# PRIMARY CARE RESPIRATORY ACADEMY

## DIAGNOSIS AND MANAGEMENT OF COPD IN PRIMARY CARE

A guide for those working in primary care

This publication, produced by PCRS-UK, is endorsed by the Royal College of General Practitioners and the British Lung Foundation

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# DIAGNOSIS AND MANAGEMENT OF COPD IN PRIMARY CARE

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**Christine Loveridge:** CL works for Education for Health, who provide spirometry training to healthcare professionals.

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## THE PRIMARY CARE RESPIRATORY SOCIETY UK

The Primary Care Respiratory Society UK (PCRS-UK) is the UK-wide professional society supporting primary care to deliver high value, patient-centred respiratory care.
Our ultimate vision is 'optimal respiratory health for all', which we seek to achieve through:

- Campaigning to influence policy and set standards in respiratory medicine, relevant to primary care nationally and locally: *the voice of primary care in respiratory medicine*
- Educating primary care health professionals to deliver and influence respiratory care
  - Open access to best practice, evidence-based clinical guidance and resources, produced by primary care respiratory experts for primary care
  - Membership scheme to support the respiratory professional development and empower primary care health professionals to provide and commission high value, patient-centred care
- Promoting and disseminating real life primary care research in respiratory conditions to support policy and educational activities

Our scientific journal, **npj *Primary Care Respiratory Medicine***, flagship annual national primary care conference and membership magazine, ***Primary Care Respiratory Update***, underpin our research, campaigning and education work.

For more information, and to join, please visit: **www.pcrs-uk.org**

## THE BRITISH LUNG FOUNDATION

The British Lung Foundation (BLF) is the only UK charity working for everyone and anyone affected by lung disease. We fund medical research, provide patient support services and health information, and campaign on issues that affect lung health.

We have 230 Breathe Easy groups around the nation, providing peer support and information to patients and carers. Many groups also support pulmonary rehabilitation, exercise classes, choirs and walking groups. For further information:

Helpline (Mon-Fri, 9am-5pm): 03000 030 555
Email: enquiries@blf-uk.org Web: http://www.blf.org.uk

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# FOREWORD

We are delighted to write a foreword for the latest update of the Primary Care Respiratory Society UK's guide to the 'diagnosis and management of chronic obstructive pulmonary disease in primary care', for healthcare professionals working in primary care.

NICE guidelines for COPD were first published in 2004 but there remains significant variation in care across the UK. Calls to the British Lung Foundation's helpline and feedback from BLF Breathe Easy groups highlight the levels of undue patient suffering, caused not only by the disease itself, but also by lack of access to the best quality of care and treatment.

COPD is a multisystem disease requiring a multidimensional assessment and holistic approach to management. Multiple morbidities is the norm, with nearly half of people with COPD having three or more additional diagnoses; in only one in five patients will COPD be an isolated disorder, emphasising the need for a holistic approach to addressing the patients' diverse long-term conditions. We are delighted to see a holistic patient-centred approach to management emphasised throughout this booklet.

Primary care health professionals are at the forefront of care in the diagnosis and management of COPD. At different stages, people with COPD may benefit from the specialist skills of respiratory physicians, respiratory physiotherapists, respiratory nurses, occupational therapists, district nurses, dieticians, pharmacists, palliative care specialists and social services (and some of these will be replicated for other co-morbid conditions). The role of primary care is, however, pivotal throughout, providing continuity of care and a generalist oversight to ensure that the patient's individual needs remain the central focus.

Practical and easy to read, this booklet is based on NICE COPD Guidelines and quality standards. It also draws on other relevant national guidance for oxygen, pulmonary rehabilitation and spirometry. It is an excellent, succinct, patient-centred guide to the diagnosis and management of COPD for the generalist primary care health professional. We hope you find it useful.

**Dr Stephen Gaduzo,** Chair PCRS-UK Executive
**Penny Woods,** Chief Executive, British Lung Foundation

# FOREWORD

The Royal College of General Practitioners is happy to endorse this comprehensive guide to the diagnosis and management of COPD in primary care.

The guide firmly puts the patient rather than the disease at the centre of management and, in line with the philosophy of the College, recognises the multimorbidity associated with COPD. In this respect, the chapter on 'holistic care', which deals with psychosocial aspects of management of morbidities, including palliative care, is particularly welcome.

This concise publication is a welcome practical guide for trainee and experienced GPs in dealing with a condition that carries with it a high morbidity and mortality in the United Kingdom today.

**Dr Maureen Baker** CBE DM FRCGP
Chair of Council, Royal College of General Practitioners

# INTRODUCTION

KEVIN GRUFFYDD-JONES

COPD is a major cause of morbidity and mortality in the United Kingdom (UK) 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, but as yet undiagnosed.[1]

This booklet was first published in 2007 and updated in 2010, based on, and concurrent with, the 2010 update of the National Institute for Health and Care Excellence (NICE) COPD Guidelines.[1]

Although there has not been an update of the Guidelines since 2010 there have been several key publications including Standards for COPD care in England[2] and Scotland,[3] an outcomes strategy for COPD and asthma in England[4] and specific guidelines for pulmonary rehabilitation,[5] oxygen therapy[6] and spirometry.[7] There has also been considerable work done by the joint British Thoracic Society/Primary Care Respiratory Society-UK 'IMPRESS' group exploring cost-effective prescribing in COPD[8] and also work to develop a national COPD disease management template.[9]

These new developments are reflected in this new edition of the PCRS-UK Quick Guide to the Diagnosis and Management of COPD, but its principle aim is to help primary care health professionals throughout the UK manage the individual patient with COPD, based on the patient-centred care approach of the NICE 2010 COPD Guidelines,[1] which recognise that:

- COPD is not just a disease of the lungs, but is a multisystem disease requiring a multidimensional assessment and holistic approach to management.
- Pharmacological and non-pharmacological therapy not only improve current control (symptoms, health status, activity levels) but also can reduce future risk of exacerbations, disease progression and mortality (depending on the intervention).

# CHRONIC OBSTRUCTIVE PULMONARY DISEASE DIAGNOSIS

JOHN HAUGHNEY

COPD is now the well-established term for the conditions in patients with airflow obstruction historically known as chronic bronchitis or emphysema. It is characterised by airflow obstruction that is not fully reversible. This airflow obstruction does not change markedly over several months and is usually progressive.

Previous attempts at differentiating asthma from COPD were based in part on the degree of airflow reversibility with bronchodilators: high in asthma and low in COPD. It has become clear that this differentiation is too simplistic. Some patients with COPD can demonstrate significant reversibility but, importantly, airflow will never return to normal.

In the Western world, cigarette smoking is the predominant cause of COPD, although other factors, particularly occupational exposures, may contribute to its development. This toxic exposure results in chronic inflammation (which differs from that seen in asthma) causing a combination of airway and parenchymal damage and, usually, subsequent airflow obstruction. To make a confident clinical diagnosis therefore, a patient must have a substantial cigarette smoking history, symptoms and objective airflow limitation (demonstrated by spirometry).

Due to a mismatch between symptoms and the pathological processes, significant airflow obstruction may be present before a patient is aware of it. Delay in presentation is also well recognised: chronic cough is a common symptom but many cigarette smokers do not perceive this as a medical issue. 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 useful aids to smoking cessation, case-finding of individuals with undiagnosed COPD (whom the British Lung Foundation refer to as 'the missing millions'[10]) is now even more worthwhile. Some healthcare organisations have introduced 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 old
- Smokers or ex-smokers
- Have any of the following symptoms:
  - o breathlessness on exertion
  - o chronic cough
  - o regular sputum production
  - o frequent winter 'bronchitis' or 'chest infections'
  - o wheeze

In terms of differential diagnosis, clinicians may wish to consider a range of factors (see Tables 2 and 3).

