

Policy Number
CP57
Title of Policy

Policy for the safe prescription, administration and monitoring of oxygen therapy in Adults

Contents:

	Page
1.0 Policy Statement	2
2.0 Definitions	2
3.0 Accountabilities	2
4.0 Policy detail	2
5.0 Financial risk assessment	2
6.0 Equity impact assessment	3
7.0 Maintenance	3
8.0 Communication and training	3
9.0 Audit Process	3
10.0 References	3

Attachments: [Attachment A](#)

Appendices: [See attachment A](#)

1.0 Policy Statement

The aims of this policy are to ensure the following.

- 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 must 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 must monitor the patient and keep within the target saturation range.

2.0 Definitions

BTS-British Thoracic Society

COPD-Chronic Obstructive Pulmonary disease

CO₂-Carbon Dioxide

HOOF-Home oxygen order form

LTOT-Long term oxygen therapy

FiO₂-Fraction of inspired oxygen

3.0 Accountabilities

The Medical Gases Committee is responsible for this policy. It is the responsibility of the Trust Oxygen Lead to ensure the policy is reviewed and updated. It is the responsibility of the Trust Medical Device Trainer to ensure appropriate clinical staff have received training in utilising equipment to deliver oxygen. It is the responsibility of clinical staff to maintain their own competence.

4.0 Policy Detail – see [Attachment A](#)

5.0 Financial Risk Assessment

1	Does the implementation of this policy require any additional Capital resources	<u>No</u>
2	Does the implementation of this policy require additional revenue resources	<u>No</u>
3	Does the implementation of this policy require additional manpower	<u>No</u>
4	Does the implementation of this policy release any manpower costs through a change in practice	<u>No</u>

5	Are there additional staff training costs associated with implementing this policy which cannot be delivered through current training programmes or allocated training times for staff.	<u>No</u>
---	---	-----------

6.0 Equality Impact Assessment

Completed – no action required

7.0 Maintenance. The Medical Gases Committee meets quarterly. The policy is reviewed on a 3 yearly basis. There is provision within the Medical Gases Committee to call an extraordinary meeting must a serious incident occur and this may lead to an earlier revision of the policy.

8.0 Communication and Training. This policy will be available on the Trust intranet. Educational training via online oxygen module (KITE) supports this policy. The key elements of the policy are included in introductory lectures for foundation trainees.

9.0 Audit Process

Criterion	Lead	Monitoring method	Frequency	Committee / Group
British Thoracic Society Annual Emergency Oxygen Audit	Clinical lead on medical gases committee	Prospective audit	2 yearly	Medical Gases Committee

10.0 References

- O'Driscoll B R, Howard L S, Davison A G et al. BTS guideline for emergency oxygen use in adult patients. Thorax 2017; Vol 72: Supplement 1.
- Summary guideline for prescribing emergency oxygen in hospital. Available on BTS website: <http://bmjopenrespres.bmj.com/content/4/1/e000170>
- Summary of prescription, administration and discontinuation of oxygen therapy. Available on BTS website: <http://bmjopenrespres.bmj.com/content/4/1/e000170>

Reference Number and Policy name: CP 57 – Policy for the safe prescription, administration and monitoring of oxygen therapy in Adults	Version: 5 June 2021		Status: Final	Author:– Consultant Respiratory Physician Director Sponsor: Chief Medical Officer
Version / Amendment History	Version	Date	Author	Reason
	1	Jan 2011	Dr Lee Dowson	Original policy
	2	Oct 2011	Dr Lee Dowson	Amended in response to a never event
	3	Nov 2012	Dr Lee Dowson	Policy renewal. Minor amendments to reflect change to usage of electronic monitoring tool and increased provision of piped oxygen in clinical areas
	4	Feb 2018	Dr Stan Ejiofor	Policy renewal. Amendments in line with new BTS guidelines and updated escort policy OP67
	4.1	Feb 2021	Consultant Respiratory Physician	Reviewed by Chief Medical Officer extended to September 2021 – Pending full review.
	5	June 2021	Dr Stan Ejiofor	Policy renewal and amendment in response to never event
Intended Recipients: All clinical directors and specialty leads.				
Consultation Group / Role Titles and Date: Medical Gases Committee: Head of Estates, Head of Portering, Medical Physics, matron, medical devices training, IMTG Lead, and Lead Respiratory Consultant.				

