# Policy:

## MD 016 Prescribing and Administration of Emergency Oxygen in Adults in Hospital

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|---|---|
| **Executive Director Lead** | Medical Director |
| **Policy Owners** | Chief Pharmacist & Lead Nurse for Physical Health |
| **Policy Authors** | Chief Pharmacist and Lead Nurse for Physical Health |

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|---|---|
| **Document Type** | Policy |
| **Document Version Number** | Version 4 |
| **Date of Approval By PGG** | 30/01/2023 |
| **Date of Ratification** | 8/02/2023 |
| **Ratified By** | QAC |
| **Date of Issue** | 8/11/2022 |
| **Date for Review** | 01/2026 |

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|---|
| **Summary of policy**<br><br>Provide a summary description of the policy |

| | |
|---|---|
| **Target audience** | Any staff prescribing, administering, storing or handling oxygen. |

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|---|---|
| **Keywords** | Physical Health, Deteriorating Patient, National Early Warning Score 2 (NEWS2), Emergency, Resuscitation, Medicines Management, Prescription of Oxygen Therapy, Administering Oxygen |

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|---|
| **Storage & Version Control**<br><br>Version 4 of this policy is stored and available through the SHSC intranet/internet. This version of the policy supersedes the previous version (V3 November 2019). Any copies of the previous policy held separately should be destroyed and replaced with this version. |

**Version Control and Amendment Log**

| Version No. | Type of Change | Date | Description of change(s) |
|---|---|---|---|
| 1.0 | Ratification and issue | May 2010 | Amendments made during consultation, prior to ratification. |
| 2.0 | Review / ratification / issue | Nov 2016 | Review undertaken to update the policy due to reaching 'review date' |
| 3.0 | Review / ratification / issue | Nov 2019 | All references are to 2017 BTS Guideline which replaces the 2008 Guideline.<br>There are other minor alterations to the policy.<br>Appendices have been updated in line with current BTS guidance (2017) |
| 4.0 | Review / ratification / issue | Feb 2023 | NEWS replaced by NEWS2.<br>Updated appendices -blurred<br>Inclusion on moving and handling and fire risk in oxygen rich environments with paraffin based products. |

**Contents**

**Flowchart** - **See Appendix G** – Guidelines and flowchart for oxygen use.

## 1. Introduction

The administration of supplemental oxygen is an essential element of appropriate management for a wide range of clinical conditions; however, oxygen is a drug and therefore requires prescribing in all but emergency situations. Failure to administer oxygen appropriately can result in serious harm to the patient. The safe implementation of oxygen therapy with appropriate monitoring is an integral component of the Healthcare Professional's role.

***This policy and guidance is based on guidelines from the British Thoracic Society (BTS).*** Guideline for oxygen use in adults in healthcare and emergency settings 2017.

## 2. Scope

This policy is for general use within wards and departments in the Trust. The Trust does not have any piped medical gases; therefore, this policy only relates to use of oxygen cylinders (with reference to the use of oxygen concentrators/air compressors).

In this Trust, where specific clinical guidelines are required for oxygen administration within specialist areas, they should reflect wherever possible the principles within this policy.

This policy will ensure that all patients who require oxygen are given the correct amount of oxygen using the most appropriate equipment. The administration of supplemental oxygen is an essential element of appropriate management for a wide range of clinical conditions; however, oxygen is a drug and therefore requires prescribing in all but emergency situations. Failure to administer oxygen appropriately can result in serious harm to the patient. The safe implementation of oxygen therapy with appropriate monitoring is an integral component of the Healthcare Professional's role.

Patients transferring from specialist areas must be transferred with a prescription for their oxygen therapy utilising target saturation if the clinical indication is ongoing.

### Exclusions

- Patients requiring specialised oxygen prescribing or patients admitted for Long Term Oxygen Therapy assessment (both should be treated in an acute general hospital).

- Patients receiving oxygen as part of palliative care or patients on the end-of-life care pathway (in which case, the prescriber should indicate this on the prescription chart).

## 3 Purpose

The aim of this policy is to ensure that:

- All patients who require supplementary oxygen therapy receive therapy that is appropriate to their clinical condition and in line with national guidance (BTS Guideline; Thorax, 2017).
- Oxygen will be prescribed according to a target saturation range. The system of prescribing target saturation aims to achieve a specified outcome, rather than specifying the oxygen delivery method alone.

- Those who administer oxygen therapy will monitor the patient and keep within the target saturation range.

## 4 Definitions

**Hypercapnia** – an abnormal increase in the amount of carbon dioxide in the blood or in the lungs

**Patient** – patient, service users, person receiving care, any critically ill person requiring emergency care (including staff and visitors)

**Paraquat** – one of the most widely used herbicides in the world. It is quick-acting and non-selective, killing green plant tissue on contact. It is also toxic to human beings when swallowed.

## 5 Detail of the policy (title needs to be changed as appropriate)

This policy covers the use and management of Oxygen within SHSC.

## 6 Duties

***Prescribers*** – prescribe oxygen in line with this policy, using the target saturation method.

**Personnel who may administer oxygen:** Applies to any registered nurse or doctor, in accordance with the Medicines Optimisation Policy.

***Those who administer oxygen have responsibility to:***

- Accurately administer oxygen following prescription
- Monitor anyone being administered oxygen
- Be aware of possible risks and benefits
- Identify problems with oxygen administration and act accordingly
- Be competent in administration of oxygen in an emergency
- Document administration appropriately
- Be aware of how to open and use an oxygen cylinder

***Those who handle or store oxygen have responsibility to:***

- Be aware of correct handling and storage
- Be aware of risks in storing and handling oxygen cylinders
- Obtain, check and ensure replacement when necessary

## 7 Procedure

### 7.1 Prescribing, administering and monitoring oxygen

#### 7.1.1 Identifying appropriate target saturations

Guidance on identifying appropriate saturations for patients is provided for prescribers in Appendix C. In summary, oxygen should be prescribed to achieve a target saturation of 94-98% for most acutely unwell patients or 88-92% for those at risk of hypercapnic respiratory failure (e.g. some patients with COPD).

#### 7.1.2 Prescribing oxygen on the drug chart

Oxygen should be prescribed on the Trust prescription card (Appendix D) and the appropriate target saturation should be entered on the chart (or if target saturations are not indicated this should be noted).

### 7.1.3 Administering oxygen

Once the target saturation has been identified and prescribed, guidance regarding the most appropriate delivery system to reach and maintain the prescribed saturation is provided for those administering oxygen in Appendix F.
Personnel who may administer oxygen is shown in Section 5 – Duties.

### 7.1.4 Monitoring and recording oxygen

The patient's oxygen saturation and oxygen delivery system should be recorded on the observation chart alongside other physiological variables as shown on the Trust National Early Warning Scoring System 2 (NEWS2) (refer to Physical Health policy). Patients should thus be monitored as specified in Appendix H.

All patients on oxygen therapy should have regular pulse oximetry measurements. The frequency of oximetry measurements will depend on the condition being treated and the stability of the patient. Patients should have their oxygen saturations monitored continuously and recorded every few minutes using the NEWS2 (refer to Physical Health policy).

Oxygen therapy should be increased if the saturation is below the desired range and decreased if the saturation is above the desired range (and eventually discontinued as the patient recovers). See section 6.10 and Appendix C for more details

Patients should be monitored accurately for signs of improvement or deterioration. Any sudden fall in oxygen saturation should lead to clinical evaluation of the patient. The National Early Warning Score system in the Physical Health policy should be used.

## 7.2 Emergency situations

In an emergency an oxygen prescription **is not** required. Oxygen should be given to the patient immediately without a formal prescription but documented later on and in the patient's record.

All peri-arrest and critically ill patients should be given 100% oxygen (15 L/m reservoir mask) whilst awaiting immediate medical review. Patients with COPD and other risk factors for hypercapnia who develop critical illness should have the same initial target saturations as other critically ill patients pending the arrival of a doctor or ambulance.

All patients who have had a cardiac or respiratory arrest should have 100% Oxygen provided along with basic/immediate life support.

