Module 1946
Chronic obstructive pulmonary disease: treatment and management

From this CPD module on asthma you will learn about:
- Treatment options for stable COPD
- Treatment options for exacerbations
- Non-pharmacological management
- Advice and information pharmacists can offer patients

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Treatment of chronic obstructive pulmonary disease (COPD) is aimed at preventing and controlling symptoms, reducing the severity and number of exacerbations, increasing exercise tolerance and reducing mortality. The approach to treatment should involve an appropriate assessment of the disease state, pharmacological and non-pharmacological measures, patient education, reduction in risk-factor exposure, and the prevention and treatment of acute exacerbations.

A multidisciplinary approach is needed, as this has been shown to increase the patient’s quality of life and reduce the number of hospital admissions.

While treatment options can be viewed as a step-like approach, it is important to recognise that management should be individualised in terms of each patient’s general health and comorbidities, and based on an assessment to reduce current symptoms and the potential risk for future exacerbations. Management is part of a cycle with regular reviews, either twice yearly or yearly depending on severity, and clinical assessments and adjustments made as needed.

Initial treatment of stable COPD should involve the identification of risk factors, and the introduction of measures to reduce exposure to these risk factors. The most identifiable risk factor is smoking, but consideration should also be given to occupational exposure to dust, fumes and gases, and other indoor and outdoor air pollutants.

Every opportunity should be taken to encourage individuals who smoke to stop. Although lung damage is irreversible, stopping smoking will help to prevent further damage and may be the only intervention needed for some patients with early-stage COPD.

Patients who smoke should be given advice about nicotine replacement therapy (NRT). Alternatively, they can be referred to their GP for information on other pharmacological therapies, such as varenicline and bupropion.

Pharmacological therapy is a major component in the management of stable COPD and can broadly be categorised into three main treatment options: bronchodilator therapy; anti-inflammatory therapy; and mucolytic therapy.

**Bronchodilator therapy**
Bronchodilators are given to patients with COPD to prevent or reduce symptoms. A short-acting bronchodilator is usually recommended as initial empirical treatment to help relieve breathlessness and improve exercise capacity. A beta-2 agonist, such as salbutamol or terbutaline, or a short-acting muscarinic antagonist (SAMA), such as ipratropium, may be used. However, regular use of short-acting bronchodilators is not recommended.

Long-acting beta-2 agonists (LABA), such as formoterol and salmeterol, and long-acting muscarinic antagonists (LAMA), such as tiotropium, glycopyrronium and umeclidinium, are used to manage COPD. They have been shown to significantly improve forced expiratory volume in one second (FEV1) and lung volumes, as well as decreasing exacerbation rates and the number of hospitalisations. Guidelines generally recommend these are used in combination, as this provides a better therapeutic effect without an increase in the risk of side effects compared with monotherapy. For this reason, there are a variety of combination LAMA/LABA products approved for use in COPD.

Methylxanthines, such as theophylline, may be used in some patients. Adding theophylline to salmeterol has shown greater improvement in FEV1 and breathlessness than with salmeterol alone. However, the National Institute for Health and Care Excellence (Nice) advises it should be used only after a suitable trial of short-acting and long-acting bronchodilator therapy, or for patients who cannot use inhaled therapy.

**Anti-inflammatory therapy**
Anti-inflammatory therapy may involve the
use of inhaled corticosteroids (ICS), oral glucocorticoids, or phosphodiesterase-4 (PDE4) inhibitors.

Inhaled corticosteroids may be used in combination with a LABA to improve lung function and reduce exacerbations in patients with moderate to very severe COPD. They may also be used as part of triple inhaled therapy, in combination with a LABA and a LAMA.

Oral glucocorticoids are usually used for the treatment of acute exacerbations of COPD and have no role in long-term daily treatment. This is due to a lack of long-term benefit against a high rate of systemic side effects. Nice recognises they may be used in some patients with advanced COPD where the glucocorticoid cannot be withdrawn after an exacerbation; however, the dose should be kept as low as possible.

Roflumilast is a phosphodiesterase-4 (PDE4) inhibitor and works by inhibiting the breakdown of intracellular cyclic AMP, thereby reducing inflammation. It is licensed as an adjunct to bronchodilators for the maintenance treatment of patients with severe or very severe COPD associated with chronic bronchitis and a history of frequent exacerbations. Nice has produced advice around the use of roflumilast in patients with COPD.

**Mucolytics**

Mucolytics, such as carbocisteine, may be used in COPD patients with a chronic cough that is productive. They should not be used for the prevention of exacerbations and should be continued only if there is symptomatic improvement, such as reduction in frequency of cough and sputum production.

