patient. COPD shows an illness trajectory demonstrating gradual deterioration punctuated by episodes of acute exacerbations that at any time can prove fatal. This trajectory provides a less clear-cut pattern than patients with terminal cancer (see Figure 5).

Figure 5. Comparison of the patterns of physical decline for people with cancer and COPD (organ failure).[17]
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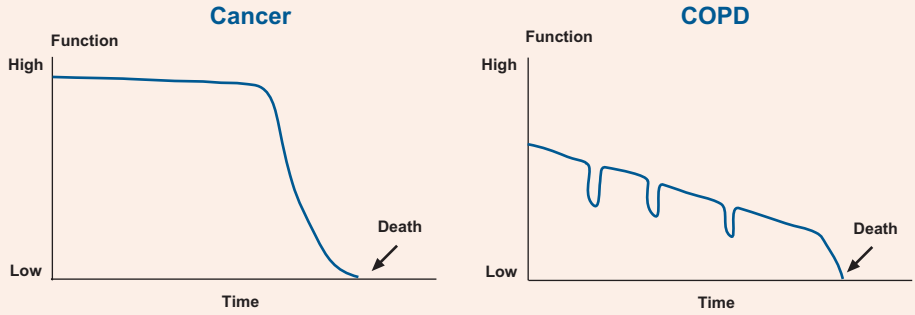

End-of-life issues should be considered in patients where there is a likelihood that they may die in the ensuring year.

There are a number of clinical markers that can alert us to the likelihood of patients with COPD fulfilling end-of-life criteria including:

- Severe airflow obstruction (FEV_1 < 30% predicted)
- Respiratory failure
- Low BMI (<19)
- Housebound (MRC dyspnoea score of 5)
- History of two or more acute exacerbations during the previous year – either from COPD or heart failure

In patients fulfilling end-of-life criteria consider:

- Completion of a DS1500 form to be sent to the benefits agency so that patients can receive a disability living allowance before the usual 6-month period
- Provision of a clear management plan in consultation with the patient and carer
- Referral to specialist services:
  - Community Matron/ Community Respiratory Nurse Specialist
  - District nurses
  - Palliative care team (including Macmillan Nurse)
  - Social Services
  - Complex Case Manager (for continuing care health funding if near to death criteria met)
- Adopting Gold Standard Framework e.g. establishing register in general practice for end of life patients
- Provide a patient-held record of care plan, available for emergency services personnel
- Provide an alert card to the Out of Hours Service containing summary of relevant patient information including preferred place of death
- Adopting Liverpool Care Pathway (for last 48 hours of life), a nationally adopted integrated care pathway for patients in the last few days of life (www.lcp-mariecurie.org.uk)

Referral criteria

Dr Noel O'Kelly

When to refer a patient appropriately for specialist opinion is often a difficult question for primary care clinicians to address. The decision to refer may be influenced by the knowledge and confidence of the primary care clinician, the referral options available within the health community, and on factors directly related to the patients themselves.

Referral for help with the diagnostic process

1. Diagnostic uncertainty
2. Dysfunctional breathing
3. Suspected severe and deteriorating COPD
   - Worsening of symptoms despite maximal therapy
   - Rapid decline in lung function (FEV_1)
   - Symptoms disproportionate to lung function
4. Age <40 yrs or alpha-1–antitrypsin deficiency
5. Onset of *cor pulmonale* or presence of significant co-morbidities
6. Red flag symptoms to exclude lung cancer
   - Haemoptysis
   - Finger clubbing
   - Unexplained rapid weight loss
   - Night sweats
7. Patients experiencing frequent infections/exacerbations
8. Patient requests second opinion

Referral for assessment of additional therapies

1. Assessment for pulmonary rehabilitation
   - Patients with functional disability despite optimal therapy (MRC dyspnoea score of 3 or more)
2. Assessment for lung surgery
   - Lung volume reduction surgery
   - Lung transplantation
3. Assessment for oxygen therapy (see section on oxygen therapy)
   - Long term O_2 therapy
     - Severe COPD patients ($FEV_1 \leq 30\%$)
     - O_2 saturation $\leq$ 92% (pulse oximetry)
4. Assessment for ambulatory O_2 therapy
   - Patients who desaturate on exercise; i.e. severe onset of dyspnoea on exertion
5. Assessment for nebulised therapy
6. Assessment for long term oral corticosteroids to justify the need or supervise withdrawal
7. Rapid decline in lung function (FEV_1)

