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Opportunistic case finding pivotal in diagnosing COPD

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FIGURE 1
The principle of COPD diagnosis is based on establishing the presence of obstructive post-bronchodilator spirometry in an at-risk individual with appropriate symptoms

How should COPD be diagnosed?

DIAGNOSIS, MANAGEMENT AND DELIVERY OF CARE FOR PATIENTS WITH CHRONIC OBSTRUCTIVE pulmonary disease (COPD) remains an important issue for clinicians. COPD accounts for more than 10% of emergency hospital admissions.

The 2008 National COPD Audit showed that the 90-day mortality rate after a COPD hospitalisation was 13.9% and almost one in three patients discharged from hospital were readmitted within three months.[1]

Over the past decade a huge number of publications have strengthened the evidence base which is the foundation for COPD management while the development of a National Clinical Strategy for COPD[2] and the 2010 update to the NICE COPD guidelines[3] should help implementation of an evidence-based approach to management. At the time of writing the consultation phase of the National Clinical Strategy had been completed but no publication date had been set.

How should severity be assessed?

What are the treatment options?

DIAGNOSIS

The principle of COPD diagnosis is based on establishing the presence of obstructive post-bronchodilator spirometry in an at-risk individual with appropriate symptoms (see figure 1, above). The case for screening the whole population for COPD has yet to be made so diagnosis is focused on opportunistic case finding.

In the UK, COPD is very rarely seen before 35 years of age and is rare below 45 unless there is an extensive history of opiate (heroin or crack) smoking. »

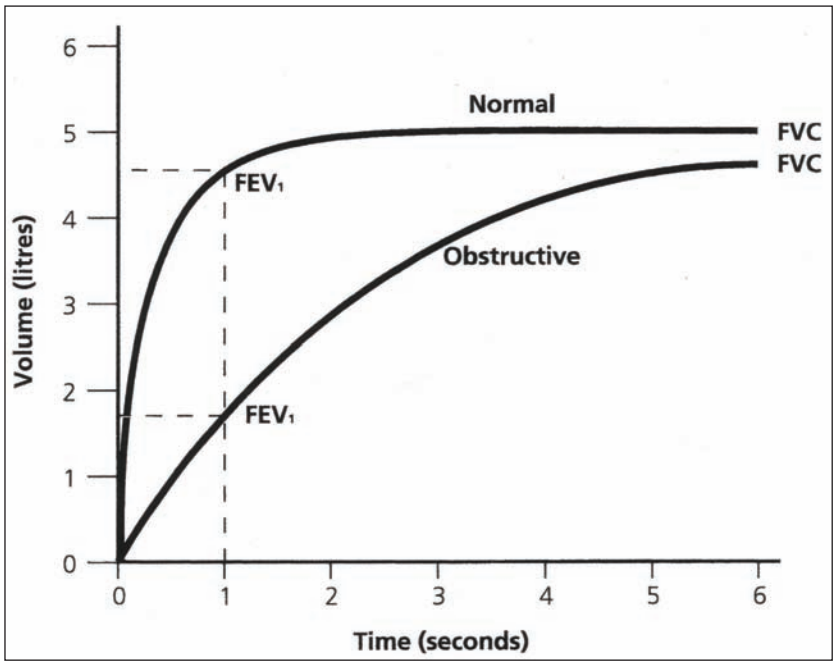


FIGURE 2
Spirometry traces illustrating normal and obstructive airflow. For the normal trace the FEV_1 is 4.5 litres, the FVC is 5.1 litres and the FEV_1/FVC ratio is 0.88. Hence, there is no airflow obstruction. For the obstructive trace (COPD) the FEV_1 is 1.8 litres, the FVC is 4.8 litres and the FEV_1/FVC ratio is 0.38 consistent with airflow obstruction

In addition, most individuals diagnosed with COPD have substantial cigarette smoke exposure and while specific occupational factors may contribute to the development of COPD most people diagnosed have smoked more than 10 and usually 20 pack years.

Finally, individuals with COPD usually have symptoms of cough and phlegm, exertional breathlessness, wheezing, recurrent winter bronchitis or a combination of these symptoms. A current or ex-smoker, aged over 35, with respiratory symptoms should undergo spirometry testing.