**Treatment recommendations**

First-line treatment for a patient with COPD is a SABA or SAMA for immediate symptom relief.

Nice then recommends dual inhaler therapy if the patient is still breathless or has exacerbations despite treatment with a SABA/SAMA. The type of dual treatment recommended depends on whether there are any features suggestive of asthma or steroid responsiveness. In addition to the short acting therapy, either a LABA and LAMA are added in the absence of asthmatic features, or a LABA and ICS if there are asthmatic features.

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) uses the patient’s classification, from A-D, to guide initial pharmacological management:

- **Group A** (low risk of exacerbations, few symptoms). A bronchodilator, either short – or long-acting, should be used. Treatment should be continued if there is evidence of benefit.
- **Group B** (low risk of exacerbations, more symptoms). Long-acting bronchodilator should be given initially. Two bronchodilators may be used in patients with severe breathlessness.
- **Group C** (high risk of exacerbations, few symptoms). A LABA should be given, with evidence to support the use of LAMA over LABA for initial therapy.
- **Group D** (high risk of exacerbations, more symptoms). A LAMA should be used. However, a LAMA/LABA may be used for initial treatment for those with greater breathlessness or exercise limitation, while a LABA/ICS may be used in those with high blood eosinophil counts or those with a history of asthma.

It should be noted that all patients should be prescribed a short-acting bronchodilator for symptomatic relief of immediate symptoms at the initiation of treatment.

After initial pharmacological treatment, patients should be reassessed. The response to treatment should be measured to see if any adjustments to pharmacological treatment are needed. The option then exists for triple therapy in those still experiencing breathlessness or exacerbations despite treatment with LABA and ICS. Consideration may be given to the addition of theophylline, carbocisteine, roflumilast or regular azithromycin (250mg three times per week) in former smokers.

Patients should be reviewed at least once per year, or more frequently if needed and depending on their COPD severity. At each review, symptoms, breathlessness and exacerbations should be discussed, as well as inhaler technique and adherence, and any non-pharmacological measures that have been implemented. During this review the treatment may need to be adjusted, which may involve escalation, de-escalation or a switch of the inhaler device or treatment.

**Exacerbations**

An exacerbation is an acute worsening of respiratory symptoms that results in additional therapy. They can be classified as mild, moderate or severe, and may be treated in primary care or hospital. Exacerbations negatively impact on the health status of the patient, the rate of hospitalisation and readmission, and the disease progression. GOLD guidelines say that more than 80% of exacerbations are managed in an outpatient setting through the use of bronchodilators, corticosteroids and antibiotics.

The primary symptom of an exacerbation is breathlessness, which is brought on by increased airway inflammation, increased mucus production and trapped gas. Other symptoms include increased sputum, cough and wheeze. Not all exacerbations are bacterial in nature, other causative factors include smoking and viral infections.

Initial management usually involves increased doses of SABAs, either via handheld inhalers or a nebuliser. A systemic use of antibiotics is justified by a review of the patient’s history. It should be noted that regular treatment with inhaled corticosteroids may reduce the frequency and severity of exacerbations.

The management of exacerbations is determined by the patient’s classification and severity of exacerbation. Mild exacerbations do not require treatment, and for moderate exacerbations, a short-acting bronchodilator should be used.

Exacerbations are managed in an outpatient setting through the use of bronchodilators, corticosteroids and antibiotics.

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corticosteroid may be used in those patients who suffer from a significant increase in breathlessness. Nice recommends 30mg oral prednisolone daily for five days. If an oral antibiotic is indicated, amoxicillin, clarithromycin or doxycycline are used as first-line therapies. Oral co-amoxiclav and levofloxacin may be used in some patients at high-risk of treatment failure. For patients who are severely unwell, or those who are unable to take oral antibiotics, guidelines are available for intravenous antibiotics – ‘Chronic obstructive pulmonary disease (acute exacerbation): antimicrobial prescribing’ at tinyurl.com/NICE-COPD.

Non-pharmacological treatment

Pulmonary rehabilitation

Pulmonary rehabilitation is a program of exercise and education for people living with a long-term lung condition and is designed for people who experience severe breathlessness. Nice recommends anyone who views themselves as being functionally disabled by COPD (anyone who scores 3 or above in the Medical Research Council dyspnoea scale) is offered pulmonary rehabilitation. GOLD guidelines recommend it is given to anyone in categories B-D. However, it is not suitable for people who suffer from unstable angina, who have had a recent heart attack, or are unable to walk independently.

