

## Frequently Asked Questions

### Implementing the Rapid Response Report ‘Oxygen safety in hospitals’

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## **Introduction**

Following the Rapid Response Report (RRR) issued on 29 September 2009, the National Patient Safety Agency (NPSA) held a webinar on 7 October 2009 to support those implementing the actions. This was well attended, with a range of nursing, medical, engineering, risk and other staff from over thirty trusts in England and organisations in Wales. There was a useful exchange of experience in making changes to improve oxygen safety, practical tips, and clarifications of actions in the RRR. We also asked participants to tell us about current practice – this showed for instance that a quarter were still routinely using cylinders at the bedside and that a third of hospitals did not have (or were not aware of) a medical gas committee. Key questions raised at the webinar were around training of staff – including porters as well as nursing and other staff, restriction of air outlets (especially in new-build) and role of the medical gas committee.

This document reflects some of that learning, focused on practical resources and material for those implementing the RRR, together with responses to queries received by the Response Unit following the release of the RRR. This information may need to be reviewed or updated as we receive more feedback from the service.

If you would like to add further questions or more detailed responses please email [dagmar.luettel@npsa.nhs.uk](mailto:dagmar.luettel@npsa.nhs.uk)

## **FAQs by action**

### **Action 1:**

This RRR and the accompanying briefing sheets ([www.nrls.npsa.nhs.uk/alerts](http://www.nrls.npsa.nhs.uk/alerts)) highlighting actions to minimise risks of oxygen therapy are immediately made available to all relevant staff.

### **How could this information be distributed?**

The information could be posted on local intranets, or adapted for use in local staff newsletters and bulletins. The information could also be included in staff induction packs and teaching materials.

### **Who should receive training?**

All staff who are involved in prescribing, administering, handling and managing oxygen and oxygen equipment should receive training. This includes nursing, medical, midwifery, allied health professional, portering, clinical engineering and estates staff.

### **Who delivers oxygen training programmes?**

There are companies (for example medical gas suppliers) that offer training packages and some tailor these to individual needs. Some trusts have buy-in from a University to include medical gas training for students. The Medical Gases Association ([www.mga.org.uk/](http://www.mga.org.uk/)) is dedicated to the promotion of study, training, research and standards in all aspects of medical gases and can provide further information.

### **Are there e-learning programmes available?**

The 'Core Learning Unit' has developed an e-learning package for medical gases (see [www.corelearningunit.com/index.php?id=2.12](http://www.corelearningunit.com/index.php?id=2.12)). The programme is designed specifically for nurses but others will be developed for porters and engineers. The training covers overview of statutory regulations, explanation of medical gases properties and their clinical uses, how to safely identify, store and handle medical gas cylinders and using medical gas pipelines. The time taken to complete the programme will vary from learner to learner but will typically take around two hours. The Unit is part of the 'Skills Academy for Health'. The programmes are funded by the Strategic Health Authorities in England and are, as such, available free of additional charges, to NHS staff. To find out more visit [www.skillsacademyforhealth.org.uk](http://www.skillsacademyforhealth.org.uk) or contact the unit on [clpu@skillsforhealth.org.uk](mailto:clpu@skillsforhealth.org.uk)

### **Where can I find material for training sessions?**

Material for training is available from the British Thoracic Society website ([www.brit-thoracic.org.uk/clinical-information/emergency-oxygen/emergency-oxygen-use-in-adult-patients.aspx](http://www.brit-thoracic.org.uk/clinical-information/emergency-oxygen/emergency-oxygen-use-in-adult-patients.aspx)). This includes a lecture for doctors (Appendix 8: Lecture for doctors) and teaching aids/slides for nurses (Appendix 9: Teaching aids for nurses). Experience is that nurses can be trained in small groups and the package can be delivered to most of the nursing workforce over a period of a few months. There is a great opportunity to get this message across to nurses due to pandemic flu.

#### **Action 2:**

The use of oxygen cylinders is minimised and where necessary a business case for increased piped oxygen provision is developed in accordance with HTM 02-01 Part A.

