Lothian Guideline for Domiciliary Oxygen Therapy Service for COPD

This document describes the standard for clinical assessment, prescription, optimal management and follow-up of patients receiving domiciliary oxygen therapy.
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term oxygen therapy</td>
<td>3</td>
</tr>
<tr>
<td>Indications</td>
<td>3</td>
</tr>
<tr>
<td>Administration</td>
<td>3</td>
</tr>
<tr>
<td>Other conditions</td>
<td>3</td>
</tr>
<tr>
<td>Assessment</td>
<td>3</td>
</tr>
<tr>
<td>Contraindications</td>
<td>4</td>
</tr>
<tr>
<td>Ambulatory oxygen therapy</td>
<td>4</td>
</tr>
<tr>
<td>Short burst oxygen therapy</td>
<td>4</td>
</tr>
<tr>
<td>Patient follow-up</td>
<td>4</td>
</tr>
<tr>
<td>Appendix 1 – Assessment flow chart</td>
<td>5</td>
</tr>
<tr>
<td>Appendix 2 – Follow-up</td>
<td>6</td>
</tr>
<tr>
<td>Appendix 3 – Oxygen therapy for non-COPD conditions and symptom relief</td>
<td>7</td>
</tr>
<tr>
<td>Appendix 4 – Aide memoire for prescribing oxygen on GP10</td>
<td>8</td>
</tr>
</tbody>
</table>
Long-term oxygen therapy (LTOT)

LTOT refers to oxygen therapy for continuous use at home for patients with chronic hypoxemia (PaO$_2$ at < 7.3 kPa).

Indications

- LTOT should be considered in COPD patients with:
  - very severe airflow obstruction (FEV$_1$ < 30% predicted)
  - cyanosis
  - peripheral oedema
  - oxygen saturations < 92% breathing air.

- Long-term oxygen therapy is indicated for patients with COPD when the PaO$_2$ is consistently at or below 7.3 kPa, breathing air during a period of clinical stability. Clinical stability is defined as the absence of an exacerbation of COPD for the previous four weeks.

- LTOT can also be prescribed in chronic hypoxemic patients when the clinically stable PaO$_2$ is between 7.3 and 8 kPa together with one of the following:
  - secondary polycythaemia
  - clinical and/or echocardiographic evidence of pulmonary hypertension
  - peripheral oedema due to pulmonary hypertension.

- LTOT should not be prescribed in patients with chronic hypoxemia with a PaO$_2$ value above 8 kPa.

Administration

- LTOT, when prescribed, is likely to be given lifelong, and is given for at least 15 hours daily to include night-time due to the presence of worsening arterial hypoxemia during sleep.

- The oxygen flow rate for such patients must be sufficient to raise the oxygen tension above 8 kPa.

Other conditions

LTOT may also be considered in patients with chronic hypoxaemia due to some other condition/s when treatment will be initiated from secondary care. (See appendix 3).

Assessment

- Assessment and measurement of blood gases and assessment for oxygen therapy requires referral to a consultant physician with an interest in respiratory medicine (See appendix 1).

- Assessment for LTOT therapy requires measurements of arterial blood gas tensions on two occasions at least 3 weeks apart in patients with an accurate diagnosis of COPD, who are receiving optimum medical management and who are clinically stable.
• Patients with borderline blood gases for LTOT prescription should be considered for reassessment in three months with arterial blood gases.

• Oxygen concentrators should be used to provide the fixed supply of oxygen at home.

**Contraindications**

**Smoking is a contraindication to prescription of LTOT. However, patients who continue to smoke and fit the criteria for LTOT should be offered smoking cessation advice.**

**Ambulatory oxygen therapy**

Ambulatory oxygen therapy refers to the provision of oxygen therapy during exercise and activities of daily living.

• Ambulatory oxygen therapy can be prescribed in patients on LTOT who are mobile and need to, or can, leave the home on a regular basis.

