The London Approach to Reducing Home Oxygen Related Harm: Shared Responsible Oxygen Prescribing and Risk Assessment

Debbie Roots, Consultant Respiratory Nurse, Homerton Hospital Co-lead, London Clinical Oxygen Network
14th November 2016
Outline

• Case Study

• Getting care right for complex hypoxic patients: Does available guidance help us?

• Responsible Oxygen Prescribing – what it is and why it matters

• London Clinical Oxygen Network messages
Case Study 1: Mrs T B

44 y/o female

Background:
- ESRF on haemodialysis
- DM with nephropathy, neuropathy and retinopathy (insulin)
- Dilated cardiomyopathy
- Obesity
- ?Asthma/?COPD

Hospital admissions (under renal team):
1. July 2014 - fluid overload; started haemodialysis
   (lung function tests: mild reversible airflow obstruction)
2. Feb 2015 - acute coronary event, fluid overload, sepsis
3. Feb 2015 - fall, fluid overload and “LRTI”
   “smoker” noted on D/S – discharged on SABA and ICS plus NRT
Case Study 1: Mrs T B

Hospital admissions:

4. July-Sept 2015

- Sepsis: faecally contaminated sacral pressure sores (bedbound) - VRE
- Community acquired pneumonia and pleural effusion
- Right DVT and pulmonary emboli
- Defunctioning sigmoid loop colostomy

PMHx
- Depression and self harm
  - “Possible developmental issues and genetic abnormality in daughter”
  - “Long term oxygen therapy”

- 3/8/15 Found smoking on ward, on oxygen, altercation ++, cigarettes removed
- 6/8/15 Found smoking on ward, on oxygen, altercation ++, cigarettes removed
- 15/8/15 Fire related to smoking on oxygen on HD ward
- Burns to face and nostrils; melted oxygen tubing stuck to face, bedclothes burnt
Discharged home 3/9/15
Died 7/9/15
Missed opportunities?

- Oxygen given in hospital: *never prescribed; no target sats set*
- Oxygen saturations: 94-96% on air, $P_aO_2$ 13kPa on 2LPM oxygen *ie not hypoxic*
- Home oxygen: prescribed by GP May 2015 after patient complained of *breathlessness*
- Home oxygen: no *oxygen assessment* or referral to specialist HOSAR team in community
- Home oxygen removal order 20/8/15: family relieved as “*mum was smoking on the oxygen all the time and we were really worried*”
- Smoking status: well known but only one recorded offer of *treatment* with NRT
- Agitation, labile mood and altercations on ward: *nicotine withdrawal* as a potential cause not discussed on any consultant WR
What does GMC say about responsible prescribing?

Good practice in prescribing and managing medicines and devices

1. In Good medical practice (2013) we say:
   - You must keep up to date with, and follow, the law, our guidance and other regulations relevant to your work.
   - You must recognise and work within the limits of your competence.
   - In providing clinical care you must:
     - prescribe drugs or treatment, including repeat prescriptions, only when you have adequate knowledge of the patient's health, and are satisfied that the drugs or treatment serve the patient's needs.
     - provide effective treatments based on the best available evidence.
     - check that the care or treatment you provide for each patient is compatible with any other treatments the patient is receiving, including (where possible) self-prescribed over-the-counter medications.
   - You must make good use of the resources available to you.
   - Documents you make (including clinical records) to formally record your work must be clear, accurate and legible. You should make records at the same time as the events you are recording or as soon as possible afterwards.
   - Clinical records should include:
     - relevant clinical findings
     - the decisions made and actions agreed, and who is making the decisions and agreeing the actions
     - the information given to patients
     - any drugs prescribed or other investigations or treatment
     - who is making the record and when.
Does GMC guidance help us to do the right thing?

WE ARE ALL RESPONSIBLE FOR:

- oxygen prescription, administration and management, including for NOT prescribing checking oxygen prescription is safe
- what are the risks for this individual?
- how will you mitigate them?
- recording clear indication, dose, duration and clinical parameters
- target sats
Does GMC guidance help us to do the right thing?