Providing structured care for people with COPD

Dr Noel O'Kelly

1. Screening for COPD patients

Perform spirometry on

- Patients who have a significant smoking history, are >35 years of age, and have a history of asthma
- Patients who have a significant smoking history, are >35 years of age, and have had a prescription for a bronchodilator in the last year
- Patients who have a significant smoking history, are >35 years of age, and have a history of an acute respiratory problem in the last year

2. Identification and diagnosis of COPD patients

- Provision of spirometry in practice, and a method to invite patients to attend

3. Assessment of impact of disease on patient

- Spirometry only indicates severity of airflow obstruction
- All patients need a multidimensional assessment – to include symptoms and exacerbation history (see pages 6 and 7)

4. COPD clinic template of care (See Table 5)

5. Management of COPD patients with reference to national, regional and local guidelines

- NICE guideline
- Regional and locally agreed guidelines

6. Identification of patients with moderate/severe disease who require referral for specialist interventions (see section on referral criteria – page 22)

- Agreed referral pathways between primary and secondary care

7. Ensuring that patients suffering from acute exacerbations receive prompt assessment and treatment

- Practice register of patients with moderate to severe COPD
- Patient education to ensure patients respond appropriately to onset of acute symptoms (as part of self-management plan)
- Systems in place within practice to allow for streamlined access to clinicians for the most vulnerable patients (moderate to severe COPD and a history of acute exacerbations)

8. Identification of patients with a history of acute exacerbations and ensuring provision of self-management plans

- Self-management plan provided to all patients with a history of recurrent COPD exacerbations

Table 5: COPD clinic template with relevant Read codes

Prompt	Read Code	Pick List
Respiratory disease monitoring	663..	6631. Initial respiratory assessment 66YL. COPD follow-up 9N4W.DNA - COPD clinic
Exception reporting: COPD	9h5..	9h51. Excepted from COPD quality indicators: Patient unsuitable 9h52. Excepted from COPD quality indicators: Informed dissent
Tobacco Consumption	137..	1371. Never smoked tobacco 1372. Trivial smoker - < 1 cig/day 1373. Light smoker - 1-9 cigs/day 1374. Moderate smoker - 10-19 cigs/d 1375. Heavy smoker - 20-39 cigs/day 1376. Very heavy smoker - 40+cigs/d 1377. Ex-trivial smoker (<1/day) 1378. Ex-light smoker (1-9/day) 1379. Ex-moderate smoker (10-19/day) 137A. Ex-heavy smoker (20-39/day) 137B. Ex-very heavy smoker (40+/day) 137H. Pipe smoker 137I. Passive smoker 137J. Cigar smoker 137M. Rolls own cigarettes 137N. Ex pipe smoker 137O. Ex cigar smoker
Date ceased smoking	137T.	
Cigarette Pack Years	137g.	
Smoking Cessation Advice	8CAL.	
Occupational Exposure to Risk Factors	ZV4C.	

Table 5: COPD clinic template with relevant Read codes continued

Prompt	Read Code	Pick List
Family History Respiratory Disease	12D..	12D1. FH: Bronchitis/COAD 12D2. FH: Asthma
Cough Symptom	171..	171.. Cough 1711. No cough 1713. Productive cough -clear sputum 1714. Productive cough -green sputum 1715. Productive cough-yellow sputum 171C. Morning cough 171D. Evening cough 2326. O/E – expiratory wheeze
Breathlessness	173..	1731. No breathlessness 173H. MRC Breathlessness Scale: grade 1 173I. MRC Breathlessness Scale: grade 2 173J. MRC Breathlessness Scale: grade 3 173K. MRC Breathlessness Scale: grade 4 173L. MRC Breathlessness Scale: grade 5
O/E Height	229..	
O/E Weight	22A..	
Body Mass index	22K..	
Systolic Blood Pressure	2469.	
Diastolic Blood Pressure	246A.	
Forced expired volume in 1 second	339O.	
Forced vital capacity - FVC	3396.	
FEV_1/FVC ratio	339M.	
Percent predicted FEV_1	339S.	
Spirometry	5882.	
Spirometry reversibility	33G..	33G0. Spirometry reversibility negative 33G1. Spirometry reversibility positive

