Guidelines for the Use of Oxygen in Palliative Care

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Summary of Main Recommendations

Introduction
Oxygen is a vital resource. However there are potential problems and risks that healthcare professionals should be aware of. 5-8, 17 There is no strong evidence that oxygen is beneficial for the management of breathlessness in palliative care. 8,11 [Level 1+]
It may be appropriate to use other strategies, pharmacological and non-pharmacological, to manage breathlessness before trialing oxygen. 21 [Level 4]
If oxygen is used, it should be reviewed after 72 hours. If it has not been beneficial, consider discontinuing. 17 [Level 1+]

Clinical assessment
• Where appropriate, patients should be investigated for reversible causes of breathlessness or hypoxia. 21, 22 [Level 4]
• Oxygen saturations may be used to guide the use of oxygen. The British Thoracic Society recommends target saturations of: 22
  □ 94-98% in patients with cancers with pulmonary involvement. [Level 4]
  □ 88-92% in patients at risk of hypercapnic respiratory failure (see Table 1). [Level 3]
• Where appropriate, target saturations should be documented by medical staff. 22 [Level 4]

Safe oxygen use
Health professionals should be aware of potential problems associated with oxygen (see Table 3). These include dry mouth, increased risk of falls and psychological dependence. 22
Patients who continue to smoke provided with oxygen are at risk of causing fires and burn injuries. 29-30

Patients who continue to smoke should undergo risk assessment and the appropriate authorities informed. 29, 30 [Level 4]
Specialist Palliative Care In-Patient Units should have:
• A policy for the safe use of oxygen. 9
• Access to a pulse oximeter.
• A range of consumables available to provide oxygen. 22 [Level 4]

Prescribing oxygen
Oxygen prescriptions should state:
• The flow rate in litres per minute.
• The method of delivery e.g. nasal specs, face mask.
• Frequency of use e.g. continuous or PRN.
• Target saturations (if appropriate). 22 [Level 4]

Patients who are discharged with home oxygen
Where available, patients should be referred to the local oxygen assessment service. [Level 4]
Section 1: Introduction

- Breathlessness is a common symptom in patients with advanced malignancy and other life-limiting illnesses. The aetiology may be multifactorial.\(^1\)\(^4\)
- Oxygen may be used in palliative care for symptom control and in situations where a patient is hypoxic.\(^1\)
- Traditionally, oxygen was considered a benign therapy with few risks.\(^5\) However, there are many potential side effects associated with oxygen, not all of which are physical.\(^5\)\(^-\)\(^8\) Oxygen may have a symbolic association of being ‘life-saving’ which may lead to a psychological dependency.\(^5\)
- All specialist palliative care inpatient units should have a policy to support the safe prescribing and use of oxygen.\(^9\) [Level 4]

Section 2: Scope and Purpose

- This guideline is primarily aimed at professionals working in specialist palliative care inpatient units. This may include doctors, nurses, physiotherapists, occupational therapists and pharmacists. However, the principles will also be relevant to those working in primary and secondary care, including the community setting.
- The aims of the guideline are to:
  - ensure oxygen is being used appropriately in palliative care patients
  - encourage the safe use of oxygen
- Table 1 summarises the scope and purpose of this guideline.

<table>
<thead>
<tr>
<th>Table 1: Scope and purpose of guideline</th>
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<tbody>
<tr>
<td><strong>Population</strong></td>
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<tr>
<td>• Adults with life-limiting disease in whom oxygen has been considered or used</td>
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<tr>
<td><strong>Populations not covered</strong></td>
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<tr>
<td>• Patients without life-limiting disease</td>
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<tr>
<td><strong>Healthcare setting</strong></td>
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<tr>
<td>• People in their usual place of residence</td>
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<tr>
<td>• Primary and community care</td>
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<tr>
<td>• Secondary care</td>
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<tr>
<td>• Hospice care</td>
</tr>
<tr>
<td><strong>Topics</strong></td>
</tr>
<tr>
<td>• Evidence-base behind use of oxygen to manage symptoms in palliative care</td>
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<tr>
<td>• Assessment and monitoring of patients using oxygen</td>
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<tr>
<td>• Side effects and risks of using oxygen</td>
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<td>• Prescribing of oxygen and consumables</td>
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<tr>
<td><strong>Topics not covered</strong></td>
</tr>
<tr>
<td>• Use of oxygen for reasons other than symptom control</td>
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Section 3: Methods

3.1 Clinical Questions

- The clinical questions were devised by the Guideline Development Group which has authored this guideline.
  - Which patients with palliative care needs benefit from oxygen?
  - What protocols should services have in place to ensure the safe use of oxygen?