The classes are made up of two main components – a physical exercise programme tailored to the person, and information sessions on how people can look after their body, with a focus on lung health, as well as advice on managing their condition and symptoms. The courses are conducted in groups of about 10 people and run over 6-8 weeks, involving two, two-hour sessions per week. Pulmonary rehabilitation classes have been shown to decrease depression and anxiety related to the disease, as well as reducing hospitalisation. It has been shown to be the most effective therapeutic strategy to improve shortness of breath, health status and exercise tolerance in stable COPD patients.

Oxygen therapy

Oxygen therapy may be used in some COPD patients. Long-term administration has been shown to increase survival in patients with severe chronic resting arterial hypoxaemia. If long-term oxygen therapy is given, patients should be advised to breathe the supplemental oxygen for a minimum of 15 hours per day. It should not be used by patients who continue to smoke despite being given access to smoking cessation services.

Patients on oxygen therapy wishing to travel by air should be reviewed by their GP to assess suitability and will need to complete a medical information form for the airline before travel. If they require oxygen on board, it will need to be booked in advance. Airlines generally do not provide oxygen at airports, so other arrangements will need to be made. Further information can be found on individual airline websites.

Surgery

Surgery can be used as a last step in the management of COPD. Surgical interventions include bullectomy, lung volume reduction surgery and lung transplant.

Advice and support for patients

Pharmacists play a vital role in the multidisciplinary management of COPD. The majority of medication prescribed for patients with COPD is delivered via an inhaler. Guidelines emphasise the importance of correct inhaler technique and that patients are only prescribed inhalers they have been trained to use.

Nice recommends patients have their ability to use an inhaler regularly assessed and corrected, if necessary, by a healthcare professional competent to do so. Pharmacists have extensive knowledge and understanding of the medicines delivered via inhalers and the advantages/disadvantages of each inhaler type. Pharmacists should regularly check inhaler technique for all patients and provide advice around measures to help improve their technique if needed, such as the use of spacers. If a patient is unable to use their prescribed inhaler correctly, or another inhaler may be more suitable for a patient, pharmacists are ideally placed to be able to contact the GP and discuss this barrier to treatment.

Spacers can be recommended for any patient. However, those patients who are unable to coordinate the actuation of an inhaler with their breath, or those who have dexterity issues, may gain the most benefit from using a spacer. Pharmacists should make sure spacers are compatible with the metered-dose inhalers patients are using, advise people on the correct use of spacers and provide advice about cleaning spacers, including the importance of letting them air dry after washing.

Pharmacists are ideally placed to monitor patients who regularly request repeat prescriptions for bronchodilator therapy. Overuse of bronchodilators may suggest that a patient may not be receiving full benefit from their COPD medicine, in which case their inhaler technique should be assessed. Or they may be experiencing a potential exacerbation or suffering from increased exacerbations – they should then be referred to their GP.

Increased requests may also mean regular, long-acting medicines are no longer sufficient to control symptoms. In that case, a patient may need to be reviewed by their GP.

Avoidance of triggers is first-line treatment for patients with, or at risk of developing,
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COPD. Smoking is a well-recognised risk factor and pharmacists should encourage all patients who smoke, whether they have COPD or not, to quit. Patients should be assessed for their level of dependency and given advice about the most suitable NRT for them, such as medicated gum, lozenges or patches.

It is recommended that all patients with COPD are up to date with their vaccines – in particular, the influenza vaccine, which has been shown to reduce the levels of serious illness and mortality, and the pneumococcal vaccine, which has been shown to reduce lower respiratory tract infections.4

Pharmacists can take an active role in this aspect of management of COPD patients, as they are able to offer the flu vaccine to patients who may need them, depending on flu service provisions in their region.

Patients should also be given suitable advice about measures they can take to help prevent themselves from contracting flu.

Pharmacists should give patients advice about correct nutrition and the importance of maintaining a healthy, balanced diet. Weight should be maintained within the normal BMI range of 20kg/m² to 25kg/m². Patients with COPD can feel breathless when eating, so they may avoid doing so, with a resultant risk of being underweight. These patients can be advised to consume small meals regularly throughout the day to maintain adequate intake.9

Breathlessness is a major symptom in COPD, so patients should be advised about controlling their breathing and different breathing techniques that can be used, such as relaxed slow deep breathing. Being in control of their breathing can help patients better manage themselves if they suddenly become out of breath.