• Ambulatory oxygen therapy may be indicated in patients with severe hypoxemia that are on LTOT up to 24 hours per day and are mainly housebound. These patients need ambulatory oxygen in order to leave the house to visit relatives, etc. This group of patients, however, may only require occasional ambulatory oxygen use.

• The flow rate of the ambulatory oxygen system will generally be the same as that used with LTOT.

• In the past, patients without chronic hypoxemia were considered for ambulatory oxygen therapy if they showed evidence of exercise desaturation. There is little evidence that this form of oxygen therapy improves activities of daily living and compliance in use of this therapy has been shown to be limited. **It is therefore not recommended.**

**Short burst oxygen therapy**

Short burst oxygen therapy refers to the intermittent use of supplemental oxygen at home, usually for periods of 10-20 minutes at a time to relieve breathlessness.

• There is, however, no good evidence available for the prescription of short burst oxygen therapy.

• All patients who have been prescribed oxygen and use it more than two hours a day via cylinders or more than two cylinders per week should be referred to a respiratory clinic for further assessment.

**Patient follow-up**

• Formal follow-up arrangements are required for all patients using home oxygen therapy to ensure that LTOT adequately corrects hypoxemia, there is good compliance with the LTOT ambulatory therapy, to detect clinical deterioration and ensure continuing requirement for oxygen therapy (See appendix 2).
APPENDIX 1

Long-term oxygen therapy assessment

- Patient should be clinically stable i.e. absence of exacerbation in the previous four weeks.
- Arterial blood gas tensions must be measured on two occasions, breathing air, not less than three weeks apart and prior to assessment for LTOT.
- Blood gases and not oxygen saturation (SaO$_2$) must be measured because assessment of hypercapnia and its response to oxygen therapy is required for safe prescription of LTOT.
- Assessment of oxygen requirements should be done using oxygen delivered from a standard oxygen source or oxygen concentrator.

**PERFORM ARTERIAL BLOOD GASES**

- **PaO$_2$ < 7.3 kPa**
  - (Or 7.3-8.0 kPa if associated with oedema, pulmonary hypertension, or secondary polycythaemia).
  - Trial of O$_2$ rates: Use the following as a guide to achieving an optimal flow rate.
  - 2 litres of O$_2$ per minute for 30 minutes via nasal prongs.

- **If PaO$_2$ > 8.0 kPa** – Patient NOT suitable for LTOT. Consider reassessment in three months.

**If PaCO$_2$ has not increased by > 0.5 kPa and:**

- **PaO$_2$ < 8.0 kPa**
  - Give 3 litres of O$_2$ per minute for 30 minutes.

- **PaO$_2$ > 8.0 kPa**
  - Patient is suitable for LTOT at 2 litres of O$_2$ per minute.
APPENDIX 2

Long-term oxygen therapy follow-up

Home follow-up

Patients on LTOT should be visited at home within four weeks of LTOT prescription by a respiratory nurse specialist experienced in the provision of domiciliary oxygen. The aims of this visit are:

- to provide further education and support for the patient and carer
- to record the $\text{SaO}_2$ by oximetry, breathing and prescribed oxygen flow rate
- for satisfactory correction of hypoxemia, $\text{SaO}_2$ should be at 92% or above on oxygen therapy
- the results of the home oxygen oximetry should be sent to the hospital specialist and GP.

All LTOT patients should be followed up six-monthly at home with measurements of $\text{SaO}_2$ on air and LTOT and communication with hospital and primary care.

Attention should also be paid during this visit to:

- concentrator location
- nasal cannulae/masks
- requirement for back-up cylinder
- check for adequate compliance with oxygen therapy
- to reinforce that no smoking is essential
- test the use of ambulatory oxygen device provided
- provide contact numbers for oxygen supplier and respiratory nurse specialist

Specialist referral

- In patients where $\text{SaO}_2$ is under-corrected, the patient may need to have repeat blood gas assessment on oxygen therapy to adjust the LTOT.