A subsequent written record must be made of what oxygen therapy has been given to every patient alongside the recording of all other emergency treatment (as Appendix D).
Any competent registered nurse/ health professional can commence oxygen therapy in an emergency situation (without the need for a formal prescription).

## 7.3 Indications

The rationale for oxygen therapy is prevention of cellular hypoxia, caused by hypoxaemia (low PaO2), and thus prevention of potentially irreversible damage to vital organs.

Therefore, the most common reasons for oxygen therapy to be initiated are:

- Acute hypoxaemia (for example pneumonia, shock, asthma, heart failure, pulmonary embolus, sepsis)
- Ischaemia (for example myocardial infarction, but only if associated with hypoxaemia (abnormally high blood oxygen levels may be harmful to patients with ischaemic heart disease and stroke).
- Abnormalities in quality or type of haemoglobin (for example acute GI blood loss or carbon monoxide poisoning).

Other indications include:

- *Pneumothorax* – Oxygen may increase the rate of resolution of pneumothorax in patients for whom a chest drain is not indicated.
- *Post operative state* – general anaesthesia can lead to decrease in functional residual capacity within the lungs resulting in hypoxaemia (Ferguson 1999). In this Trust, the most common example is pre and post-Electro Convulsive Therapy.

### 7.4 Contra-indications

There are no absolute contraindications to oxygen therapy if indications are judged to be present. The goal of oxygen therapy is to achieve adequate tissue oxygenation using the lowest possible $FiO_2$ (fraction to inspired oxygen). Patients with paraquat poisoning or bleomycin lung injury may be harmed by supplemental oxygen. Avoid oxygen unless the patient is hypoxaemic.

### 7.5 Cautions

#### 7.5.1 Oxygen administration and carbon dioxide retention

In patients with chronic carbon dioxide retention, oxygen administration may cause further increases in carbon dioxide and respiratory acidosis. This may occur in patients with COPD, neuromuscular disorders, morbid obesity or musculoskeletal disorders. There are several factors which lead to the rise in carbon dioxide with oxygen therapy in patients with hypercapnic respiratory failure and details are in the BTS guideline.

#### 7.5.2 Other precautions/ Hazards/ Complications of oxygen therapy

- Drying of nasal and pharyngeal mucosa
- Oxygen toxicity
- Absorption atelectasis (partial or total collapse of a lung, non-expansion of lungs at birth)
- Skin irritation
- Fire hazard
- Potentially inadequate flow resulting in lower $FiO_2$ (fraction to inspired oxygen) than intended due to high inspiratory demand or inappropriate oxygen delivery device or equipment faults.

### 7.6 Transfer and transportation of patients receiving oxygen

Patients who are transferred from one area to another must have clear documentation of their ongoing oxygen requirements and documentation of their oxygen saturation. If a patient transfers from an area not utilising the target saturation system their oxygen should be administered as per the transferring areas prescription until the patient is

reviewed and transferred over to the target saturation scheme, which should occur as soon as possible. Patients requiring oxygen therapy should be accompanied by a trained member of the nursing staff wherever possible. If this does not occur, clear instructions must be provided for personnel involved in the transfer of the patient, which must include delivery device and flow rate.
***Oxygen saturation should be monitored continuously by registered healthcare professionals for seriously ill patients.***

*Patients who are medically unstable and those requiring high dose oxygen therapy (Reservoir mask, Venturi mask above 35% or Humidified oxygen above 35% or nasal or simple mask above 5 L/min) whilst being transferred from one area to another should be accompanied by a registered healthcare professional. HCA staff may transfer stable patients with low NEWS2 score who are on low dose oxygen. Clear instructions must be provided for personnel involved in the transfer of the patient, which must include delivery device and flow rate.*
*Staff must ensure there are adequate numbers of oxygen cylinders and that they are full when they leave the department/ward.*

### 7.7 Peri-operative and immediately post operatively

The usual procedure for prescribing oxygen therapy in these areas should be adhered to, utilising the target saturation. In this Trust, the most common example is pre and post-Electro Convulsive Therapy.

If a patient is transferred back to the ward on oxygen therapy and is not on the target saturation system, the need for ongoing oxygen therapy should be reviewed as soon as possible. If oxygen therapy is to be continued, it should be prescribed using the target saturation scheme unless there is an alternative time-limited instruction from the anaesthetist for selected patients.

### 7.8 Nebulised therapy and oxygen (including oxygen concentrators/air compressors)

When nebulised therapy is administered to patients at risk of hypercapnic respiratory failure (see section 7.5), it should be driven by compressed air. If necessary, supplementary oxygen should be given concurrently by nasal prongs at 1 to 4 litres per minute to maintain an oxygen saturation of 88 to 92% or other specified target range.

Oxygen concentrators/air compressors should be used as described by specialist prescriber. Also maintained and serviced as per manufacturer/supplier instructions. This should be recorded and records stored locally (Please see Records Management Policy for Retention Schedule).

### 7.9 Normal Oxygen saturations

- In adults less than 70 years of age at rest at sea level 96%-98% when awake.
- Aged 70 and above at rest at sea level 94%-98% when awake.
- Patients of all ages may have transient dips of saturation to 84% during sleep.
- “Normal range” for COPD patients- 88 to 92%.

### 7.10 Summary Oxygen Administration protocol (and weaning protocol)

| ACTION | RATIONALE |
|---|---|
| All patients requiring oxygen therapy will have a prescription for oxygen therapy recorded on the patients drug prescription chart. N.B exceptions - see Emergency situations (Section 6.2) | Oxygen should be regarded as a drug and should be prescribed. BTS National guidelines (2017). British National Formulary (https://bnf.nice.org.uk/). |
| The prescription will incorporate a target saturation that will be identified by the clinician prescribing the oxygen. | Certain groups of patients require different target ranges for their oxygen saturation, see Tables 1-4 (Appendix C).<br>Certain groups of patients are at risk of hypoxaemia, particularly patients with COPD. |
| The prescription will incorporate an initial starting dose (i.e. delivery device and flow rate) | To provide the nurses with guidance for the appropriate starting point for the oxygen delivery system and flow rate.<br>To provide an accurate record. |
| The drug chart should be signed at every drug round | To ensure that the patient is receiving oxygen if prescribed and to consider weaning and discontinuation |
| Once oxygen is in situ the nurse will monitor observations. All patients should have their oxygen saturation observed for at least five minutes after starting oxygen therapy. If a patient is receiving intermittent therapy they may be monitored at least 8 hourly. (Appendix H) | The clinical observations chart should be reviewed at every drug round and the drug chart should be signed to indicate that the patient is within target, or appropriate action has been taken if not, or else indicate that the patient is breathing air. |
| Oxygen saturations must always be interpreted alongside the patient's clinical status incorporating the National Early Warning Score. | To identify early signs of clinical deterioration, e.g. elevated respiratory rate |
| If the patient falls outside of the target saturation range, the oxygen therapy will be adjusted accordingly<br>The saturation should be monitored continuously for at least 5 minutes after any increase or decrease in oxygen dose to ensure that the patient achieves the desired saturation range. | To maintain the saturation in the desired range. |
| ***Saturation higher than target specified or >98% for an extended period of time.*** | |
| • Step down oxygen therapy as per prescription | The patient will require weaning down from current oxygen delivery system. |
| • Consider discontinuation of oxygen therapy | The patients clinical condition may have improved negating the need for supplementary oxygen |
| ***Saturation lower than target specified*** | |
| • Check all elements of oxygen delivery system for faults or errors including oxygen cylinder | In most instances a fall in oxygen saturation is due to deterioration of the patient however equipment faults should be checked for. |
| • Step up oxygen therapy as per prescription. Any sudden fall in oxygen saturation should lead to clinical | To assess the patients response to oxygen increase, and ensure that PaCO2 has not risen to an unacceptable level, or Ph |

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|---|---|
| evaluation e.g. NEWS2. Consider contacting medic. | dropped to an unacceptable level and to screen for the cause of deteriorating oxygen level (e.g. pneumonia, heart failure etc) |
| • Monitor NEWS2 and respiratory rate for further clinical signs of deterioration | Patient safety |
| **Saturation within target specified** | |
| • Continue with oxygen therapy, and monitor patient to identify appropriate time for stepping down therapy, once clinical condition allows | Patient Safety |
| • A change in delivery device (without an increase in oxygen therapy) does not require review by the medical team. | The change may be made in stable patients due to patient preference or comfort. E.g. from face mask to nasal cannula |
| **Oxygen delivery methods** | |
| The Trusts recommended delivery devices will be utilised to ensure a standardised approach to oxygen delivery, see Appendix F | Previous audits have demonstrated wide variations in delivery devices across clinical areas, potentially increasing the risk of adverse incidents |

### 7.11 Humidification

Humidification may be required for some patient groups, especially "neck-breathing patients" for example service user's with a tracheostomy and those who have difficulty in clearing airway secretions or mucus. **Guidance should be sought from respiratory specialists in the General Hospital.**

### 7.12 Health and Safety issues are covered in Appendix I.

### 7.13 Ordering, supplying, storage and replacement of oxygen cylinders – information provided in Appendix G

## 8 Development, Consultation and Approval

***Version 1***

Small working group with Pharmacist, Senior Nurses and Junior Doctor. Also linking this work with that of the Physical Health Group, especially relating to the Patient Early Warning Score System.