Table 5: COPD clinic template with relevant Read codes continued

Prompt	Read Code	Pick List
Inhaler technique observed	6637.	663H. Inhaler technique – good 6631. Inhaler technique - poor
Inhaler technique shown	6636.	
Standard Chest X-Ray	535..	5351. Standard chest X-ray requested 5352. Standard chest X-ray normal 5353. Standard chest X-ray abnormal
Pulse Oximetry monitoring	8A44.	
Oxygen Therapy	877..	6639. Home Oxygen Supply 8771. Oxygen therapy
Home Nebuliser	6638.	
COPD	H3…	H36.. Mild chronic obstructive pulmonary disease H37.. Moderate chronic obstructive pulmonary disease H38.. Severe chronic obstructive pulmonary disease
COPD with acute exacerbation, unspecified	H3y1.	
Admit COPD emergency	8H2R.	
Referred to Chest Physician	8H4C.	
Referral to respiratory nurse specialist	8HHJ.	
Referral to Social Services	8HHB.	
Flu Vaccine	65E	65E.. Influenza vaccination 68NN. Influenza immunisation advised in surgery 8I2F. Influenza vaccination contraindicated 9OX5. Influenza vaccination declined 14LJ. H/O: influenza vaccine allergy

Table 5: COPD clinic template with relevant Read codes continued

Prompt	Read Code	Pick List
Pneumococcal Vaccine	6572.	65720 Pneumococcal vaccination given 8CAG. Pneumococcal immunisation advised in surgery
		8I2E. Pneumococcal vaccination contraindicated 8I3Q. Pneumococcal vaccination declined
Alpha-1-antitrypsin deficiency	C3762	
Quality of life assessment completed	3894.	
Hospital anxiety and depression scale	388J.	
COPD self-management plan given	66YI.	
COPD clinical management plan	8CR1.	
Pulmonary rehabilitation	8FA..	8H7u. Referral to pulmonary rehabilitation 8FA1. Pulmonary rehabilitation programme commenced 8FA2. Pulmonary rehabilitation programme completed
Refer for Palliative Care	ZV57C	
Medication review done	8B3V.	
Medication changed	8B316	
COPD follow-up	66YL.	

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PCRS-UK resources

The Primary Care Respiratory Society UK offers a range of publications and resources to assist health-care professionals in the diagnosis and management of COPD. These include our ever popular series of opinion sheets which offer a two-page summary of key information on a host of issues surrounding the management of COPD. For a detailed list of our opinion sheets and relevant journal articles, which are freely available via our websites, see below.

In addition, the PCRS-UK provides a range of resources available only to members of the PCRS-UK. These include clinic checklists, case histories, educational materials, Patient Group Directions (PGDs), Protocols, Summary Guidance and audit information. Members of PCRS-UK can download all of these tools and resources freely from our website. Non-members can view the available resources by joining our trial access scheme – see (http://www.pcrs-uk.org/directory/trial_access.php).

Presentation, diagnosis and assessment of COPD

Diagnostic Spirometry in Primary Care:
http://www.thepcrj.org/journ/vol18/18_3_130_147.pdf

Spirometry opinion sheet:
http://www.pcrs-uk.org/resources/os1_spirometry.pdf

Screening and case finding of COPD opinion sheet:
http://www.pcrs-uk.org/opinions/os38_screening.pdf

Diagnosis of COPD in primary care opinion sheet:
http://www.pcrs-uk.org/opinions/os37_diagnosis.pdf

Differential diagnosis of the breathless patient opinion sheet:
http://www.pcrs-uk.org/opinions/os36_diff_diag.pdf

IPCRG Guidelines for Diagnosis of Respiratory Disease:
http://www.thepcrj.org/journ/vol15/15_1_20_34.pdf

Spirometry in primary care case-identification, diagnosis and management of COPD:
http://www.thepcrj.org/journ/vol18/18_3_216_223.pdf

Management of COPD

COPD self management opinion sheet:
http://www.pcrs-uk.org/resources/os11_copd_self_man.pdf

COPD review opinion sheet:
http://www.pcrs-uk.org/resources/os19_copd_review.pdf

Management of stable COPD opinion sheet:
http://www.pcrs-uk.org/resources/os13_copd_stable.pdf

