Humber Teaching
NHS Foundation Trust

STANDARD OPERATING PROCEDURE
MEDICAL GASES - ORDERING, RECEIPT, STORAGE, PRESCRIBING AND ADMINISTRATION

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Instigated by: **Date Instigated:**	Steven Leeman (Estates Operations Manager) Medical Gas Group October 2023
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Consultation:	Medical Gas Group Drugs and Therapeutics Group Weeliat Chong - Chief Pharmacist
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Name of Trust Strategy / Policy / Guidelines this SOP refers to:	Medical Gases Policy F-031

VALIDITY – All local SOPS should be accessed via the Trust intranet

CHANGE RECORD

Version	Date	Change details
1.0	*November 2023*	*New SOP. Approved at Drugs and Therapeutics Group (30 November 2023). Sent to Policy Management for final formatting and intranet upload on 7 May 2024.*

Contents

1. INTRODUCTION

Medical gases are Licensed Medicines, and as such are subject to the Medicines Act, and must be treated in the same way as all other medicines.

This document sets out the procedure for the handling of medical gas cylinders & concentrators within Humber Teaching NHS Foundation Trust (HTFT).

2. SCOPE

This SOP applied to all staff who have access to medical gasses.
The main aim of this SOP is to set standards in practice to ensure that medical gas is handled appropriately and safely within HTFT.

3. DUTIES AND RESPONSIBILITIES

Chief Pharmacist
The Chief Pharmacist is responsible for optimising the use of medicines within the Trust, ensuring that the relevant standards relating to medicines optimisation set by the Care Quality Commission (CQC) and the National Institute for Health and Clinical Excellence (NICE) are achieved.

Resus Officer
The resus officer is responsible for assessing and advising on the size of cylinder and medical gas that should be held in each HFTF service area.

Clinical Pharmacists
These Pharmacists are responsible for ensuring prescribed medical gas have been assessed as clinically appropriate via clinical screening (SystmOne), clinical verification (Lorenzo) or by endorsement (paper-based MAR charts).

Ward based Medicines Optimisation Technicians
Medicines Optimisation Technicians are responsible for ordering and receipt of medical gas cylinders.

Non ward based Medicines Optimisation Technicians
Medicines Optimisation Technicians are responsible for ordering of medical gas cylinders.

Practitioner
A member of the team who is competent in the safe and secure handling of medicines and medicines administration.
The practitioner is responsible for exchange and receipt of medical gas cylinders and administering the medical gas as per the prescription.
Oxygen therapy must be prescribed, however may be administered without a prescription in an emergency if there is no prescriber on site.
The practitioner is accountable for their decision and action taken, which must be fully documented in the patient's notes. Medical staff/emergency services must be contacted immediately.

Team Managers
Those in charge of an area, unit or ward are responsible for ensuring the safe storage of medical gas.

Porters
Are responsible for exchange and receipt of medical gas cylinders including checking, storage and tagging as per section 4.2
The responsibility of ordering the medical gas sits with the organisation using it.

4. PROCEDURES

Medical Gases within the Trust are standardised to one supplier – Currently BOC Medical.

All cylinders within the Trust should operate via either an on/off hand wheel and flow regulator or a key system
All Cylinders are capable of administering high-flow rates of oxygen (0 -15 litres per minute). For guidance on how to use CD oxygen cylinders refer to Appendix 1.
Every cylinder has a batch label, identifying the batch number, filling date and expiry date. It also identifies the cylinder size and type of contents.

List of expected minimum stock levels in Appendix 2.

4.1. Ordering

All clinical areas in the Trust have their own cylinder account with BOC medical and this should be cited when arranging any returns and replacements.
Ward based technicians, site porters or other responsible persons that procure for sites can place orders directly with BOC either via the online ordering portal or by calling 0800 111 333.

For areas who do not have a ward-based technician, for supply or return please email hnf-tr.pharmacyprocurement@nhs.net with the following information:

- Order details:
  - Medical gas required
  - Cylinder size
  - Number of cylinders required
  - Number of cylinders to be collected
  - Unit/service name and address
  - Contact name and number for delivery

Routine Order
For orders placed Monday – Thursday before midday delivery will be the next working day.
The Unit can request a morning or afternoon delivery, however this is not guaranteed.

Emergency Order
Call pharmacy procurement on 01482 301732
The requesting Unit must consider that once placed an Emergency Order can take up to six hours for delivery to be made.

Out of hours
Contact the manager on call.