The majority of the policy is taken from the British Thoracic Society example policy, then adapted for use within the Trust.

Other material used is by kind permission of the Joint Royal Colleges Ambulance Liaison Committee (JRCALC). Again this is based on the guidance, etc from the British Thoracic Society.

**Version 2**

Minor changes have been made to the previous version, as we are still awaiting an update from British Thoracic Society (late 2016), which may mean a further review.

Checked with Pharmacy, who advise prescribing oxygen is still on paper chart as JAC electronic prescribing is no able to do this.

There has been no further consultation, other than feedback received during training about the previous version.

Changes in Version 2
Section 3 – Definitions – extended

Section 6 – decreased use of abbreviations
Section 6.8 – now includes reference to air compressors/concentrators with more details
Appendix H – more instruction about prescribing of oxygen
Appendix L – more specific instruction for monitoring and recording

**Version 3.0**

**Changes have been made in line with British Thoracic Society Guidance (2017).**

Pharmacy – the prescription of oxygen is still unavailable on JAC; the prescription recording information in appendix H has been reviewed by pharmacy to reflect the new guidance

There has been no further consultation and feedback received during training has been used to update this policy.

**Changes in Version 3.0**

**Section 5 – Duties – Those who administer oxygen have a responsibility to: be aware how to open and use an oxygen cylinder (included in local induction and ILS training.**

Appendix H
Regular Oxygen: Prescribe as OXYGEN Target Saturation range on prescription chart
As required oxygen: Prescribe as Target range
Emergency Oxygen: Prescribe as Oxygen target range

**Changes in Version 4.0**

Revised reference sources – updated information on BNF 2022 (online), standardised across policy NEWS2 use, minor language and typographical corrections. Interim resuscitation officer, Medicines Optimisation Committee members

## 9 Audit, Monitoring and Review

Managers are responsible for monitoring that weekly checks are undertaken on equipment and this includes oxygen cylinders.

The Medicines Optimisation Committee will receive information about oxygen-related incidents, these will follow a review by a Pharmacist, Senior Nurse and a Doctor (as a temporary Medical Gas group). The more Serious Incidents will be reviewed in line with the Trust Incident Reporting and Investigation Policy. The Medical Gas group will review reports relating to oxygen training, and this will be reported to the Medicines Optimisation Committee.

Audit of oxygen cylinders – this will be undertaken annually by Supplies Department with a Senior Nurse. This will include checking cylinders are fit for purpose and department weekly checks are recorded. Optional audits may be performed in clinical areas. Audit pro-formas are available on the BTS website.

**Monitoring Compliance Template**

| Minimum Requirement | Process for Monitoring | Responsible Individual/ group/committee | Frequency of Monitoring | Review of Results process (e.g. who does this?) | Responsible Individual/group/ committee for action plan development | Responsible Individual/group/ committee for action plan monitoring and implementation |
|---|---|---|---|---|---|---|
| A) Weekly check of cylinder and contents | Weekly emergency bag checklist | Department manager | Weekly | 4 weekly review by manager | Medicines Optimisation Committee or Medical Devices Group | Medicines Optimisation Committee or Medical Devices Group |
| B) Staff training | Records kept by ETD | Department manager | Annual | Mandatory Training Lead | Resuscitation and Physical Health Group | Medicines Optimisation Committee or Medical Devices Group |

| | | | | | | |
|---|---|---|---|---|---|---|
| C) Audit of oxygen cylinders | Check of weekly checklist, visual check of cylinder, and check number of cylinders | Supplies Department | Annual | Supplies Department | Resuscitation and Physical Health Group | Medicines Optimisation Committee or Medical Devices Group |

This policy will be reviewed in 3 years, or earlier if needed due to changes in national guidance, lessons learned or incidents.

## 10 Implementation Plan

*All policies should include an outline implementation plan (this will summarise sections 7, 8 and 9 above). It should include consideration of:*

- *Dissemination, storage and archiving*
- *Training and development requirements and who will provide the training*
- *Any new job roles and responsibilities and how these will be implemented*
- *Resources needed*
- *Timescales*
- *Lead role and responsibilities for implementation*
- *Audit or monitoring of implementation planned*

*The implementation plan should be presented as an action plan and include clear actions, lead roles, resources needed and timescales. The Director of Corporate Governance team can provide advice on formats for action plans; however, an example layout for the plan is shown below:*

| **Action / Task** | **Responsible Person** | **Deadline** | **Progress update** | **Action / Task** | **Responsible Person** | **Deadline** | **Progress update** |
|---|---|---|---|---|---|---|---|
| Upload revised policy onto intranet and Trust website; And remove and archive old version. | Director of Corporate Governance | Within 5 working days of finalisation | | *e.g. Upload new policy onto intranet and remove old version* | *Chief Pharmacist* | *February* 2023 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A communication will be issued to all staff via the Connect immediately following publication. | Director of Corporate Governance | Within 5 working days of issue | | *e.g. Make team aware of new policy* | *Team manager* | *Feb* 2023 | |
| A communication will be sent to ward/team managers to cascade release of revised policy to all staff within their team | Physical Health Lead | Within 5 working days of issue | | | | | |
| Make team aware of new policy | Team manager | Within one month of policy issue | | | | | |
| Training available for:<br>- prescribers<br>- those who administer oxygen<br>those who store/handle oxygen | Resuscitation and Physical Health Team | Already part of ILS training | | | | | |
| Make sure those prescribing oxygen have received training on this policy (this is part of Trust Immediate Life Support training) | Medical Director | Already part of ILS training | Medical Education Services to ensure Medics trained elsewhere are familiar with the Trust Policy (record training on OLM) | | | | |
| Make sure Registered Nurses and Doctors with access to oxygen | Ward Manager | Already part of ILS training | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| have training about prescribing, administering and storing/handling oxygen (this is part of Immediate Life Support training and should be part of local induction training for new/flexi/agency staff) | | | | | | | |
| Those administering oxygen should also be trained in use of the pulse oximeter (included in Immediate Life Support training, and also National Early Warning Score training) | Ward Manager | Already part of ILS training and Early Warning Score Training | | | | | |
| Identify staff who store/handle oxygen. And provide base line Oxygen training as per local induction to include the opening and use of an oxygen cylinder and the safe storage of medical gasses. | Ward Manager | Within 1 month of policy issue | | | | | |

## 11 Dissemination, Storage and Archiving (Control)

The previous policy will be removed from the Trust intranet by the Clinical Governance team. Team managers are responsible for ensuring that it is also removed from any policy and procedure manuals, or files stored in their offices and destroyed. Archiving – The Clinical Governance team will keep a paper and an electronic version of the previous policy for archive purposes. Please contact them if a copy is needed.

| Version | Date added to intranet | Date added to internet | Date of inclusion in JARVIS | Any other promotion/ dissemination (include dates) |
|---|---|---|---|---|
| 1.0 | May 2010 | | | Specific training dates provided around the new policy and contents |
| 2.0 | November 2016 | | | Part of Immediate Life Support training.<br>Link to be sent to medics about how to meet training need. |
| 3.0 | November 2019 | | | ILS to be reviewed in line with current guidance. Date for completion 30/11/19 by Resuscitation and Physical Health Team.<br>Email to be sent to ward/team managers within one month of policy issue.<br><br>Policy updates to be included in Connect. |
| 4.0 | February 2023 | | | Email to be sent to ward/team managers within one month of policy issue.<br><br>Policy updates to be included in Connect |

## 12 Training and Other Resource Implications

All nurses and doctors involved in prescribing or administrating oxygen should be taught using the oxygen policy. Teaching aides are available on https://www.brit-thoracic.org.uk/quality-improvement/clinical-resources/ A record of all those who have been trained will be kept.

