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We thank the developer, contributors and reviewers of the first edition of this programme.

Disclaimer
We have developed this learning programme to support your practice in this topic area. We recommend that you use it in combination with other established reference sources. If you are using it significantly after the date of initial publication, then you should refer to current published evidence. CPPE does not accept responsibility for any errors or omissions.

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Learning with CPPE

The Centre for Pharmacy Postgraduate Education (CPPE) offers a wide range of learning opportunities for the pharmacy workforce. We are based in the Manchester Pharmacy School and Pharmaceutical Sciences and are funded by the Department of Health to provide continuing education for practising pharmacists and pharmacy technicians providing NHS services in England. For further information about our learning portfolio, visit: http://www.cppe.ac.uk

CPPE 1  2  3

We recognise that people have different levels of knowledge and not every CPPE programme is suitable for every pharmacist or pharmacy technician. We have created three categories of learning to cater for these differing needs:

CPPE 1 Core learning (limited expectation of prior knowledge)
CPPE 2 Application of knowledge (assumes prior learning)
CPPE 3 Supporting specialties (CPPE may not be the provider and will direct you to other appropriate learning providers).

This is a CPPE 2 learning programme and assumes that you already have some knowledge of the topic area.

Continuing professional development (CPD) – You can use this focal point unit to support your CPD. Consider what your learning needs are in this area. Use your CPD record sheets to plan and record your learning.

Programme guardians – A programme guardian is a recognised expert in an area relevant to the content of a learning programme. They will review the programme every six months to ensure quality is maintained. We will post any alterations or further supporting materials that are needed as an update on our website. We recommend that you check for these updates if you are using a programme more than six months after its initial publication date.

Feedback – We hope you find this learning programme useful for your practice. Please help us to assess its value and effectiveness by visiting the my CPPE record page on our website. Alternatively, please email us at: feedback@cppe.ac.uk
About your focal point event

Before coming along to this event you will have already completed Book 1 to help you identify your own learning needs, read the key information and then related it to your own area of practice and professional development.

This book uses a case study and clinical vignettes to help you apply what you have learnt so far and encourages you to measure the changes in your practice. We also include some suggested answers to the learning activities.

At this event you will work through a more detailed case study and some brief clinical vignettes with your professional colleagues, and discuss your approach to the Directing change scenario from Book 1. You may be attending a CPPE tutor-led event or have arranged to meet with your own CPPE ‘learning community’.

Just to remind you, in this unit we consider:

- the recent trends in COPD
- the causes, risk factors and pathogenesis of COPD
- how COPD is diagnosed
- the management of COPD, including drug and non-drug therapies
- the specific roles of various medicines in stable disease and acute exacerbations.

This is to certify that

attended the CPPE focal point event on COPD on

Location

CPPE pharmacy tutor signature

CPPE tutor name
Case study – management of COPD

Time to prepare: 15 minutes to review and answer the questions individually or in small groups.

Time to discuss: 15 minutes to discuss the answers with your colleagues.

Glynis is 60 years old and has recently retired from her job working for a firm that manufactures fabrics. She is a thin lady who appears older than her stated age. Glynis visits her GP as she is beginning to get short of breath while climbing the stairs and is struggling to walk to the end of her road. She explains to the GP that for the past six months she has become increasingly short of breath while carrying out daily activities.

Glynis takes no regular medications and has no history of drug allergy.

She says she has not had any acute changes in her breathing, but she does have a chronic cough that produces around one or two tablespoons of clear sputum daily. Her cough has not changed recently, and the colour and volume of her sputum have also remained unaltered. She says she is not suffering from chest pains or wheezing and has not been coughing up blood.

She has smoked at least ten cigarettes a day since she was 20, but has recently cut down to five a day because of her shortness of breath. She says she would like to stop completely, but finds it hard because she has smoked for such a long time. In the last few years she has had at least two chest infections each year requiring treatment with antibiotics.

The GP suspects COPD and conducts spirometry testing, the results of which are:

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<td>1.79 L</td>
</tr>
<tr>
<td>FEV₁/FVC</td>
<td>0.67</td>
</tr>
</tbody>
</table>
1. **What clinical features and risk factors of COPD does Glynis exhibit? What grade of severity does Glynis' COPD fall into?**

2. **What is the single most important intervention that will help Glynis' symptoms and improve her prognosis? How could the pharmacy team support such an intervention?**

3. **What initial treatment would you recommend for Glynis? On what evidence have you based your decision?**

Several weeks later, Glynis visits your pharmacy. On her last visit the GP prescribed salbutamol and ipratropium inhalers, taking two puffs of each four times a day via a metered-dose inhaler and spacer. Glynis tells you that her inhaler technique is excellent and that she has been taking the medication as she was told. When you ask about her breathing she tells you that there has been little improvement.
She is still very short of breath and has to use her salbutamol much more than the prescribed dose. With pharmacy team support and the use of nicotine replacement therapy, Glynis has not had a cigarette for two weeks.

4. **What recommendations would you make about Glynis’ prescribed therapy to help her control her breathing? Why?**

Glynis continues to report that her breathlessness is getting worse. Her Medical Research Council (MRC) dyspnoea score is now four and in the last few days she has been producing more sputum than usual. Her sputum has also turned a yellow-green colour.

