Chronic Obstructive Pulmonary Disease (COPD) Guideline
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1. **Diagnosing COPD**

Consider any patient over the age of 35 with symptoms of:

- breathlessness
- chronic cough
- regular sputum production
- history of exposure to risk factors, especially cigarette smoking
- repeated chest infections.

Spirometry must confirm diagnosis.

2. **Risk factors**

**Exposure:**

- tobacco smoking
- occupational dusts or chemicals
- indoor and outdoor air pollution/particulates
- cannabis smoking

**Host:**

- $\alpha_1$ - antitrypsin deficiency
- lower socio-economic status

3. **Diagnostic tests**

All new diagnoses of COPD require spirometry.

A post bronchodilator FEV$_1$/VC ratio < 0.7
(Note: spirometers often express this as 70%) indicates the presence of chronic airflow obstruction and is a diagnostic criteria for COPD

Reversibility testing is not necessary for the diagnosis or to plan treatment. It may help distinguish between asthma and COPD.

Consider asthma if the FEV$_1$ returns to normal or results in an increase of >400mls post-bronchodilator.

Individuals may have both asthma and COPD. (In trying to distinguish between COPD and asthma, a careful history of childhood symptoms such as variable wheeze, or atopy and nocturnal symptoms is essential).

**Assessment of severity**

No single measure provides an adequate assessment of the severity of the disease in an individual patient. Severity assessment has implications for therapy and relates to prognosis. The severity of airflow obstruction is defined (GOLD and NICE) as follows.
<table>
<thead>
<tr>
<th>Post-bronchodilator FEV$_1$</th>
<th>≥80%predicted</th>
<th>50-79%predicted</th>
<th>30-49%predicted</th>
<th>&lt;30%predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEV$_1$/VC</td>
<td>Ratio &lt;0.7 (70%)</td>
<td>Ratio &lt;0.7 (70%)</td>
<td>Ratio &lt;0.7 (70%)</td>
<td>Ratio &lt;0.7 (70%)</td>
</tr>
<tr>
<td>MILD</td>
<td>MODERATE</td>
<td>SEVERE</td>
<td>VERY SEVERE</td>
<td></td>
</tr>
</tbody>
</table>

Patients with a FEV$_1$/VC ratio < 0.7 may have mild COPD but in the elderly this can lead to an over-diagnosis of COPD.

The FEV$_1$ poorly reflects the degree of disability in COPD.

A more comprehensive assessment of severity includes the degree of airflow obstruction and the known prognostic factors as follows.

- breathlessness (MRC scale)
- exercise capacity eg six-minute walk test
- BMI
- frequency of exacerbations
- partial pressure of oxygen in arterial blood (PaO2)
- cor pulmonale.

### Medical Research Council (MRC) Breathlessness Scale

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

### 4. Chest x-ray

A chest x-ray is not essential to establish the diagnosis of COPD but is often helpful when considering alternative diagnoses. A chest x-ray is part of the post-diagnosis assessment, especially with patients who smoke. Clinicians should have a low threshold for requesting a chest x-ray in any patient who smokes and has respiratory symptoms.

A chest x-ray **must** be done if:

- patient is not responding to treatment
- there is a possibility of a new or alternative diagnosis
- the patient’s condition is worsening.
5. Additional investigations 
(may be helpful in certain circumstances)

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial domiciliary peak flow measurements</td>
<td>• to exclude asthma if diagnostic doubt remains</td>
</tr>
<tr>
<td>Alpha-1 antitrypsin</td>
<td>• if early onset (&lt; 45 years), minimal smoking history or family history</td>
</tr>
<tr>
<td>Transfer factor for carbon monoxide (TLCO)</td>
<td>• to investigate symptoms disproportionate to spirometric impairment</td>
</tr>
<tr>
<td>CT scan of the thorax</td>
<td>• to investigate symptoms disproportionate to spirometric impairment</td>
</tr>
<tr>
<td></td>
<td>• to investigate abnormalities on CXR</td>
</tr>
<tr>
<td></td>
<td>• to assess suitability for surgery</td>
</tr>
<tr>
<td>ECG</td>
<td>• to assess cardiac status if features of cor pulmonale</td>
</tr>
<tr>
<td>Echocardiogram</td>
<td>• to assess cardiac status if features of cor pulmonale</td>
</tr>
<tr>
<td>Pulse oximetry</td>
<td>• to assess need for oxygen therapy</td>
</tr>
<tr>
<td></td>
<td>• if cyanosis or cor pulmonale present or if FEV₁ &lt; 50% predicted</td>
</tr>
<tr>
<td>Sputum culture</td>
<td>• to identify organisms if sputum is persistently present and purulent or during and exacerbations</td>
</tr>
</tbody>
</table>