Name and date of Trust level committee where reviewed	Medical Gases Committee Trust Policy Group – September 2021
Name and date of final approval committee	Trust Management Team – September 2021
Date of Policy issue	October 2021
Review Date and Frequency (standard review frequency is 3 yearly unless otherwise indicated)	September 2024 (3 yearly)
Training and Dissemination: Oxygen clinical training package. Basic respiratory skills course in place for foundation year doctors. Circulation to clinical leads and matrons. Nurses communication group. Policy available through Trust intranet.	
Publishing Requirements: Can this document be published on the Trust's public page: Yes If yes you must ensure that you have read and have fully considered it meets the requirements outlined in sections 1.9, 3.7 and 3.9 of OP01, Governance of Trust-wide Strategy/Policy/Procedure/Guidelines and Local Procedure and Guidelines , as well as considering any redactions that will be required prior to publication.	
To be read in conjunction with: Medical Gases Policy. Mandatory oxygen training package on KITE.	
Initial Equality Impact Assessment (all policies):	Completed <u>Yes</u> / No
Full Equality Impact assessment (as required):	Completed Yes / No / <u>NA</u>
Contact for Review	Chairman of the medical gases committee
Implementation plan / arrangements	Chairman of the medical gases committee
Monitoring arrangements and Committee	Medical gases committee. Annual British Thoracic Society (BTS) Emergency oxygen audit
Document summary / key issues covered: 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. The Policy has been reviewed and approved by the Medical Gas Committee and the Medicines Management Committee.	

High Risk Policy?**Definition:**

- Contains information in the public domain that may present additional risk to the public e.g. contains detailed images of means of strangulation.
- References to individually identifiable cases.
- References to commercially sensitive or confidential systems.

If a policy is considered to be high risk it will be the responsibility of the author and chief officer sponsor to ensure it is redacted to the requestee.

No (delete as appropriate)

If Yes include the following sentence and relevant information in the Intended Recipients section above – In the event that this is policy is made available to the public the following information should be redacted:

Name of document: **Policy for the safe prescription, administration and monitoring of oxygen therapy in Adults**

Name of author: Dr Stan Ejiofor

Job Title: Respiratory Consultant

I, _____ the above named author confirm that:

- The Strategy/Policy/Procedure/Guidelines (please delete) presented for ratification meet all legislative, best practice and other guidance issued and known to me at the time of development of the said document.
- I am not aware of any omissions to the said document, and I will bring to the attention of the Executive Director any information which may affect the validity of the document presented as soon as this becomes known.
- The document meets the requirements as outlined in the document entitled Governance of Trust- wide Strategy/Policy/Procedure/Guidelines and Local Procedure and Guidelines(OP01).
- The document meets the requirements of the NHSLA Risk Management Standards to achieve as a minimum level 2 compliance, where applicable.
- I have undertaken appropriate and thorough consultation on this document and I have detailed the names of those individuals who responded as part of the consultation within the document. I have also fed back to responders to the consultation on the changes made to the document following consultation.
- I will send the document and signed ratification checklist to the Policy Administrator for publication at my earliest opportunity following ratification.
- I will keep this document under review and ensure that it is reviewed prior to the review date.

Signature of Author: Dr Stan Ejiofor

Date: 26/7/2021

Name of Person Ratifying this document (Chief Officer or Nominee):

Job Title:

Signature:

- I, the named Chief Officer (or their nominee) am responsible for the overall good governance and management of this document including its timely review and updates and confirming a new author should the current post-holder/author change.