### **How can I access the HTM 02 – 01 document?**

The *Health Technical Memorandum 02-01: Medical gas pipeline systems* is available at: <https://estatesknowledge.dh.gov.uk/>

The link takes you to the knowledge and information portal and you have to register to access the Department of Health estates and facilities guidance. All NHS staff can access the documents free of charge but there will be a charge for non NHS staff.

### **Does the HTM 02-01 apply to LIFT buildings and primary care centres?**

Yes. It applies to primary care trusts (PCTS) and dental practices, and all healthcare premises that use medical gases and cylinders. The HTM is the most appropriate guidance to be used when designing and managing medical gases in healthcare premise including NHS Local Improvement Finance Trust (LIFT) projects.

#### **Action 3**

Where the use of oxygen cylinders is unavoidable (i.e. transfer and emergency situations or for mental health trusts), robust systems are in place to ensure reliable and adequate supplies, including checking and stocktaking of cylinders.

### **When should cylinders be replaced?**

This needs to be locally agreed. Some trusts have a policy in place which state that cylinders should be replaced when they are less than three quarters full.

### How can I calculate how long a cylinder will last?

The formula for calculating this is:

**Volume of cylinder in litres/ flow rate in litres per minute = minutes it lasts**

#### **For example:**

How long would a D size cylinder (340 litres) last when on nasal “specs” at 4 litres a minute?

*340 litres/4 litres a minute = 85 minutes (1.4 hours)*

### Are tables available for different oxygen cylinder sizes and flow rates which show how long cylinders last?

Staff at Colchester Hospital University NHS Foundation Trust have generated such tables for general use and for neonatal use (see pages 8 and 9).

#### **Action 4**

The risks of confusing oxygen and medical compressed air are assessed and action plans developed (e.g. removing the medical air flow meter from the wall outlet when not in regular use).

### What is piped air used for on general wards?

Piped air is mainly used mainly to drive nebulizers (the alternatives are electric compressors but they are noisy and therefore not favoured).

### Why do new hospitals still have air and oxygen at each bedside?

When new hospitals are built, a generic ‘template’ for wards is normally used in case they change functions - therefore all wards/beds will normally have both air and oxygen. It should be considered if the provision of air flowmeters could be limited.

### What can prevent confusion between air and oxygen?

Labels are available to prevent confusion between air and oxygen. During the webinar, one of our speakers showed a photograph of such a label which was developed in Australia.



The AirGuard can be fitted to air flowmeters to provide a clearly marked physical barrier that can be swung aside to allow for connection of air tubing. It reduces likelihood of incorrect connection of tubing and provides a bold labelling of the air outlet. Oxygen is left unchanged and is freely accessible. Although this has not been formally reviewed or endorsed by the NPSA or other organisations, individuals wanting further information can go to [www.fbe.com.au/AirGuard/AirGuard.html](http://www.fbe.com.au/AirGuard/AirGuard.html)

#### **Action 5**

Oxygen is prescribed in all situations in accordance with BTS guidelines (but note these do not cover critical care or children under 16 years). In an emergency, oxygen should always be given immediately and documented later.

#### **The guidance recommends oxygen is always prescribed; would a patient group directive (PGD) rather than patient specific prescription be an acceptable authorisation?**

The dispensing of oxygen does not technically require a prescription because it is not a 'prescription only medicine'. However, the clinician who initiates oxygen therapy should communicate clearly to the person who actually administers oxygen to the patient and an accurate record must be kept of exactly what has been given to the patient. In this respect, oxygen is in the same category as paracetamol, aspirin, ibuprofen, antihistamines, anti-emetics and many other medicines that do not require a prescription if purchased by a patient for his/her own use but do require **accurate documentation** if administered by a health professional to a patient (see BTS guidelines, section 11<sup>1</sup>). It is recommended in the guideline that oxygen should be prescribed on the **drug chart** using a **target saturation range**.

A PGD is a written instruction for the sale, supply and/or administration of a named medicine for a defined clinical condition. PGDs allow a range of specified health care professionals to supply and/or administer a medicine directly to a patient with an **identified clinical condition** without them necessarily seeing a prescriber. The health care professional working within the PGD is responsible for assessing that the patient fits the **criteria** set out in the PGD.