5. **Glynis’ symptoms suggest she is experiencing an exacerbation of her COPD. What treatment would you recommend?**

Glynis' condition deteriorates and she has to be admitted to hospital two days later. Unfortunately, the treatments prescribed to manage her exacerbation were not started soon enough. While she is in hospital for seven days her medication regimen is changed and she is discharged on the following:
Focus on patient safety

### Drug Dose

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seretide 250 metered-dose inhaler</td>
<td>Two puffs twice daily through an Aerochamber</td>
</tr>
<tr>
<td>Prednisolone tablets</td>
<td>30mg daily</td>
</tr>
<tr>
<td>Tiotropium soft mist inhaler</td>
<td>Two puffs once daily</td>
</tr>
<tr>
<td>Doxycycline capsules</td>
<td>100mg daily for three more days</td>
</tr>
</tbody>
</table>

The discharge prescription also gives the following information:

- **Exacerbation of COPD**
- **Self-management plan provided**
- **Referral for pulmonary rehabilitation**

6. What are your concerns with Glynis' discharge plan?

7. Glynis is provided with a self-management plan when she is discharged from hospital. How can the pharmacy team continue to best support this patient?
Clinical vignettes

Time to prepare: 15 minutes to review and answer the questions individually or in small groups.

Time to discuss: 15 minutes to discuss the answers with your colleagues.

In this section of focal point, we look at brief clinical scenarios and particularly focus on decision making and communication. Review each of the clinical vignettes and come up with a suitable response to manage the situation. You may wish to practise these responses using role play.

Clinical vignette 1

As part of the multidisciplinary training that general practitioners undergo, the local junior doctor, Ciaran, starts a placement at your pharmacy. Ciaran asks you whether inhaled corticosteroids actually improve lung function or only reduce exacerbations.

Construct a reply to Ciaran.
Clinical vignette 2

Mrs Hassim visits your pharmacy and asks to speak to you. She explains that she was at the hospital yesterday for an outpatient appointment. While there she saw someone reading a leaflet for pulmonary rehabilitation. She was too frightened to ask the consultant what pulmonary rehabilitation was. She asks you what it is and if it will cure her COPD.

Construct a response to Mrs Hassim.

Clinical vignette 3

Selena, a pharmacy technician, is using patient medical records (PMRs) to identify patients who would be suitable for targeted Medicine Use Reviews (MURs). She asks about a patient, Mr Fox, who is regularly prescribed the following inhalers; salmeterol, tiotropium and salbutamol. This is a combination she has not seen before and asks you if this is usual.

Construct an explanation for Selena.
Clinical vignette 4

Fred Dodds has COPD and is a regular patient of yours. His wife comes into the pharmacy and tells you that he has just been discharged from hospital and she brings in a new prescription for morphine sulphate modified release (MR) capsules 10mg to be taken twice a day. Your pre-registration student asks why a patient with COPD would be prescribed an opioid as this could cause respiratory depression?

How would you respond?
Directing change

Time to prepare: none – you should have done this before the event.
Time to discuss: 15 minutes to discuss the answers with your colleagues.

Revisit the scenario you made notes on in Book 1. Discuss the solutions and ideas you developed with your colleagues.

What are you now going to do differently as a result of the learning and discussions at the workshop?

You have reached the end of the activities for this focal point event; the remainder of this book contains follow-up activities and the suggested answers. You may wish to spend some time after the event looking through these with colleagues.
After your *focal point* event: putting your learning into practice

Now it is time to assess your learning, determine your readiness to change and put your new knowledge into practice.
Putting your learning into practice

There are four actions you should undertake to ensure that what you have learnt in this focal point unit influences your future practice.

1. Work through the practice activities listed below
2. Evaluate your learning by revisiting the Moving into focus questions
3. Complete the CPPE online e-assessment
4. Reflect on the Steps for change outlined on page 17

1. Practice activities (45 minutes)

You might wish to start to put some of your learning into practice by undertaking the following activities.

- Conduct two MUR sessions with COPD patients. Help them identify lifestyle decisions that could improve their quality of life.
- It is part of the pharmacy contract to complete a clinical audit annually. Complete an audit with COPD patients. Some of the following areas could be audited; are patients who are prescribed inhalers able to use them correctly? Are patients aware of why it is important to use their inhalers correctly? Is a patient’s COPD well controlled?
- Contact your local respiratory nurse and find out about the local availability and referral criteria for pulmonary rehabilitation.

When will you complete these activities?

2. Evaluate your learning (15 minutes)

The second step is to revisit the Moving into focus questions.

1. List the respiratory and non-respiratory symptoms of COPD.
2. In patients with COPD who continue to smoke, why is it important to encourage them to stop?
3. What is the role, if any, of corticosteroids in the treatment of COPD?
4. List currently available drugs in the following groups, that have a license for use in COPD:

- Short-acting beta₂ agonists (SABAs)
- Short-acting muscarinic antagonists (SAMAs)
- Long-acting muscarinic antagonists (LAMAs)
- Long-acting beta₂ agonists (LABAs)
- LABA with inhaled corticosteroid (ICS) combinations.

5. What is the definition of an ‘exacerbation’ of COPD?

Can you answer these now?

3. Access e-assessment (30 minutes) 📚

The next step in assessing your learning is to access the online e-assessment on our website.

- Go to: http://www.cppe.ac.uk
- Choose Login and complete the login process. If you are a new user you will need to click on Register with CPPE, gain your password and follow the instructions to sign up.
- When you have logged in, go to assessment in the top menu bar, click on e-assessment portfolio, and then scroll down to find the e-assessment entitled CPPE 2 focal point: COPD.
- Click on the 📚 icon and follow the on-screen instructions.
- If you complete the e-assessment successfully you will be able to print your own certificate of achievement.