## TABLE 2: DIFFERENTIAL DIAGNOSES

**1. Pulmonary**

- Asthma
- Bronchiectasis
- Sarcoidosis
- Tuberculosis
- (Stenosing) bronchial tumour
- Interstitial lung disease
- Pleural disease

**2. Extrapulmonary**

- Congestive cardiac failure
- Drugs e.g. ACE inhibitors, methotrexate

## TABLE 3: 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 over weeks | • Variable over weeks |

Primary care-based studies, for example one from Devon,[11] 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, and, on examination, various signs may be present. **(Box 1)** The diagnosis therefore is based on a combination of history (substantial exposure to cigarette smoke or other noxious compound, persistence and progression of the condition, recurrent episodes of 'bronchitis' or 'chest infections'), the presence of symptoms (some of: exertional breathlessness, productive cough, regular sputum production, wheeze), the confirmation of the presence of airflow obstruction by spirometry and the absence of any reasonable alternative diagnosis. 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).

## BOX 1: 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
- Muscle wasting/cachexia

Spirometry, and thus demonstration of airflow obstruction, is crucial to a diagnosis. 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 obstruction (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 and predict prognosis, it may under- or over-estimate the severity of the impact of the disease on the individual. A multifactorial assessment of the patient's health status is therefore required (see below). Be prepared to reconsider the diagnosis if, after treatment, the airflow obstruction disappears or considerable reversibility consistent with asthma is identified.

In some resource-poor countries, the use of peak expiratory flow as an objective measure of airflow obstruction is being investigated, but there is no role for this test when spirometry is readily available. 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 (concurrent) diagnosis of asthma.

As part of an initial assessment, in addition to spirometry, patients should also have:

- their smoking status recorded
- an estimation of their MRC dyspnoea score[12]
- a record of the number of exacerbations (courses of steroids/lower respiratory antibiotics) in the last year

- 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)
- oxygen saturation (Sp02).

Traditionally, a single physiological measurement-FEV,-has been used to grade the severity of COPD. This fails to take account of other important features of the disease: symptoms; exercise capacity; quality of life, and exacerbation frequency. Several measures have been developed to address this issue, including the Global Initiative for Chronic Obstructive Lung Disease (GOLD) ABCD classification, Age Dyspnoea airflow Obstruction ADO,[13] Dyspnoea, Obstruction, Smoking, Exacerbation (DOSE) index[14] and, the measure currently recommended by NICE, the Body-Mass Index, Airflow Obstruction, Dyspnoea, and Exercise Capacity Index in Chronic Obstructive Pulmonary Disease, the BODE index.[15] This multidimensional index has been demonstrated to better predict mortality better than $FEV_1$ alone. Its calculation requires measurements of BMI, spirometry, modified MRC dyspnoea score (a -1 scale, but otherwise similar to MRC) and a six minute walking test. Surely the last of these restricts its use in routine general practice, however the DOSE index[14] is easy to adopt in practice. Online calculators are available[16].

Primary care clinicians should aim to identify differential diagnoses, possible extrapulmonary effects and co-morbidities by asking about the following:

- weight loss
- effort intolerance
- waking at night
- ankle swelling
- fatigue
- occupational hazards
- chest pain
- haemoptysis.

Identification of some of these features may help lead to the diagnosis of a co-morbidity (**see page 37** for information on co-morbidities).

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.

In people with COPD there are often significant co-morbidities, for example, cardiac disease, diabetes, lung cancer, arthritis, dementia, depression, and heart diseases. As always, we need to manage the patient, not the individual diseases.

Record the diagnosis using Read codes **(see page 43)**.

## CASE FINDING IN PRIMARY CARE

In December 2013, the UK National Screening Committee concluded that 'a national screening programme to detect COPD at an early stage is not recommended.'[17] However, several strategies for case finding have been proposed. These could be active (sending questionnaires to patients) or opportunistic (identifying people with potential COPD at surgery visits).[18] Further work from this research group suggests that the opportunistic approach is both more effective and cost effective.[19] By narrowing the criteria for further evaluation the yield increases. Of course, there is a greater risk of missing those with the illness. Regardless of the strategy used, the target group in the UK is smokers, age 35 years and over[20] or age 40 years and over.[21] Patients should be asked about respiratory symptoms or any history of recurrent chest infections. Scoring schemes have been developed.[22] A positive response will lead to objective assessment. Some advocate the use of mini-spirometers to EXCLUDE those with normal lung function before progressing to full spirometry for the remainder.[23]

When diagnostic uncertainty exists, a guide to when to refer is given in **Table 4**.

### TABLE 4: WHEN TO REFER

Diagnostic uncertainty

- No history of cigarette smoking / noxious gas exposure
- Mismatch between symptoms and objective tests
- Confounding important co-morbidities
- Any restrictive pattern on spirometry
- Severe disease at presentation or rapidly declining symptoms or lung function
- Occupational history
- Predominant excessive sputum production
- Onset of symptoms under 40 years of age or family history of alpha-1-anti-trypsin deficiency (A1AD)

A1AD is a genetically inherited condition that affects between 1 in 3,000 and 1 in 4,000 people in the UK. It is reported that about 3% of people with COPD have A1AD. In the presence of neutrophils (as a result of inflammation, infection or smoking) a deficiency of A1A results in excess activity of elastase in the lung, which results in tissue destruction and emphysematous change. A simple blood test in primary care can be undertaken to test for A1AD.

## BOX 2: RED FLAG SIGNS/SYMPTOMS

Important alternative diagnoses possible (red flags)

- Haemoptysis
- Weight loss
- Acute breathlessness
- Crushing central chest pain on exertion
- Very low Sp02
- Finger clubbing and abnormality on chest x-ray

## Occupational issues

Research quoted by the UK Health and Safety Executive (HSE) suggests that about 15% of COPD is likely to be work-related.[24] Workplace exposures likely to contribute to COPD include various dusts (coal, cotton, grain, flour, silica, and wood) as well as certain fumes and chemicals (welding fume, isocyanates, cadmium, vanadium, and polycyclic aromatic hydrocarbons). Most authorities continue to recommend referral for specialist advice if an occupational link is suspected, both for the purposes of diagnosis and management and because there may be legal and financial issues that require specialist input.

# SPIROMETRY

CHRIS LOVERIDGE

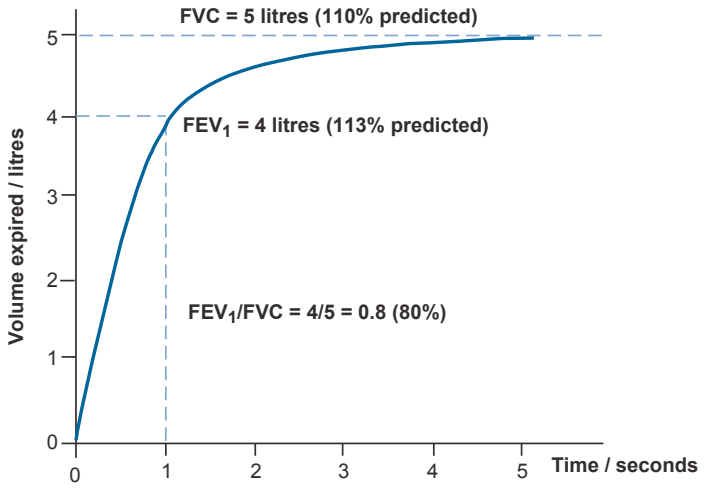
There is no single diagnostic test for COPD. The diagnosis is confirmed or refuted by spirometry after comprehensive clinical history has identified risk factors and symptoms. Spirometry is the measurement of airflow and volume using varying types of equipment which should all conform to international standards.[25] Spirometers should be regularly cleaned and sterilised. They need to be calibrated yearly and verified before each session.[7]

Spirometry identifies the presence of airflow obstruction, this may be reversible as in asthma or fixed as in COPD. Poorly performed spirometry can lead to incorrect diagnosis and treatment, therefore all health professionals undertaking diagnostic spirometry should do so to an accredited quality assured standard. Standards for diagnostic spirometry have been published[7] and guidelines to define accredited training are due to be published. Further information about spirometry can be obtained from the PCRS Spirometry information sheet – see http://www.pcrs-uk.org/resource/Opinionsheets/spirometry-opinion-sheet