To the person approving this document:

Please ensure this page has been completed correctly, then print, sign and email this page only to: The Policy Administrator

IMPLEMENTATION PLAN

To be completed when submitted to the appropriate committee for consideration/approval

Policy number and policy version CP57v5	Policy Title: Policy for the safe prescription, administration and monitoring of oxygen therapy in Adults	
Reviewing Group		Date reviewed:
Implementation lead: Print name and contact details S Ejiofor		
Implementation Issue to be considered (add additional issues where necessary)	Action Summary	Action lead / s (Timescale for completion)
Strategy; Consider (if appropriate) 1. Development of a pocket guide of strategy aims for staff 2. Include responsibilities of staff in relation to strategy in pocket guide.	none	
Training; Consider 1. Mandatory training approval process 2. Completion of mandatory training form	Oxygen training module already available via KITE/My Academy. Consideration to re-instate mandatory status	TBC
Development of Forms, leaflets etc; Consider 1. Any forms developed for use and retention within the clinical record MUST be approved by Health Records Group prior to roll out. 2. Type, quantity required, where they will be kept / accessed/stored when completed	none	
Strategy / Policy / Procedure communication; Consider 1. Key communication messages from the policy / procedure, who to and how?	Email communication via clinical leads/matron group and RWT bulletin	TBC
Financial cost implementation Consider Business case development	n/a	
Other specific Policy issues / actions as required e.g. Risks of failure to implement, gaps or barriers to implementation		

Contents

1. Introduction
 2. Aim
 3. Oxygen Saturations; Prescribing, Administering and Monitoring Oxygen Therapy
 4. Exclusions
 5. Specialist areas
 6. Indications
 7. Contra-indications
 8. Cautions
 9. Transfer and Transportation of Patients Receiving Oxygen Therapy
 10. Nebulised Therapy and Oxygen
 11. Implementation
 12. Health and Safety
 13. Appendices
- A] [Example of Oxygen prescription within the hospital prescription chart](#)
- B] [Administering acute oxygen therapy](#)
- C] [Equipment used in the delivery of oxygen](#)
- D] [Monitoring of patients](#)
- E] [Humidification](#)
- F] [Oxygen cylinder run times](#)
- G] [Regulator flow competency \(HCAs\)](#)
- H] [Operational guidance for assessment of HCA regulator flow competency](#)
- I] [Health and safety](#)

1.0 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. The Policy has been reviewed and approved by the Medical Gas Committee and the Medicines Management Committee.

2.0 Aim

The aims of this policy are to ensure the following.

- All patients who require supplementary oxygen therapy receive therapy that is appropriate to their clinical condition and in line with national guidance (British Thoracic Society (BTS) Guideline; Thorax, 2017).
- Oxygen must 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 must monitor the patient and keep within the target saturation range.

3.0 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 greater than 94% when awake.
- Patients of all ages may have transient dips to 84% during sleep.

3.1 Identifying appropriate target saturations

Guidance on identifying appropriate saturations for patients is covered in the online mandatory training program (clinical component). In summary, oxygen must 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 (carbon dioxide retention).

During national pandemics oxygen target saturations may be altered. If this occurs separate communication will cascade this information and this will temporarily supersede the target ranges stated in this document.

3.2 Prescribing oxygen on ePMA

Oxygen must be prescribed, selected from the appropriate template in ePMA ([Appendix A](#)). The current templates indicate the oxygen saturation target with different saturation targets for patients at risk of carbon dioxide retention.

3.3 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 in *figures 1 and 2* of <http://bmjopenrespres.bmj.com/content/4/1/e000170> and covered in the online mandatory training program. Any qualified healthcare professional who has completed the mandatory adult clinical oxygen training package is able to administer oxygen therapy. [Guidance for administration of oxygen therapy and the devices used are shown in Appendices B and C.](#)

Where a patient requires oxygen in a clinical area where piped oxygen is provided at each bed space, the patient must be connected to the piped supply as soon as possible and must not receive continued therapy from a cylinder. If a patient requires oxygen therapy in a clinical area where there is no permanent supply, e.g. West Park Hospital, the oxygen therapy must be provided using a concentrator. If the patient is on long term oxygen therapy this needs to be requested on an individual patient basis prior to admission to West Park Hospital.

Otherwise, **cylinder use must be reserved** for transfers and providing temporary oxygen in clinical areas where no permanent supply is present. If patients need to receive oxygen temporarily from a cylinder, this must not be for more than 4 hours. If a patient becomes unwell at West Park hospital and has a new oxygen requirement then they must be transferred back to New Cross Hospital as soon as possible.