All doctors should be taught about the oxygen policy. Teaching aids are available on the British Thoracic Society website.

Emergency oxygen use for critically ill patients or cardio-respiratory arrest. This training is included in the Trust Immediate Life Support training programme. This programme will also include the use of Pulse Oximeter.

All departments which use oxygen will have a Pulse Oximeter available for use when using oxygen.

Any other staff who handle or store oxygen should be identified. Managers can contact Pharmacy or the Resuscitation and Physical Health Team for specific staff training.

## 13 Links to Other Policies, Standards (Associated Documents)

- Resuscitation Policy
- Incident Reporting & Investigation Policy
- Physical Health Policy (which includes the New Early Warning Score 2 System)

- BTS Guideline for oxygen use in adults in healthcare and emergency settings, O'Driscoll BR et al Thorax 2017; 72: Suppl 1 i1-i89

- Summary guideline for prescribing oxygen emergency oxygen in hospital. Available on BTS website: Emergency Oxygen | British Thoracic Society | Better lung health for all (brit-thoracic.org.uk)

- Summary of prescription, administration and discontinuation of oxygen therapy. Available on BTS website: Emergency Oxygen | British Thoracic Society | Better lung health for all (brit-thoracic.org.uk)

## 14 Contact Details

*The document should give names, job titles and contact details for any staff who may need to be contacted in the course of using the policy (sample table layout below). This should also be a list of staff who could advice regarding policy implementation.*

| ***Title*** | ***Name*** | ***Phone*** | ***Email*** |
|---|---|---|---|
| Physical Health Lead Nurse | Penelope Fati | | penelope.fati@shsc.nhs.uk |
| Chief Pharmacist | Abiola Allinson | 01142718630 | Abiola.allinson@shsc.nhs.uk |

## Appendix A

## Equality Impact Assessment Process and Record for Written Policies

**Stage 1** – **Relevance** - Is the policy potentially relevant to equality i.e. will this policy potentially impact on staff, patients or the public? This should be considered as part of the Case of Need for new policies.

| | | |
|---|---|---|
| **NO** – No further action is required – please sign and date the following statement.<br>**I confirm that this policy does not impact on staff, patients or the public.** | ***I confirm that this policy does not impact on staff, patients or the public.***<br>Name/Date: Abiola Allinson 03/01/2023 | **YES,** Go to **Stage 2** |

**Stage 2 Policy Screening and Drafting Policy** - Public authorities are legally required to have 'due regard' to eliminating discrimination, advancing equal opportunity and fostering good relations in relation to people who share certain 'protected characteristics' and those that do not. The following table should be used to consider this and inform changes to the policy (indicate yes/no/ don't know and note reasons). Please see the SHSC Guidance and Flow Chart.

**Stage 3** – **Policy Revision** - Make amendments to the policy or identify any remedial action required and record any action planned in the policy implementation plan section

| SCREENING RECORD | Does any aspect of this policy or potentially discriminate against this group? | Can equality of opportunity for this group be improved through this policy or changes to this policy? | Can this policy be amended so that it works to enhance relations between people in this group and people not in this group? |
|---|---|---|---|
| **Age** | **No** | | |
| **Disability** | **No** | | |
| **Gender Reassignment** | **No** | | |
| **Pregnancy and Maternity** | **No** | | |

| | | | |
|---|---|---|---|
| **Race** | **No** | | |
| **Religion or Belief** | **No** | | |
| **Sex** | **No** | | |
| **Sexual Orientation** | **No** | | |
| **Marriage or Civil Partnership** | **No** | | |

Please delete as appropriate: - Policy Amended / Action Identified (see Implementation Plan) / no changes made.

Impact Assessment Completed by:
Name /Date Abiola Allinson 03/01/2023

**Appendix B**

# Review/New Policy Checklist

This checklist to be used as part of the development or review of a policy and presented to the Policy Governance Group (PGG) with the revised policy.

| | | Tick to confirm |
|---|---|---|
| | **Engagement** | |
| 1. | Is the Executive Lead sighted on the development/review of the policy? | Y |
| 2. | Is the local Policy Champion member sighted on the development/review of the policy? | Y |
| | **Development and Consultation** | |
| 3. | If the policy is a new policy, has the development of the policy been approved through the Case for Need approval process? | N/A |
| 4. | Is there evidence of consultation with all relevant services, partners and other relevant bodies? | Y |
| 5. | Has the policy been discussed and agreed by the local governance groups? | Y |
| 6. | Have any relevant recommendations from Internal Audit or other relevant bodies been taken into account in preparing the policy? | N/A |
| | **Template Compliance** | |
| 7. | Has the version control/storage section been updated? | Y |
| 8. | Is the policy title clear and unambiguous? | Y |
| 9. | Is the policy in Arial font 12? | Y |
| 10. | Have page numbers been inserted? | Y |
| 11. | Has the policy been quality checked for spelling errors, links, accuracy? | Y |
| | **Policy Content** | |
| 12. | Is the purpose of the policy clear? | Y |
| 13. | Does the policy comply with requirements of the CQC or other relevant bodies? (where appropriate) | Y |
| 14. | Does the policy reflect changes as a result of lessons identified from incidents, complaints, near misses, etc.? | N/A |
| 15. | Where appropriate, does the policy contain a list of definitions of terms used? | Y |
| 16. | Does the policy include any references to other associated policies and key documents? | Y |
| 17. | Has the EIA Form been completed (Appendix 1)? | Y |
| | **Dissemination, Implementation, Review and Audit Compliance** | |
| 18. | Does the dissemination plan identify how the policy will be implemented? | Y |
| 19. | Does the dissemination plan include the necessary training/support to ensure compliance? | Y |
| 20. | Is there a plan to<br>i. review<br>ii. audit compliance with the document? | Y |
| 21. | Is the review date identified, and is it appropriate and justifiable? | Y |

**Appendix C**

# Guidelines and flowchart for oxygen use

**OXYGEN – update January 2023**

## Table 1 Critical illnesses requiring high levels of supplemental oxygen

**Table 1** Critical illness requiring high levels of supplemental oxygen

Section 8.10

The initial oxygen therapy is a reservoir mask at 15 L/min pending the availability of reliable oximetry readings.
For patients with spontaneous circulation and a reliable oximetry reading, it may quickly become possible to reduce the oxygen dose while maintaining a target saturation range of 94–98%.
If oximetry is unavailable, continue to use a reservoir mask until definitive treatment is available.
Patients with COPD and other risk factors for hypercapnia who develop critical illness should have the same initial target saturations as other critically ill patients pending the results of blood gas results after which these patients may need controlled oxygen therapy with target range 88–92% or supported ventilation if there is severe hypoxaemia and/or hypercapnia with respiratory acidosis.

| | Additional comments | Recommendations |
|---|---|---|
| Cardiac arrest or resuscitation | Refer to resuscitation guidelines for choice of delivery device during active resuscitation. Give highest possible inspired oxygen concentration during CPR until spontaneous circulation has been restored. | Recommendation E1 |
| Shock, sepsis, major trauma, drowning, anaphylaxis, major pulmonary haemorrhage, status epilepticus | Also give specific treatment for the underlying condition | Recommendations E2–E4 |
| Major head injury | Early tracheal intubation and ventilation if comatose | Recommendation E5 |
| Carbon monoxide poisoning | Give as much oxygen as possible using a bag-valve mask or reservoir mask. Check carboxyhaemoglobin levels.<br>A normal or high oximetry reading should be disregarded because saturation monitors cannot differentiate between carboxyhaemoglobin and oxyhaemoglobin, owing to their similar absorbances.<br>The blood gas PO2 will also be normal in these cases (despite the presence of tissue hypoxia). | Recommendation E6 |

COPD, chronic obstructive pulmonary disease; CPR, cardiopulmonary resuscitation; $PO_2$, oxygen tension arterial or arterialised blood gases.