WE ALL HAVE A RESPONSIBILITY TO:

- have the full picture about the person you are prescribing oxygen for
- is oxygen is the right treatment for them?
- is this the right time?
- consider interactions (risk)
  - tobacco dependence
  - substance misuse
  - cognitive impairment
  - immobility/falls
- work as part of a team
  - patient
  - MDT (pharmacists)
- take advice!
Does GMC guidance help us to do the right thing?

WE ALL HAVE A RESPONSIBILITY TO:

24. You should reach agreement with the patient on the treatment proposed, explaining:
   a. the likely benefits, risks and burdens, including serious and common side effects
   b. what to do in the event of a side effect or recurrence of the condition
   c. how and when to take the medicine and how to adjust the dose if necessary, or how to use a medical device
   d. the likely duration of treatment
   e. arrangements for monitoring, follow-up and review, including further consultation, blood tests or other investigations, processes for adjusting the type or dose of medicine, and for issuing repeat prescriptions.

30. You must contribute to the safe transfer of patients between healthcare providers and between health and social care providers. This means you must share all relevant information with colleagues involved in your patient’s care within and outside the team, including when you hand over care as you go off duty, when you delegate care or refer patients to other health or social care providers. This should include all relevant information about their current and recent use of other medicines, other conditions, allergies and previous adverse reactions to medicines.

31. It is essential for safe care that information about medicines accompanies patients (or quickly follows them, for example on emergency admission to hospital) when they transfer between care settings.

• Give information about oxygen prescription in a way patients and carers can understand
• Ensure information about oxygen prescription is shared with other HCPs (GP, nursing home, fire service)
Do BTS guidelines help us to do the right thing?
Do BTS guidelines help us to do the right thing?

Common difficult clinical scenario 1: Should LTOT be started on hospital discharge after COPD exac?

Evidence review
30-60% patients do not meet LTOT criteria after 12-14 weeks..
Oxygen withdrawal can be difficult..

Evidence statement

- Patients referred for LTOT assessment after an exacerbation of COPD can show improvement in hypoxaemia with recovery above the threshold for LTOT after an 8-week period.
  - Evidence level 1+

Recommendation

- Patients should undergo formal assessment for LTOT after a period of stability of at least 8 weeks from their last exacerbation. (Grade B)
Common difficult clinical scenario 2: How should oxygen treatment be withdrawn?

Patients should be made aware that O2 treatment may be temporary.

Recommendations

- Patients initiated on LTOT should be provided with formal education by a specialist home oxygen assessment team to ensure compliance with therapy. (Grade D)
- Patients being commenced on home oxygen on discharge from hospital should be advised that home oxygen may be removed if reassessment shows clinical improvement. (Grade D)

- LTOT patients should receive follow-up visits at 6–12 months after their initial 3-month follow-up, which can be either home based or in combination with hospital or clinic visits. (Grade D)
- Follow-up visits should be conducted by a specialist home oxygen assessment team with the necessary skills to deliver patient education and manage withdrawal of home oxygen. (Grade D)

Good practice point

- All patients for whom LTOT has been ordered should be visited at home within 4 weeks by a specialist nurse or healthcare professional with experience of domiciliary oxygen therapy. The visit provides an opportunity to highlight potential risks and should be used to reinforce education and offer support to the patient and carer. Compliance may be checked, along with smoking status, symptoms of hypercapnia and oxygen saturations on oxygen to check that oxygen is therapeutic. (√)
Do BTS guidelines help us to do the right thing?

Common difficult clinical scenario 3: Should oxygen be prescribed to palliate breathlessness?

Evidence review
No evidence for palliative oxygen
Evidence for benefit of opioids
Fans

**Evidence statements**

- Measurements of oxygenation do not correlate well with the subjective experience of dyspnoea in patients with cancer or end-stage cardiorespiratory disease. Evidence level 2+
- Hypoxaemic patients do not experience a significant difference in symptoms between air and POT despite having improved oxygen saturations when administered oxygen. Evidence level 2+
- Non-hypoxaemic patients or those with mild levels of hypoxaemia who would not normally qualify for LTOT do not experience symptomatic benefit with POT compared with air. Evidence level 1++
- Opioids are significantly better than POT in reducing the intensity of dyspnoea in non-hypoxaemic or hypoxaemic patients. Evidence level 1+

**Recommendations**

- Patients with cancer or end-stage cardiorespiratory disease who are experiencing intractable breathlessness should not receive treatment with POT if they are non-hypoxaemic or have mild levels of hypoxaemia above current LTOT thresholds (SpO₂ $\geq$ 92%). (Grade A)
- Patients with cancer or end-stage cardiorespiratory disease who are experiencing intractable breathlessness should receive assessment for a trial of treatment with opiates from an appropriately trained healthcare professional. (Grade A)
- Patients with cancer or end-stage cardiorespiratory disease who are experiencing intractable breathlessness should receive assessment for a trial of treatment with non-pharmacological treatments including fan therapy, from an appropriately trained healthcare professional. (Grade D)
Do BTS guidelines help us to do the right thing?