6. Co-morbidities

All of the conditions listed below occur frequently with COPD because they have many risk factors in common. Consider and treat these conditions. If left untreated, poor overall outcomes can occur.

- cardiovascular disease
- depression/anxiety
- osteoporosis
- carcinoma of the lung
- weight loss and skeletal muscle dysfunction.

7. Treatment of COPD

Treatment will:
- reduce risk factors
- relieve symptoms
- improve exercise tolerance
- improve health status
- prevent and treat complications
- prevent and treat exacerbations
- reduce the effects of co-morbidities
- reduce mortality
- maximise the patient’s and carer’s understanding.
Reduce risk factors by:
- stop smoking (this reduces the rate of progression of the disease)
- childhood immunisations
- flu vaccination
- pneumococcal vaccination.

Measure treatment effectiveness by:
- improvement in symptoms
- increase in activities of daily living
- improvement in exercise tolerance.

Questions to assess response to therapy:
- has your treatment made any difference to you?
- is your breathing any easier?
- can you do things now that you could not do before?
- can you do things now faster than before?
- can you do the same things now but with less breathlessness?

Use of inhaled therapies
(Extract from NICE clinical guideline 101: Chronic Obstructive Pulmonary Disease)

Algorithm 2a: Use of inhaled therapies
Please note This algorithm should be used within the wider context of the management of COPD, including algorithms 1, 2 and 3
It is important to note that in Scotland the Scottish Medicines Consortium (SMC) has not accepted the use of any LABA + ICS combination inhaler where the FEV1>50%. Individual clinicians should take account of SMC’s advice when exercising their clinical judgement.

FREQUENTLY ASKED QUESTIONS

Can the FEV₁ be used to assess the response to treatment?
- while the FEV₁ measurement is critical to establishing COPD diagnosis, it is seldom useful when assessing the response to therapy
- judge clinical response by improvement of symptoms, exercise tolerance, activities of daily living
- the MRC scale of breathlessness score may show improvements in breathlessness. However, meaningful improvements in symptoms can occur without any change in this score and thus it is not used to assess the response to t.

What is the place of theophylline?
This may be given for a trial period after treatment with long-acting bronchodilator/ICS combination inhaler therapy has failed or symptoms persist. Monitor response and continue treatment only if the symptoms improve. Monitor plasma levels and be aware that many drugs can modify theophylline metabolism, including smoking.

Should oral corticosteroids be used for maintenance treatment?
In COPD, it is not recommended that they be used for maintenance.

Should inhaled corticosteroids be used alone in patients with COPD?
They do not have a licence for COPD and should not be prescribed alone.

What benefit can combination inhalers (Inhaled corticosteroids / long acting beta agonists) provide patients with COPD?
Combination inhalers can:
- reduce breathlessness
- improve lung function
- reduce exacerbations
- improve the quality of life.

- they should be used for patients with severe airways obstruction (FEV₁<50% of predicted, see treatment chart) and repeated exacerbations
- the patient should be checked after a few weeks and the clinical benefit of the inhaler should be reviewed. The inhaler should be stopped if no clinical benefit is achieved.
(see treatment chart on page 6)

However, inhaled corticosteroids may increase the incidence of pneumonia especially in the elderly.
- The cost efficiency of combined inhalers should be considered.
Types of inhaler differ in price and new preparations now have varied dosage regimes
**Should mucolytics be used?**
The Lothian Joint Formulary Committee has not approved their use and the evidence is poor. If prescribed they should be reassessed after one month for any benefits.

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**8. Delivery systems**

**INHALERS**

**Be sure to:**
- teach the technique and re-check
- be familiar with different types of inhalers
- change inhalers if a patient is having trouble coping with a certain type
- encourage the use of spacer devices when needed.