## Table 2 Serious illnesses requiring moderate levels of supplemental oxygen if the patient is hypoxaemic

**Table 2** Serious illnesses requiring moderate levels of supplemental oxygen if the patient is hypoxaemic

Section 8.11

The initial oxygen therapy is nasal cannulae at 2–6 L/min (preferably) or simple face mask at 5–10 L/min unless stated otherwise.
For patients not at risk of hypercapnic respiratory failure who have saturation below 85%, treatment should be started with a reservoir mask at 15 L/min and the recommended initial oxygen saturation target range is 94–98%. If oximetry is not available, give oxygen as above until oximetry or blood gas results are available. Change to reservoir mask if the desired saturation range cannot be maintained with nasal cannulae or simple face mask (and ensure that the patient is assessed by senior medical staff). If these patients have coexisting COPD or other risk factors for hypercapnic respiratory failure, aim at a saturation of 88–92% pending blood gas results but adjust to 94–98% if the $PCO_2$ is normal (unless there is a history of previous hypercapnic respiratory failure requiring NIV or IMV) and recheck blood gases after 30–60 min, see table 4.

| | Additional comments | Recommendations |
|---|---|---|
| Acute hypoxaemia (cause not yet diagnosed) | Reservoir mask at 15 L/min if initial $SpO_2$ below 85%, otherwise nasal cannulae or simple face mask<br>Patients requiring reservoir mask therapy need urgent clinical assessment by senior staff. | Recommendations D1–D3 |
| Acute asthma pneumonia lung cancer | | Recommendations F1–F3 |
| Deterioration of lung fibrosis or other interstitial lung disease | Reservoir mask at 15 L/min if initial $SpO_2$ below 85%, otherwise nasal cannulae or simple face mask | Recommendation F4 |
| Pneumothorax | Needs aspiration or drainage if the patient is hypoxaemic. Most patients with pneumothorax are not hypoxaemic and do not require oxygen therapy.<br>Use a reservoir mask at 15 L/min if admitted for observation. Aim at 100% saturation. (Oxygen accelerates clearance of pneumothorax if drainage is not required.) | Recommendations F5–F6 |
| Pleural effusions | Most patients with pleural effusions are not hypoxaemic. If hypoxaemic, treat by draining the effusion as well as giving oxygen therapy. | Recommendation F7 |
| Pulmonary embolism | Most patients with minor pulmonary embolism are not hypoxaemic and do not require oxygen therapy. | Recommendation F8 |
| Acute heart failure | Consider CPAP or NIV in cases of pulmonary oedema. | Recommendations F9–F10 |
| Severe anaemia | The main issue is to correct the anaemia. Most anaemic patients do not require oxygen therapy. | Recommendations F11–12 |
| Postoperative breathlessness | Management depends on underlying cause. | Recommendation J1 |

COPD, chronic obstructive pulmonary disease; CPAP, continuous positive airway pressure; IMV, invasive mechanical ventilation; NIV, non-invasive ventilation; $PCO_2$, arterial or arterialised carbon dioxide tension; $SpO_2$, arterial oxygen saturation measured by pulse oximetry.

## Table 3 COPD and other conditions requiring controlled or low-dose oxygen

**Table 3** Conditions for which patients should be monitored closely but oxygen therapy is not required unless the patient is hypoxaemic

Section 8.13

If hypoxaemic, the initial oxygen therapy is nasal cannulae at 2–6 L/min or simple face mask at 5–10 L/min unless saturation is below 85% (use reservoir mask) or if at risk from hypercapnia (see below).
The recommended initial target saturation range, unless stated otherwise, is 94–98%.
If oximetry is not available, give oxygen as above until oximetry or blood gas results are available.
If patients have COPD or other risk factors for hypercapnic respiratory failure, aim at a saturation of 88–92% pending blood gas results but adjust to 94–98% if the $PCO_2$ is normal (unless there is a history of respiratory failure requiring NIV or IMV) and recheck blood gases after 30–60 min, see table 4.

| | Additional comments | Recommendations |
|---|---|---|
| Myocardial infarction and acute coronary syndromes | Most patients with acute coronary artery syndromes are not hypoxaemic and the benefits/harms of oxygen therapy are unknown in such cases. Unnecessary use of high concentration oxygen may increase infarct size. | Recommendation F13 |
| Stroke | Most patients with stroke are not hypoxaemic. Oxygen therapy may be harmful for non-hypoxaemic patients with mild–moderate strokes. | Recommendation F14 |
| Hyperventilation or dysfunctional breathing | Exclude organic illness. Patients with pure hyperventilation due to anxiety or panic attacks are unlikely to require oxygen therapy.<br>Rebreathing from a paper bag may cause hypoxaemia and is not recommended. | See section 8.13.3 |
| Most poisonings and drug overdoses (see table 1 for carbon monoxide poisoning) | Hypoxaemia is more likely with respiratory depressant drugs, give antidote if available, for example, naloxone for opiate poisoning.<br>Check blood gases to exclude hypercapnia if a respiratory depressant drug has been taken.<br>Avoid high blood oxygen levels in cases of acid aspiration as there is theoretical evidence that oxygen may be harmful in this condition.<br>Monitor all potentially serious cases of poisoning in a level 2 or 3 environment (high dependency unit or intensive care unit). | Recommendation F15 |
| Poisoning with paraquat or bleomycin | Patients with paraquat poisoning or bleomycin lung injury may be harmed by supplemental oxygen.<br>Avoid oxygen unless the patient is hypoxaemic.<br>Target saturation is 85–88%. | Recommendation F16 |
| Metabolic and renal disorders | Most do not need oxygen (tachypnoea may be due to acidosis in these patients) | Recommendation F17 |
| Acute and subacute neurological and muscular conditions producing muscle weakness | These patients may require ventilatory support and they need careful monitoring which includes spirometry. If the patient's oxygen level falls below the target saturation, they need urgent blood gas measurements and are likely to need ventilatory support. | Recommendation G4 |
| Pregnancy and obstetric emergencies | Oxygen therapy may be harmful to the fetus if the mother is not hypoxaemic. | Recommendations H1–H4 |

COPD, chronic obstructive pulmonary disease; IMV, invasive mechanical ventilation; NIV, non-invasive ventilation; $PCO_2$, arterial or arterialised carbon dioxide tension.

## Table 4 Conditions for which patients should be monitored closely but oxygen therapy is not required unless the patient is hypoxaemic

**Table 4** COPD and other conditions requiring controlled or low-dose oxygen therapy

Section 8.12

Prior to availability of blood gases, use a 24% Venturi mask at 2–3 L/min or 28% Venturi mask at 4 L/min or nasal cannulae at 1–2 L/min and aim for an oxygen saturation of 88–92% for patients with risk factors for hypercapnia but no prior history of respiratory acidosis. Adjust target range to 94–98% if the $PCO_2$ is normal (unless there is a history of previous NIV or IMV) and recheck blood gases after 30–60 min.

| | Additional comments | Recommendations |
|---|---|---|
| COPD and other conditions causing fixed airflow obstruction (eg, bronchiectasis) | May need lower range if acidotic or if known to be very sensitive to oxygen therapy. Ideally use 'alert cards' to guide therapy based on previous blood gas results. Increase Venturi mask flow by up to 50% if respiratory rate is above 30 breaths/min. | Recommendations G1–G2 and section 8.12.1 |
| Exacerbation of CF | Admit to regional CF centre if possible, if not discuss with regional centre or manage according to protocol agreed with regional CF centre. Ideally use 'alert cards' to guide therapy. Increase Venturi mask flow by up to 50% if respiratory rate is above 30 breaths/min. | Recommendations G1, G3, G6 |
| Neuromuscular disease, neurological condition and chest wall deformity | May require ventilatory support.<br>Risk of hypercapnic respiratory failure | Recommendations G1, G4, G6 |
| Morbid obesity | | Recommendations G1,G5, G6 |

CF, cystic fibrosis; COPD, chronic obstructive pulmonary disease; IMV, invasive mechanical ventilation; NIV, non-invasive ventilation; $PCO_2$, arterial or arterialised carbon dioxide tension.