- Patients should be referred for reassessment to a hospital specialist if there is clinical deterioration or symptoms of worsening hypercapnia.
Appendix 3

Oxygen therapy for non-COPD conditions and symptom relief

Long-term oxygen therapy may be considered in the following conditions where criteria, similar to those applying to COPD, will be applicable. Patients should have been fully assessed by a respiratory physician and will be discharged from hospital with a recommendation for oxygen therapy.

- Severe chronic asthma
- Interstitial lung disease
- Cystic fibrosis
- Bronchiectasis
- Pulmonary vascular disease
- Primary pulmonary hypertension

Oxygen therapy may also be recommended for symptomatic relief without all the criteria for long-term oxygen therapy being in place for the following conditions

- Palliative care
- Heart failure

Occasionally a patient may be discharged with a prescription for oxygen before a full assessment has occurred. The discharge should indicate when the full assessment will be done. The supply of oxygen by cylinder should be for a short time only.

In late 2009 or early 2010, a National Policy on oxygen therapy is due to be published. This will contain all the information on the use and prescribing of oxygen for Scotland.
Appendix 4

Aide memoire for prescribing oxygen on GP10

Prescribed on GP10 and supplied by Community Pharmacy.

Short-term use
Patients must be assessed by a respiratory specialist for all forms of oxygen therapy.

<table>
<thead>
<tr>
<th>CYLINDERS Size F 1360 Litres</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AF</strong></td>
<td><strong>DF</strong></td>
</tr>
<tr>
<td>Requires a regulator (head) to be prescribed along with masks and tubing</td>
<td>Has an integral regulator but masks and tubing must also be prescribed</td>
</tr>
<tr>
<td>Cost: £9.09</td>
<td>Cost: £10.04</td>
</tr>
</tbody>
</table>

Giving Set
Comprises of a regulator, 2 x Ventimasks Mk IV and tubing. If the prescriber does not specify the cylinder type, an AF cylinder must be supplied.

Ambulatory/Portable Oxygen Therapy
Patients must be assessed to obtain portable oxygen and it is not a replacement for large cylinders or concentrators. No more than three cylinders are permitted at any one time and the patient is required to sign a contract with the community pharmacy.

<table>
<thead>
<tr>
<th>CYLINDER Size DD 460 Litres</th>
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<tbody>
<tr>
<td><strong>DD</strong></td>
<td></td>
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<tr>
<td>Supplied with integral regulator but masks/nasal cannulae and tubing must also be prescribed.</td>
<td></td>
</tr>
<tr>
<td>When prescribing, must specify “portable oxygen” and the volume of the cylinder (460 litres)</td>
<td></td>
</tr>
<tr>
<td>Cost: £22.98</td>
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<tr>
<th>ADMINISTRATION EQUIPMENT prescribable on GP10</th>
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<tbody>
<tr>
<td><strong>Masks</strong></td>
<td><strong>Nasal Cannulae</strong></td>
</tr>
<tr>
<td>• Ventimask MK IV, 28%*</td>
<td>• Intersurgical 1161</td>
</tr>
<tr>
<td>• Intersurgical 0100 Mask 28%</td>
<td></td>
</tr>
<tr>
<td>• Venticaire Venturi Mask 28%</td>
<td></td>
</tr>
<tr>
<td>• Intersurgical 005 Mask</td>
<td></td>
</tr>
<tr>
<td>• Venticaire Mask</td>
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*If type of mask not specified on GP10, Ventimask Mk IV will be supplied.

Domiciliary oxygen equipment is not suitable for:

<table>
<thead>
<tr>
<th>WHY</th>
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<tbody>
<tr>
<td>Emergencies</td>
<td>This requires high concentration oxygen at a flow rate of 10-15 litres/minute</td>
</tr>
<tr>
<td>Cluster headache</td>
<td>This requires 100% oxygen at a rate of 7-12 litres/minute</td>
</tr>
<tr>
<td>Nebulising with Oxygen</td>
<td>This requires flow rate of 6 litres/minute</td>
</tr>
</tbody>
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The Scottish Drug Tariff only allows supply of regulators for flow rates of 2 or 4 litres per minute.