**The correct delivery system is as important as the drug used**

**NEBULISERS**

- nebuliser assessments trials should be done by secondary care respiratory physicians (this gives an added benefit to the patient of having the nebuliser maintained)
- consider a nebuliser in patients with severe airways obstruction (FEV1 < 50 predicted) if the patient has excessive or distressing shortness of breath despite maximum therapy
- nebulised therapy should not continue to be prescribed without confirming improvement in one or more of the following:
  - a reduction in symptoms and/or
  - an increase in activities of daily living or exercise capacity.

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**9. Oxygen Therapy**

**Short-burst oxygen therapy (SBOT)**

There is no good evidence to support the use of short burst oxygen therapy.

**Long-term oxygen therapy (LTOT)**

LTOT can prolong life. It is indicated in patients with hypoxaemia (PaO₂ < 7.3 kPa) when in a stable condition. Secondary care assessment is required for the provision of long-term oxygen therapy.

Consider long-term oxygen therapy in patients with:
- severe airflow obstruction
- cyanosis
- polycythemia
- raised JVP or peripheral oedema
- pulmonary hypertension
- O₂ saturation of < 92% while breathing air.

Patients who continue to smoke will rarely be considered for long-term oxygen therapy.

**Consider ambulatory oxygen therapy in mobile patients on long-term oxygen therapy.**
10. Pulmonary rehabilitation

Evidence shows that pulmonary rehabilitation benefits all patients with COPD, particularly those with severe to very severe COPD or an MRC breathlessness score of three or more.

Patients with moderate COPD are usually still active and have fewer symptoms.

All patients with repeated exacerbations or who are admitted to hospital with an exacerbation should be fast tracked for pulmonary rehabilitation.

Pulmonary rehabilitation:
- improves exercise tolerance
- improves the quality of life
- reduces symptoms
- reduces the number of exacerbations
- reduces hospital admissions
- is available in all CHPs (in Edinburgh CHP, home-based rehabilitation is available).

For contact information see section 18 (page 12)

11. Exacerbations

Symptoms:
- increase in shortness of breath
- increase in cough
- increase in sputum volume and purulence
- decreased exercise tolerance
- drowsiness.

Consider prescribing a long-acting $\beta_2$ agonist/steroid combination inhaler if the FEV$_1$ is $< 50\%$.

Consider and select patients who may benefit from having antibiotics and steroids at home.

Patients should be encouraged to start treatment early in an exacerbation. Use the Lothian self-management plan (see Appendix 2)

If the patient is drowsy they should always be admitted unless palliative care is considered.

Treatment:
- amoxycillin 500mg, three times a day for 5 days.
- or doxycycline 200mg day 1 then 100mg daily for 4 days (5 days total)
- patients should consult their GP.
Patients in the community should have oximetry available to help assess exacerbation severity.

See Appendix 1: Protocol for management of COPD exacerbation in primary care

12. Referral for consultant opinion

Consider referral if:
- diagnosis is unclear
- patient has severe COPD (FEV1 < 30% of predicted)
- cor pulmonale (fluid retention or peripheral oedema)
- increasing shortness of breath
- haemoptysis
- rapidly decreasing FEV1
- for assessment for O2 therapy if oxygen saturation (92% or less) while breathing air
- chest x-ray shows bullae in the lung
- patient is less than 40 years old
- symptoms are disproportionate to pulmonary function
- patient has frequent infections/exacerbations
- for assessment for nebuliser.

13. Discharge and follow-up

Criteria for discharge:
- patient and carer understand use of inhalers
- home care arrangements in place, for example oxygen, supported home care and specialist nurse follow-up
- family, patient, nurses, AHP, community health partnership (CHP) staff and medical staff confident that the patient will cope
- follow up at respiratory clinic or by specialist nurse within 4 to 6 weeks in community respiratory team services (see CHP variations)
- COPD self-management plan.

14. Palliative care

Many patients will reach a stage in their illness where palliative care should be considered and will be of benefit. Making an exact prognosis is difficult in COPD.

The ‘surprise’ question may help - “would you be surprised if this patient died in the next year?”

If the answer is “no” the patient may be in the palliative phase of their illness. Some patients may express this by saying “hospital admissions make me feel worse rather than better.”

In the palliative care stage the focus should change. Discuss interventions with the patient to maximise their understanding and decision-making.