3.2 Literature Search

- Systematic electronic database searches were done to find articles relevant to the clinical questions. AMED, EMBASE, HMIC, Ovid MEDLINE, PsychINFO, BNI, CINAHL, Health Business ELITE and Cochrane databases were searched in March 2013. A full explanation of the search strategy, results and appraisal of evidence can be found in Appendix 1. A supplementary search was undertaken in July 2013 specifically looking at home oxygen and fire risk.
- Grading of level of evidence and recommendations follows the Cheshire and Merseyside Palliative and End of Life Care Network Audit Group Guideline Development Manual and uses SIGN criteria.

Section 4: Guideline Recommendations

4.1 Evidence base for the use of oxygen in palliative care

- Long-term oxygen therapy (LTOT) has been shown to improve survival in patients with COPD. However published research does not support the routine use of oxygen in palliative care and at the end of life for the relief of, or palliation of, breathlessness.

- Inhalation of air has been shown to be as effective as oxygen for symptomatic relief of breathlessness. Use of air also avoids difficulties associated with oxygen including fire risks, central hypoventilation and cost. However air is not routinely used for symptom control.

- Published research suggests that other strategies for managing breathlessness should be instituted before using oxygen. Once these other strategies have been optimised, a trial of oxygen for symptomatic benefit is reasonable, provided the benefits outweigh the risks and the patient has been counselled.

- It is recommended that when oxygen is trialed, patients should be reassessed after 72 hours. The oxygen should be discontinued if it has not been of benefit.

4.2 Assessment

- Breathlessness or hypoxia may be caused by an acute, reversible event. Patients should be assessed and oxygen used if clinically indicated.

- Patients with palliative care needs being considered for oxygen therapy for breathlessness may undergo assessment using various tools, including BORG, VAS, MRC Dyspnoea score, Dyspnoea-12 and the Multidimensional Dyspnea Profile. The measurement of oxygen saturations using a pulse
oximeter should be used to inform decision-making around the use of oxygen therapy.

- Patients with interstitial lung disease may need oxygen because of significant desaturation on exercise. These patients should already be supported by specialist respiratory services and have regular review of their need for oxygen. Close liaison between such services and palliative care is recommended. [Good Practice Point]

4.3 Principles of Use of Oxygen

- Pharmacological and non-pharmacological strategies for symptom control may be utilised simultaneously. [Level 4]

- If the patient is hypoxic, reversible causes should be identified and treated where appropriate. The use of oxygen should be considered. [Level 4]

- There is no evidence to support the use of oxygen in the absence of hypoxia. Where other strategies have been optimised, a trial of oxygen may be reasonable but the patient should be counselled about the risks and benefits. The effectiveness should be assessed after 72 hours.

- For patients in the last days or hours of life, the decision to continue or withdraw oxygen should be made on an individual basis and discussed with the patient and those identified as important to them. [Good Practice Point]

4.4 Monitoring

- The British Thoracic Society (BTS) recommends that in patients with cancers with pulmonary involvement, the target oxygen saturation should be 94%-98%. [Level 4]

- For patients at risk of hypercapnic respiratory failure (see Table 2), BTS Guidelines recommend target saturations of 88% to 92%. [Level 3] Excess oxygen therapy may lead to respiratory depression, drowsiness or confusion. Staff should be aware of the importance of monitoring oxygen saturations.

- Palliative care physicians should establish whether or not patients have a history of hypercapnic respiratory failure. This may require liaison with other services e.g. respiratory, community, specialist oxygen services. [Good Practice Point]

<table>
<thead>
<tr>
<th>Table 2 Patients at risk of hypercapnic respiratory failure</th>
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<tbody>
<tr>
<td>• COPD</td>
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<tr>
<td>• Neuromuscular disorders</td>
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<tr>
<td>• Severe kyphoscoliosis</td>
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<tr>
<td>• Overdose of opioids or benzodiazepines</td>
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<tr>
<td>• Severe scarring from old tuberculosis</td>
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For each patient who is prescribed oxygen, medical staff should determine target saturations and clearly document in the case notes. However, checking saturations may not be appropriate in some patients, and in these cases oxygen can be titrated according to symptoms. [Level 4]

Specialist palliative care in-patient units should have access to a pulse oximeter in order to measure oxygen saturations. There should also be access to a range of consumables to deliver oxygen at a particular flow rate or concentration. [Level 4]

4.5 Side effects and risks of oxygen therapy

There are a number of side effects and risks associated with oxygen therapy and these are listed in Table 3.