Implementing PGDs may be appropriate both in circumstances where groups of patients may not have been previously identified (e.g. minor injuries and first contact services), and in services where assessment and treatment follows a **clearly predictable pattern** (e.g. immunisation, family planning). In general, a PGD is **not meant to be a long-term means** of managing a patient's clinical condition. This is best achieved by a health care professional prescribing for an individual patient on a one-to-one basis. Legal requirements and guidance on PGDs are set out in the circular HSC 2000/026 *Patient group directions [England only]* (available at: [www.dh.gov.uk/en/PublicationsAndStatistics/LettersAndCirculars/HealthServiceCirculars/DH\\_4004179](http://www.dh.gov.uk/en/PublicationsAndStatistics/LettersAndCirculars/HealthServiceCirculars/DH_4004179))

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<sup>1</sup> O'Driscoll BR, Howard LS, Davison AG. *Guidelines for emergency oxygen use in adult patients*. Thorax 2008; 63 (Suppl. VI): vi1-68. Available at: [www.brit-thoracic.org.uk/](http://www.brit-thoracic.org.uk/)

Therefore, a PGD could be used for oxygen treatment in special areas, such as recovery units (for example all patients meeting certain criteria will have a specified oxygen treatment; these criteria should also specify exemptions and clearly state which patients are not covered by the PGD). However, on general wards for example, oxygen should always be prescribed by a health care professional for an individual patient on a one-to-one basis using a target saturation range.

More information on PGDs is available at:

[www.portal.nelm.nhs.uk/PGD/viewRecord.aspx?recordID=259&referer=](http://www.portal.nelm.nhs.uk/PGD/viewRecord.aspx?recordID=259&referer=)

A trust could also have a policy statement for emergency oxygen. For example: Oxygen may be administered in an emergency situation without a prescription. Oxygen in an emergency situation is delivered at a flow rate of 10-15 litre/minute ideally via a high concentration oxygen mask. Once emergency oxygen therapy has commenced medical assistance must be summoned and all actions must be documented later.

#### **Action 6**

Pulse oximetry is available in all locations where oxygen is used.

#### **We do occasionally administer oxygen in our social care homes at the end of life. Is it also a requirement for our homes to have a pulse oximetry?**

This RRR applies to hospital settings only and the recommended actions are for acute, community and mental health hospitals. It is therefore not a requirement under this RRR to have pulse oximetry available in social care homes. The RRR refers to the British Thoracic Society guidelines which do not apply to patients receiving terminal palliative care. In these circumstances, it should always be a clinical decision to establish if the oxygen saturation levels should be regularly monitored.

#### **Our dentists in the community hospital use oxygen in medical emergencies and for procedures requiring sedation, do they have to have pulse oximetry available?**

It is essential to provide optimal oxygen therapy at the earliest possible opportunity while the patient is being assessed and treated in the community. Target saturation should be used and pulse oximetry is necessary to achieve this. Therefore, pulse oximetry must be available in all locations where emergency oxygen is being used (BTS guidelines, Section 9: Emergency use of oxygen in ambulances, community and pre-hospital settings).

#### **Action 7**

A multidisciplinary group (such as a medical gas committee) is responsible for reviewing oxygen related incidents, developing a local oxygen policy and a training programme.

#### **Who should be a member of the group?**

The constitution of the committee will depend on local circumstances, but should include, as a minimum, representatives from estates, clinical areas, pharmacy, health and safety, risk management, clinical engineering, portering service and a member of the Board.

Note that discussion at the webinar indicated that sometimes medical gas committees lacked particular clinical input (e.g. senior nursing representatives), although important issues of nurse training would be within their remit.

**Should problems relating to 'nitrous oxide' and 'suctioning' be discussed by this group as well?**

Yes. The committee should cover all medical gases and suction.

**Are you expecting each mental health trust to have a medical gas committee?**

No. Mental health trust and other hospitals where oxygen is less frequently used (e.g. community hospitals) might consider adapting existing committees and assign responsibilities to current multidisciplinary groups, such as 'clinical risks' or 'Medicine Management' Committees. They could also, for example, collaborate with their local acute hospital and have representation on existing medical gas committees (or similar). However, it is still important that there is a named lead in these organisations to oversee the safe use of oxygen and other medical gases in community and mental health hospitals.