4.2. Receipt

On receipt of the cylinders, the receiving practitioner should check:

- The supplied cylinder is full
- Has a minimum of 2 years expiry.
- The cylinder valve and regulator valve for damage

After checking the cylinder is satisfactory:

- At sites with more than one organisation present, attach the appropriate coloured tag to the collar to align with the organisation account it was ordered against i.e.
  YELLOW – CHCP
  PINK – HUTH
  RED – HUMBER
- The tag should only be removed on return and under no circumstances should cylinders be shared between organisations.
- The delivery note should be signed and dated.

- The cylinder(s) should be safely and securely stored in the allocated location
- Delivery notes handed to pharmacy or stored appropriately for future audit.

4.3. Storage

- Medical gas cylinders are stored:
    - In areas with restricted access that are dry and clean and not subject to extremes of heat or cold;
    - away from stocks of combustible material;
    - separately from industrial and other non-medical cylinders;
    - separation should be maintained between full and empty cylinders and clearly identified.
- All Trust locations where medical gas cylinders are stored must have gas cylinder warning signs displayed (including temporary signs if someone is receiving oxygen in their room).
- Cylinders must be located in a safe and secure environment.
- Cylinders must be identified as part of the COSHH and fire risk assessments.
- All spare and in-use cylinders must be adequately restrained; stored and secured in an upright position. They should not be free standing as they risk falling over injuring staff or patients, and this could also cause damage to the cylinders.
- Cylinders must be kept clean, dry and stored away from sources of heat or ignition.
- Cylinders should also be handled with care, never knocked violently or allowed to fall over. Never roll cylinders along the ground.
- CD cylinders may be stored in Emergency Response Bags; if additional CD cylinders are held, these should be restrained to the wall in a CD holder.
- HX cylinders must be stored vertically and transported on an appropriate type and size of oxygen trolley.
- Additional HX cylinders should be restrained to the wall by a safety chain or on an oxygen trolley when not in use.
- When using medical gas cylinders it is important that no part of the cylinder valve or equipment is either lubricated or contaminated with oil or grease.
- For patients who need home visits, arrangements need to be made with the ambulance patient transport service to enable transport of the patient and oxygen.
- All equipment must be handled in line with the Manual Handling of Objects / Loads Procedure

Staff should not transport oxygen cylinders in their own motor vehicles.

4.4. Prescribing

Medical gases (including oxygen) are licensed medicines and, as such, are subject to the Medicines Act and must be treated in the same way as any other medicine.

The prescription for the medical gas should include:

- Patients name
- Medical gas and concentration (where appropriate)
- Method of administration,
- The percentage and/or rate of flow.

This can be achieved via a prescription written for an individual patient on the prescription and administration chart or electronic prescribing system.

The NPSA (2009) report the potential for serious harm if oxygen is not administered or handled properly. The main safety concerns relate to underuse and overuse of oxygen:

- Underuse of oxygen is extremely dangerous as it exposes critically ill patients to the risk of hypoxic organ damage.
- Overuse of oxygen can also be harmful, especially for patients with chronic obstructive pulmonary disease (COPD) who are at risk of hypercapnic respiratory failure (as are patients with cystic fibrosis, severe obesity and bronchiectasis)
- The concentration of oxygen required depends on the condition being treated; the administration of an inappropriate concentration of oxygen can have serious or even fatal consequences.
- Current prescribing guidelines on oxygen therapy can be accessed via the current edition of the British National Formulary.

4.5. Administration

- Before a medical gas is administered to a patient, written authority from a prescriber must be obtained. This authority must include the name, and concentration of the medical gas (where appropriate), the method of administration, the percentage and/or rate of flow. This can be achieved via a prescription written for an individual patient on the prescription and administration chart or on an approved bespoke chart or electronic prescribing system.
- The location where oxygen is administered must be risk-assessed to ensure a safe environment at all times by the clinical staff.
- A designated Practitioner administering a medical gas to a patient must administer in accordance with the prescription and record on administration chart / electronic system
- The administering practitioner should ensure their hands are not contaminated with hand creams or any petroleum based lotions.
- The patient should be advised not to use creams or petroleum based lotions whilst receiving oxygen therapy
- If the patients needs to use moisturisers on their lips and nose when breathing oxygen, water based gels such as KY Jelly.

In an emergency situation oxygen may be administered without a prescription by any staff who have undertaken the appropriate training.