Table 1

Classification of COPD severity based on the 2010 NICE guideline on COPD (CG101)[3]

NICE 2010 grading of COPD severity	Airflow obstruction measured by post-bronchodilator FEV_1/ FVC	FEV_1 expressed as a percentage of predicted value
Mild (stage 1)	<0.7	>80% + symptoms
Moderate (stage 2)	<0.7	50-79%
Severe (stage 3)	<0.7	30-49%
Very severe (stage 4)	<0.7	<30% or <50% with respiratory failure

Note that symptoms have to be present to diagnose mild COPD

Table 2

Current treatment for COPD

COPD stage	Treatment
All patients	● Smoking cessation ● Influenza and pneumococcal vaccination ● Weight management ● Pulmonary rehabilitation if breathless ● Short-acting bronchodilators
FEV_1 >50% predicted	● Long-acting bronchodilators
FEV_1 <50% predicted	● Inhaled corticosteroid/long-acting bronchodilator
FEV_1 <30% predicted	● Long-term and ambulatory oxygen ● Lung volume reduction surgery and transplantation
Also consider	● Theophyllines ● Mucolytics ● PDE4 inhibitor

The hallmark of COPD is the presence of airflow obstruction after administration of a bronchodilator (usually inhaled or nebulised salbutamol).[3] Hence, if the ratio of forced expiratory volume in 1 second (FEV_1) to forced vital capacity (FVC) is less than 0.7 after bronchodilation this suggests a diagnosis of COPD (see figure 2, left).

There are two important caveats. The first is that while normal spirometry excludes COPD, obstructive spirometry is seen in asthma and bronchiectasis emphasising the importance of clinical features. Second, older individuals, in particular men, may have marginally obstructive spirometry due to aging-related loss of lung elastic recoil.

Spirometry needs to be performed by an appropriately trained individual who is doing the test regularly. A variety of training courses exist including many supported by the Association of Respiratory Technology and Physiology.

ASSESSMENT OF SEVERITY

A further significant change introduced in the 2010 NICE guideline is the new grading system for COPD severity.[3] Since 2005 the UK has been out of step with other countries but the new severity classification (see table 1, left) brings us into line with the European, American and GOLD (global) guidelines.[4]

A system based on FEV_1 alone oversimplifies disease severity and full clinical assessment should include symptoms, frequency of exacerbations and impact of disease on functioning and health status.

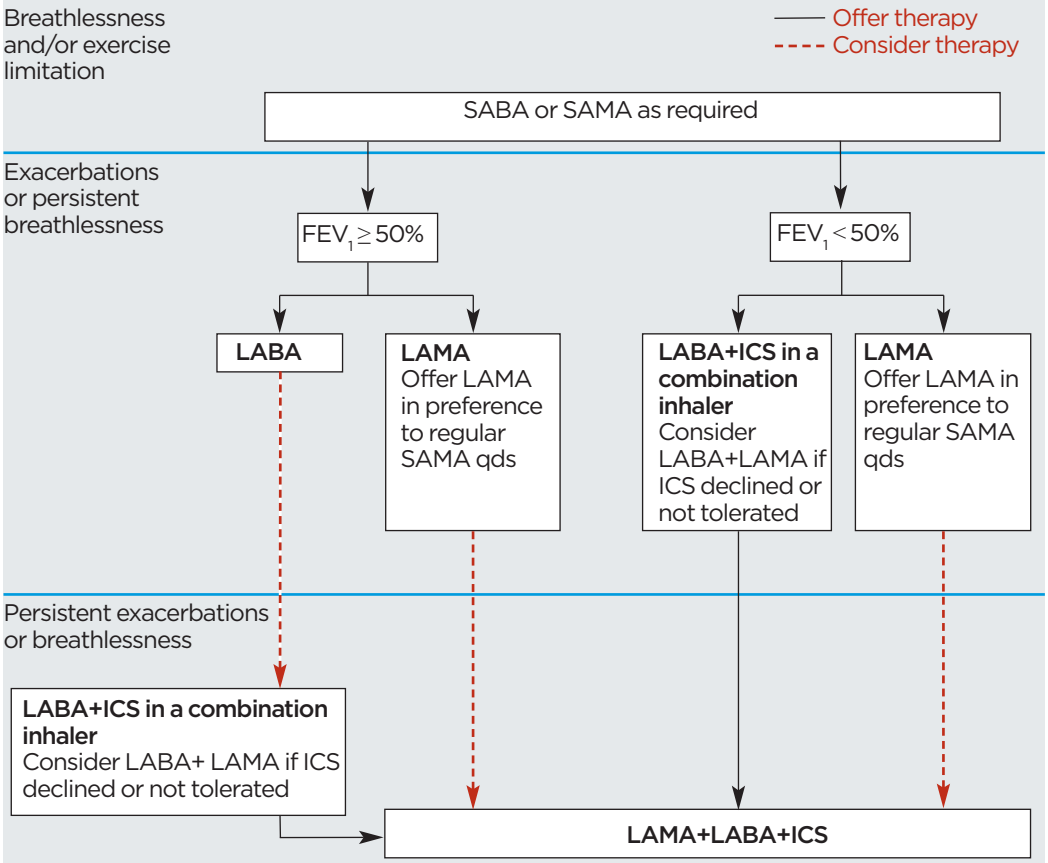
A variety of prognostication indices have been developed and two recently published indices, ADO[5] and DOSE[6], are potentially applicable in primary care as they no longer require a formal assessment of exercise capacity.