**Can anyone share an "exemplar" Terms of Reference for a Medical Gas Committee?**

An example TOR from Colchester Hospital University NHS Foundation Trust can be found on pages 10 and 11.

## APPENDIX 1: FULL OXYGEN CYLINDER RUN TIMES (BOC)

Size → Flow ↓	D (340 ltrs)	PD (300 ltrs)	CD/DD (460 ltrs)	E (680 ltrs)	F/AF (1360 ltrs)	HX (2300 ltrs)	ZX (3040 ltrs)	G (3400 ltrs)	J (6800 ltrs)
	0.25	22.6	20.0	30.6	45.3	90.6	153.3	202.6	226.6
0.5	11.3	10.0	15.3	22.6	45.3	76.6	101.3	113.3	226.6
0.75	7.5	6.6	10.2	15.1	30.2	51.1	67.5	75.5	151.1
1	5.6	5.0	7.6	11.3	22.6	38.3	50.6	56.6	113.3
2	2.8	2.5	3.8	5.6	11.3	19.1	25.3	28.3	56.6
3	1.9	1.6	2.5	3.7	7.5	12.7	16.8	18.8	37.7
4	1.4	1.2	1.9	2.8	5.6	9.5	12.6	14.1	28.3
5	1.1	1.0	1.5	2.2	4.5	7.6	10.1	11.3	22.6
6	0.9	0.8	1.2	1.8	3.7	6.3	8.4	9.4	18.8
7	0.8	0.7	1.0	1.6	3.2	5.4	7.2	8.0	16.1
8	0.7	0.6	0.9	1.4	2.8	4.7	6.3	7.0	14.1
9	0.6	0.5	0.8	1.2	2.5	4.2	5.6	6.2	12.5
10	0.5	0.5	0.7	1.1	2.2	3.8	5.0	5.6	11.3
12	0.5	0.4	0.6	0.9	1.8	3.1	4.2	4.7	9.4
15	0.4	0.3	0.5	0.7	1.5	2.5	3.3	3.7	7.5

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Time = Hours

## APPENDIX 2: FULL - CD OXYGEN CYLINDER RUN TIMES (ULTRA LOW FLOWRATES)

LPM	HOURS (460 ltrs)
0.01	766
0.02	383
0.03	255
0.04	191
0.05	153
0.06	127
0.07	109
0.08	95.8
0.09	81.1
0.1	76.6
0.2	38.3
0.25	30.6
0.3	25.5
0.4	19.1
0.5	15.3
0.6	12.7
0.7	10.9
0.75	10.2
0.8	9.5
0.9	8.5
1.0	7.6



Before using the oxygen equipment you have been supplied with, please take a few moments to read this safety and operating information

- Be mindful – Oxygen is a medicine! - read the label.
- Never handle the equipment with oily or greasy hands.
- Never use oxygen or store cylinders where there are naked flames or incandescent heat (i.e. cigarettes, cookers, fires, heaters, boilers and candles etc)
- Always turn cylinder valve on “slowly”
- Cylinder contents (CD size) 460 litres of gas
- Always turn cylinder off when not in use and store in a safe place.

**Stay Safe!**

## APPENDIX 3: MEDICAL GAS MANAGEMENT COMMITTEE Terms of Reference

### Introduction

For management of medical gases to be successful it needs to be a multidisciplinary process involving clinicians, pharmacists, engineers and support staff. When these disciplines work together, appropriate risk management can be implemented and patient and staff safety maintained. Essex Rivers Healthcare Trust needs to work in partnership with their engineering support and portering services contractor (Carillion) to achieve this control of safety.

### Aim

The aim of this committee is to provide the framework to ensure that the Trust complies with current legislation and best practice guidelines for medical gases. Its remit will include ensuring that the Trust; plans strategically for medical gas developments, be they structural changes in new or refurbished buildings or developments in clinical treatments; provides cost effective supply arrangements that guarantee gas availability; and provides sound training programmes that ensure staff work within their competency level.