Some other tips for managing breathlessness include: using a hand-held fan near the face; wearing loose clothes and shoes that are easy to put on and take off; and making sure their day is planned ahead, with plenty of opportunities to rest.10

You should give patients advice about how to decrease their risk of experiencing an exacerbation. Measures such as quitting smoking, reducing exposure to passive smoke, hygiene measures to reduce the risk of an infection, minimising exposure to indoor or outdoor air pollution and increasing physical activity can all prove beneficial.3

Further information

The British Lung Foundation at tinyurl.com/BLF-COPD and GOLD at goldcopd.org both have sections on their websites with helpful, downloadable resources for patients and healthcare professionals, including breathing tips and diagrams of positions that people can adopt to help manage breathlessness in COPD.

CPD 5-minute test

1. COPD patients can often experience breathlessness while eating, which may in turn contribute to them avoiding adequate nutritional intake.
   True or false

2. Only COPD patients at higher risk of exposure to flu should seek out an influenza vaccine.
   True or false

3. Patients prescribed long-term oxygen therapy are recommended to breathe supplemental oxygen for a maximum of 15 hours per day.
   True or false

4. Pulmonary rehabilitation is not recommended for patients who are unable to walk independently, suffer from angina or have a history of recent myocardial infarction.
   True or false

5. For those patients where systemic corticosteroid therapy is indicated, Nice recommends 30mg oral prednisolone daily for five days.
   True or false

6. Carbocisteine should used in patients with a chronic productive cough, irrespective of symptomatic improvements to help prevent exacerbations.
   True or false

7. An important step of any treatment approach for any patient diagnosed with COPD is smoking cessation where appropriate, including NRT, varenicline and bupropion.
   True or false

8. Ipratropium is a suitable first treatment step for patients with COPD in group C as defined by GOLD guidelines.
   True or false

9. Short-acting beta-2 agonists are particularly valuable in the relief of breathlessness and improvement of exercise capacity.
   True or false

10. Combination inhalers have been shown to improve therapeutic response in patients with COPD, despite increasing the risk of side effects compared to monotherapy.
    True or false
COPD CPD planned learning

What are you planning to learn?

In my role as a community pharmacist, it's important to understand what treatments my patients with COPD may be using. Therefore, this learning on managing stable COPD and acute exacerbations is valuable, as it will enable me to better support my patients. I recognise a gap in my knowledge when it comes to the stepwise approach to treatment for COPD patients who are newly diagnosed, as well as those with a worsening condition who might require treatment escalation. I hope to refresh and maintain my existing skills, such as counselling on inhaler technique, so that I can carry out regular reviews for my patients.

How are you planning to learn it?

• I plan to discuss inhaler technique with my community pharmacy colleagues. I want the team to be aware that inhaler technique can be a big factor in managing patients with COPD, and understand how we can support our patients with education and counselling about their various inhalers.

• I plan to find out more about the appropriate treatments that might be used in acute exacerbations of COPD, including corticosteroids and antibiotics, using the resources available at Nice's page on 'Chronic obstructive pulmonary disease (acute exacerbation): antimicrobial prescribing' at tinyurl.com/NICE-COPD1.

• I also plan to complete the five-minute test at www.chemistanddruggist.co.uk/update-plus to test my knowledge and confirm what I have learned.

Give an example of how this learning has benefited the people using your services.

This learning has provided me with the foundation for understanding the key steps in treatment for COPD, including escalation, de-escalation and prevention of acute exacerbations. This was particularly valuable when a patient presented at my community pharmacy with a long-standing history of COPD last week.

This patient had a five-year history of COPD diagnosis, and had until recently been very stable on treatment, including a SABA and LAMA. The patient has complained of some recent symptoms that were respiratory in nature, and therefore I decided to investigate further. In addition to worsening breathlessness, the patient also complained of increased sputum production and a change in the colour of their sputum. Given that the symptoms had presently acutely, and were suggestive of an exacerbation, rather than worsening COPD control, I decided to refer them to their GP.

The patient returned with a prescription for oral doxycycline and confirmed that the GP also believed they were experiencing an acute exacerbation of COPD. After clinically screening and checking the prescription, I decided to provide the patient with counselling on their medicine as well as other factors in respect to acute exacerbation. I was able to deduce that although they had quit smoking when they were diagnosed, a number of family members were still actively smoking, which included smoking inside the home. I informed the patient that passive smoking may actively contribute to an increased risk of exacerbations. The patient agreed to talk with their family to discuss not smoking in their residence, to hopefully improve their quality of life and reduce the likelihood of recurrent exacerbations.

The knowledge I have gained through this module has allowed me to develop my competency in COPD treatments and the managements of acute exacerbations, including the practical steps that we can suggest to our patients.