Things to consider:
• share understanding with colleagues (palliative care register)
• concentrate on symptom reduction
• maximise the patient’s understanding of their illness
• consider an anticipatory care plan for palliative care (symptoms, place of care, DNAR, essential treatments)
• notify out of hours for DNAR status and special notes
• maximise support for family
• opioids, benzodiazepines, and tricyclic antidepressants should be used when appropriate for breathlessness in patients with end-stage COPD unresponsive to other medical therapy (see Lothian Palliative Care guidelines)

15. Travelling with COPD

Patients travelling with long-term oxygen therapy need advanced planning

For land and sea travel, the options include:
• taking the oxygen concentrator if travelling by car
• arranging for cylinder provision by making advanced contact with the local primary care organisation at the destination.

If given sufficient notice the respiratory nurse specialists may be able to help. Another district can arrange services such as concentrators.

Air travel involves exposure to a relatively hypoxic environment during a flight. The great majority of patients can and do fly without difficulty.

Guidelines indicate:
• patients with moderate or severe COPD and resting saturation over 95% are safe to fly without oxygen
• all patients on long-term oxygen therapy plus oxygen saturation below 92% on air should arrange in advance for in-flight oxygen
• patients with significant COPD and oxygen saturation between 92% and 95% may benefit from a referral for a fitness-to-fly test. During a flight the degree of de-saturation in this group is unpredictable (refer to respiratory outpatient department).

16. Help agencies for patients and carers

• Breatheasy groups - www.lunguk.org/supporting-you/breathe-easy
• VOCAL (Edinburgh and Midlothian) - www.vocal.org.uk
• Airways (SJH catchment area) - Secretary, tom-daly@blueyonder.co.uk
• Carers of West Lothian - 01506 771750, www.carers-westlothian.com
• Carers of East Lothian - 0131 665 0135, www.coel.org.uk
• Carers Scotland - www.carerscotland.org
17. **Patient information - websites, helplines and leaflets**

- **Chest, Heart & Stroke Scotland**  
  Website: [www.chss.org.uk](http://www.chss.org.uk)  
  Helpline: 0845 077 6000  
  COPD specific information and booklets: [www.chss.org.uk/chest/index.php](http://www.chss.org.uk/chest/index.php)

- **British Lung Foundation**  
  Website: [www.lunguk.org](http://www.lunguk.org)  
  Helpline: 08458 50 50 20  
  About COPD: [www.lunguk.org/you-and-your-lungs/conditions-and-diseases/copd.htm](http://www.lunguk.org/you-and-your-lungs/conditions-and-diseases/copd.htm)

- **Smokeline**  
  Website: [www.canstopsmoking.com](http://www.canstopsmoking.com)  
  Helpline: 0800 84 84 84

18. **Contacts**

**Respiratory nurse specialist service**  
- Royal Infirmary of Edinburgh - 0131 242 1878 (phone), 0131 242 1877 (fax)  
- West Lothian CHCP - 01506 651826  
- St. John’s Hospital - 01506 523865  
- Western General Hospital - 0131 537 1799 (phone/fax)

**Pulmonary rehabilitation**  
- Edinburgh CHP - 07969 334 704  
- West Lothian - 01506 522063  
- East and Midlothian - 07500 765 919  
- Royal Infirmary of Edinburgh - 0131 242 1904

**Edinburgh Community Respiratory Team** - 07826 894 067

**Edinburgh IMPACT Team (IMPproved Anticipatory Care and Treatment):**  
- North West Edinburgh - 0131 537 5077  
- North East Edinburgh - 0131 536 6208  
- South West Edinburgh - 0131 449 8602/8603  
- South Central Edinburgh - 0131 537 9235  
- South East Edinburgh - 0131 536 9677/9678

**Lothian Respiratory Managed Clinical Network (MCN)**  
[www.lothianrespiratorymcn.scot.nhs.uk](http://www.lothianrespiratorymcn.scot.nhs.uk)
19. References

All information sourced from both GOLD guidelines and NICE guidelines in addition to Lothian material.