COPD review opinion sheet:
http://www.pcrs-uk.org/resources/os19_copd_review.pdf

COPD mucolytic therapy opinion sheet:
http://www.pcrs-uk.org/resources/os2_mucolytics.pdf

Smoking cessation opinion sheet:
http://www.pcrs-uk.org/resources/os17_smoking_cess.pdf

Exacerbations of COPD

COPD exacerbations opinion sheet:
http://www.pcrs-uk.org/resources/os16_copd_exac.pdf
http://www.pcrs-uk.org/resources/os11_copd_self_man.pdf
COPD review opinion sheet:
http://www.pcrs-uk.org/resources/os19_copd_review.pdf

Pulmonary rehabilitation

IMPRESS group. Principles, definitions and standards for pulmonary rehabilitation. 1-9. 1-2-0008. London, The British Thoracic Society.
http://www.impressresp.com/Portals/0/IMPRESS/PrinciplesofPR.pdf
Best Practice Pulmonary Rehabilitation:
http://www.pcrs-uk.org/resources/gpiag_pul_rehab_bestpract_200306.pdf
Pulmonary rehabilitation opinion sheet:
http://www.pcrs-uk.org/resources/os26_pul_rehab.pdf

Oxygen therapy

Pulse oximetry opinion sheet:
http://www.pcrs-uk.org/resources/os28_pulse_oximetry.pdf
Routine use of oxygen in primary care opinion sheet:
http://www.pcrs-uk.org/opinions/os39_routineo2.pdf
Home oxygen opinion sheet:
http://www.pcrs-uk.org/resources/os8_home_oxygen.pdf

End-of-life care

Palliative care opinion sheet:
http://www.pcrs-uk.org/resources/os7_palliative_care.pdf
End of Life Care Discussion Paper:
http://www.thepcrj.org/journ/vol17/17_1_46_50.pdf

Providing structured care

COPD self management opinion sheet;
http://www.pcrs-uk.org/resources/os11_copd_self_man.pdf
Self care and self management in COPD opinion sheet:
http://www.pcrs-uk.org/opinions/os34_copd_self_care.pdf
COPD review opinion sheet:
http://www.pcrs-uk.org/resources/os19_copd_review.pdf
COPD National Strategy Resources:
http://www.pcrs-uk.org/copd_ns/index.php and http://www.pcrs-uk.org/copd_qrg/index.php

Resources

Consultation on a strategy for Services for Chronic Obstructive Pulmonary Disease (COPD) in England
http://www.pcrs-uk.org/copd_qrg/qrg_strategy_in_full.pdf

NI Framework for the diagnosis and management of COPD
http:// www.dhsspsni.gov.uk/rsf_full_consultaion2_doc.pdf

Scottish Standards for COPD
http://www.nhshealthquality.org/nhsqis/controller?p_service=Content.show&p_applic=CCC&pContentID=7648

Organisations

- **Primary Care Respiratory Society UK.** The Primary Care Respiratory Society UK (www.pcrs-uk.org) is the UK-wide professional society dedicated to meeting the vision of "optimal respiratory care for all". Registered charity No: 1098117
  http://www.pcrs-uk.org.
- **British Lung Foundation**: Registered charity (charity no. 326730) offering help, support and information for patients and carers on all aspects of lung disease
  http://www.lunguk.org
- **British Thoracic Society:** Information and guidelines on management of lung disease for health professionals.
  http://www.brit-thoracic.org.uk/copd
- Stopping Smoking
- **Quit**: An independent charity offering help with stopping smoking
  http://www.quit.org.uk
- NHS Stop Smoking Helpline:
  http://www.givingupsmoking.co.uk

Training for health professionals in COPD

Education for Health
http://www.educationforhealth.org.uk

Respiratory Education UK
http://www.respiratoryeduk.com/

Acknowledgements

The PCRS-UK wishes to thank David Bellamy, Rachel Booker and the British Lung Foundation for their involvement in the production and review of this booklet.

The PCRS-UK would like to acknowledge the support received in the provision of educational grants from Boehringer Ingelheim Ltd/Pfizer and AstraZeneca UK Ltd to support the development of the original booklet and from Allen & Hanburys, the specialist respiratory division of GlaxoSmithKline to support the development of this revised version of the guide.

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