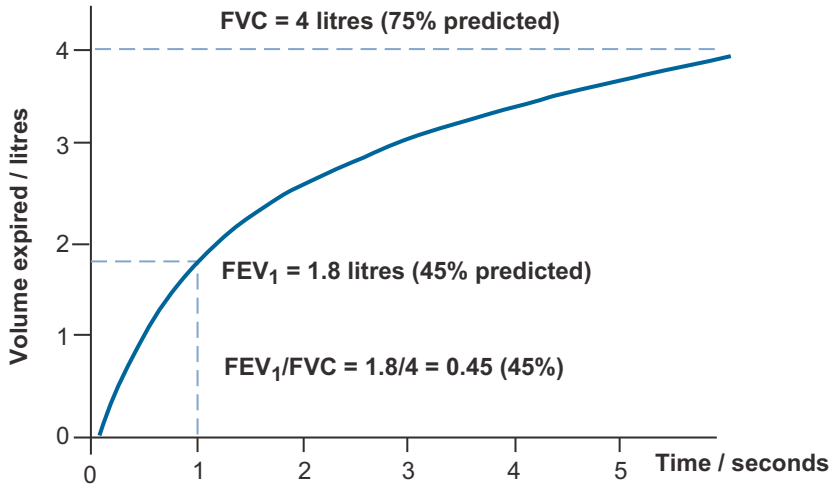
A normal spirometry trace is shown in **Figure 1**. A typical spirometry tracing from a patient with COPD is shown in **Figure 2**.

A diagnosis of airflow obstruction can be made if the $FEV_1$/ forced vital capacity (FVC) ratio is <0.7 (i.e.,<70%).

## FIGURE 1 : SPIROMETRY TRACING OF A PATIENT WITH NORMAL AIRWAYS



## FIGURE 2 - SPIROMETRY TRACING OF A PATIENT WITH COPD: AN OBSTRUCTIVE PICTURE




The diagnosis of COPD should be made only if symptoms AND mild airflow obstruction ($FEV_1$>80%) are present. In the presence of mild airflow obstruction a diagnosis of COPD should not be made unless symptoms are also present.

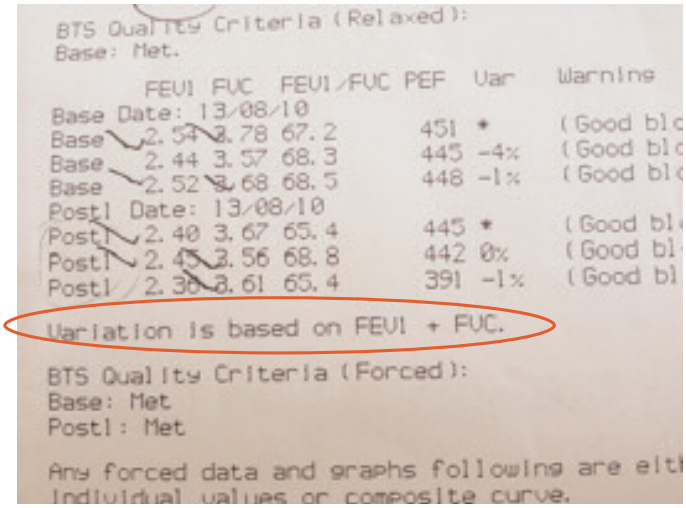
The issue of repeatability/reproducibility is a contentious one with very little evidence underpinning the recommendation of 100ml between blows.[26] However, the closer that the blows are to each other the more reassured the operator can be that reproducibility has been achieved, i.e., the patient has consistently blown the best that they can.

The Association for Respiratory Technology & Physiology (ARTP) guidelines state that three good quality blows should be achieved, of which, the best two should be within 100mL or 5% of each other.[27] The quality assured diagnostic spirometry document recommends the repeatability criteria are met when the 'difference between blows is no more than 100mL ideally (and certainly no more than 150mL in the occasional highly variable patient)'.[7,Footnote 1]

Footnote 1: The Primary Care Respiratory Society Guideline (Levy ML, Quanjer PH, Booker R, *et al*. Diagnostic Spirometry in Primary Care: Proposed standards for general practice compliant with American Thoracic Society and European Respiratory Society recommendations. *Prim Care Respir J* 2009;**18**(3):130-147. DOI: http://dx.doi.org/10.4104/pcrj.2009.00054 ) states that the spirometer should be set to indicate whether the tests meet the current standards for repeatability. Currently this means that the two largest $FEV_1$ and FVC (or other VC) readings must be within 150mL of each other.

There is also confusion around the use of 5% variability but not from lack of evidence or application. This relates more to the settings of some current spirometry models. Some equipment calculates between-blow variability and show this as a percentage figure which is assumed by most healthcare professionals to be between blow variability. However, as is the case below **(Figure 3)** the between blow variability is based on the $FEV_1$ + FVC and not on the individual parameters. This variation can be seen below the blows.

**FIGURE 3 : SAMPLE SPIROMETRY PRINTOUT SPECIFYING BETWEEN-BLOW VARIABILITY**




Diagnosis should only be made using post-bronchodilator spirometry. Airflow obstruction is defined as a reduced post-bronchodilator $FEV_1$/FVC ratio less than 0.7.

The use of this fixed ratio raises concerns in the respiratory world about over-diagnosis in the elderly and under-diagnosis in the younger age groups. Because of these 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. This concept is known as the 'lower limit of normal' (LLN) and remains a subject of much debate.

Recently published reference values for all people from 3–90 years of age,[28] which incorporate different ethnicities and age ranges, advocate the use of LLN to reduce the rates of misdiagnosis, which is seen internationally. COPD is often misdiagnosed as asthma both, in the UK and internationally: this cannot be acceptable if it results in inappropriate treatment and management.[29]

A diagnosis of COPD can be made without formal spirometry reversibility (baseline spirometry – salbutamol 400mcg – repeat spirometry) testing although pre- and post-treatment of symptoms (with a bronchodilator) spirometry will achieve the same results. Those who return to normal lung function i.e. ratio more than 0.70 or have a substantial increase in $FEV_1$ (more than 400mL) may have asthma and peak flow diaries should be considered with a trial of treatment to confirm this diagnosis in conjunction with a good clinical history.[25,30]

It is also recognised that a significant increase in $FEV_1$ does not predict the response to long-term treatment with these therapies.

Similarly, although spirometry indicates the severity of airflow obstruction by using the level of $FEV_1$ % predicted, it may under- or over-estimate the severity of the impact of the disease on the individual. There are examples in all areas of care where patients with an $FEV_1$ of 30% of predicted (very severe airflow obstruction) are still working. Conversely, those with only moderate airflow obstruction (60% of $FEV_1$) are housebound and completely debilitated by their COPD.

It should also be noted that within the NICE 2010 definition of airflow obstruction that symptoms should be present with mild airflow obstruction to diagnose COPD.[1] The severity of airflow limitation can also be used to guide treatment interventions (along with symptoms) and predict prognosis in combination with other parameters. (BODE,[15], DOSE[14].

## BOX 3: TOP TEN TIPS FOR REPORTING SPIROMETRY RESULTS.[7]

1. Demographics
2. Technical acceptability of the blow
3. The number of blows performed
4. Quality of the blows
5. Repeatability
6. Airflow obstruction
7. Severity of airflow obstruction
8. Limitations of the machine interpretation
9. Reversibility
10. Check the clinical picture

Within the quality assured diagnostic spirometry document[7] there is guidance as to a process for working through a spirometry trace in a logical manner to ensure standards have been reached. This should aid quality assurance **(See Box 3)**.

It is widely acknowledged there are approximately 2 million people who have COPD but who are as yet undiagnosed.[10] These 'missing millions' are the subject of much discussion around the use of screening or more focussed case finding. Research in this area has been in place for many years but there is a lack of consensus as to the most beneficial way to achieve identification of these people. The use of a questionnaire and targeted screening spirometry appears to be the way forward, targeting the over 35 year old ex-or current smoker. The most important factor, however, is the follow up of reduced hand-held/screening spirometry with full quality assured diagnostic spirometry to confirm or refute the findings.