Common difficult clinical scenario 3: Should oxygen be prescribed to palliate breathlessness?

Good practice point

- POT may on occasion be considered by specialist teams for patients with intractable breathlessness unresponsive to all other modalities of treatment. In those instances, individual formal assessment of the effect of palliative oxygen on reducing breathlessness and improving quality of life should be made. (✓)
Effect of palliative oxygen versus room air in relief of breathlessness in patients with refractory dyspnoea: a double-blind, randomised controlled trial.
Abernethy AP, McDonald CF, Frith PA et al. Lancet 2010 Sep 4; 376 (9743); 784-93

Large double-blind RCT
9 sites Australia, USA & UK
239 patients with refractory dyspnoea but PaO₂>7.3kPa
1:1 assignment to O2 at 2L/min or medical air via concentrator
7/7 for 15 h/day
Breathlessness symptom scores am and pm
Side effects
Effect of palliative oxygen versus room air in relief of breathlessness in patients with refractory dyspnoea: a double-blind, randomised controlled trial.
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Lancet 2010 Sep 4; 376 (9743); 784-93

Mean breathlessness score (points)

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<tr>
<th></th>
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<th>Air</th>
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<tr>
<td>Am</td>
<td>-0.9</td>
<td>-0.7</td>
</tr>
<tr>
<td>Pm</td>
<td>-0.3</td>
<td>-0.5</td>
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NO DIFFERENCE in symptoms or quality of life

Nasal irritation (both groups) and nose bleed (oxygen)

“Since oxygen provides no additional symptomatic benefit for relief of refractory dyspnoea in patients with life-limiting illness ….less burdensome strategies should be considered…”
Do BTS guidelines help us to do the right thing?

Common difficult clinical scenario 4:
Should hypoxic smokers be prescribed home oxygen?

Do smokers with COPD get mortality benefit from LTOT?

What are the risks to patients prescribed home oxygen who continue to smoke?
Do BTS guidelines help us to do the right thing?

Common difficult clinical scenario 4:
Should hypoxic smokers be prescribed home oxygen?

Good practice points

- Safety should be a factor when making decisions regarding ordering home oxygen. Education and written information should be provided to the patient and their family or carers regarding the safe use of oxygen and its equipment. (√)

- The risks of prescribing oxygen to active smokers should be considered on a case-by-case basis: this should include a home visit to assess the patient’s home situation, attitude toward risks and smoking behaviour. Home oxygen assessment services may decide not to prescribe home oxygen to smokers if the risks are in their judgement too high. Particular consideration needs to be given to risks to children and risks to neighbours in multiple occupancy dwellings. A risk assessment tool should be used, and the health professional who is undertaking the risk assessment may need to visit the home in conjunction with the local fire service and/or the oxygen contractor. Where there is reasonable doubt, the therapy should not be prescribed. (√)

- Patients who continue to smoke or live with other household smokers should be informed that the order for home oxygen will be reviewed and evidence of increased risk may lead to withdrawal of home oxygen therapy. (√)
Responsible Oxygen Prescribing: definition

LTOT = Mortality benefit = outcome that matters to patients but...

RightCare

Balance priorities of care

PRIMUM
NON
NOCERE

KING'S HEALTH PARTNERS
LONDON CLINICAL OXYGEN NETWORK:

- Subgroup of London Respiratory Network (NHSE Strategic Clinical Networks)

AIMS:

- Agree and offer clear standards for responsible oxygen prescribing to providers and commissioners
- Understand/highlight variation in practice
- Collaboration and building links
- Peer support/training
- Practical guidance
- Represent LRN
1. Oxygen is a medicine that should always be planned, prescribed and reviewed by staff trained in oxygen prescription and use.