When will you access the e-assessment?
4. Reflection – steps for change (15 minutes)

The final step is to think about the following statements and note down how you feel about them. This should help you determine any requirements for your further development.

I have achieved my personal learning objectives that I set myself on page 11 in Book 1.

Strongly disagree □  Disagree □  Agree □  Strongly agree □

I have identified additional learning I need to undertake to improve my knowledge of the therapeutic management of COPD.

Strongly disagree □  Disagree □  Agree □  Strongly agree □

I would like to follow up a best practice idea expressed by a colleague at the focal point event/within my learning community.

Strongly disagree □  Disagree □  Agree □  Strongly agree □

After reflecting on these statements, what steps will you take now to make them reality?
Suggested answers to:

- Moving into focus questions
- Practice points
- Talking points
- Case study
- Clinical vignettes

Please remember that these answers are suggestions only. You should also refer to local COPD guidelines.
These are the authors’ suggested responses to the learning activities and they should be used as a guide during your focal point event. Where possible, use your own local guidelines and policies to inform the discussion and answers. We have provided short answers to the questions and case study and, where appropriate, these are followed by discussion points that provide a little more detail.

Moving into focus

1. List the main respiratory and non-respiratory symptoms of COPD.

The three most common respiratory symptoms in the early stages of COPD are:
- Cough
- Sputum production on coughing
- Breathlessness

Some common non-respiratory symptoms of COPD are:
- Weight loss
- Finger clubbing
- Hyperinflated chest
- Cardiovascular disease
- Depression
- Anxiety
- Anorexia

Discussion points
- **Cough** may be the first symptom to appear, but it is often ignored. It may be occasional and not accompanied by sputum production, and is often dismissed as ‘smoker’s cough’.
- **Sputum production on coughing** (productive cough) occurs in up to half of smokers. A change in colour (from colourless or white to yellow or greenish) and an increased quantity of sputum often indicates infection of the bronchi.
- **Breathlessness**, at first on exertion, but later also at rest, is usually the symptom that makes people go to their doctor, as it limits what they can do.
2. In patients with COPD who continue to smoke, why is it important to encourage them to stop?

There are a number of important reasons why people should stop smoking at any stage of their disease.

Stopping smoking is one of the few interventions that reduce disease progression (the decline in FEV₁) in COPD and improve morbidity and mortality. There is evidence that some therapies such as inhaled steroids may not be as effective in patients who smoke. Smokers with COPD are more likely to have airway bacteria colonisation in the stable state, which may enhance disease progression. Smoking is the most important risk factor for lung cancer, and COPD itself is a risk for lung cancer. Smoking is associated with cardiovascular disease, which is a common co-morbidity in COPD.

3. What is the role, if any, of corticosteroids in the treatment of COPD?

Regular treatment with inhaled steroids does not modify the long-term decline of lung function in patients with COPD. However, regular treatment with inhaled corticosteroids has been shown to reduce the frequency of exacerbations and thus improve health status for symptomatic COPD patients with an FEV₁ of less than 50 percent. Inhaled corticosteroids are not recommended for use alone in COPD and are used in combination with a LABA.

Maintenance use of oral corticosteroid therapy in COPD is not normally recommended although some patients with advanced COPD may require maintenance oral corticosteroids when these cannot be withdrawn following an exacerbation.

A course of prednisolone 30 mg/day for 7 to 14 days significantly increases a patient’s FEV₁ and is recommended in all exacerbations when worsening breathlessness interferes with daily activities.

Discussion points

None of the inhaled corticosteroids currently available are licensed for use alone in the treatment of COPD.

In the NICE treatment algorithm for managing patients with stable COPD, inhaled corticosteroids, in combination inhalers with long-acting beta₂ agonists, are used in the following patients:

In people who remain breathless or have exacerbations despite using short-acting bronchodilators as required, if FEV₁ < 50 percent predicted or; in people with an FEV₁ ≥ 50 percent who remain breathless or have exacerbations despite
maintenance therapy with a long-acting beta\textsubscript{2} agonist (LABA) or a long-acting muscarinic antagonist (LAMA).

If a patient has persistent breathlessness or exacerbations then triple therapy of a LABA with inhaled corticosteroid (ICS) (in a combination inhaler) plus a LAMA can be considered, irrespective of their FEV\textsubscript{1}. Not all patients will benefit from triple therapy; those with an FEV\textsubscript{1} < 50 percent and frequent exacerbations are more likely to benefit. Inhaled steroids help to reduce eosinophilic inflammation that occurs at a time of an exacerbation. Escalation of treatment should only be considered when a patient has persistent breathlessness or exacerbations and use of bronchodilation has been optimised. Adherence and inhaler technique should also be confirmed before any change to therapy.

Health professionals should also be aware of the potential risk of developing side effects (including non-fatal pneumonia, adrenal suppression, diabetes and osteoporosis) in people with COPD treated with inhaled corticosteroid therapy, and be prepared to discuss the risks and benefits with patients.\textsuperscript{1}

Although NICE recommend 30mg/day for 7 to 14 days a recent study has shown that treatment with prednisolone 40mg/day for 5 days is non-inferior to 14 days with regard to time to next exacerbation during six months follow-up.\textsuperscript{2} Therefore local policies will vary and need to be taken into account.