3.4 Monitoring and recording oxygen

The patient's oxygen saturation and oxygen delivery system must be recorded on the electronic monitoring system or observation chart if electronic monitoring is not available. Patients must be monitored as specified in [Appendix D](#).

All patients on oxygen therapy must have regular pulse oximetry measurements. The frequency of oximetry measurements will depend on the condition being treated and the stability of the patient. This will be guided by the electronic early warning score system where available or by paper-based escalation protocols elsewhere. In all cases patients must have their oxygen saturations monitored and acted upon at least 4 hourly. The observation frequency may be overridden by a senior medical practitioner, in which case this must be recorded in the patient's clinical record. Critically ill patients must have their oxygen saturations monitored continuously and recorded every few minutes whereas patients with mild breathlessness due to a stable condition will need less frequent monitoring.

Oxygen therapy must 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).

Any sudden fall in oxygen saturation must lead to clinical evaluation of the patient and, in most cases, measurement of blood gases. In addition, a gradual increase in the amount of oxygen required to maintain the specified target saturations also indicates a deteriorating clinical scenario requiring urgent medical attention.

Patients must be monitored accurately for signs of improvement or deterioration. Clinicians must also monitor skin colour for peripheral cyanosis and respiratory rate. Oxygen saturations of less than 92%, with or without oxygen, noisy or laboured breathing, or respiratory rates of less than 8 or more than 25 must be reported immediately to the medical team, according to the early warning or Track and Trigger Early Warning System.

3.5 Emergency situations

In the emergency situation an oxygen prescription **is not** required. Oxygen must be given to the patient immediately without a formal prescription or drug order but documented later in the patient's record.

All critically ill patients must be given the maximum concentration of inspired oxygen (15 l / min by reservoir mask) whilst awaiting immediate medical review. Patients with COPD and other risk factors for hypercapnia who develop critical illness must have the same initial target saturations as other critically ill patients pending the results of urgent arterial blood gas analysis, after which these patients may need controlled oxygen therapy or supported ventilation if there is severe hypoxaemia and / or hypercapnia with respiratory acidosis.

Any qualified health professional can commence oxygen therapy in an emergency situation.

4.0 Exclusions

- Patients admitted to specialist areas with a specialised oxygen prescribing policy (see section 5).
- Patients receiving oxygen as part of palliative care or patients on the end of life care pathway (in which case, the prescriber must indicate the desired range or 'monitoring not required' under 'other' on the treatment sheet).

- This policy does not cover paediatric practice.

5.0 Specialist Areas

This policy is for general use within general wards and departments. Where specific clinical guidelines are required for oxygen administration within specialist areas, they must be approved via the appropriate clinical governance forum with ratification from the Medical Gas Committee.

6.0 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.

The most common reasons for oxygen therapy to be initiated are:

- *Acute hypoxaemia* (for example pneumonia, shock, asthma, heart failure, pulmonary embolus);
- *Ischaemia* (for example myocardial infarction, but only if associated with hypoxaemia because abnormally high levels may be harmful to patients with ischaemic heart disease and stroke);
- *Abnormalities in quality or type of haemoglobin* (for example acute 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, especially following thoracic or abdominal surgery) resulting in hypoxaemia (Ferguson 1999).

7.0 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 FiO₂. Supplemental oxygen must be administered with caution in patients suffering from paraquat poisoning and with acid inhalation or previous bleomycin lung injury.

8.0 Cautions

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 (CO₂) with oxygen therapy in patients with hypercapnic respiratory failure and details are in the BTS guideline.

8.1 Hazards

- Drying of nasal and pharyngeal mucosa

- Oxygen toxicity
- Pressure sores from oxygen masks or cannulae
- Absorption atelectasis
- Skin irritation
- Fire hazard
- Potentially inadequate flow resulting in lower FiO₂ than intended due to high inspiratory demand or inappropriate oxygen delivery device or equipment faults.

8.2 Humidification

Humidification may be required for some patient groups, especially “neck-breathing patients” and those who have difficulty in clearing airway secretions or mucus. See [Appendix E](#)

9.0 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 (see specialist areas above) their oxygen must be administered as per the transferring area’s prescription until the patient is reviewed and transferred over to the target saturation scheme, which must occur as soon as possible.