# ASSESSMENT OF COPD IN PRIMARY CARE

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. The NICE COPD Guideline 2010[1] and COPD Quality Standard 2011[2] both emphasise the importance of a multidimensional, patient-centred approach to assessment, which includes the degree of airflow limitation **(See Table 5)** but also includes the following:

- Severity of cough (including purulence and viscosity of sputum)
- Degree of breathlessness using the MRC Dyspnoea Score[12] (reflects exercise tolerance and functional limitation) – **(See Table 6)**
- 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 ≤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),[31] and Clinical COPD Questionnaire (CCQ),[32] are easy to use in primary care
- Assessment of co-morbidities.

**TABLE 5: NICE GUIDELINES 2010 GRADING OF SEVERITY OF AIRFLOW OBSTRUCTION**

| Severity | Post-bronchodilator $FEV_1$ |
|---|---|
| Mild – Stage 1 | ≥ 80%* |
| Moderate – Stage 2 | 50-79% |
| Severe – Stage 3 | 30-49% |
| Very Severe – Stage 4 | <30%** |
| *only in the presence of symptoms | ** or ≤50% with respiratory failure |

Most primary care computer systems will provide summary pages of other principal co-morbidities such as cardiac problems, diabetes, anaemia. Regular assessments may involve joint assessments of these conditions (e.g. diabetes and COPD) rather than review of COPD alone.

**TABLE 6: MEDICAL RESEARCH COUNCIL (MRC) DYSPNOEA SCORE[1]**

| 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 |

- In patients with functional disability (MRC Score ≥3 )/exacerbations, consider:
    - o 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 b using a validated tool such as the Patient Health Questionnaire (PHQ-9)[33] or GAD for anxiety.[34] Consider screening for osteoporosis in patients with BMI<20, on regular oral steroids, with two or more exacerbations per year.

- Multidimensional assessment tools have been developed to assess disease severity and reflect prognosis. These include measurement of:
    - o Body Mass Index, Obstruction ($FEV_1$ % predicted), Dyspnoea (MRC score), Exercise (as measured by 6-minute walking test) BODE index[15]
        - ° Of more practical use in primary care is the DOSE[14] score **(Table 7)**:
        - ° Dyspnoea (MRC Score)
        - ° Obstruction ($FEV_1$ % predicted)
        - ° Smoking status
        - ° Exacerbation frequency

A DOSE score of 4 or more suggests a higher risk of hospital admission and increased mortality and can be used as the basis for targeting higher risk patients.

- Social needs. Record social support and needs (including carers and allowances)

## TABLE 7: DOSE INDEX SCORING SYSTEM

| Components | DOSE index points | | | |
|---|---|---|---|---|
| | 0 | 1 | 2 | 3 |
| MRC scale | 0–1 | 2 | 3 | 4 |
| $FEV_1$% pred | >50 3 | 0–49 | <30 | |
| Smoking status | Non-smoker | Smoker | | |
| Exacerbations in previous year* | 0–1 | 2–3 | >3 | |

*The annual exacerbation rate was calculated from information on exacerbations in the previous 6 months. Zero exacerbations were classified as a score of 0, 1–2 exacerbations as a score of 1, and >2 exacerbations as a score of 2.

$FEV_1$% pred = forced expiratory volume in 1 second percentage predicted.

# MANAGEMENT OF COPD IN PRIMARY CARE

KEVIN GRUFFYDD-JONES

**Pages 25 and 26** 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]

## 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 is one of the most cost effective interventions in the management of people with COPD and can slow disease progression and reduce mortality. It is an essential part of COPD management. NICE have produced standards of care and guidance for smoking cessation (PH10[35] and QS43[36]) the key features of which are:

- People who smoke should be referred to 'evidence-based' smoking cessation services. This can be based in the community (including the practice with appropriate training) or in secondary care, but should adhere to national guidelines with auditable results.
- People who smoke should be offered individual or group behavioural support (at least weekly until 4 weeks after the quit date) plus pharmacotherapy in the form of nicotine replacement therapy (NRT), bupropion or varenicline
- A quit rate of at least 35% after 4 weeks, backed up by carbon monoxide monitoring, should be aimed for. Twelve-month quit rates of 12-23% are quoted in the guidelines.[35,36]

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

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

4. **Dietary advice**
   a. Overweight patients (BMI>25) should be advised to lose weight (and consider obstructive sleep apnoea in these people).
   b. Underweight patients (BMI<20) should be referred to a dietitian and referral for bone densitometry to detect osteoporosis considered.

5. **Patient disease education**
   This should include information about the disease and its treatment with an emphasis on encouragement of guided self-management, including COPD action plans where appropriate. PCRS-UK offers an opinion sheet on self-management.[33] The British Lung Foundation (www.blf.org.uk) also has an excellent range of materials plus advice for patients on how to access the BLF helpline and 'Breathe Easy' groups for peer support. Where possible, the same format for self-management action plans should be used by primary and secondary care and community teams to ensure consistent information is provided to patients.

## 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 or those with disordered breathing patterns (e.g. in anxiety).

**Figure 6** shows the NICE 2010 Guidelines pharmacotherapy algorithm. The treatment options are increasing rapidly with the development of new inhaled corticosteroids, long-acting anti-muscarinic* antagonists, long-acting βeta-2 agonists and various combinations of these. At the time of publication these agents are not yet reflected in the NICE Guidelines. For more up-to-date information on inhaled treatments see the PCRS-UK information sheet.[37]

The choice of a particular therapy depends on cost and the patient's choice of a particular inhaler device.[38,39] 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 and optimise inhaler technique and adherence when the patient is reviewed.

### I. Intermittent breathlessness

- Use a short-acting βeta-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* antagonist (ipratropium) can be used; onset of action is within 20 minutes and duration of action 4 – 6 hours

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

**II 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:**

- A long-acting anti-muscarinic antagonist (LAMA) (e.g. tiotropium, aclidinium, glycopyrronium and umeclidinium). The main side effect is a dry mouth.

**OR**

- Long-acting βeta-2-agonists (LABA) (e.g. salmeterol, formoterol, indacaterol, vilanterol and olodaterol). The main side effects are palpitations and tremor.

*** July 2015 Update:- LABA/LAMA combinations are now available: olodaterol/tiotropum (Spiolto™), vianterol/umeclidinium (Anoro™), formoterol/ aclidinium (Duaklir™) and indacaterol/glycopyrronium(Ultibro™). These produce varying degrees in improvement in the lung function, symptom scores and health status compared to the individual components. The place in guidelines is a matter of debate at present but the international GOLD guidelines[40] suggest they should be as a second-line therapy to mono-bronchodilator therapy in 'Group B' patients (i.e. persistent symptoms and low exacerbation risk)*

For patients with an $FEV_1$ < 50% predicted, the NICE Guidelines recommend the use of inhaled corticosteroid/long-acting βeta-2-agonist (ICS/LABA) combination therapy in preference to LABA alone.

- In July 2015, the ICS/LABA combinations licensed for treatment of COPD at the following doses: formoterol 12mcg/budesonide 400mcg (Symbicort™); salmeterol 50mcg/fluticasone 500mg
  (Seretide™) and budesonide 320mcg/formoterol 9mcg (Duoresp-Spiromax™) given twice daily via dry powder devices; fluticasone furoate 92mcg/vilanterol 22mcg given via a once daily dry powder device (Relvar™) and formoterol 6mcg/beclomethasone 100mcg (Fostair™) given via a metered- dose inhaler.

- Patients should be advised of the side effects of the ICS component including dry mouth, oral candidiasis, dysphonia and the increased risk of non-fatal pneumonia. 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] Local side effects of the ICS component can be minimised by use of a spacer device with an MDI and advising patients to rinse their mouths with water after inhaling the ICS
  and ensuring they spit out the water after rinsing.

It should be noted that ICS are not licensed to be used in COPD except in combination, with a LABA. New combination agents of LAMA, LABA, ICS are becoming available. Please see PCRS-UK Table of Inhaled Drugs.[27]

**GOLD Guidelines 2016**
The Global Initiative for Chronic Obstructive Lung Disease (GOLD) Guidelines have been updated in 2016.[40]

In these guidelines the goals of COPD management are centred around IMPROVING CURRENT CONTROL (e.g. symptoms and health status) and REDUCING FUTURE RISK (e.g. of exacerbations and reducing the risk of dying). Patients are categorised according to their symptomatology and risk status into A-D categories **(see Figure 4)** with patients having ≥ 2 severe exacerbations / ≥ 1 hospital admission for COPD in the previous year and/or $FEV_1$ % predicted <50% being deemed high risk. Patients with a modified MRC score (mMRC)* and/or COPD Assessment test (CAT)22 score >10 are deemed as having high symptoms.