4. List currently available drugs in the following groups, that have a license for use in COPD:

| Short-acting beta\textsubscript{2} agonists (SABAs), |
| Short-acting muscarinic antagonists (SAMAs), |
| Long-acting muscarinic antagonists (LAMAs), |
| Long-acting beta\textsubscript{2} agonists (LABAs) and |
| LABA with inhaled corticosteroid (ICS) combinations. |

<table>
<thead>
<tr>
<th>Beta\textsubscript{2} agonists</th>
<th>Muscarinic antagonists</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short-acting</strong> Salbutamol (eg, Ventolin, Salamol, Airomir) Ipratropium (Atrovent)</td>
<td></td>
</tr>
<tr>
<td>Terbutaline (Bricanyl)</td>
<td></td>
</tr>
<tr>
<td><strong>Long-acting</strong> Formoterol (eg, Atimos, Oxis, Foradil) Tiotroium (Spiriva)</td>
<td></td>
</tr>
<tr>
<td>Salmeterol (Serevent) Acclidinium (Eklira)</td>
<td></td>
</tr>
<tr>
<td>Indacaterol (Onbrez) Glycopyrronium (Seebri)</td>
<td></td>
</tr>
</tbody>
</table>
Long-acting beta\textsubscript{2} agonists (LABA) with inhaled corticosteroid (ICS) combinations;
- Fluticasone plus salmeterol (Seretide)
- Budesonide plus formoterol (Symbicort)

5. What is the definition of an ‘exacerbation’ of COPD?

An exacerbation is a sustained worsening of the patient’s symptoms from his or her usual stable state that is beyond normal day-to-day variations, and is acute in onset. Commonly reported symptoms are worsening breathlessness, cough, increased sputum production and change in sputum colour. The change in these symptoms often necessitates a change in medication.\textsuperscript{1}

Discussion points

Initial management of an exacerbation may include the following:
- Increase the frequency of bronchodilator.
- Oral antibiotics should be started if sputum is purulent or there are clinical signs of pneumonia.
- Oral prednisolone should be started if patient has persistent shortness of breath.
Practice and talking points

Talking point A
What sources could you use to find out data on COPD in your local area?

Quality and Outcomes Framework (QOF) database
NHS Atlas of variation: respiratory disease
Local respiratory teams

QOF database, available at: http://www.gpcontract.co.uk
Once on the site, you can use the Find organisation search box to find your local practice by name, or you can drill down through the data by scrolling down the page to Members of this organisation – click on England then repeat this process for strategic health authorities, until you see a list of practices. When you have found the practice you want, click on COPD to see the local data. Hovering over each indicator will bring up a description and scrolling down the page will show you the results graphically, compared to regional and national averages.

NHS atlas of variation, available at:
http://www.sepho.org.uk/extras/maps/NHSatlasRespiratory/atlas.html
This data shows how previous PCT areas perform compared to other areas against a list of indicators. To view the results for your area choose one of the indicators on the left hand side and then click on your area.

Practice point 1
Calculate the number of pack years for which a patient has smoked if they have smoked ten cigarettes a day for 38 years.

\[
\text{Number of cigarettes per day} \times \frac{\text{number of years smoked}}{20} = \text{Number of pack years}
\]

\[
10 \times 38 \text{ years} = 19 \text{ pack years}
\]
Discussion points

The risk of developing COPD increases with the number of cigarettes smoked and the length of time for which the person has smoked (ie, a higher pack year). A significant smoking history for COPD is anything above 15 pack years.

Practice point 2

What are the clinical similarities and differences between a patient with asthma and one with COPD?

Both asthma and COPD are chronic obstructive diseases that involve underlying airway inflammation, although predominantly neutrophilic inflammation is found in stable COPD as oppose to eosinophilic inflammation found in asthma.

COPD is characterised by airflow limitation that is not fully reversible and is usually progressive. It is also associated with an abnormal inflammatory response in the lungs to noxious particles or gases. In contrast, episodes of asthma are usually associated with widespread but variable airflow obstruction, which is often reversible.

A chronic productive cough is common in COPD but uncommon in asthma.

Significant diurnal or day-to-day variability of symptoms and night-time waking due to breathlessness and/or wheeze are common in asthma, but uncommon in COPD.

Discussion points

The age of onset differs in that symptoms under the age of 35 are rare in COPD, but common in asthma.

Practice point 3

What is the place of mucolytic drug therapy in the management of COPD?

Mucolytic drug therapy should be considered in patients with a chronic cough with sputum production, but should only be continued if there is symptomatic improvement such as reduction in sputum production and/or viscosity and reduction in the frequency of cough. Mucolytic drugs are not recommended for routine use to prevent exacerbations in patients with stable COPD.

Discussion points

In COPD mucolytics are prescribed to reduce the viscosity of sputum to aid expectoration. In some patients with COPD use of mucolytics can reduce
exacerbations and the BNF recommends a trial of 4 weeks and stopping treatment if there is no benefit.

**Talking point B**

What factors should be taken into consideration when choosing an inhaler for a patient?

The following are important considerations when choosing an inhaler device for a patient:

- Ease of use
- Portability
- Accuracy of dose
- Availability of specific drug in different devices
- Patient preference
- Patient’s age
- Dexterity
- Side effects
- Patient’s inspiratory rate
- Licensing
- Contraindications
- Cost effectiveness
- Availability of compatible spacers if needed

**Discussion points**

There are a number of different inhaler devices available and most patients should be able to take drugs by inhalation.