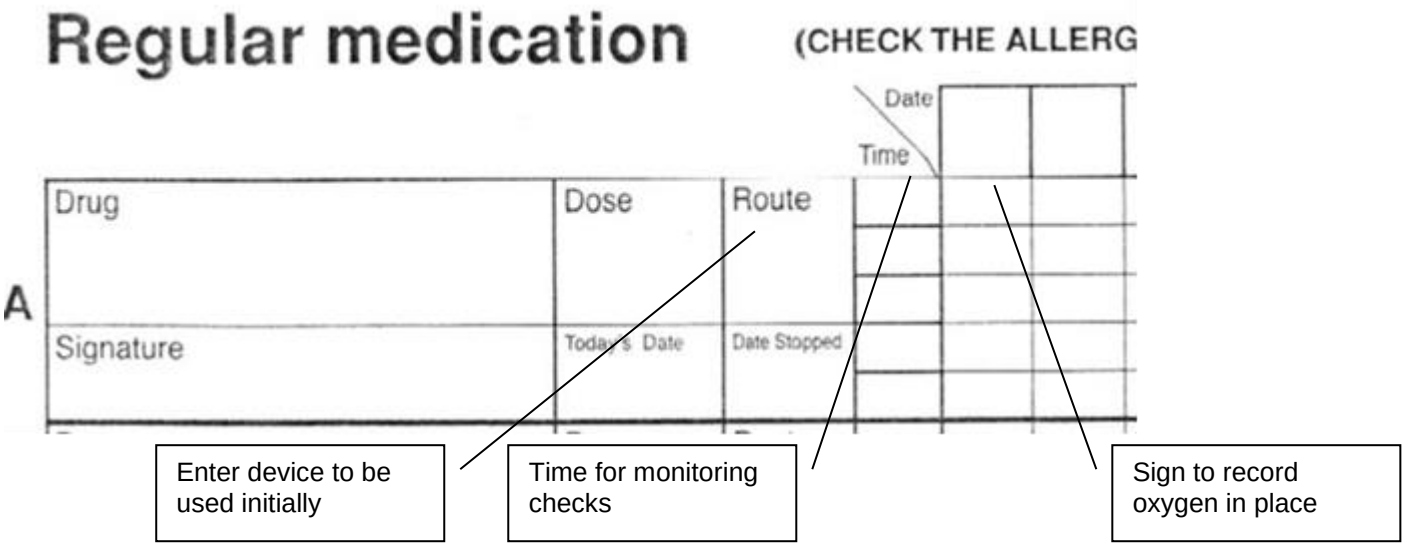
Oxygen prescription for acutely hypoxaemic patients – **if person's parameters are outside the grey boxes please contact 2222 for emergency ambulance. SHSC staff will not be performing arterial blood gases**

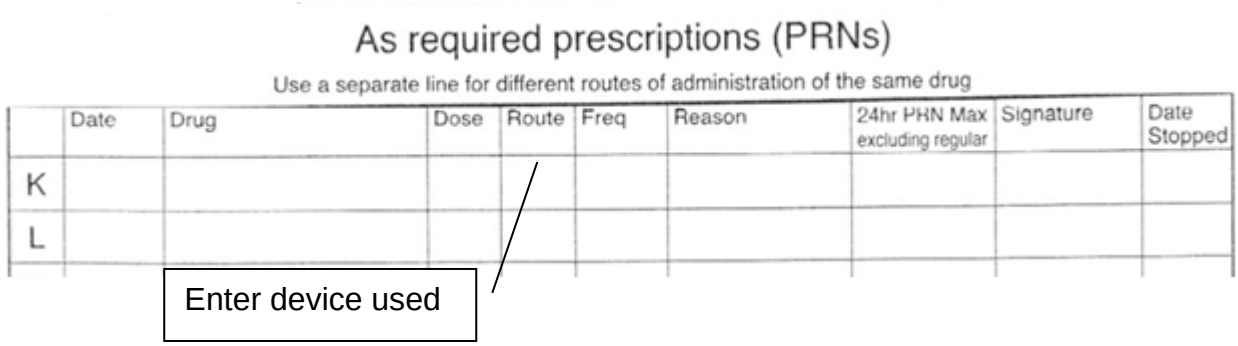

**Figure 1** Chart 1 - Oxygen prescription for acutely hypoxaemic patients in hospital. Any increase in $FIO_2$ must be followed by repeat blood gases in 1 hour (or sooner if conscious level deteriorates). *If pH is < 7.35 ([H+] > 45 nmol/L) with normal or low PaCO2, investigate and treat for metabolic acidosis and keep $SpO_2$ 94–98%. ABG, arterial blood gas; COPD, chronic obstructive pulmonary disease; $FiO_2$, fraction of inspired oxygen; ICU, intensive care unit; NIV, non-invasive ventilation; $PaCO_2$, arterial carbon dioxide tension; $PCO_2$, carbon dioxide tension; $PO_2$, oxygen tension; $SpO_2$, arterial oxygen saturation measured by pulse oximetry.

**Appendix D**

## Oxygen prescribing using the Trust prescription chart

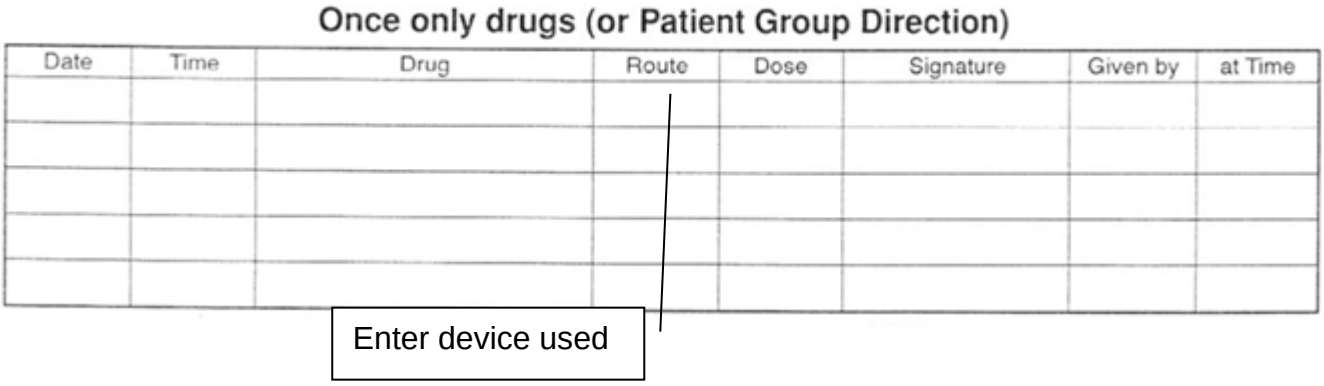
Use current drug card with guidelines in this policy.
Where electronic prescribing is in place – oxygen should be prescribed on drug card and cross referenced on ePMA system by prescribing '**XXX OXYGEN PRESCRIBED ON PAPER XXX**'.