**Figure 5** shows GOLD treatment recommendations based on these patient categories. Of particular note is that initial ICS/LABA combinations should be reserved for patients at high risk and that LABA/LAMA combinations be used as second line therapy for highly symptomatic patients after LABA or LAMA monotherapy.

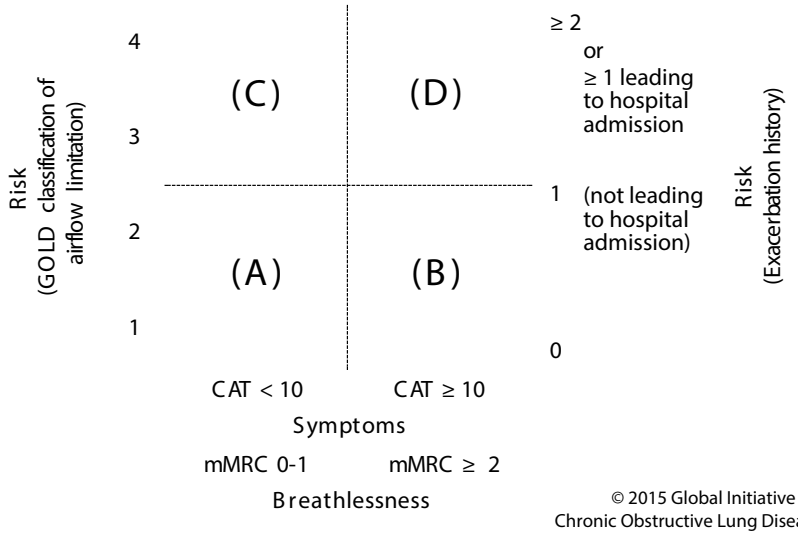
**** mMRC score is equivalent to MRC score minus 1, e.g. mMRC score of 1 = MRC score 2***

## b) Managing cough

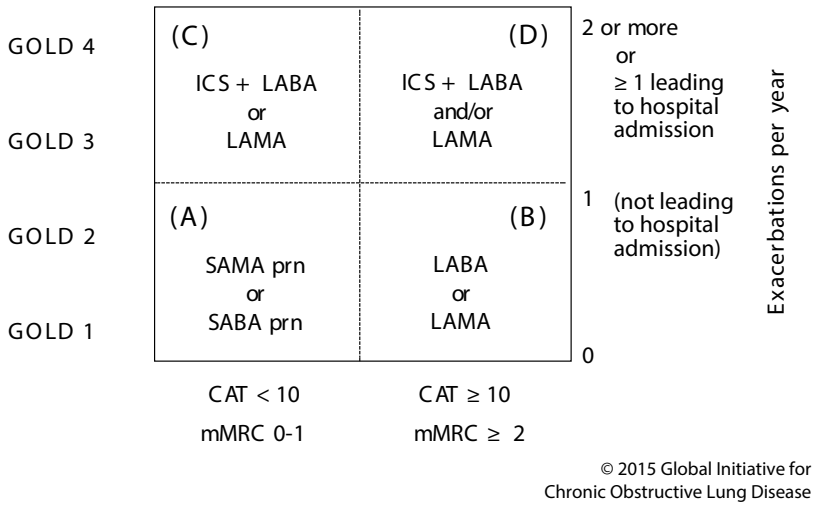
- Patients with distressing, viscid sputum may be helped by a mucolytic agent – carbocisteine (Mucodyne™) or mecysteine (Visclair™). Patients with a positive symptomatic response to a 4-week trial of either agent should continue treatment long-term

- Physiotherapy may be of benefit such as the 'Active cycle of breathing' – see http://www.livingwithcopd.ie/index.php/living-with-copd/active-cycle-of-breathing-techniques-actb
- Consider a diagnosis of bronchiectasis in patients with recurrent or chronic purulent cough especially in a non-smoker

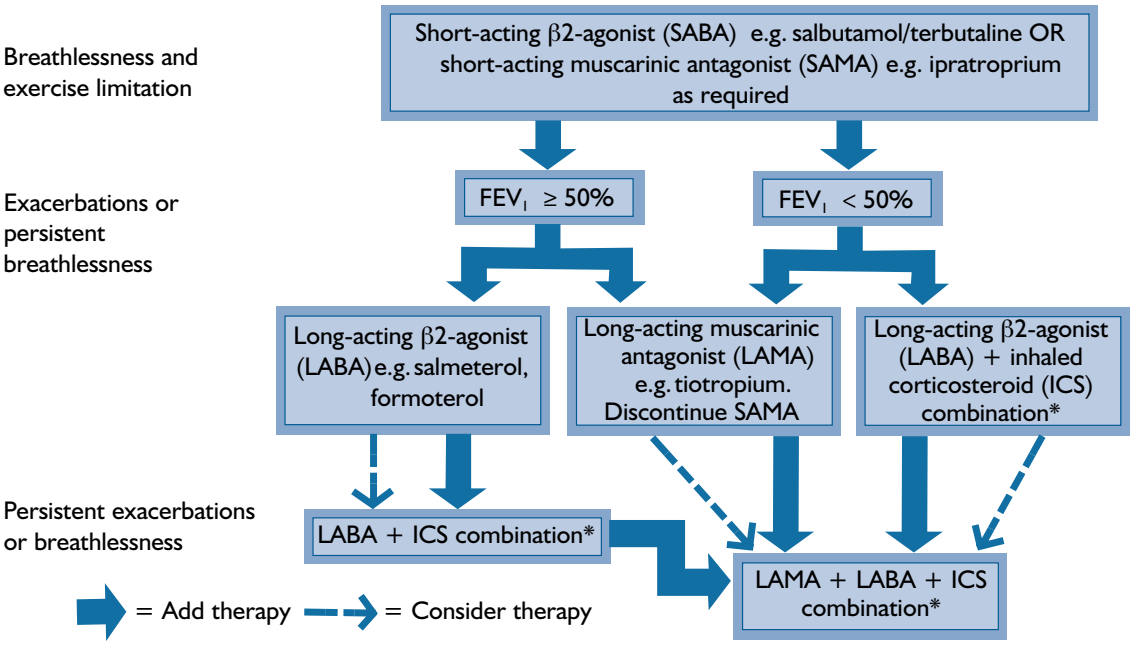
## FIGURE 4: COMBINED ASSESSMENT OF COPD