It is the **responsibility of the allocated registered nurse or healthcare professional to ensure that there is sufficient oxygen within the cylinder to meet the patient’s needs** during transfer. This will depend on the flow rate, the cylinder size and its state of fill. An illustration of how to use a portable cylinder and chart is provided to aid these calculations– [Appendix F](#). Patient requiring oxygen therapy whilst being transferred from one area to another must be accompanied by appropriately trained staff.

The Escort policy [Appendix 1](#)

http://intranet.xrwh.nhs.uk/pdf/policies/OP_67_appendix1.pdf and [Appendix 2](#)

http://intranet.xrwh.nhs.uk/pdf/policies/OP_67_appendix2.pdf provide guidance on who ‘appropriately trained staff’ are.

If a patient requires oxygen in a clinical area where piped oxygen is available the patient must be connected to the piped supply by an appropriate clinically qualified person as soon as possible and not receive continued therapy from a cylinder.

Patients who require oxygen therapy for a chronic illness / long term treatment/receiving no more than 2 litres - can be safely escorted by a Health Care Assistant (HCA) Bands 2 or 3, or an Associate Nurse of Bands 3 or 4.

To ensure patient safety is maintained and the correct device is used to administer Oxygen, the HCA must undertake a competency based assessment [Appendix G](#) to enable them to transfer the oxygen from a wall mounted device to an oxygen cylinder and back

again as required. They should also be up to date with their Basic Life Support level 2. Full Guidance on the training and monitoring of this is available in [Appendix H](#).

9.1 Discharging patient with oxygen

Long Term Oxygen Therapy (LTOT) is the term used to describe the provision of oxygen therapy for at least 15 hours a day at home in patients who are clinically stable. Clinical stability is defined as the absence of an infective exacerbation of chronic lung disease for the previous six to eight weeks.

Patients therefore should not be assessed during an inpatient episode. Temporary oxygen may be prescribed in patients (including palliative) who are stable enough to be discharged home but in whom hypoxaemia is confirmed via an arterial blood gas. This is referred to as a temporary Hoof A prescription (Home Oxygen Order Form part A).

Patients who are discharged with temporary home oxygen must be followed up with the Home Oxygen Service Assessment and Review team (HOS-AR).

For any information regarding discharging patients with oxygen go to http://intranet.xrwh.nhs.uk/departments/respiratory_services/oxygen_assessment_service.aspx

10.0 Nebulised therapy and oxygen

When nebulised therapy is administered to patients at risk of hypercapnic respiratory failure (see section 8.0), it must be driven by compressed air. If necessary, supplementary oxygen must be given concurrently by nasal prongs at 1-6 litres per minute to maintain an oxygen saturation of 88-92% or other specified target range. Nebuliser therapy guidance can be found via the link

http://intranet.xrwh.nhs.uk/pdf/policies/AdultMedicalGuidelines/DPROC_RESP_21_Nebuliser_Therapy_v1.pdf

Summary Oxygen Administration protocol (and weaning protocol)

ACTION	RATIONALE
All patients requiring oxygen therapy will have a prescription for oxygen therapy recorded on the patient's drug prescription chart. N.B. exceptions-see emergency situations.	Oxygen must be regarded as a drug and must be prescribed. BTS National guidelines (2017).
The prescription must incorporate a target saturation identified by the clinician prescribing the oxygen in accordance with the Trust's oxygen guideline.	Certain groups of patients are at risk of hyperoxaemia, particularly patients with COPD.
The drug chart must 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 health care	To identify if oxygen therapy is maintaining

professional will monitor observations in line with Trust policy. All patients must 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.	the target saturation or if an increase or decrease in oxygen therapy is required.
The oxygen delivery device and oxygen flow rate must be recorded alongside the oxygen saturation on electronic monitoring tool or the appropriate observation chart where electronic monitoring is not available.	To provide an accurate record and allow trends in oxygen therapy and saturation levels to be identified.
Oxygen saturations must always be interpreted alongside the patient's clinical status incorporating the early warning score.	To identify early signs of clinical deterioration, e.g. elevated respiratory rate.