2. Oxygen is a medicine to treat hypoxia, not breathlessness, and therefore should not be prescribed for breathlessness without hypoxia (cluster headache excluded).

Why? Connotations and culture:
Universal, Everyday, Essential, Unassailable “good”, Vital, Pure, Fresh, Clean..
1. Oxygen is a medicine that should always be planned, prescribed and reviewed by staff trained in oxygen prescription and use.

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Why? Connotations and culture:
Universal, Everyday, Essential, Unassailable “good”, Vital, Pure, Fresh, Clean..
3. Just as any other medicine, oxygen should not be prescribed without a clear indication, dose and duration. Intended benefits, risks and contraindications should be considered.

4. Acute oxygen prescription must include the target oxygen saturation range and state the appropriate interface and range of flow rates to achieve this. Oxygen saturations must be monitored according to an agreed and feasible management plan. Those who administer oxygen should have regular and ongoing training so that they are able to monitor and respond to a patient’s oxygen saturations within the management plan.
Why?

British Thoracic Society
Emergency Oxygen Audit Report
National Audit Period: 15 August – 1 November 2015
Ronan O’Driscoll

Number of records submitted: 2473 wards (55,208 patients)
Number of participants: Part 1 = 180 hospitals (139 trusts); Part 2 = 147 hospitals (114 trusts)

- 7741 (14%) patients on oxygen in hospital setting
- 43% no prescription or bedside order
- 52% no target saturation specified
- 72% of drug rounds: no nursing staff review/signature for oxygen
5. Long term home oxygen treatment (15-24 hours per day) and oxygen used with non-invasive ventilation should only be prescribed after specialist review. This must include a risk assessment around possible fire, burns, falls and ability to use complex equipment. The identification and communication of risks is the responsibility of the prescriber.
Why?

Home Oxygen: administration of oxygen at concentrations higher than those noted in room air for patients with chronic hypoxia with aim of:

- Reducing hypoxaemia
- Improving survival
- Decreasing ventilatory load
- Decreasing pH & myocardial load
- Reducing arrhythmias
- Reducing secondary polycythaemia
- Improving sleep quality
- Reducing disability
- Improving neuropsychological health
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4 major kinds of home oxygen therapy

1. Long-term O2 therapy (LTOT) (use ≥15 hours/day)
2. Short-burst O2 therapy (SBOT)
3. Ambulatory oxygen therapy
4. Palliative Oxygen Therapy
Why?

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2 major kinds of home oxygen therapy

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2 major kinds of home oxygen therapy

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LONG TERM TREATMENT
Think of it like a STATIN
85,000 oxygen users in England
£100 million/year
COPD, ILD, Pulmonary hypertension, chest wall disease
4% neonates, children
4% cardiac, neurological or palliative care

24-43% home oxygen prescribed = not used
20% COPD patients who would benefit do not receive it
London: 70% home oxygen prescribed on discharge
2012: one oxygen company in London
Why?

Follow up – variable

Links between hospital and community teams – variable

Lack of commissioned Home Oxygen pathways

Gaps in agreed risk assessment procedure
An example!

Air Liquide audit 2016: London nursing and care homes
(11,000 home oxygen users in London, £12 million/yr)
245 adult patients with HOOF in nursing homes, mean age 77
1 in 5 patients: indication for oxygen unknown
7% paediatric order!
Only 1 in 3 had a current prescription
68% under-using oxygen therapy
15% over-using oxygen therapy
Lack of information as to indication for oxygen and who to contact for guidance, absence of clinical directives from prescribers resulting in ‘PRN’ oxygen use and training needs around storage/use of oxygen equipment

Caroline Lock et al, accepted for presentation BTS 2016
6. Oxygen prescription for people who smoke poses a danger, to patients themselves and to others, because of the fire risk.

Starting or continuing home oxygen prescription in this group is very strongly discouraged.

Support for smoking cessation must be the priority for treatment and may itself remove the need for oxygen by improving blood gases.