## FIGURE 5: MANAGE STABLE COPD: PHARMACOLOGICAL THERAPY RECOMMENDED FIRST CHOICE

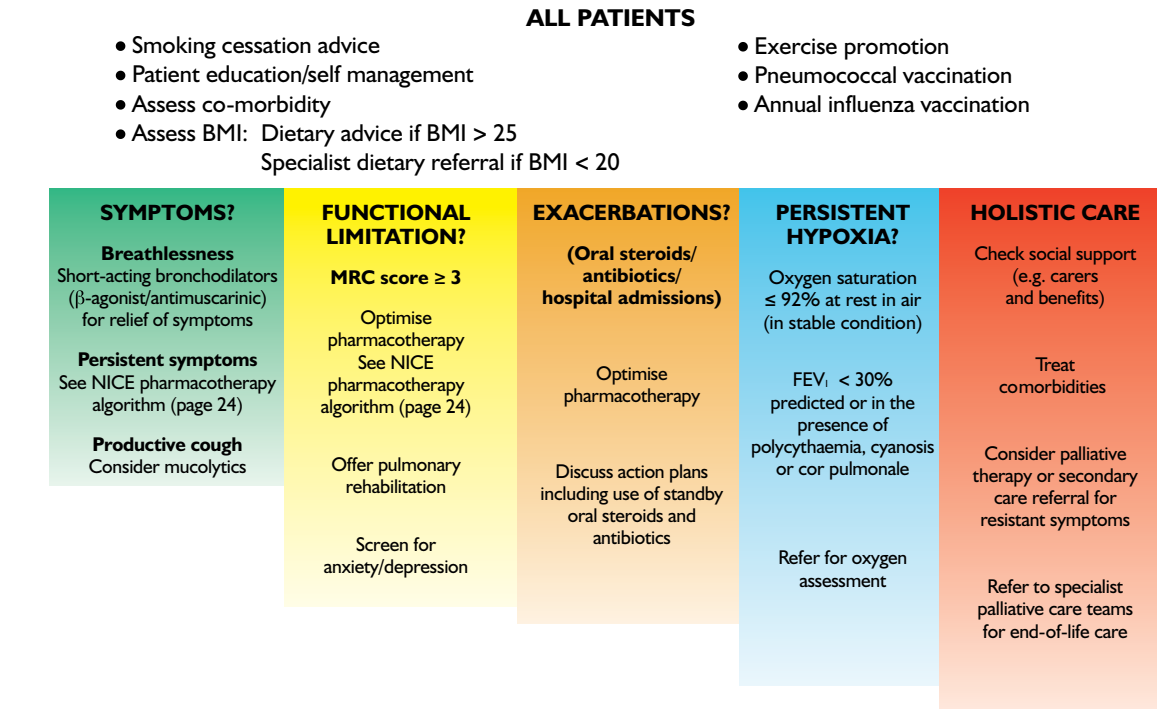


## FIGURE 6: INHALED PHARMACOTHERAPY ALGORITHM.[1] ADAPTED FROM NICE 2010 GUIDELINES




At each stage assess and optimise inhaler technique and adherence before proceeding to the next stage. Correct inhaler technique is important in ensuring delivery and deposition of the drug(s) to the airways. This should be reinforced and checked at every opportunity.

## FIGURE 7: MULTIDIMENSIONAL ASSESSMENT



## c) 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 25)**
- Be offered pulmonary rehabilitation
- Be screened for depression and anxiety and treated with pharmacotherapy or cognitive behavioral therapy where indicated.

## d) Patients with exacerbations of COPD

- Optimise pharmacotherapy **(see algorithm on page 25)** and non-drug therapy (e.g. pulmonary rehabilitation)
- Treat co-morbidities, e.g. depression, osteoporosis
- Self-management action plans[41,42] should be discussed including the provision of standby oral antibiotics/oral steroids but patients should be encouraged to notify their usual healthcare professional when these are used.
- Sputum culture for persistent exacerbations, can show colonisation with haemophilus, etc.

**See page 33** for more information on managing exacerbations of COPD.

## e) Patients with hypoxia

Refer patients for formal oxygen assessment by the local specialist respiratory team if:

- Oxygen saturations ≤92% in air, at rest, during a period of 'clinical stability', (not defined but probably at least 5–6 weeks after an exacerbation [irrespective of level of severity])
- $FEV_1$ <30% predicted (unless pulse oximetry >92% at rest and on exercise).
- *Cor pulmonale* (ankle oedema and raised JVP). **See page 31** for more information on oxygen therapy.

## f) Holistic care

For all patients this involves an awareness of, and appropriate treatment/referral for, comorbidity 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 37** for more information on holistic care.

# PULMONARY REHABILITATION

RUPERT JONES

## Definition

Pulmonary rehabilitation (PR) is a multidisciplinary 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.

## Indication

COPD patients with breathlessness often avoid exercise and become unfit and demotivated. They become anxious, depressed and socially isolated and this leads to a cycle of decline. PR addresses all these issues.

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. It is also recommended to be undertaken within four weeks of discharge from hospital after an acute exacerbation.[5,43]

PR is recommended in all international guidelines and has a strong evidence base[44] that it is effective in improving:

- Quality of life
- Exercise capacity
- Dyspnoea
- Readmissions
- Mortality.

In a controlled study, it halved the number of bed days and reduced overall healthcare consumption.[45] PR is the most cost-effective intervention in COPD after smoking cessation and flu vaccination.[8] Access to PR has improved dramatically, and is available in 90% of UK hospitals according to the National COPD audit of 2008,[46] with the PR programmes being either in hospital or community-based.

## Components

PR exercise consists of:

- Individually tailored and increased exercise during the programme
- Supervised exercises preferably twice-weekly
- Upper- and lower-limb exercises
- Individually tailored exercise, although group sessions for education take place with a regimen to be followed at home during and after the programme.

### Education

Main topics include:

- Relaxation
- Breathing control
- Pathophysiology
- Drug treatment
- Self-management
- Advice on continuing exercise, sex, anxiety and depression management, and smoking cessation
- 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 and that the programme is standardised.

After discharge with an acute exacerbation of COPD, PR should be offered to all suitable patients within one month.[5,43] To achieve fast entry onto programmes, rolling programmes where patients start and finish at any time throughout the programme are preferred to static programmes where all start and finish together.[2]

### 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[47]
- Questionnaires such as the St. Georges Respiratory Questionnaire,[48] Chronic Respiratory Disease Questionnaire,[49] the Hospital Anxiety and Depression scale,[50] and the Lung Information Needs Questionnaire[51]

### 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). Repeat PR programmes are effective for some patients.

# OXYGEN THERAPY

RUPERT JONES

Oxygen is a widely misunderstood and over-prescribed drug with major potential for toxicity. Home oxygen costs over £100m and much of it is wasted.[4] Oxygen is for treating hypoxia and has little or no place in the management of dyspnoea in normoxaemic patients. Oxygen should normally be prescribed after a formal assessment by a specialist oxygen assessment service. 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 in respiratory disease and it should not be used except in palliative care in the presence of hypoxia (and even then the evidence of effectiveness is weak).

### 2. Long-term oxygen therapy (LTOT)

Oxygen provided for at least 15 hours a day, and up to 24 hours a day may have additional benefit. Whilst it can prolong life in patients with persistent hypoxia in a stable condition LTOT has few benefits on quality of life. Currently, it is both over-and under-prescribed and poorly adhered to by patients, despite its proven benefits.[52] LTOT should be prescribed only after assessment by a specialist home oxygen assessment service. LTOT should not normally be started during an exacerbation, if so it should be reassessed when the patient is stable.

### 3. Ambulatory oxygen therapy

This is suitable for those people on LTOT to enable them to leave the house, and a few other patients who meet the following criteria:

- Severe breathlessness with hypoxia
- Oxygen desaturation with exercise, and
- Improved exercise capacity when ambulatory oxygen is provided, e.g. using a 6-minute walking test.

### 4. Emergency oxygen

This is addressed in the section acute exacerbations **(see page 35)**.

## Who should be assessed?

Patients with any of these features, in stable COPD, require pulse oximetry (SaO2):

- $FEV_1$ < 30% predicted, and considered in those with $FEV_1$ 30–49%.
- Cyanosis
- Polycythaemia
- Peripheral oedema.

If the $SaO_2$ is less than or equal to sign for consistency 92% breathing air on two occasions in a stable state, they should be referred for specialist oxygen assessment service including arterial blood gas analysis. People with oedema or polycythaemia may be referred with SaO2 greater than sign 92%.

For patients considering travelling by air, detailed advice is available from the British Thoracic Society statement on managing passengers with respiratory disease planning air travel.[53]

**Resources**

- British Thoracic Society guideline for use of home oxygen in adults - **www.brit-thoracic.org.uk/guidelines-and-quality-standards/home-oxygen-guideline-adults/**

# EXACERBATIONS OF COPD

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.

Acute exacerbations are common at all levels of disease severity, and the frequency of previous admissions is a good guide to future risk. Exacerbations range from minor self-treated events to hospitalisation. COPD exacerbations are the second most common cause of acute medical admissions and carry a high morbidity and mortality, within three months of an admission 34% of patients were re-admitted and 14% had died.[54]

## 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 5–7 days usually) if symptoms persist despite adequate bronchodilators
3. Antibiotics if sputum goes yellow or green (see action plan sample – **Figure 8**, **Page 34**).

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. Home supplies of steroids and antibiotics should be closely monitored, as some patients may overuse them, and patients should be asked to notify their GP or nurse when they have been used so that the exacerbation can be recorded and rescue pack supply replenished.