<p>If the patient falls outside of the target saturation range, the oxygen therapy will be adjusted accordingly.</p> <p>The saturation must 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.</p>	To maintain the saturation in the desired range.
<i>Saturation higher than target specified or >98% for an extended period of time.</i>	
<ul style="list-style-type: none"> Step down oxygen therapy as per guidance for delivery. 	The patient will require weaning down from current oxygen delivery system.
<ul style="list-style-type: none"> Consider discontinuation of oxygen therapy. 	The patients clinical condition may have improved negating the need for supplementary oxygen.
<i>Saturation lower than target specified</i>	
<ul style="list-style-type: none"> Check all elements of oxygen delivery system for faults or errors. 	In most instances a fall in oxygen saturation is due to deterioration of the patient however equipment faults must be checked for.
<ul style="list-style-type: none"> Step up oxygen therapy as per protocols; figure 2 http://bmjopenrespres.bmj.com/content/4/1/e000170. Any sudden fall in oxygen saturation must lead to clinical evaluation and in most cases measurement of blood gases. 	To assess the patient's response to oxygen increase, and ensure that PaCO ₂ has not risen to an unacceptable level, or pH dropped to an unacceptable level and to

	screen for the cause of deteriorating oxygen level (e.g. pneumonia, heart failure etc).
<ul style="list-style-type: none"> Monitor Early Warning Score and respiratory rate for further clinical signs of deterioration. 	Patient safety.
Saturation within target specified	
<ul style="list-style-type: none"> Continue with oxygen therapy, and monitor patient to identify appropriate time for stepping down therapy, once clinical condition allows. 	
<ul style="list-style-type: none"> 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).

Oxygen delivery methods	
The Trusts recommended delivery devices will be utilised to ensure a standardised approach to oxygen delivery, see Appendix C .	Previous audits have demonstrated wide variations in delivery devices across clinical areas, potentially increasing the risk of adverse incidents.

11.0 Implementation

The oxygen policy is overseen by the Medical Gases Committee (MGC) chaired by the Director of Estates and reports to the Medicines Management Committee. All healthcare professionals involved in prescribing or administering oxygen must be taught on the oxygen policy.

Audits will be performed in all clinical areas. Audit proformas are available on the BTS website. The hospital will participate in the national audits organised by the BTS annually.

Oxygen incidents are reviewed at the MGC on a quarterly basis. There is provision to call an emergency meeting of the MGC following a red incident or never event.

The BTS has appointed oxygen champions in all Trusts to help introduce the Guideline.

12.0 Health and Safety issues are covered in [Appendix I](#)

Appendix A

Oxygen prescription ePMA

Oxygen	Target Saturation 88% to 92% LTOT users and Type 2 RF inhaled FOUR times a day
Oxygen	Target Saturation 90% to 93% Specialist areas only (continuous oximetry in use) inhaled FOUR times a day
Oxygen	Target Saturation 92% to 96% Type 1 RF inhaled FOUR times a day

Nurses:

Documentation against this prescription is confirmation that oxygen is being appropriately administered to achieve target saturations

**Oxygen
inhaled , FOUR times a day**

Target Saturation 88% to 92% LTOT users and Type 2 RF

Nurses:

Documentation against this prescription is confirmation that oxygen is being appropriately administered to achieve target saturations

**Oxygen
inhaled , FOUR times a day**

Target Saturation 90% to 93% Specialist areas only (continuous oximetry in use)

Nurses:

Documentation against this prescription is confirmation that oxygen is being appropriately administered to achieve target saturations

**Oxygen
inhaled , FOUR times a day**

Target Saturation 92% to 96% Type 1 RF

Appendix B

Administering acute 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 to the patient the patient. It is the clinician's role to assess the patient and use the prescribed system.	To provide accurate oxygen delivery. Most stable patients prefer nasal cannulae to masks.
3. Ensure oxygen is prescribed on prescription chart. In some situations, a protocol may be in place to allow designated health care professionals 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. 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 enable patient to understand the rationale for oxygen usage.
7. Assemble the oxygen delivery system carefully as shown in Appendix C .	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 manufacturers instruction.	To administer correct % of oxygen.
11. Ensure patient has either a drink or a mouthwash within reach.	To prevent drying of 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 (single patient device).