Ideally an inhaler device should have the following properties:

- Be able to deliver an accurate dose of drug to the lungs
- Minimal deposition of the drug at other sites
- Be easy to use
- Minimal side effects
- Cost effective
- Able to be used with a low inspiratory rate
- Portable
Availability of compatible spacers if needed

Inhalers should only be prescribed after ensuring that the patient is able to use the device correctly and this should be checked periodically, by asking the person to demonstrate their technique. This will ensure that good technique is maintained.

**Practice point 4**

What questions could you ask to assess the effectiveness of therapy for patients with COPD?

- Has your treatment made a difference to you?
- Is your breathing easier in any way?
- Can you do some things now that you couldn’t do at all before the treatment?
- Can you do the same things as before, but faster?
- Can you do the same things as before, but are now less breathless when you do them?
- Has your sleep improved?

**Discussion points**

An example of a simple form that can be used to assess the impact of COPD on patients is the COPD assessment test (CATest). [http://www.catestonline.org](http://www.catestonline.org)
Case study – management of COPD

Glynis is 60 years old and has recently retired from her job working for a firm that manufactures fabrics. She is a thin lady who appears older than her stated age. Glynis visits her GP as she is beginning to get short of breath while climbing the stairs and is struggling to walk to the end of her road. She explains to the GP that for the past six months she has become increasingly short of breath while carrying out daily activities.

Glynis takes no regular medications and has no history of drug allergy.

She says she has not had any acute changes in her breathing, but she does have a chronic cough that produces around one or two tablespoons of clear sputum daily. Her cough has not changed recently, and the colour and volume of her sputum have also remained unaltered. She says she is not suffering from chest pains or wheezing and has not been coughing up blood.

She has smoked at least ten cigarettes a day since she was 20 but has recently cut down to five a day because of her shortness of breath. She says she would like to stop completely but finds it hard because she has smoked for such a long time. In the last few years she has had at least two chest infections each year requiring treatment with antibiotics.

The GP suspects COPD and conducts spirometry testing, the results of which are:

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<td>1.79 L</td>
</tr>
<tr>
<td>FEV₁/FVC</td>
<td>0.67</td>
</tr>
</tbody>
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1. What clinical features and risk factors of COPD does Glynis exhibit? What grade of severity does Glynis' COPD fall into?

Glynis presents with a clinical scenario suggestive of COPD based on her age, smoking history, weight, frequent chest infections and gradual worsening of respiratory symptoms – breathlessness on exertion, a reduction in exercise tolerance, chronic cough and regular sputum production. Working in a fabrics factory is also one of the identified occupational risk factors for COPD.

Glynis is considered to have moderate COPD based on her spirometry results and her breathlessness score.

Discussion Points

- NICE classification of severity of airflow obstruction has been updated to reflect international opinion. These classifications are therefore different to those previously used by NICE.

- NICE has graded the severity of airflow limitation in COPD as follows:  

<table>
<thead>
<tr>
<th>FEV₁</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥80 percent predicted</td>
<td>Stage 1 – Mild</td>
</tr>
<tr>
<td>50-79 percent predicted</td>
<td>Stage 2 – Moderate</td>
</tr>
<tr>
<td>30-49 percent predicted</td>
<td>Stage 3 – Severe</td>
</tr>
<tr>
<td>&lt;30 percent predicted</td>
<td>Stage 4 – Very severe</td>
</tr>
</tbody>
</table>

Another useful tool to use in grading severity is the Medical Research Council (MRC) score for measurement of dyspnoea and looks at level of patient functionality and patient orientated outcomes (see Book 1 pages 20-21).

Severity of a patient’s disease should not be based on their airflow limitation alone. Assessment of COPD severity should consider the level of symptoms, the degree to which they affect daily life, the severity of the spirometric abnormality, and the presence of complications such as respiratory failure, right heart failure, weight loss and arterial hypoxaemia. All newly diagnosed COPD patients should have a chest x-ray, full blood count and body mass index (BMI) calculated to exclude other respiratory illnesses and causes of breathlessness.

Continued on next page
The BODE Index is another available index for assessment of COPD which may be used in some settings. This index uses 4 variables; BMI (B), airflow obstruction (O), dyspnoea (D) and exercise capacity (E) to predict all cause mortality and death from respiratory causes and is recommended by NICE as a means of determining disease severity. For more information see the following link; http://ebm.bmj.com/content/9/5/156.full.

2. What is the single most important intervention that will help Glynis' symptoms and improve her prognosis? How could the pharmacy team support such an intervention?

Glynis has a significant smoking history. Her pack year history is at least 20 years. Recognising that COPD is progressive and not fully reversible, smoking cessation is the one intervention, which can reduce the rate of decline of COPD.

The pharmacy team can support Glynis either through direct offering of an in-house smoking cessation service, or referral to the NHS smoking cessation service.

Discussion Points

- The calculation of pack years to determine Glynis’ cigarette consumption can be found in Book 1, page 14. The relationship between smoking, enhanced decline in lung function and age in patients with COPD can also be found in Book 1, page 22.

- Pharmacy teams need to know about their in-house or local smoking cessation services. These services could offer nicotine replacement products or other medication via patient group directions or vouchers in combination with either one-to-one or group counselling service to ensure successful quit rates.