GOLD (2008) *Global strategy for the diagnosis, management and prevention of chronic obstructive pulmonary disease*
Global Initiative for Chronic Obstructive Lung Disease
www.goldcopd.com

GOLD (2008) *Pocket guide to COPD diagnosis, management and prevention, a guide for health care professionals*
Global Initiative for Chronic Obstructive Lung Disease
www.goldcopd.com

National Institute for Clinical Excellence
www.nice.org.uk/guidance/CG12/101

Lothian Joint Formulary
www.ljf.scot.nhs.uk

Lothian palliative care in advanced lung disease guideline

Lothian Guideline for Domiciliary Oxygen Service Guideline
APPENDIX 1: Protocol for management if COPD exacerbation in primary care

Protocol for management of COPD exacerbation in primary care

Chronic obstructive pulmonary disease (COPD) is a common and serious condition. As the disease progresses, patients develop exacerbations (a change in the patient's baseline breathlessness, cough, and/or sputum volume or purulence that is beyond normal day-to-day variations, is acute in onset, and may warrant a change in regular medication in a patient with underlying COPD).

Bronchodilators and corticosteroids are the mainstay of treatment of exacerbations. Antibiotics should be used for patients with an increase in breathlessness, volume of sputum and sputum purulence, or an increase in two of these symptoms if increased sputum purulence.

Many patients with an exacerbation of COPD can be managed successfully at home.

All acute exacerbations can also be assessed and cared for by;

Edinburgh have access to the Community Respiratory Team (CRT) (08.00 – 18.00 daily) tel 07826894067
West Lothian have access to REACT (patients older than 75 yrs 09.00 -15.00 weekdays) tel 01506 524149

These community based teams will help and advise or take over the care of patients. The CRT may enable treatment of exacerbations in the community thus preventing the need for hospital admission. The CRT has admitting rights.

LUCS and the CRT have direct telephone contact for advice from a respiratory consultant.

Patients should be considered for direct admission to hospital if there is evidence of a severe exacerbation of COPD (oxygen saturations significantly below the patient’s normal measurement, or confusion) and for those who do not respond to initial treatment.

Decisions about management of a patient with an exacerbation of COPD will vary depending on the patient's individual circumstances including the severity of their underlying disease, the presence of other medical conditions, and their social situation. The community teams can manage complex cases and so help support patient care at home.

Sources/further reading (needs updated)
COPD Exacerbations

Patient attends GP practice or out of hours service LUCS with exacerbation of COPD

Are there symptoms or signs of severe exacerbation?

History
Marked increase in severity of symptoms including:
- Breathlessness
- Cough or sputum
- New limitation of daily activities

Examination
Onset of new physical signs
- Oxygen sats below patient’s normal value
- Central cyanosis
- Peripheral oedema
- Reduced consciousness or confusion

Are there other factors that give cause for concern?
- Three or more exacerbations in past year
- Previous hospital admission requiring ventilation eg, NIV
- Significant co-morbidities and/or diagnostic uncertainty
- Poor socioeconomic conditions (e.g. not coping at home)
- No improvement despite optimal therapy

GP management of the patient at home or referral to CRT (Edinburgh)

REACT (WL if >70)
- Maximise bronchodilator therapy (e.g. via spacer device/nebuliser)
- Corticosteroid if no contraindications (30mg prednisolone) for 7 days

Antibiotics if increased purulent sputum – amoxicillin 500mg 3 times a day for 5 days if penicillin allergy
   Doxycycline 200mg day 1 then 100mg daily for 4 days

Consider emergency admission to hospital

Advise patient about actions to take if deterioration in symptoms (including contact with NHS24)
Monitor patient regularly, and review markers of severity

COPD Exacerbations

CRT ECHP
REACT WLCHP

Pulmonary Rehabilitation

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Self-Management Plan for COPD

This is your personal management plan.

The aim of this plan is to help you have better control of your chronic obstructive pulmonary disease (COPD). It will enable you to monitor your symptoms and to know what to do if you have an exacerbation. An exacerbation is a rapid and sustained worsening of your symptoms that may warrant a change to your regular treatment.

This plan includes sections for recording medication, monitoring symptoms and treating exacerbations.

Name: __________________________________________

Date of birth: ________________ CHI: ____________________

Diagnosis/diagnoses: __________________________________________

GP practice contact number (Mon to Fri, 8am to 6pm)

Outside these hours, phone NHS 24 on 08454 24 24 24

Community/nurse respiratory service ____________________________ Date for review __/__/____

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