TREATMENT

Current treatment for COPD is listed in table 2, left. The most important single intervention is smoking cessation as this is proven to reduce decline in FEV_1 and reduce mortality. There is clinical trial evidence for efficacy of nicotine replacement, bupropion, varenicline and nortriptyline in improving quit rates. In addition, there is also evidence that influenza vaccination improves outcomes in COPD. Pulmonary rehabilitation benefits patients with COPD who are functionally limited by breathlessness and is addressed in »

Figure 3

Recommendations for inhaler therapy



SABA= short-acting beta agonist **LABA**= long-acting beta agonist **ICS**= inhaled corticosteroid
SAMA= short-acting muscarinic antagonist **LAMA**= long-acting muscarinic antagonist

Adapted from NICE GC 101. Chronic obstructive pulmonary disease: Management of chronic obstructive pulmonary disease in adults in primary and secondary care (partial update)[3]

Table 3

British Thoracic Society recommendations on criteria for referral of COPD patients to a specialist respiratory outpatient clinic[15]

Reason	Purpose
Diagnostic uncertainty and exclusion of asthma	Establish diagnosis and optimise treatment. Check degree of reversibility
Unusual symptoms, e.g. haemoptysis	Investigate cause including malignancy
Rapid decline in FEV_1	Optimise management
Suspected severe COPD	Optimise management
Onset of cor pulmonale	Confirm diagnosis and optimise treatment
Assessment for home oxygen	Optimise management, measure blood gases and prescribe oxygen
Assessing the need for pulmonary rehabilitation	Optimise treatment and refer to service
Bullous lung disease	Confirm diagnosis and refer to medical or surgical units for bullectomy
COPD <40 years of age	Establish diagnosis and exclude alpha-1-antitrypsin deficiency
Assessment for lung transplantation or lung volume reduction surgery	Identify criteria for referral to transplant centre
Frequent chest infections	Rule out bronchiectasis
Dysfunctional breathing	Establish diagnosis and refer for pharmacological or non-pharmacological management

more detail below.

Guidance on inhaler therapy was recently updated by NICE and is summarised in figure 3, left.[3] Long-acting bronchodilator therapy (tiotropium, salmeterol, formoterol and indacaterol) is recommended at an early stage for patients with an FEV_1 of greater than 50% predicted with combination long-acting beta agonist/inhaled corticosteroid inhalers generally reserved for patients with an FEV_1 of less than 50% predicted and/or frequent exacerbations.

The role of mucolytics is still unclear although there is evidence that the drugs reduce exacerbation rates in patients not taking inhaled corticosteroids.[7,8] A therapeutic trial may be worthwhile in certain cases. The newly licensed PDE4 inhibitor roflumilast may benefit some patients, in particular those with symptoms of chronic bronchitis.[9,10] The current UK licence is for treatment in patients with an FEV_1 of <50% predicted and frequent exacerbations.

The primary aims of treatment are to improve symptoms such as breathlessness, exercise capacity, activity and sleep quality and to reduce exacerbations. It should be noted that generally no single treatment is transformative and treatment usually involves a combination of multiple therapies.

PULMONARY REHABILITATION

Pulmonary rehabilitation is based on the principle that peripheral muscle training can help reverse the effects of deconditioning usually associated with COPD (as well as a number of other respiratory conditions). The evidence base for rehabilitation is very strong with positive effects shown on breathlessness, exercise capacity, activity level, exacerbation rate, leg muscle strength and quality of life.[11,12] Efficacy has been shown in patients who are functionally limited (MRC grade 2-5). However, it is important to optimise treatment before rehabilitation as this may improve the benefit obtained.