- Smoking quit rate targets can be found via Public Health Observatory data sites and these can help support offering a service which targets COPD patients. This can give measurable patient outcomes in terms of delayed progression of illness and reduced exacerbations. http://www.lho.org.uk/LHO_T opics/National_Lead_Areas/NationalSmoking.aspx

- The Department of Health have produced An Outcomes Strategy for COPD and Asthma in England in 2011. This document outlined the Department of Health’s tobacco campaign in support of prevention of COPD as it is recognised as the top cause of preventative premature death in respiratory related illness, so is key to continue supporting patients not to start or to quit. (see resources section Book 1, pages 8-9).
One particular concern is ensuring adequate patient education, especially with those COPD patients on oxygen therapy where smoking is not just a continued risk for their illness, but is dangerous as an explosive and fire risk around oxygen cylinders. More information can be found on the British Lung Foundation website. http://www.blf.org.uk/Page/Oxygen

3. What initial treatment would you recommend for Glynis? On what evidence have you based your decision?

Start a short-acting beta₂ agonist, such as salbutamol, or a short-acting muscarinic antagonist, such as ipratropium bromide, to alleviate symptoms as required. Short-acting bronchodilators should be used as needed; their onset of action ranges from approximately five minutes (beta₂ agonists) to 30 minutes (muscarinic antagonists) and effects last for between three and six hours.

Your evidence base for these decisions should be the NICE clinical guideline for COPD.¹

Discussion Points

- Glynis’ therapy should be assessed after four weeks. It may be necessary to combine both the short-acting bronchodilator agents to improve symptoms. It might be suggested that she uses them on a regular basis.
- Introduction of a new medicine gives opportunity for referral into the New Medicines Service (NMS). Pharmacists should teach and assess inhaler technique to ensure patients receive the most from their inhaled medication. Patients should also be advised on how to recognise when symptoms are not being managed by the short-acting bronchodilator as necessary. A CPPE learning programme; New medicine service – Asthma and COPD is available to help support your practice in this area.
- Pulmonary rehabilitation should be offered to all appropriate people with COPD, including patients with MRC dyspnoea score of grade 3 and above. For further information see discussion points for question 6.

Several weeks later, Glynis visits your pharmacy. On her last visit the GP prescribed salbutamol and ipratropium inhalers, taking two puffs of each four times a day via a metered-dose inhaler and spacer. Glynis tells you that her inhaler technique is excellent and that she has been taking the medication as she was told. When you ask about her breathing she tells you that there has been little improvement. She is still very short of breath and has to use her salbutamol much more than the prescribed dose.
With pharmacy team support and the use of nicotine replacement therapy, Glynis has not had a cigarette for two weeks.

4. What recommendations would you make about Glynis' prescribed therapy to help her control her breathing? Why?

Adherence and inhaler technique should always be checked before considering any change to therapy. This should be done by getting the patient to demonstrate their technique rather than asking them.

You could recommend a regular long-acting beta2 agonist (LABA) or a long-acting muscarinic antagonist (LAMA) to try to improve her symptoms, as there has been no improvement. NICE recommends regular LAMA in preference to regular short-acting muscarinic antagonist (SAMA).

Discussion points

- Check patient’s adherence and technique before considering changes in therapy. Adherence may be a problem as the patient is using a spacer. Four times daily might suggest that doses during the day, when perhaps not at home, may not be taken using the spacer. Spacer devices can be cumbersome to carry and hence doses may be being missed. Inhaler technique should be reinforced at every opportunity.

- In patients who remain breathless, or have exacerbations despite using short-acting bronchodilators, NICE recommends that regular bronchodilation with a long-acting muscarinic antagonist (LAMA) or a long-acting beta2 agonist (LABA) should be offered. In more severe COPD (FEV1 <50 percent predicted) the LABA should be in combination with an inhaled corticosteroid (ICS), or a LAMA can be used on its own. These medicines can improve lung function, reduce dynamic hyperinflation of the lungs, and hence reduce the work of breathing and improve exercise capacity.

- Long-acting bronchodilators can improve patient’s quality of life, reduce the frequency of exacerbations, including exacerbations leading to hospitalisation, in patients with COPD.

- The NICE guidance\(^1\) says that both LABAs and LAMAs are clinically effective and that there was no strong evidence to favour one over the other. A more recent Cochrane review found that there is insufficient evidence to suggest which bronchodilator provides long-term benefit in quality of life.\(^6\)
If a LAMA is started then regular short-acting muscarinic antagonist (SAMA) should be stopped. A short-acting beta\textsubscript{2} agonist (SABA) as required can be used at all stages of treatment.

The pharmacy team should continue to support and check on continued smoking cessation.

Glynis continues to report that her breathlessness is getting worse. Her Medical Research Council (MRC) score is now four and in the last few days she has been producing more sputum than usual. Her sputum has also turned a yellow-green colour.

5. **Glynis’ symptoms suggest she is experiencing an exacerbation of her COPD. What treatment would you recommend?**

Glynis should now be prescribed an antibiotic for five days at a therapeutic dose with oral prednisolone 30mg every morning for 7-14 days.

**Discussion points**

- Systemic corticosteroids are beneficial in the management of exacerbations of COPD. They shorten recovery time and improve lung function (FEV\textsubscript{1}) and hypoxaemia (PaO\textsubscript{2}). They may reduce the risk of early relapse, the risk of treatment failure and the length of hospital stay.

- Although NICE recommend 30mg/day for 7 to 14 days a recent study has shown that treatment with prednisolone 40mg/day for 5 days is non-inferior to 14 days with regard to time to next exacerbation during six months follow-up.\textsuperscript{2} Therefore local policies will vary and need to be taken into account.

- Antibiotics should be used to treat exacerbations of COPD associated with a history of more purulent sputum.

