Ambulatory Oxygen for London

This guide has been produced to help healthcare maximise the benefit of the new oxygen contract for patients and to reduce waste.

The indications and provision of LTOT (static concentrators in the home for long term treatment of chronic respiratory failure) have not changed.

It is the provision of ambulatory oxygen, principally to treat breathlessness in patients who become hypoxic on exercise and who are also physically active, that is new. The guide is aimed at adults but much of the content will apply to children for whom both portable (younger) and ambulatory (older) oxygen is normally essential.

Why ambulatory oxygen?

The purpose of Ambulatory Oxygen (AO) is to enable patients to remain as physically active as possible. Increasing exercise capacity has a survival advantage in COPD and may also reduce admissions. There is also evidence that ambulatory oxygen improves life quality in respiratory failure.

AO should be considered for all patients receiving LTOT who regularly leave the home.

It is also useful in some patients, such as those with interstitial or pulmonary vascular lung disease, who do not qualify for LTOT but who are profoundly breathless and hypoxic on exercise.

A patient is conventionally assessed for AO if the oxygen saturation (SpO2) falls below 90% on exercise. To be considered for AO, exercise tolerance must be shown to improve with oxygen and, at review, it should be determined that AO is being used. In addition, every attempt should be made to help smokers to stop.

Top tips for Ambulatory Oxygen

1. Clinicians ordering equipment should be competent in performing and interpretation of ambulatory oxygen assessments

2. Before assessment, patients should be asked if they are willing to use oxygen outside the home. If they are reluctant to do so ambulatory oxygen may not be indicated.

3. Patients should be assessed using the equipment being considered for them.

4. Unless there are special circumstances, only one type of ambulatory equipment is required.
5. After starting LTOT, an initial 2 month trial using portable cylinders may be useful before undertaking a full assessment. Use during this period may then guide equipment selection.

6. The Modality selection tool may help in ambulatory oxygen selection but does not take into account life-style or patient ability to use the equipment.

7. Use standard 3 day delivery when ordering ambulatory oxygen.

8. As with LTOT, ambulatory oxygen may not be appropriate if patients smoke.

9. After considering barriers to use, consider removing ambulatory oxygen if not being used.

10. The oxygen equipment provided by the NHS should not be taken outside the UK. The gas supply company may enable such trips to be made through a private arrangement with patients.

**Patient selection**

Three groups of patients, characterized by their different oxygen requirements, are recognised (BTS clinical component of HOS, 2006):

**Group 1: LTOT patients who only walk short distances outdoors**

This is the majority of advanced COPD patients on LTOT. They will have limited mobility but may still leave the house regularly. In most, a complex assessment is not required.

A standard portable cylinder will usually be prescribed to enable trips away from home. A long lead from the O2 concentrator should suffice for most activities of daily living indoors (bearing in mind the danger of trips and falls). The ‘ambulatory’ flow rate will usually be set at the LTOT flow rate but may need increasing for more significant exertion, such as climbing stairs, or during an AECOPD.

A HOOF B should be completed, ordering sufficient cylinders to meet the needs of the patient and avoid frequent deliveries.

**Group 2: More mobile LTOT users and those LTOT users with CF, ILD etc who take regular exercise**

These patients are often recognised as needing AO at PR programmes. They tend to be younger with less co-morbidity. They require specialist assessment to maximise the benefit of the new ambulatory devices and to explain the benefits and rationale of AO. 1-2 visits will be required for equipment titration with a subsequent follow up at 3/12 to ensure AO is being optimally used. Thereafter, follow up will normally be by the local arrangements for monitoring oxygen.
Group 3: Non LTOT patients who are limited by severe breathlessness relating to oxygen desaturation

These patients will often have interstitial lung disease (ILD), chest wall disease (scoliosis or profound obesity) or pulmonary vascular disease.

They will require specialist assessment.

**Why does the new contract make specialist assessment necessary?**

Ambulatory oxygen has been unpopular with clinicians and with many patients in the past. This was mostly because cylinders were heavy and insufficient flow rates were prescribed. As a result, the cylinders were used as a portable supply of oxygen rather than as ambulatory devices.

The new contract offers many new modalities that enable much greater benefit from AO. In many cases, however, they demand individual patient assessment and review.

The new equipment includes:

- Standard and lightweight ambulatory cylinders +/- conserver
- Self-fill cylinders (a compressor on top of a concentrator)
- Liquid oxygen (LOX) portable flask refillable from a home reservoir (Dewar)
- A portable concentrator (that can be carried or pulled on a trolley)
- A transportable, wheel along concentrator that can provide LTOT at home and on trips away from home. It is not suitable for ambulatory use but has a battery option.