Particular benefit has been shown for rehabilitation early after a COPD exacerbation[13] and there is evidence that repeat rehabilitation is helpful in the majority of patients.[14]

REFERRAL

The vast majority of patients with COPD are managed in primary and/or intermediate care but there are circumstances where secondary care »

key points

SELECTED BY
Dr Peter Saul
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COPD accounts for more than 10% of emergency hospital admissions. The 2008 National COPD Audit showed that the 90-day mortality after a COPD hospitalisation was 13.9% and almost one in three patients discharged from hospital were readmitted within three months.

The principle of COPD diagnosis is based on establishing the presence of obstructive post-bronchodilator spirometry in an at-risk individual with appropriate symptoms. COPD is very rarely seen before 35 years of age and is rare below 45 unless there is an extensive history of opiate (heroin or crack) smoking. Most individuals diagnosed with COPD have substantial cigarette smoke exposure, more than 10 and usually 20 pack years.

Patients with COPD usually have symptoms of cough and phlegm, exertional breathlessness, wheezing, recurrent winter bronchitis or a combination of these symptoms. A current or ex-smoker, aged over 35, with respiratory symptoms should undergo spirometry testing. The hallmark of COPD is the presence of airflow obstruction after administration of a bronchodilator. However, while normal spirometry excludes COPD, obstructive spirometry is also seen in asthma and bronchiectasis emphasising the importance of clinical features.

A significant change introduced in the 2010 NICE guideline is the new grading of COPD severity. A system based on FEV_1 alone oversimplifies disease severity and full clinical assessment should include symptoms, frequency of exacerbations and impact of disease on functioning and health status.

The most important single intervention is smoking cessation as this is proven to reduce decline in FEV_1 and reduce mortality. All patients should also receive influenza and pneumococcal vaccination, weight management, pulmonary rehabilitation (if breathless) and short-acting bronchodilators. The evidence base for rehabilitation is very strong with positive effects shown on breathlessness, exercise capacity, activity level, exacerbation rate, leg muscle strength and quality of life. The vast majority of patients with COPD are managed in primary and/or intermediate care but there are circumstances where secondary care assessment should be sought.

Death is a common outcome for patients with COPD, approximately 25,000 COPD patients in England and Wales die each year. Around 1 in 12 patients hospitalised because of COPD die in hospital. It is increasingly recognised that many patients with COPD could benefit from improved end of life care.

Box 1

Key summary points

- When published, the National Clinical Strategy for COPD will produce a framework around which improved diagnosis and treatment of COPD can be delivered
- COPD should be confirmed by the presence of appropriate symptoms in a current or ex-smoker with airflow obstruction on post-bronchodilator spirometry
- Long-acting bronchodilators should be used at an early stage in patients with COPD
- Pulmonary rehabilitation is recommended in all patients with COPD functionally limited by breathlessness
- The BTS has published referral criteria for COPD

assessment should be sought. In 2008 the BTS issued a statement on criteria for specialist referral, admission, discharge and follow-up for adults with respiratory disease (see table 3, p23).[15]

END OF LIFE CARE

Death is a common outcome for patients with COPD, approximately 25,000 COPD patients in England and Wales die each year. Around 1 in 12 patients hospitalised because of COPD die in hospital. It is increasingly recognised that many patients with COPD could benefit from improved end of life care; however, it is difficult to predict mortality risk in COPD patients. A number of factors are associated with higher mortality including lower FEV_1, older age, severe breathlessness, lower body mass index and poorer exercise capacity. However, even where a number of poor prognostic features are present at the time of assessment there remains up to a 30% chance that the patient will be alive after five years. End of life care is recognised as an area that would benefit from greater study.

CONCLUSIONS

Accurate diagnosis remains vital in patients with COPD and opportunistic case finding is advocated. Recent research has clarified the role of a variety of therapies with the cornerstones of treatment remaining smoking cessation, pharmacological treatment and pulmonary rehabilitation. The National Clinical Strategy for COPD should clarify a framework covering prevention, diagnosis, treatment and end of life care.

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Useful information

The British Lung Foundation, the national charity for respiratory disease, supports a network of more than 200 Breathe Easy self-help groups
www.lunguk.org

The BLF helpline (08458 505020) offers advice and information to healthcare professionals, patients and carers. Mon-Fri 10am to 6pm

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