Monitoring

- Oxygen saturation levels should be monitored using a pulse oximeter in all patients receiving oxygen therapy.
- A pulse oximeter is a medical device used to measure oxygen saturation (SpO2) levels within the body and to monitor the effectiveness of oxygen. For further guidance regarding Pulse oximetry refer to Royal Marsden Manual Online via the following link Respiratory assessment and pulse oximetry - Royal Marsden Manual (rmmonline.co.uk)

4.6. Decontamination and Discharge

- The Medical Oxygen cylinders are to be cleaned with warm water to remove any contaminants, no abrasive fluids or creams are to be used to clean cylinders.
- The cylinders should be cleaned on entry to the ward to reduce the risks of cross infection.
- At no times should a cylinder be discharged, they should be returned if necessary to the stores with the residue of gas within the cylinder.

4.7. Emergencies

Training for emergency administration of oxygen is delivered as part of the Immediate Life Support training. The training will reflect current British Thoracic Society guidance.

- All employees that work directly with patients and have access to an emergency grab bag.
- All Emergency Grab Bags have a CD oxygen cylinder. These are the small portable cylinders for the use of emergency oxygen. They hold 460 Litres of Oxygen, which if running at a rate of 15 litres per minute (LPM), will provide approximately 30 minutes of oxygen.

- In all instances the ambulance service must be called where a patient requires emergency oxygen
- Staff will administer emergency oxygen until the emergency services arrive.
- The emergency services will then take responsibility for the patient's continuing health care needs and transporting the patient to Accident and Emergency Department if required.

In an emergency situation oxygen may be administered without a prescription by any staff who have undertaken the appropriate training.

Refer to Oxygen Therapy Quick Reference Guidance G404

For guidance on how to use CD oxygen cylinders refer to Appendix 1.

4.8. Oxygen Concentrators

An oxygen concentrator is a medical device that separates oxygen from other gases that are present in the surrounding air and can provide a supply of oxygen for administration.
It should be noted that the oxygen supply from a concentrator is not as concentrated as from a cylinder or pipeline and is around 93%. This requires to be recorded on the patient notes if supplies are from a concentrator.

Oxygen concentrators are available within the trust at Malton hospital, Eastfield Health Centre and Whitby Hospital.

They are used in oxygen clinic when assessing patients for suitability of home oxygen therapy. The concentrators (along with the oxygen cylinder) are provided by Baywater Health who are contracted by the ICB to provide oxygen equipment to the Home Oxygen Service.

The oxygen concentrators remain the property of Baywater Health. Baywater are responsible for servicing.

4.9. Use around Electronic devices, cigarettes and flammable substances/devices

- When using medical gas cylinders it is important that no part of the cylinder valve or equipment is either lubricated or contaminated with oil or grease.
- Take care if using oil or petroleum-based hand creams as these could provide sufficient contamination to the medical cylinder valve surface when handling the cylinder to cause an ignition when the valve is turned on.
- The application of paraffin-based skin products to patients, e.g. Diprobase ointment, emulsifying ointment, white soft paraffin causes an additional potential fire hazard when administering oxygen to them.
- Smoking (including electronic cigarettes and use of charging devices) or open flames is not permitted in the same vicinity of any oxygen carrying device or accessory.

4.10. Incident Reporting

Refer to Reporting an Incident SOP21-018

4.11. Recalls and alerts

Refer to Alerts Procedure

5. TRAINING

All personnel that handle or use medical gases should have undertaken specific training on the medical gas safety.
Training can be accessed via Medical Equipment - elearning for healthcare

6. REFERENCES

Safe and Secure Handling of Medicines Procedures Proc431.pdf (humber.nhs.uk)
Reporting an Incident SOP21-018.pdf (humber.nhs.uk)
Alerts Procedure (humber.nhs.uk)
Oxygen Therapy Quick Reference Guidance G404.pdf (humber.nhs.uk)
Is it safe to use hand creams and other lotions which contain petroleum bases? | BOC Knowledge Base - UK (boconline.co.uk)
Contaminated cylinders | BOConline UK
BTS Home Oxygen Standards 2017.pdf (humber.nhs.uk)

Appendix 1: Oxygen Cylinder Operating Instructions

Cylinders are delivered with dust covers which are protecting the:

<table>
<tr><td>On/Off Hand-wheel
and/or
  </td><td>Oxygen Outlet
  </td></tr>
<tr><td>1. To commence cylinder use, first switch the HX or CD cylinder on by:
Turning the on/off hand-wheel slowly anti-clockwise two revolutions
  </td><td>2. Attach the oxygen tubing and required oxygen administration device to the oxygen flow outlet.
  </td></tr>
<tr><td>3. Turn the oxygen flow controller clockwise to set the required flow rate; the correct flow rate setting must be fully visible in the window.
Check for flow of oxygen gas prior to use.
  </td><td>4. After cylinder use return the oxygen flow controller to ‘0’ and remove and dispose of any used oxygen tubing and oxygen administration device.
  </td></tr>
<tr><td>5. Switch the device off by turning the on/off hand-wheel clockwise.
Check the ‘live’ gauge to ensure adequate supply for next administration.
  </td><td></td></tr>
</table>

Appendix 2: Expected Stock Levels of Medical Gases

Location	101-CD	101-HX	101-F
136 Suite	2		
Avondale Unit - Miranda House	2		
Bartholomew House	1		
Becca House	1		
Coltman Street Clinic	1		
ECT Unit - Miranda House	1	8	
Estates/facilities - Mary Seacole Building		1	
Granville Court	3	3	
Hallgate Surgery	5		
Hawthorne Court	1		
Humber Centre	6	1	1
Inspire Walker Street	3	1	
Learning Centre	3	1	
Lilac Ward - Townend Court	3		
Maister Court	1		
Maister Lodge	1	2	
Humber Primary Care - Providence Place	3		
Humber Primary Care – Station Avenue	4		
Market Weighton Group Practice	2	1	
Mill view Court	1		
Mill View Lodge	1	1	
Newbridges Acute Unit	5		
Occupational Health - Victoria House	1		
PICU - Miranda House	4		
Pine View	1		
Pocklington Health Centre	1		
Scarborough Rugby Club	1		
STaRS - Townend Court	1		
Substance Misuse - 7 Baker Street	1		
Westlands Acute Unit	2		
Whitby Community Ward	1	1	
Whitby MIU	1		2
Willow Ward - Townend Court	2		

Appendix 3: Equality Impact Assessment

For strategies, policies, procedures, processes, guidelines, protocols, tenders, services

1. Document or Process or Service Name:

2. EIA Reviewer (name, job title, base and contact details):

3. Is it a Policy, Strategy, Procedure, Process, Tender, Service or Other?

Main Aims of the Document, Process or Service
Please indicate in the table that follows whether the document or process has the potential to impact adversely, intentionally or unwittingly on the equality target groups contained in the pro forma

Equality Target Group	Is the document or process likely to have a potential or actual differential impact with regards to the equality target groups listed?	How have you arrived at the equality impact score?
1. Age 2. Disability 3. Sex 4. Marriage/Civil Partnership 5. Pregnancy/Maternity 6. Race 7. Religion/Belief 8. Sexual Orientation 9. Gender re-assignment	Equality Impact Score Low = Little or No evidence or concern (Green) Medium = some evidence or concern(Amber) High = significant evidence or concern (Red)	a) who have you consulted with b) what have they said c) what information or data have you used d) where are the gaps in your analysis e) how will your document/process or service promote equality and diversity good practice

Equality Target Group	Definitions	Equality Impact Score	Evidence to support Equality Impact Score
Age	Including specific ages and age groups: Older people Young people Children Early years	Low	This SOP is consistent in approach regardless of age.
Disability	Where the impairment has a substantial and long term adverse effect on the ability of the person to carry out their day to day activities: Sensory Physical Learning Mental health (including cancer, HIV, multiple sclerosis)	Low	This SOP is consistent in approach regardless of disability.
Sex	Men/Male Women/Female	Low	This SOP is consistent in approach regardless of sex/gender
Marriage/Civil Partnership		Low	This SOP is consistent in approach regardless of relationship status
Pregnancy/ Maternity		Low	This SOP is consistent in approach regardless of pregnancy/maternity status
Race	Colour Nationality Ethnic/national origins	Low	This SOP is consistent in approach regardless of race
Religion or Belief	All religions Including lack of religion or belief and where belief includes any religious or philosophical belief	Low	This SOP is consistent in approach regardless of religion or beliefs

Equality Target Group	Definitions	Equality Impact Score	Evidence to support Equality Impact Score
Sexual Orientation	Lesbian Gay men Bisexual	Low	This SOP is consistent in approach regardless of sexual orientation
Gender Reassignment	Where people are proposing to undergo, or have undergone a process (or part of a process) for the purpose of reassigning the person's sex by changing physiological or other attribute of sex	Low	This SOP is consistent in approach regardless of gender identity.

Summary

Please describe the main points/actions arising from your assessment that supports your decision. See above.	
EIA Reviewer: Leanne Bloor	
Date completed: 29.09.2023	Signature: L.Bloor