**Emergency oxygen**

**This should be recorded on the Prescription Chart following administration.**



**Appendix E**

# ADMINISTERING OXYGEN THERAPY

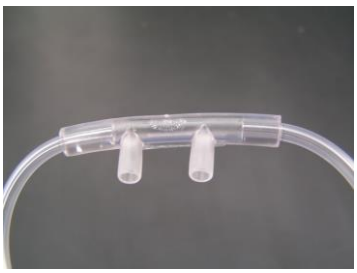
| ACTION | RATIONALE |
|---|---|
| 1. Ensure patency of airway | To promote effective oxygenation |
| 2. The type of delivery system used will depend on the needs and comfort of It the patient. It is the nurses role to assess the patient and use the prescribed system. | To provide accurate oxygen delivery to the patient. Most stable patients prefer nasal cannula to masks. |
| 3. Ensure oxygen is prescribed on prescription chart.<br>In some situations a protocol may be in place to allow designated nurses to administer oxygen. In these cases the doctor must review the patient's condition within the stated time and prescribe oxygen accordingly | To ensure a complete record is maintained and expedite patient treatment.<br>The exception to this action would be during an emergency situation where the resuscitation guideline should be followed. |
| 4. Ensure that the oxygen dose is clearly indicated. If nasal cannula or reservoir masks are being used check that the flow rate is clearly indicated | In accordance with the administration of medicines policy. |
| 5. Inform patient and or relative/ carer of the combustibility of oxygen | Oxygen supports combustion therefore there is always a danger of fire when oxygen is being used |
| 6. Show and explain the oxygen delivery system to the patient. Give the patient the information sheet about oxygen | To obtain consent and cooperation |
| 7. Assemble the oxygen delivery system carefully as shown in Appendix J | To ensure oxygen is given as prescribed |
| 8. Attach oxygen delivery system to oxygen source. | To ensure oxygen supply is ready |
| 9. Attach oxygen delivery system to patient according to manufacturer's instructions | For oxygen to be administered to patient |
| 10. Turn on oxygen flow in accordance with prescription and manufacturer's instruction. | To administer correct % of oxygen |
| 11. Ensure patient has either a drink or a mouthwash within reach. | To prevent drying or the oral mucosa. |
| 12. Clean oxygen mask as required with general purpose detergent and dry thoroughly needed. Discard systems after use. | To minimise risk of infection<br><br>(Single patient device) |

**Appendix F**

## Equipment used in the delivery of oxygen (Choose the appropriate delivery device)

1. Oxygen source (cylinder)
2. Flow meter (built-in to cylinder)
3. Saturation monitor (pulse oximeter)
4. Oxygen Delivery system

### e) Nasal cannula

| DEVICE | DESCRIPTION | PURPOSE |
|---|---|---|
| **Nasal Cannula**<br>  | Nasal cannula consist of pair of tubes about 2cm long, each projecting into the nostril and stemming from a tube which passes over the ears, and which is thus self-retaining.<br><br>**Uncontrolled oxygen therapy**<br>  | Cannula are preferred to masks by most patients. They have the advantage of not interfering with feeding and are not as inconvenient as masks during coughing and sneezing.<br>It is not advisable to assume what percent oxygen (FI02) the patient is receiving according to the Litres delivered but this is not important if the patient is in the correct target range. |

| ACTION | RATIONALE |
|---|---|
| 1. (When using nasal cannula). Position the tips of the cannula in the patient's nose so that the tips do not extend more than 1.5cm into the nose. | Overlong tubing is uncomfortable, which may make the patient reject the procedure. Sore nasal mucosa can result from pressure or friction of tubing that is too long. |
| 2. Place tubing over the ears and under the chin as shown above. Educate patient re prevention of pressure areas on the back of the ear. | To allow optimum comfort for the patient.<br>To prevent pressure sores. |
| 3. Adjust flow rate, usually 2-4 l/min but may vary from 1-6 l/min in some circumstances. | Set the flow rate to achieve the desired target oxygen saturation. |

**b) Fixed performance mask (Venturi mask and valve)**

| DEVICE | DESCRIPTION | PURPOSE |
|---|---|---|
| **Venturi mask**<br>  | A mask incorporating a device to enable a fixed concentration of oxygen to be delivered independent of patient factors or fit to the face or flow rate. Oxygen is forced out through a small hole causing a Venturi effect which enables air to mix with oxygen.<br><br>**Controlled oxygen therapy** | This is a high-performance oxygen mask designed to deliver a specified oxygen concentration regardless of breathing rate or tidal volume.<br><br>**Venturi devices come in different colours for %**<br><br>Blue = 24%<br>White = 28%<br>Yellow = 35%<br>Red = 40%<br>Green = 60% |

| ACTION | RATIONALE |
|---|---|
| 1. (When using Venturi mask) Connect the mask to the appropriate Venturi barrel attached firmly into the mask inlet. | To ensure that patient receives the correct concentration of oxygen |
| 2. Fasten oxygen tubing securely. | Correctly secured tubing is comfortable and prevents displacement of mask/cannula. |
| 3. Assess the patient's condition and functioning of equipment at regular intervals according to care plan. | To ensure patient's safety and that oxygen is being administered as prescribed. |
| 4. Adjust flow rate. The minimum flow rate is indicated on the mask or packet. The flow should be doubled if the patient has a respiratory rate above 30 per minute. | Higher flows are required for patients with rapid respiration and high inspiratory flow rates. This does not affect the concentration of oxygen but allows the gas flow rate to match the patient's breathing pattern. |

## c) Simple face mask (variable flow)

| DEVICE | DESCRIPTION | PURPOSE |
|---|---|---|
|  **Simple face mask** Variable Percentage (Delivers unpredictable concentrations that vary with flow rate) *Nasal cannula should be used for most patients who require medium dose oxygen, but a simple face mask may be used due to patient preference or if the nose is blocked* | Mask has a soft plastic face piece; vent holes are provided to allow air to escape. Maximum 50%-60% at 15ltrs/minute flow. **Uncontrolled Oxygen therapy** | This is a variable performance device. The oxygen concentration delivered will be influenced by**:** **a.** the oxygen flow rate (litres per minute) used, leakage between the mask and face. **b.** the patient's tidal volume and breathing rate. **NOT to be used for $CO_2$ retaining patients.** |

| ACTION | RATIONALE |
|---|---|
| (If using simple face mask) Gently place mask over the patient's face, position the strap behind the head or the loops over the ears then carefully pull both ends through the front of the mask until secure. | Ensure a comfortable fit and delivery of prescribed oxygen is maintained. |
| Check that strap is not across ears and if necessary insert padding between the strap and head. | To prevent irritation. |
| Adjust the oxygen flow rate. Must never be below 5L/min | Flows below 5L/m do not give enough oxygen and may cause increased resistance to breathing and may also cause CO2 re-breathing due to the small mask size. |

## d) Reservoir mask (non re-breathe mask)

| DEVICE | DESCRIPTION | PURPOSE |
|---|---|---|
| **Reservoir Mask**<br><br>**(Non-rebreathe Mask)**<br><br>  | Mask has a soft plastic face piece with flap-valve exhalation ports which may be removed for emergency air-intake. There is also a one-way valve between the face mask and reservoir bag.<br><br>**Uncontrolled oxygen therapy** | In non re-breathing systems the oxygen may be stored in the reservoir bag during exhalation by means of a one-way valve. High concentrations of oxygen 80-90% can be achieved at relatively low flow rates.<br><br>**NOT to be used for C02 retaining patients except in life-threatening emergencies such as cardiac arrest or major trauma.** |

| ACTION | RATIONALE |
|---|---|
| f) (Non Rebreathe Reservoir Mask) Ensure the reservoir bag is inflated before placing mask on patient, this can be maintained by using 10-15 litres of oxygen per min. | To ensure the optimal flow of oxygen to the patient. |
| 2. Adjust the oxygen flow to the prescribed rate. | Inadequate flow rates may result in administration of inadequate oxygen concentration to the patient. |

**In disposable reservoir, oxygen flows directly into the mask during inspiration and into the reservoir bag during exhalation. All exhaled air is vented through a port in the mask and a one-way valve between the bag and mask, which prevents re-breathing.**