Ongoing specialist follow up of this high risk group of hypoxic smokers is essential.
Mortality benefit
CV risk of nocturnal hypoxia
Reduce PAP
Reduce polycythaemia

BUT:

Current practice based on 36 year old studies
NOTT 1980: 203 pts.........................38% smokers
MRC 1981: 87 pts <70years..............43% smokers
Survival benefit seen after 2 YEARS
No assessment of OSA/hypoventilation
No survival benefit in treating moderate hypoxaemia (PaO₂>7.5)
1987: 12 year study of LTOT: 51% continued to smoke
= 10 yr survival 26% = airflow obstruction

[Cooper CB, Waterhouse J, Howard P. Twelve year clinical study of patients with hypoxic cor pulmonale given domiciliary oxygen therapy. Thorax 1987;42:105-110]

Physiological effect of oxygen is attenuated by smoking

Why?

First do no harm..
24-40% COPD patients still smoke
Vulnerable patients
Highly tobacco dependent
Social isolation
Deprivation
Pressure of discharge planning
Non specialist teams/inadequate support for colleagues

1 in 4 of all O2 related domestic fires result in death
1 in 3 result in serious injury

Electronic cigarettes

Cigarettes and E-cigarettes - The Risks

This leaflet gives guidance on the dangers of smoking whilst using oxygen therapy. The dangers of using an electronic cigarette or similar device whilst using oxygen therapy are exactly the same as it would be with smoking ordinary cigarettes. Electronic devices also carry a risk of explosion or ignition and can cause a fire whilst recharging.

Smoking should be avoided in a home where oxygen is used. Oxygen itself does not burn, but it does help a fire to start and to keep burning. If air is enriched with increased levels of oxygen, there is a chance that a fire will start and spread more quickly, and continue to burn hotter and faster. Because oxygen can build up unceded and saturate our surroundings, home oxygen users are at greater risk from their clothing, bedding, furniture and hair catching fire if they smoke, or if other people smoke in close proximity to them. In oxygen-rich areas, fabrics, wood, paper, and other materials which normally do not burn easily in air could suddenly catch fire on contact with a small spark from a lit cigarette or electronic cigarette.

Remember
Never smoke a cigarette or use an electronic cigarette whilst on oxygen therapy or close to a patient using oxygen.
Never charge an electronic cigarette or similar device close to a patient using oxygen therapy or near to the oxygen source itself.
Please contact your Healthcare Professional for further advice on help to stop smoking.

Deviates and Facilities Alert

Ref: EFA/2014/002 Issued: 16 JUNE 2014

Device

E-cigarettes, batteries and chargers
Includes reusable and disposable electronic cigarettes (e-cigarettes), cigars, pipes and similar battery powered tobacco replacement products which use a heating element (atomiser) to produce a vapour which resembles smoke.

Problem

Potential fire or explosion during:
- recharging the battery
- use in an oxygen rich environment
Disposable e-cigarettes are not affected by the charging problem.

Action

- All staff should be made aware of the fire hazard associated with the use and recharging of e-cigarettes.
- E-cigarette batteries should not be recharged in premises or vehicles.
- E-cigarettes should not be used in an oxygen rich environment.
- Safety advice should be given to patients receiving therapies at home (see Annex).
Why?

• In most cases of smoking and oxygen related domestic fire, the fire is limited in extent and the fire services are not involved.

• Fire services can only report fires known to them.

• No national data on number of patients on oxygen who smoke.

• No systematic NHS reporting system – prescriber may not know that patient has been admitted/treated for burns.
7. Specialist oxygen assessment and follow up should include individualised patient and carer education about oxygen treatment, comprehensive risk assessment and carbon monoxide monitoring.

Health care professionals should discuss with the patient his or her responsibility to use oxygen safely, the risks of a smoking relapse and the importance of continued abstinence from smoking.

Time should be allowed to check patients’ and carers’ understanding of this complex message.
Prevalence of home oxygen use by age

Why?
Why?