Appendix C

EQUIPMENT USED IN THE DELIVERY OF OXYGEN (Choose the appropriate delivery device)

1. Oxygen source (piped or cylinder)
2. Flow meter
3. Saturation monitor
4. Oxygen Delivery system

a) Nasal cannula

DEVICE

Nasal Cannulae



DESCRIPTION

Nasal cannulae consist of a 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.

Uncontrolled oxygen therapy



PURPOSE

Cannulae 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.

It is not advisable to assume what percent oxygen (FiO_2) the patient is receiving according to the litres delivered but this is not important if the patient is in the correct target range.

ACTION

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.
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.
3. Adjust flow rate, usually 2-4 l / min but may vary from 1-6 l / min in some circumstances.

RATIONALE

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.

To allow optimum comfort for the patient.
To prevent pressure sores.

Set the flow rate to achieve the desired target oxygen saturation.

b) Fixed performance mask (Venturi mask and valve)

DEVICE

Venturi mask



DESCRIPTION

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.

Controlled oxygen therapy

PURPOSE

This is a high-performance oxygen mask designed to deliver a specified oxygen concentration regardless of breathing rate or tidal volume.

Venturi devices come in different colours for %

- Blue = 24% oxygen flow 2l/min
- White = 28% oxygen flow 4l/min
- Yellow = 35% oxygen flow 8l/min
- Red = 40% oxygen flow 10l/min
- Green = 60% oxygen flow 15l/min

ACTION

1. (When using Venturi mask.) Connect the mask to the appropriate Venturi barrel attached firmly into the mask inlet.
2. Fasten oxygen tubing securely.
3. Assess the patient's condition and functioning of equipment at regular intervals according to care plan.
4. Adjust flow rate. The minimum flow rate is indicated on the mask or packet. The flow must be doubled if the patient has a respiratory rate above 30 per minute.

RATIONALE

- To ensure that patient receives the correct concentration of oxygen.
- Correctly secured tubing is comfortable and prevents displacement of mask / cannulae.
- To ensure patient's safety and that oxygen is being administered as prescribed.
- 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



Simple face mask

Variable Percentage (delivers unpredictable concentrations that vary with flow rate.)

Nasal cannulae 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.

ACTION

(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.

Check that strap is not across ears and if necessary insert padding between the strap and head.

Adjust the oxygen flow rate. **Must never be below 5L / min.**

DESCRIPTION

Mask has a soft plastic face piece, vent holes are provided to allow air to escape.

Maximum 50%-60% at 15litres / minute flow.

Uncontrolled Oxygen therapy

PURPOSE

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 CO₂ retaining patients.

RATIONALE

Ensure a comfortable fit and delivery of prescribed oxygen is maintained.

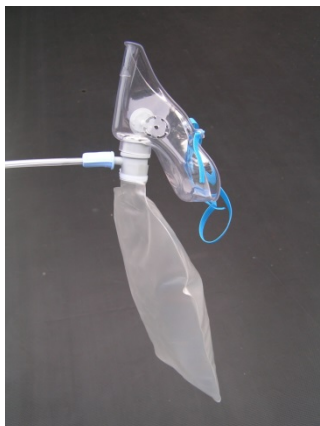
To prevent irritation.

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-rebreathe mask)

DEVICE

**Reservoir Mask
(Non-rebreathe Mask)**



DESCRIPTION

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.

Uncontrolled oxygen therapy

PURPOSE

In non-rebreathing 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.

NOT to be used for CO2 retaining patients except in life-threatening emergencies such as cardiac arrest or major trauma.

ACTION

1. (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.

2. Adjust the oxygen flow to the prescribed rate.

RATIONALE

To ensure the optimal flow of oxygen to the patient.

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.

e) **Tracheostomy mask for patients with tracheostomy or laryngectomy**

DEVICE



DESCRIPTION

Mask designed for “neck breathing patients”. Fits comfortably over tracheostomy or tracheotomy. Exhalation port on front of mask.