## g) Tracheostomy mask for patients with tracheostomy or laryngectomy

| DEVICE | DESCRIPTION | PURPOSE |
|---|---|---|
|  <br><br>**Tracheostomy mask**<br>Variable Percentage<br>(Delivers unpredictable concentrations that vary with flow rate) | Mask designed for "neck breathing patients". Fits comfortably over tracheostomy or tracheotomy. Exhalation port on front of mask.<br><br>**Uncontrolled Oxygen therapy** | This is a variable performance device for patients with tracheostomy or tracheotomy. The oxygen concentration delivered will be influenced by**:**<br>**a.** the oxygen flow rate (litres per minute) used.<br>**b.** the patient's tidal volume and breathing rate.<br><br>**Use cautiously at low flow rates in CO2 retaining patients as there may be no alternative.** |

| ACTION | RATIONALE |
|---|---|
| Gently place mask over the patient's airway, position the strap behind the head then carefully pull both ends through the front of the mask until secure. | Ensure a comfortable fit and delivery of prescribed oxygen is maintained. |
| Adjust the oxygen flow rate to achieve the desired target saturation range. Start at 4 l/min<br>and adjust the flow up or down as necessary to achieve the desired oxygen saturation range. | To ensure that the correct amount of oxygen is given to keep the patient in the target range. |

h) **Oxygen Flow Meter**

| DEVICE | DESCRIPTION | PURPOSE |
|---|---|---|
| **Oxygen flow meter**<br>Delivers oxygen to the patient. | Device to allow the patient to receive an accurate flow of oxygen, usually between 2 and 15 litres per minute.<br><br>Flowmeter built into the cylinder. | To ensure that the patient receives the correct amount of oxygen. |

| ACTION | RATIONALE |
|---|---|
| 1. Open the valve on the oxygen cylinder (grey finger-valve on side of cylinder). | To ensure that the patient receives the correct amount of oxygen. |
| 2. Attach the oxygen tubing to the nozzle on the flow meter/cylinder. | |
| 3. Turn the finger-valve on top of the cylinder to obtain the desired flow rate. | |

i) **Other devices**

Patients may be admitted with, or need, other devices (for example, oxygen concentrators). For specific information about these contact Senior Nurse as in Section 14. Contact details

**Appendix G**

# Checking and stocktaking oxygen cylinders

## Checking and storing of oxygen cylinders

Oxygen cylinders should be checked at least weekly, and after each use for the following:

- Contents are oxygen
- Expiry date
- Amount left in cylinder – if in red zone a replacement should be requested (or less than half full for CD cylinder)
- No damage to the cylinder
- Is the cylinder stored correctly? Does the room have correct sign on the door?
- Is there clear storage of empty and full cylinders? Empty cylinders clearly labelled as 'EMPTY'.
- Is the location of oxygen cylinders noted on the 'Fire Sheet'?


## Ordering, supplying and replacement of oxygen cylinders

**The standard oxygen cylinders in use in the Trust are HX and CD sizes**

***Oxygen cylinders can be ordered through Supplies Department***

- replacement cylinders can be obtained by non-stock requisition to Supplies
- you should supply the delivery point code (original to each department) as stated on invoices (Check with Supplies Department if you are not sure)

***Longley Centre***

- replacement cylinders can be obtained by non-stock requisition to Supplies
- you should supply the delivery point code (original to each department) as stated on invoices (Check with Supplies Department if you are not sure)

## Complaint oxygen cylinders

- *Faulty cylinder* – where there is a minor complaint and the patient is not put at risk, e.g.: Faulty valve operation, Damaged valve outlet, Minor leaks from valve
- *Incident cylinder* – where there is a serious complaint and a patient is considered to have been at risk, e.g.: cylinder has been involved in a fire, wrong gas in the cylinder

***Report immediately*** by phone to British Oxygen Company (BOC) ***on Freephone 0800 111 333***, have the following details ready:

- Customer name and address
- Person you wish to receive the investigation report if required
- Number of cylinders involved
- For each faulty cylinder, information from the batch label including:
  - Batch number
  - Filling date
  - Expiry date
  - Cylinder size code and gas product
  - Nature of the complaint and any serious consequences which may have arisen

The complaint cylinder should be segregated and labelled with a tie-on label to prevent inadvertent use. Await instructions from BOC.

A Trust Incident report should then be completed following the Incident Reporting and Investigation Policy.

## Oxygen Cylinder Storage Checklist

Handle oxygen cylinders carefully, using a trolley if necessary
Keep cylinders secured upright
When not in use, store oxygen cylinders in a well-ventilated storage area away from combustible materials and separately from cylinders of flammable gas
Only store as many cylinders as you need to
Return empty cylinders to the supplier
Empty cylinders may still be dangerous – treat them with care Keep cylinders clean and free from oils, grease, and dust
Never allow smoking while oxygen is in use

**Appendix H**

## Monitoring of Patients

See National Early Warning Score System (NEWS2) in Physical Health Care Policy

| ACTION | RATIONALE |
|---|---|
| 1. Observe the following:<br>a. Monitoring oxygen saturation levels pulse oximeter (record on NEWS2)<br>b. Visual observations of skin colour for central cyanosis (blue lips)<br>c. Respiratory rate (record on NEWS2)<br>d. Any sign of respiratory distress should be reported immediately | In order to accurately monitor the patient or signs of improvement or deterioration. |
| 2. If the oxygen saturation is above or below the target saturation the observer must inform the personnel who are qualified to administer oxygen (usually a Nurse – see Section 5 - Duties). | |
| 3. Check the patients mouth and nose and behind the ears | To identify signs of infection and pressure sores as soon as possible. |
| 4. Monitor for dehydration and dryness of skin, mouth – offer water (do not apply oil-based creams, etc) | To identify physical health issues and ensure patient comfort & safety |
| 5. Record all observations as per frequency indication on NEWS2 | To ensure adequate record keeping. |
| 6. Sign prescription chart | To record monitoring has taken place |

**Appendix I**

## HEALTH AND SAFETY (of cylinder/concentrator)

| ACTION | RATIONALE |
|---|---|
| 1. Inform patients and carers about the combustibility of oxygen | Oxygen supports combustion, there is always a danger of fire when oxygen is being used. |
| 2. Oxygen should be stored in an area designated as no smoking. | |
| 3. Electrical appliances should be kept at least five feet away from the source of oxygen. | Oxygen can be potentially dangerous when in contact with sources of ignition and flammable material. |
| 4. Avoid grease or oil coming into contact with apparatus. | Oxygen can be potentially dangerous when in contact with sources of ignition and flammable material. |
| 5. Store unused cylinders in a dry well-ventilated place. | |
| 6. Signs should be placed on the doors of room where oxygen cylinders are used/stored.   | Signs are available from Supplies Department |
| 7. Note location of oxygen cylinders on the 'Fire' log sheet | |
| 8. Transporting oxygen in vehicles<br>– guidance card should be carried<br>– cylinder should be secured | Advice available from<br>Health & Safety Risk Advisor or<br>Senior Nurse – Clinical Training Lead |

Note: In an oxygen enriched atmosphere, materials not normally considered to be flammable may become flammable; flammable materials ignite and burn more vigorously. Clothing may become saturated with oxygen and become an increased fire risk; when returned to normal ambient air, clothing takes about five minutes to be free of the gas enrichment. Blankets and similar articles should be turned over several times in normal ambient air following suspected oxygen enrichment.

Within clinical areas oxygen cylinders:

- HX cylinders must be kept and transported in the HX specific trollies. CD cylinders can be free standing.

- Must not have oils, petroleum jelly or any grease stored anywhere near them as in the presence of high-pressure oxygen they are liable to spontaneously ignite even in minute quantities.
- Should be handled using clean hands or gloves specially when assembling oxygen equipment, e.g. making connections. (Hand cream is also highly combustible in the presence of pressurise oxygen)

**Handling cylinders**

In order to comply with current manual handling regulations, it is advisable that when handling medical gas cylinders, the following precautions are followed:

- Never roll cylinders along the ground as this may cause the valve to open accidentally. It will also damage the cylinder label and paintwork.
- Cylinders should be handled with care, never knocked violently or allowed to fall over.
- Never paint or obscure any markings or labels on cylinders
- Never apply any unauthorised labels or markings to cylinders, unless advised by the supplier to identify faulty or incident cylinders.
- Empty cylinders should be removed as soon as possible. This is achieved by contacting procurement department and arranging an exchange which is usually available within 2 to 3 days.
- The storage and handling recommendations in this procedure are not exhaustive and recognised gas cylinder safety training must be provided by the organisation, or the organisation must have evidence of training from the contracted support service providing storage and or movement of oxygen cylinders. Training must be current and relevant.