Patients who smoke should be warned about the associated risks. Patients who continue to smoke while provided with oxygen are at greater risk of adverse consequences, including causing fires, burn injuries and death. It may not be appropriate to supply oxygen to patients who are still smoking. Health professionals should undertake a full risk assessment and inform the oxygen and fire services. Local policies should provide further guidance. [Level 4]

Table 3: Side effects and risks of oxygen therapy

<table>
<thead>
<tr>
<th>Side effect</th>
<th>Risk</th>
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<tbody>
<tr>
<td>Claustrophobia</td>
<td>Loss of independence</td>
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<tr>
<td>Dry nose/eyes/mouth</td>
<td>Pressure sores to ears or nose</td>
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<tr>
<td>Drowsiness</td>
<td>Psychological dependence</td>
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<tr>
<td>Fire risk</td>
<td>Reduced mobility and risk of falls</td>
</tr>
<tr>
<td>Hypercapnic respiratory failure</td>
<td>Social isolation</td>
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4.6 Prescribing oxygen

Oxygen is a drug, and should be prescribed appropriately. This may be on a handwritten drug chart or via an electronic prescribing system. [Level 4]

Prescriptions for oxygen should specify:
- The flow rate in litres per minute
- The method of delivery e.g. nasal specs, face mask, non-rebreather mask
- Frequency of use e.g. continuous, PRN, overnight
- Target saturations [Level 4]

Prescribers should be trained on the oxygen systems available in the community and how to order these. [Level 4]

If a patient is discharged with oxygen therapy and a local oxygen service is available consider referring to the service for assessment. [Good Practice Point]
Section 6: Standards

1. Every specialist palliative care inpatient unit should have a policy for the use of oxygen. [Grade D]
2. All specialist palliative care in-patient units should have equipment available to measure oxygen saturations. [Grade D]
3. The indication for the use of oxygen should be clearly recorded in the patient case notes. [Grade D]
4. Oxygen should be prescribed, including flow rate and system of delivery. [Grade D]
5. If the measurement of oxygen saturation is clinically appropriate, a target range should be documented. [Grade D]
6. The use of oxygen should be reviewed within 72 hours of starting. If it has not been beneficial, consider discontinuing. [Grade B]
7. A patient information leaflet should be given to all patients commenced on oxygen therapy. [Grade D]
8. All staff involved in administering or prescribing oxygen therapy should receive appropriate training. [Grade D]
9. If oxygen is provided for a patient who continues to smoke, a risk assessment should be carried out and the patient should be counselled on the risks. This should be clearly documented. [Grade D]
10. For patients who are discharged on oxygen, primary care services should be provided with information on the equipment supplied, the flow rate and the delivery system used. [Grade D]

Applications and Implications

The audit of use of oxygen in the region highlighted two issues of patient safety. Firstly, the audit showed that there was scope for improvement in the prescribing of oxygen. Secondly, risk assessments for patients who smoke while supplied with oxygen are carried out infrequently at best. Individual units are encouraged to prioritise these areas.

Staff education around the importance of and rationale for measuring oxygen saturations should also be addressed. Future audits of this guideline will assess whether local practice has improved.

Acknowledgments and Declarations of Interest

We acknowledge the work of the following in supporting these guidelines. Damian Cullen, Clinical Audit Officer, at Liverpool Heart and Chest Hospital for support and assistance in collecting and analysing audit data. Dr Martin Ledson, Consultant Respiratory Physician, at Liverpool Heart and Chest Hospital for his comments and review of the guidelines. Dr Sara Booth Associate Lecturer University of Cambridge, Honorary Consultant, Cambridge UHNHSFT, for her input as external reviewer.

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Review Date
The guidelines will be reviewed three years after publication as outlined in the Cheshire and Merseyside Palliative and End of Life Care Network Audit Group Guideline Development Manual.10

References
9. Cheshire and Merseyside Palliative and End of Life Care Strategic Clinical Network Audit Group meeting, 12th September 2013.


27. Leadership Alliance for the Care of Dying People. One Chance to Get It Right: Improving people’s experience of care in the last few days and hours of life. London. 2014.[Link]


Appendix 1: Systematic Review Summary Form

Guideline Title: Guidelines for the Use of Oxygen In Palliative Care
Reviewers: CL Robinson, AA Scott, H Bonwick, A Thompson

Clinical Question – To investigate the role of oxygen in palliative care

Databases NHS Evidence Healthcare Database and Cochrane.
Terms ‘palliative’ ‘terminal’ ‘end of life’ AND ‘oxygen’ were searched in the title.

Records identified AMED, EMBASE, HMIC, Ovid MEDLINE, PsychINFO, BNI, CINAHL, Health Business ELITE and Cochrane databases (n = 372)

Records after duplicates removed (n = 134)

Records excluded (n = 113)
Foreign language = 10
Inappropriate topic = 101
Full text not available = 2

Records screened (n = 134)

Full-text articles assessed for eligibility (n = 21)

Full-text articles excluded (n = 4)
Review article (n = 4)

Studies included in final literature review (n = 17)