## FIGURE 8: COPD ACTION PLAN

**WHAT ACTION TO TAKE IF YOUR SYMPTOMS GET WORSE:**

**FIRST**

**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 for at least 24 hours: **start ANTIBIOTICS**.

**RELIEVER TREATMENT**

**Salbutamol** via Inhaler or Nebuliser
Maximum dose ...../..... times per day

Other .....

**ANTIBIOTICS**

Please take your home supply **or** obtain a prescription without delay from the surgery.

**PREDNISOLONE**

Take 30mg once daily (6 x 5mg tablets) for 7-14 days



**THEN** Look at table

| Symptoms | OK | CAUTION | ACTION |
|---|---|---|---|
| Breathless-ness | Normal/ Usual | Worse than usual | Much worse than usual |
| Cough | Normal/ Usual | More than usual | Much more than usual |

If all of your symptoms are in the **green OK column** continue usual treatment

If any of your symptoms are in the **orange CAUTION column**:
Increase your **RELIEVER TREATMENT**, take regularly up to maximum dose. Keep a close eye on your symptoms. If you improve within 2 days resume usual treatment.
**If NO improvement start PREDNISOLONE**

If any of your symptoms are in the **red ACTION column**:
Take maximum reliever treatment **and** start **PREDNISOLONE immediately**

**FOLLOW-UP**

Please contact your surgery within 24 hours of starting prednisolone or and/or antibiotics

**WARNING**

**At any time if you get**

**Severe symptoms:**

If you have symptoms in the **red ACTION column** have tried medication and you are not getting better, please **contact your doctor/ nurse for an urgent appointment**

**EMERGENCY**

If you have any of the following:
- Very short of breath
- Chest pains
- High fever
- Feeling of agitation, fear, drowsiness or confusion

**DIAL 999 AMBULANCE**

**Oxygen**

In an emergency please **do not** use **high flow** oxygen.
Give sufficient oxygen to reach the target saturation .....-..... %
(usual range 88-92%)

In influenza outbreaks, when alerted by the local Public Health Laboratory, antiviral drugs 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. 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 inpatient assessment including chest X-ray, blood gases and ECG are:

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

**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.

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). High flow oxygen is contraindicated.

After an exacerbation, a thorough review is indicated including:

- Optimal drug treatment (see management section **pages 20–28**) including inhaler technique review
- Self-management advice
- Pulmonary rehabilitation where appropriate
- Assessment for oxygen as appropriate.

NICE Quality Standard[2] suggests that people who have had an exacerbation of COPD are provided with individualised written advice on early recognition of future exacerbations, management strategies (including appropriate provision of antibiotics and corticosteroids for self-treatment at home) and a named contact.

# HOLISTIC CARE

HILARY PINNOCK

## Assessing and dealing with comorbidities

Multiple morbidities is the norm. Nearly half of people with COPD will have three or more additional diagnoses and in only one in five will COPD be an isolated disorder.[55] The most common comorbid conditions are chronic pain, depression and coronary heart disease. The relative impact of these conditions will vary, but at times their presence may eclipse the burden of COPD. Two-thirds of people with COPD will die of other conditions (principally heart disease, cancer).[57]

## Common diagnostic pitfalls

Increasing breathlessness in a COPD patient may not be due to COPD. This was the focus of a recent 'education@pcrj', which describes a systematic approach to history taking and examination combined with targeted investigation of pulmonary, cardiovascular, thromboembolic and systemic causes to ensure that comorbidities are identified and managed.[56]

- Congestive heart failure shares similar symptoms of breathlessness, cough, and fatigue; though orthopnoea, ankle oedema and chest pain may help differentiate. Readily; available investigations (chest X-ray, electrocardiography, echocardiography) may help confirm or refute the diagnosis.[57]
- A change in symptoms, or failure to recover from an exacerbation should raise suspicion of lung cancer, especially in smokers/ex-smokers >40 years old. Haemoptysis and/or persistent symptoms of cough, chest/shoulder pain, breathlessness, weight loss or hoarseness are important 'red flags', which should trigger prompt referral to a chest physician.[58] A normal chest X-ray does not exclude lung cancer.[59]

## Important management challenges

Disease-specific guidelines base recommendations on trials which typically exclude patients with significant co-morbidity, limiting application in real-life practice. Slavishly following recommendations can result in care that has been described as 'measurably better but meaningfully worse',[60] as polypharmacy and/or contradictory advice confuse the patient. The skill is to decide when patients with comorbid disease are, and are not likely to benefit from guideline recommendations.[61]

Common examples of the competing interests of multiple morbidities include:

- Pulmonary rehabilitation is an effective intervention for those who participate. However, arthritis may prevent or limit participation in exercise.

- People with anxiety and depression are less likely to attend and complete a pulmonary rehabilitation course.[62] Referring clinicians may be able to help by optimising management of the limiting comorbidity,[63] and positively addressing patients' practical concerns about attendance
- The risk-benefit of drugs needs to be assessed for the individual patient, considering both potential harms of COPD treatment on co-morbid conditions and *vice versa*. βeta-2-agonists might exacerbate some arrhythmias, and concerns have been raised about cardiovascular risk with tiotropium delivered by fine mist devices, despite benefits in other trials.[64] Fear of precipitating bronchospasm has discouraged rescribing of beta blockers for people with COPD who develop heart failure, though there is now clear evidence of benefit with cardio-selective βeta-1-blockers.[65] Statins may also reduce morbidity in COPD.[66]
- Smoking cessation advice is likely to be applicable to all long-term conditions, but some lifestyle advice maybe less easy to apply across conditions. Advice to increase exercise may be difficult to follow in the presence of troublesome arthritis. Collating the various dietary advice given to a patient with (say) COPD, constipation, diverticular disease, diabetes and hypertension may cause confusion, and be impossible to follow if breathlessness is making chewing high-fibre foods uncomfortable.

**Practical considerations for organisation of care**

There is a tension between the organisational convenience of disease-specific clinics and the needs of the patient for a holistic review of their diverse long-term conditions. Understandable complaints about compartmentalised clinics[67] have to be balanced against the benefits of receiving expert care from specialist professionals.

*'In the olden days, when you know you saw your GP and I think that was the role that tied things together. Now, but now, there are so many specialist clinics and, you know, you go to the asthma clinic at the surgery, you go to the diabetic clinic at the surgery, you see? You know, they're all compartmentalised I think.'* (40–49 year old woman).[67]

- Consider how COPD reviews can be integrated with care for common co-morbidities. This will not only require consideration of the professional expertise available within clinics, but also organisational strategies to ensure that review reminders are not COPD-specific but co-ordinate with other regular checks the patient needs
- Establish at the outset of the review which symptoms or conditions are troubling the patient most at that time. Quality and Outcomes (QOF) Framework templates need to be completed, but set aside time to ensure the patient's agenda is also met
- Generic symptom-based clinics (e.g. breathlessness clinics) may be efficient for patients and the health service.[68]

### Care for people with very severe COPD

As COPD becomes more severe, the burden of disabling physical symptoms (especially breathlessness) increases, compounded by comorbidity, psychological distress and social isolation.[69,70]

### The silence of people with COPD

The story of COPD is lifelong,[71] as the structure of the lungs is slowly but inexorably damaged by a lifetime of exposure to cigarette smoke.[72] This is in sharp contrast with the story of many life-threatening conditions (e.g. cancer) where a change in health status is followed by a diagnosis, which leads to a programme of treatment, with hopes of cure but recognition of the possibility of death. People with COPD tell of symptoms and psychosocial consequences which develop imperceptibly over many years with no clear beginning. They typically 'normalise' their (often considerable) limitations as the result of 'old age',[73] about which 'nothing can be done',[69] and about which they often remain silent.[69,71] A lifetime of gradually increasing disability is punctuated with exacerbations (during which they could have died) but once back to 'normal' there is little or no sense of the imminent threat of death.[62] Future concerns tend to focus on coping with the increasing challenge of living as independently as possible with COPD.

### The lack of transition to palliative care

The uncertain prognosis challenges identification of a transition point to palliative care services leading to concerns about 'prognostic paralysis'.[72] The 'surprise question' – ' Would I be surprised if my patient died in the next 12 months? ' – may be more useful than biomarkers in individual patients. In addition, the concept of a transition point does not resonate with patients who are generally focussed on living with COPD with no immediate thoughts of death (until the next exacerbation).