Prevalence of home oxygen use by age

<table>
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<tr>
<th>Frailty</th>
<th>Comorbidity</th>
<th>Polypharmacy</th>
<th>Advanced disease</th>
<th>Limited prognosis</th>
<th>Advance care planning</th>
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<td>70-74</td>
<td>75-79</td>
<td>80-84</td>
<td>85+</td>
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Age group
Factors/risks to consider

- Tobacco dependence
- Alcohol dependence
- Substance misuse
- Cognitive impairment
- Sensory impairment
- Mental health disorder
- Impaired mobility/poor balance/falls
- Social isolation
- Multiple occupancy dwellings
- Social deprivation/poor housing/hoarding
- Pets!
National Risk Form for Home Oxygen Prescription 2016/17

- With new HOOF/HOCF
- Sets out risks
- Responsibility of prescriber
- Mitigation of risks
- Specialist/MDT decisions
- Primary care giver, Fire Rescue Service, family
- Permission not to prescribe!
What are Responsibilities of Home Oxygen Company?

National Framework Agreement for HOS 2000

- Desk based risk assessment on receiving HOOF
- Field based assessment at installation and every 6/12
- O2 equipment well ventilated, away from naked flame
- O2 equipment not obstructing access
- Need for fixing tubing to reduce trip hazards
- Verbal and written info for patient and carers
- Regular checks – filters, flow meters, concentration of O2
- Concern flagged to HOSAR/nominated lead
• An under-recognised/used member of the MDT!

• Provided with list of addresses where home oxygen in place

• Community Fire Safety Officer can visit:
  - fire safety
  - smoke alarms
  - safe exit routes
  - fire retardant bedding
8. Patients on long term oxygen therapy **at risk of harm from excessive oxygen** should be identified and their **care plan shared** with their GP and local hospitals as well as ambulance and out of hours services.
Why?

Patients at risk from high flow oxygen therapy

• Previous acidotic hypercapnic respiratory failure
• Compensated type 2 respiratory failure
• Elevated bicarbonate on ABGs (venous too)

(COPD, cystic fibrosis, kyphoscoliosis, chest wall disease, neuromuscular disease, obesity hypoventilation)

TARGET SATS 88-92%

CONTROLLED OXYGEN THERAPY
Document held electronically by LAS

- Treatment that is outside standard pre hospital clinical practice guidelines
- Specific treatment of patients with high risk medical conditions
- Paediatric patients with complicated life limiting conditions where resuscitation should be/should not be withheld

Flags address

Alerts crew to clinical info being held

Copy in patient’s home – patient and carers must be aware

Review date from 1-3 years
**Example Patient Specific Protocol**

**For**

**Patient at risk from high flow oxygen in emergency transfer**

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**London Ambulance Service NHS Trust**

**Patient Specific Protocol**

PSP XV/10

This protocol has been specifically prepared for the patient named below and details the treatment to be given in specified circumstances.

<table>
<thead>
<tr>
<th>Patient's Name</th>
<th>Date of Birth</th>
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<table>
<thead>
<tr>
<th>Address</th>
<th>NHS Number</th>
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**Reason for protocol:**
The above patient is known to be at risk of hypercapnic respiratory failure should they receive high flow oxygen.
In an emergency please give controlled oxygen therapy to maintain oxygen saturations not higher than 88%-92%.

**Specific Treatment / Instructions:**
Please consider the use of the GSTT@Home service for this patient as an alternative to admission. For advice please ring Kings College Hospital Integrated Respiratory Team on 0203 299 6531 (0900-1700hrs Monday – Sunday)

If required please transport to the nearest A&E Department.

All other aspects of clinical care remain unchanged.

If required contact EOC and ask for the Clinical Support Desk OR the On Call Clinical Advisor

Name of Referring Clinician: Dr Irem Patel, Consultant Respiratory Physician, Kings College Hospital, London. SE5 9RS.
Clinician contact details: Office Tel. (020) 3299 4740

Fionna Moore BSc, FRCS, FRCS (Ed), FCEM, FIMC (Ed)
Medical Director
London Ambulance Service NHS Trust

Date of Issue:
9. Patients who may benefit from ambulatory oxygen to **maximise their independence** should have a specialist assessment with access to the full range of relevant equipment to meet their individual needs.
10. Home Oxygen Service Assessment and Review (HOSAR) services are **vital** to ensure evidence based patient centred care and optimal value for money.

They should be **integrated** with local **respiratory** services to be effective.
• Getting Oxygen Right for Discharge
• Home Oxygen Risk Assessment Tool
• Responsible Oxygen Prescribing Messages
• Guide to writing a Patient Specific Protocol
• Example PSP for controlled oxygen therapy
• Oxygen in Cluster Headache

THANK YOU