**Home-fill cylinders from O2 concentrator**

- The self-fill system consists of a concentrator and compressor that re-fills portable cylinders.

- Self-fill has the advantage of independence from the need for regular deliveries but it delivers a pulsed dose which may limit its value for some patients.

- When simultaneously using the concentrator to provide static oxygen, the fill time of the portable cylinder is prolonged.

- Patient/family should be capable of filling cylinders as social carers may not be allowed to do so.

**Transportable concentrator**

- The transportable concentrator is only suitable for patients requiring flow rates of continuous oxygen up to 3 litres per minute.

- It is best used for providing static oxygen in patients who spend time away from home on a regular basis.

- In these circumstances, it should be used as the LTOT oxygen source and replace the static concentrator.
Although it may not be required, a back-up cylinder is routinely provided with the transportable concentrator.

**Portable concentrators**
- The portable concentrator only delivers pulse oxygen and is more suitable for convenient oxygen delivery when travelling rather than ambulatory use.
- The 5 settings are not equivalent to flow rate (litres per minute) and will be less effective.
- The portable concentrator should be the main source of portable/ambulatory oxygen if prescribed.

**Liquid Oxygen**
- Liquid oxygen best suits patients who remain physically active or who are regularly out of the home for several hours and require high flow rates.
- The patient or carer needs to be able to fill the portable flask from the reservoir tank (Dewar). Homes above the second floor are likely to be unsuitable because of difficulties with delivery of the Dewar.

**Home oxygen prescribing**

The provision of basic ambulatory equipment will be available from most acute sites that regularly arrange home oxygen prior to discharge and from community services that assess patients for HOS in the home or in a community facility.

Staff will often carry out simple assessments to look for oxygen desaturation on exercise. National recommendations are for such services to sit within a comprehensive and integrated COPD service.

More specialist assessment will be carried out in a limited number of specialist centres. Staff will be familiar with the wide range of equipment and be able to carry out exercise tests using the different modalities to best meet the complex needs that some patients have. The Primary Care Commissioning Good Practice Guide (2011) provides further information on HOS-ARS services.

**Ambulatory oxygen assessment centres will have:**
- An area in which walking tests can be carried out
- Staff with experience and training
- A & C support: to maintain records, appointments etc
- Spirometry, oximetry and ABGs/ELBGs capability

The equipment available in a specialist centre is likely to include:
- O2 concentrators
- Standard & light weight cylinders
- LOX & flasks
- Conserver devices for O2 cylinders

**Aspects of assessment:**
A reproducible exercise test should be used to assess the appropriate flow rate/setting of a device. Endurance tests may be more sensitive than maximal exercise tests (Davidson et al, 1988, Eaton et al, 2006).

The different ambulatory devices have advantages and disadvantages e.g. weight, flow profile, respiratory rate limits etc. Patients should be assessed on the device that is likely to best suit their needs (Tiep et al, 2002; Gallegos and Shigeoka, 2006; BTS Clinical component, 2006).

Pulsed oxygen devices vary in sensitivity and patient value. Settings required for activity will not be the same for every device.

Aspects of mobility, such as bags or trolleys, need to be assessed.

It may not be possible to prevent exercise de-saturation.

Assessment will usually involve more than one session. An interim prescription may enable better tailoring of equipment to patient need.

Referral to HOS-AR & follow up arrangements

Local commissioning will dictate referral and follow up.

Normally patients will need to be seen again at 6 months and within 6 weeks of an acute illness that results in hospital admission. Annual re-assessment has been recommended (Primary Care Commissioning, 2011) and this may include repeat exercise testing and blood gases.

Patients with more rapidly progressive disease, such as ILD, may require more frequent follow up.

Telephone contact may be an efficient method of follow up.

Under or over use

Where the review indicates that the patient is not deriving clinical benefit (under-use) or is making excessive demands (frequent cylinder deliveries, multiple devices) review should take place to ascertain if this is due to:

- inadequate device or flow rate prescription: reassessment is needed
- no longer indicated: AO should be withdrawn
- AO is restricting patient activities: an alternative device should be tried or AO discontinued

Cost implications of ambulatory oxygen with the new contract

Whilst the previous contract was mostly based on a daily charge, the new contract has both delivery and rental costs. The pricing for the different ambulatory devices will therefore be more dependent on delivery charges. Stock holding (up to 8 cylinders) may be cost effective as may Home fill which avoids delivery charges. Generally, costs will range from £600 to £1600 pa depending on system chosen and delivery schedules.

References


• NHS Primary Care Commissioning (2011) Home oxygen service- Assessment and Review- Good Practice guide.


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London Respiratory Team  
Share ideas, connect with respiratory colleagues and sign up to our regular alerts at http://www.networks.nhs.uk/nhs-networks/london-respiratory-team