**The Medical Gas Management Committee will have the following constitution and terms of reference:**

### Membership

Designation	Name	Group Designation of Objectives
Service Manager	Anne Morris	Chair, 1, 2, 3, 4, 7, 8, 9, 11
Hard FM Contract Manager, Estates	Terry Robertson	2, 3, 7, 8, 9
Senior Authorised Engineer (Carillion)	Bob Hudson	2, 3, 4, 6, 7, 8, 9, 11
Lead Biomedical Engineer for medical gases	Steve Connew	2, 4, 6, 7, 8, 9, 11
Quality Assurance Pharmacist/ Quality Controller for Medical Gases	Monica Douch	Deputy Chair, 2, 4, 6, 7, 8, 9, 11
Medication Risk Pharmacist	Owei Eradiri	2, 4, 6, 7, 8, 9, 10, 11
Nursing & Quality Education Development Manager	Alexina Weston	4, 7, 8, 9, 11
Senior Nurse Manager (Critical Care)	Shelagh Lissone	4, 7, 8, 9, 11
Nominated Anaesthetist	Dr Helen Porter	4, 7, 8, 9, 11
Senior Operating Department Assistant	Nicholas Pearce	4, 7, 8, 9, 11
Portering Services Manager	David Cottrell	4, 5, 7, 8, 9, 11
Principal Biomedical Scientist (for cylinder supply contract issues)	Peter Hitchcock	4, 5, 8, 9, 11
Technical/Administrative support	Melanie Derrick	1

In addition, the Trust's Risk Manager will be included in the agenda distribution and minutes for the committee and will be free to attend any meetings.

The committee may extend invitations to other Trust members or outside contractors as it considers necessary. This will include the contract suppliers for medical gas supplies.

As elected from within the membership the Committee will be chaired by the Service Manager Theatres, Anaesthetics and Critical Care. The Quality Controller for Medical Gases will act as Deputy Chair.

### **Quorum**

A meeting will be quorate if six members are present, but there must be at least one engineer, one pharmacist and one nurse. If members cannot attend, they will be expected to send an appropriate deputy.

### **Reporting Arrangements**

The medical gas management committee is a sub-Committee of the Trust's Risk Management Committee, to whose meetings it sends regular reports. It is responsible to the Trust's Clinical governance and Trust Board via the Risk Management Committee.

### **Objectives**

The committee will meet on a three monthly basis to fulfil the following roles:

1. The committee must ensure that the Trust's medical gas policy is updated on a regular basis in line with Trust policies and procedures.
2. The committee will ensure that national guidance provided in Health Memorandum HTM 02 is followed.
3. The committee will plan new medical gas installations to conform to HTM 02 requirements and the perceived future needs of the Trust.
4. The committee will maintain procedures for safe working on piped medical gas supplies.
5. The committee will maintain procedures for the safe ordering and distribution management for medical gas cylinders.
6. The committee will maintain safe procedures for preventative and breakdown maintenance of pipeline systems and medical gas equipment.
7. The committee will regularly review contingency arrangements to ensure that they reflect the clinical needs of the service.
8. A multidisciplinary audit procedure will be set up to review practice within the Trust and identify practice improvement.
9. Incident reports pertaining to medical gases will be reviewed at committee meetings and Trust wide improvements commissioned to provide appropriate risk management control.
10. Any major incidents reported will be submitted to the National Patient Safety Agency (NPSA).
11. Training needs for all staff groups working with medical gases will be kept under review to ensure that the Trust's training programmes are providing suitable competency training and reflecting ongoing practice improvement.

Additional meetings may be called as necessary to address Risk Management issues.

**Clinical governance**

The committee will submit an annual written report to the Risk Management Committee for onward submission to the Trust Board. Regular reports to each Risk Management Committee meeting will also be expected.

**Review of ToR**

These will be reviewed every two years.

**Presented to Risk Management Committee on 22 February, 2006.**

**Updated by Monica Douch, Quality Assurance Pharmacist to conform to CNST requirements.**

25 October 2006