- Initial empirical treatment should be amoxicillin, doxycycline or clarithromycin, depending on local resistance patterns. The choice and length of treatment will depend on local policies. Up to date advice on the preferred choice of antibiotics in primary care is available from Public Health England (formerly the Health Protection Agency). Information is available at: [www.hpa.org.uk](http://www.hpa.org.uk).

- Routine sputum culture is now not recommended in patients managed in primary care according to NICE.\textsuperscript{1}

- Bronchodilator therapy may also be increased to control symptoms.

- UK Medicines Information advice is that the corticosteroid (prednisolone) should be prescribed as non-enteric coated tablets as there is no good evidence of reduced risk of peptic ulcers compared to uncoated tablets.
Glynis' condition deteriorates and she has to be admitted to hospital two days later. Unfortunately, the treatments prescribed to her were not started soon enough to control her exacerbation. While she is in hospital for seven days her medication regimen is changed and she is discharged on the following:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seretide 250 metered-dose inhaler</td>
<td>Two puffs twice daily through an Aerochamber</td>
</tr>
<tr>
<td>Prednisolone tablets</td>
<td>30mg daily</td>
</tr>
<tr>
<td>Tiotropium soft mist inhaler</td>
<td>Two puffs once daily</td>
</tr>
<tr>
<td>Doxycycline capsules</td>
<td>100mg daily for three more days</td>
</tr>
</tbody>
</table>

The discharge prescription also gives the following information:

- Exacerbation of COPD
- Self-management plan provided
- Referral for pulmonary rehabilitation
What are your concerns with Glynis’ discharge plan?

There are a number of problems with Glynis’ prescription.

This is triple therapy initiated quite early into her COPD management, which is not considered cost effective compared to use in patients with more severe COPD, according to NICE. Therefore question if this is appropriate at this stage of her COPD.

MHRA has raised concerns about the cardiovascular safety of tiotropium in a soft mist inhaler. Similar concerns have not been made with tiotropium as a dry powder inhaler.

There is no short-acting beta2 agonist for Glynis to use on an as-needed basis, for prophylaxis before activity or when she becomes short of breath.

There is no course length on the prednisolone – it would usually be stopped after a 7-14 day course for an acute exacerbation. This needs to be queried and clarified.

Discussion points

- The Seretide Evohaler is not licensed for the treatment of COPD (the Accuhaler 500 is licensed). It is commonly prescribed off-label for patients with COPD, however the Seretide Accuhaler was the device used in all the supportive clinical trials and is in fact more cost-effective than the high-strength Evohaler. The Symbicort Turbohaler is an alternative combination inhaler that is licensed for COPD.

- If the Seretide Evohaler is continued pharmacy teams are then advised to ensure correct inhaler technique is being used. Poor inhaler technique could lead to inadequate dose of inhaled medication and result in more side effects. Devices, such as the In Check device, are useful for testing that the inspiratory rate used by the patient is correct for the device chosen.

- Increased corticosteroid side-effect concerns with both high-dose inhaled and systemic forms being taken. Pharmacy teams should be aware of the need to check and where necessary supply patients with a steroid card.

- Due to the risk of infection patients should receive pneumococcal vaccination and be reminded of the need for an annual influenza vaccination.
There is good evidence that pulmonary rehabilitation improves quality of life, exercise capacity and breathlessness in patients with COPD. Pharmacy teams are encouraged to investigate locally what provision there is for pulmonary rehabilitation. Find out where it is being provided and how to contact the team.

7. Glynis is provided with a self-management plan when she is discharged from hospital. How can the pharmacy team continue to best support this patient?

Self-management plans may contain sections for recording medication, oxygen status and lung function, monitoring symptoms and preventing exacerbations. It also features helpful guidance on breathing techniques, healthy eating, the weather and details of useful contacts. Other aspects the plan could include are:

- How to recognise when the COPD is getting worse (breathlessness, more sputum, coloured sputum, and/or fever).
- How to initially increase the use of short-acting bronchodilators.
- When to start oral corticosteroids and/or antibiotics if the patient has a rescue pack.
- When to contact a primary healthcare professional if they are concerned or not responding to treatment.

The pharmacy team can continue to best support this patient by ensuring compliance with medication (through the MUR service including routine inhaler technique checks), continued smoking cessation support and recommendation of pneumococcal vaccination and annual influenza vaccination.

Discussion points

- Pharmacy teams can support patients by finding out if they understand how their self-management plan is followed, especially how to deal with exacerbations and how to use the rescue pack. Pharmacists should confirm with patients that they know when to begin treatment with the oral corticosteroids, antibiotics or both.
It is also worth considering the holistic management of COPD patients. Being aware of a COPD patient’s mental health, as many suffer with depression or anxiety, and their nutritional health will be important so that early intervention can be initiated by referral to appropriate primary healthcare professionals.

Referral to patient support groups, such as the British Lung foundation (see resources section Book 1) may be helpful.

Remember there are other related illness to observe with COPD patients such as cardiovascular disease, cor pulmonale and other co-morbidities.
Clinical vignettes

Clinical vignette 1

As part of the multidisciplinary training that general practitioners undergo, the local junior doctor, Ciaran, starts a placement at your pharmacy. Ciaran asks you whether inhaled corticosteroids actually improve lung function or only reduce exacerbations. Construct a reply to Ciaran.

The bottom line

Inhaled corticosteroid therapy will not improve lung function. The aim of inhaled corticosteroid treatment is to reduce exacerbation rates and slow the decline in health status. You should consider the small increased risk of pneumonia with inhaled corticosteroid therapy and patients should be informed appropriately.