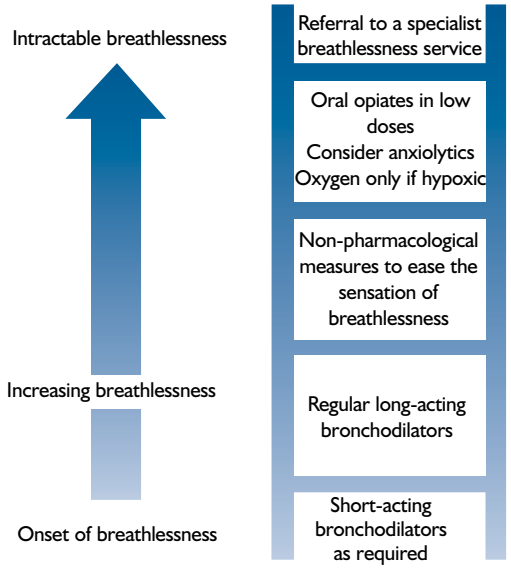
### Providing supportive care

A new approach, independent of prognosis, is needed to address the range of disabilities with which people with severe COPD are living. Primary care could routinely assess physical, psychological, social and spiritual needs for people with more severe disease (e.g. MRC Dyspnoea scores 4 or 5) enabling supportive care to be provided as needs evolve:

- Assess and palliate physical symptoms. Analogous to the pain ladder, a stepwise approach may be used to relieve breathlessness,[73] **(see Figure 9)** but symptoms of coughing, pain and fatigue are also common. **(See pages 21-23** and **Table 8**[74])
- Look for and treat psychological distress: anxiety and depression are common.
- Ask about social needs for both the patient and their carer(s). An occupational therapist could assess for, aids and adaptations, which could support independent living.
- Offer to discuss the future. Patients may, or may not want to discuss dying, but they may have practical concerns about the future that can be discussed openly.

Many of these issues can be managed from within primary care as part of good care of people with a disabling long-term condition, calling on specialist palliative care for advice on intractable symptoms or complex psychosocial problems.

## FIGURE 9: COPD BREATHLESSNESS LADDER[7] Reprinted with permission from Pinnock *et al.*[73]




## TABLE 8: PALLIATIVE PRESCRIBING FOR PATIENTS WITH END-STAGE COPD.[74]

| Symptom | Advice | Suggested prescription |
|---|---|---|
| Dyspnoea | Opiates, titrating the dose to achieve relief of dyspnoea. Cool air, e.g. from a fan, sometimes increases comfort | Initial dose: morphine 5mg 4 hourly |
| Cough | Opiates | Morphine 5mg 4 hourly |
| Excess secretions | Anticholinergics (but take care to avoid the discomfort of a dry mouth) | sc hyoscine 400–600mg or glycopyrronium 200mcg 4–6 hourly |
| Anxiety | Benzodiazepines. Note: high doses of beta-agonists can aggravate anxiety | For example, Diazepam 5–10mg daily |
| Confusion | Oxygen may reduce confusion due to hypoxia. Haloperidol or levomepromazine may ease confusion and restlessness | Haloperidol 2mg or levomepromazine 6mg 12 hourly |

**Importance of teamwork, and the pivotal role of the generalist**

The management of multimorbidity and the supportive care of people with very severe COPD demand multidisciplinary teamwork. At different points in their lifelong story, people with COPD may benefit from the specialist skills of respiratory physicians, respiratory physiotherapists, respiratory nurses, occupational therapists, district nurses, dieticians, pharmacists, palliative care specialists, social services (and some of these will be replicated for other multimorbid conditions). Paradoxically, the more complex the problems, the more important is the role of primary care in providing continuity of care and a generalist oversight to ensure that the patient's individual needs remain the central focus.[75]

*'Complex patients, characterized by multiple chronic illnesses and competing priorities, often derive the greatest value from shared care, with selective specialist care integrated by primary care'.*[75]

# COPD CLINIC TEMPLATES

RUPERT JONES

In primary care there are advantages in using templates that can optimise the value of the time spent assessing patients and help ensure consistency of clinical assessment and data recording. Recording certain information consistently before a patient is discharged from hospital can reduce their chance of readmission.[76] Templates can be used in general practice as follows:

- For annual reviews. These reviews may be used to perform a comprehensive clinical assessment of the patient in terms of their lung function (ideally post bronchodilator spirometry); their level of current symptom, e.g. breathlessness; their health care consumption, including exacerbation frequency and admissions, and their treatment. Treatment reviews include their inhaled therapies, their compliance and inhaler technique, vaccination, lifestyle counselling and referral to rehabilitation, oxygen assessment or palliative care, etc. Action plans for people experiencing exacerbations may be administered or reviewed
- Opportunistic entering of appropriate data in normal GP or nurse appointments
- To aid management and optimise time spent with the patient. Interactive templates are available, which can guide the consultation and management, e.g. for a patient with $FEV_1$ < 30% to suggest that pulse oximetry is indicated
- For quality improvement. Templates can be used to record important data in standardised format which allows quality improvement by measuring and auditing key metrics (including and beyond QOF items) and assessing the quality of care provided and comparing data on other providers.

Some templates, such as iCOPD, GRASP and Lung Health represent a more user-friendly way of completion and provide some feedback to facilitate guideline-based management.

The National COPD audit team is working with the Health, and Social Services Information Centre (HSCIC) to produce a list of metrics and the necessary Read codes designed for automated extraction. There are a number of metrics in development. The production of the metrics and their codes has been led by the PCRS-UK members in conjunction with the RCGP, RCP, Health Intelligence and other primary care experts. At the time of publication a national template does not yet exist but this work will help in the production of such a template. In the meantime, we have provided a list of read codes we feel you should be using **(Box 4)**; make sure your template includes them to ensure high quality respiratory care beyond QOF.

The national COPD audit data collection was planned for 2014, dependent on obtaining the necessary information governance approvals. The audit encouraged all practices to use standard codes to measure key metrics, allowing proper comparisons on a large scale. One of the metrics was the proportion of patients in whom key Read codes were recorded. By working in a unified way using templates collecting standard information, we can improve the care of patients with COPD in primary care.

It is important to remember that time spent with the patient is most valuable, and the care provided must be centred on the patient and not on the computer screen. Entering information on a template should not be done at the cost of care for the patient.

## BOX 4: SUGGESTED COPD TEMPLATE

| Prompt | Read Code |
|---|---|
| COPD Review | 666YL |
| Initial Assessment | 6631 |
| COPD Follow up | 66YL |
| DNA | 9N4W |
| **Diagnosis** | |
| Cough symptom | 171 |
| Breathlessness | 173 |
| Sense $FEV_1$ | 339b |
| % predicted $FEV_1$ | 339S |
| $FEV_1$/FVC ratio | 339M |
| Chest X-ray | 535 |
| **Review**: | |
| Smoking status | 137 |
| (Stem for variety of codes on smoking status) | 8CAL |
| Smoking cessation advice | 8HTH |
| Referral to smoking clinic | 8HTH |
| Height | 229 |
| Weight | 22A |
| Body Mass Index (BMI) | 22K |
| Post-bronchodilator $FEV_1$ | 139b |
| % predicted $FEV_1$ | 339b |

| Prompt | Read Code |
|---|---|
| Flu vaccine given | 65E |
| Pneumoccoal vaccine given | 6572 |
| MRC score (1-5) | 173(H –L) |
| Inhaler technique: | |
| Good | 663H |
| Poor | 663L |
| Health status (CAT/CCQ) | 3894 |
| Number COPD exacerbations last 12 months | 66YF |
| Number COPD admissions last 12 months | 8H2R |
| Referral to pulmonary rehabilitation | 6H7U |
| Self-management advice | 666YI |
| Given Pulse Oximetry | 44YA |
| Referral for oxygen assessment | 389A |
| Oxygen at home | 6639-2 |
| Carer support discussed | 3892 |
| Health and Social Care package agreed | 8C82 |
| Refer for palliative care | 8H7g |

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