Supporting the statements

According to a systematic review of the use of Inhaled corticosteroids for stable COPD, carried out by the Cochrane foundation, long-term use of ICS (more than six months) did not consistently reduce the rate of decline in forced expiratory volume in one second (FEV₁) in COPD patients. There was no statistically significant effect on death rate. Inhaled corticosteroids were beneficial in slowing down the rate of decline in quality of life and reducing the frequency of exacerbations. Inhaled corticosteroids did increase the risk of side effects including oral thrush infection and hoarseness and the rate of pneumonia.

Inhaled corticosteroids are used in the following patients:

In people with stable COPD who remain breathless or have exacerbations despite using short-acting bronchodilators as required, the following can be used as maintenance therapy:

1. In patients with FEV₁ < 50 percent predicted - either long-acting beta₂ agonist (LABA) with an inhaled corticosteroid (ICS), in a combination inhaler, or a long-acting muscarinic antagonist (LAMA).

2. In people with stable COPD and an FEV₁ ≥ 50 percent who remain breathless or have exacerbations despite maintenance therapy with a LABA then a LABA with ICS (in a combination inhaler) can be considered. Inhaled corticosteroids help to reduce eosinophilic inflammation that occurs at a time of an exacerbation. ICSs are of benefit in those people with an FEV₁ < 50 percent and frequent exacerbations.

If a patient has persistent breathlessness or exacerbations then triple therapy of a LABA with an ICS (in a combination inhaler) plus a LAMA can be considered,
irrespective of their FEV₁. Not all patients will benefit from triple therapy; those with an FEV₁ <50 percent are more likely to benefit. Escalation of treatment should only be considered when a patient has persistent breathlessness or exacerbations and use of bronchodilation has been optimised.

Clinical vignette 2
Mrs Hassim visits your pharmacy and asks to speak to you. She explains that she was at the hospital yesterday for an outpatient appointment. While there she saw someone reading a leaflet for pulmonary rehabilitation. She was too frightened to ask the consultant what pulmonary rehabilitation was. She asks you what it is and if it will cure her COPD.

Construct a response to Mrs Hassim.

The bottom line:
COPD is a progressive irreversible illness with no cure.

Pulmonary rehabilitation combines exercise classes and health education, aiming to improve quality of life by increasing exercise tolerance and reducing shortness of breath. It also provides a support network and increases social contact that patients find very helpful.

Supporting the statements
According to NICE clinical guideline 101, pulmonary rehabilitation should be offered to all appropriate patients with COPD, including those who have had a recent hospitalisation for an exacerbation and those who consider themselves functionally disabled by COPD (usually MRC grade 3 and above).¹

Patients should be made aware of the benefits of pulmonary rehabilitation and the commitment required to gain these.

Pulmonary rehabilitation is not suitable for patients who are unable to walk, have unstable angina or who have had a recent myocardial infarction.

The Booklet “What should I expect from pulmonary rehabilitation?” available from the British Lung Foundation, is useful to understand and explain what pulmonary rehabilitation involves.

http://www.blf.org.uk/Publication/Detail/What-should-I-expect-from-Pulmonary-Rehabilitation
Clinical vignette 3

Selena, a pharmacy technician, is using the PMRs to identify patients who would be suitable for targeted MURs. She asks about a patient, Mr Fox, who is regularly prescribed the following inhalers; salmeterol, tiotropium and salbutamol. This is a combination she has not seen before and asks you if this is usual.

Construct an explanation for Selena.

The bottom line:
The combination of a long-acting beta₂ agonist (LABA) with a long-acting muscarinic antagonist (LAMA) can be considered as an alternative to a LABA plus inhaled corticosteroid (ICS) in a combination inhaler, if an ICS is either declined or not tolerated.1

A short-acting beta₂ agonist (SABA) as required can be continued at all stages of treatment.

Supporting the statements
This combination is suggested in the NICE clinical guideline algorithm for the management of stable COPD.1
Clinical vignette 4

Fred Dodds has COPD and is a regular patient of yours. His wife comes into the pharmacy and tells you that he has just been discharged from hospital and she brings in a new prescription for morphine sulphate modified release (MR) capsules 10mg to be taken twice a day. Your pre-registration student asks why a patient with COPD would be prescribed an opioid as this could cause respiratory depression?

How would you respond?

The bottom line:
Opioids should be used when appropriate to palliate breathlessness in patients with end-stage COPD which is unresponsive to other medical therapy.

Why?
Opioids are commonly used to treat dyspnoea in palliative medicine. The use of opioids in this way has been the subject of a Cochrane review4 which confirmed the overall beneficial effects of both oral and parenteral opioids on dyspnoea and the fact that that both were more effective than placebo.5

Supporting the statements
There is a role for palliative care for patients dying from non-cancer conditions including COPD. This care should be provided by a multidisciplinary team and focus on symptom control and optimising quality of life in patients with end stage COPD.

In addition to opioids, benzodiazepines, tricyclic antidepressants, major tranquillisers and oxygen should also be used when appropriate for breathlessness in patients with end-stage COPD unresponsive to other medical therapy.1
References


References


5. NPC. Recent safety issues with inhaled treatments for COPD. MeReC bulletin No 4 Volume 19.

Notes
References
5. NPC. Recent safety issues with inhaled treatments for COPD. MeReC bulletin No 4 Volume 19.

Notes
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