PURPOSE

This is a variable performance device for patients with tracheostomy or tracheotomy. The oxygen concentration delivered will be influenced by:

- a. the oxygen flow rate (litres per minute) used;
- b. the patient’s tidal volume and breathing rate.

Tracheostomy mask

Variable Percentage

(Delivers unpredictable concentrations that vary with flow rate)

Uncontrolled Oxygen therapy

Use cautiously at low flow rates in CO2 retaining patients as there may be no alternative.

ACTION

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.

Adjust the oxygen flow rate to achieve the desired target saturation range. Start at 4 L / min and adjust the flow up or down as necessary to achieve the desired oxygen saturation range.

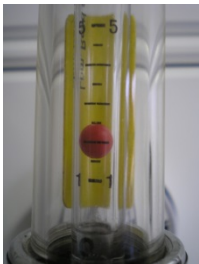
RATIONALE

Ensure a comfortable fit and delivery of prescribed oxygen is maintained.

To ensure that the correct amount of oxygen is given to keep the patient in the target range.

f) **Oxygen Flow Meter**

DEVICE



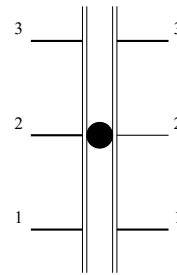
DESCRIPTION

Device to allow the patient to receive an accurate flow of oxygen, usually between 2 and 15 litres per minute. May be wall-mounted or on a cylinder.

Take special care twin oxygen outlets are used in your area or if there are air outlets which may be mistaken for oxygen outlets.

PURPOSE

To ensure that the patient receives the correct amount of oxygen.



Correct Setting for 2 L/ min

Oxygen flow meter

Delivers oxygen to the patient.

ACTION

Attach the oxygen tubing to the nozzle on the flow meter.

Turn the finger-valve to obtain the desired flow rate. The CENTRE of the ball shows the correct flow rate. The diagrams show the correct setting to deliver 2 L / min. **Always ensure Oxygen supply is flowing to the patient**

LOOK, LISTEN & FEEL

RATIONALE

To ensure that the patient receives the correct amount of oxygen.

g) Oxygen flow meter checks



The Royal Wolverhampton **NHS**
NHS Trust

WALL FLOWMETERS USER CHECKS

Always Check Flowmeters on a Regular Basis

- **Ensure Flowmeter is correctly inserted into the Wall Outlet**
- **Ensure Tubing Nipple is Correctly Fitted**
- **Operate Flowmeter to Ensure Oxygen Supply**
- **When Flowmeter is Turned Off check for any Oxygen Leaks**
- **Ensure Appropriate Face Mask and Tubing are available for use**
- **Always ensure Oxygen supply is flowing to the patient**

When setting the Flowmeter at its maximum value please ensure that you don't continue to turn the valve beyond the 15 litre mark (this can deliver considerably more than the 15 litres intended)



Tubing Nipple

Appendix D

MONITORING OF PATIENTS - See local observation/early warning score chart

<p>1. Observe the following:</p> <ul style="list-style-type: none">a. Monitor arterial oxygen saturation levels according to Trust Oxygen policy;b. Visual observations of skin colour for central cyanosis (blue lips);c. Respiratory rate;d. Any sign of respiratory distress must be reported immediately.	<p>To accurately monitor the patient for signs of improvement or deterioration.</p>
<p>2. If the arterial oxygen saturation is above or below the target saturation the observer (often a Health Care Assistant) must inform the personnel who are qualified to administer oxygen.</p>	
<p>3. Check the patient's mouth and nose and behind the ears.</p>	<p>To identify signs of infection and pressure sores as soon as possible.</p>
<p>4. Record all observations on appropriate Chart:</p> <ul style="list-style-type: none">- 4 hourly if on continuous oxygen;- 8 hourly if on intermittent oxygen.	<p>To ensure adequate record keeping.</p>

Appendix E

HUMIDIFICATION



This should only be used if specifically requested by the doctor or physiotherapist in the following circumstances.

1. If the flow rate exceeds 4 litres per minute for several days
2. Tracheotomy or tracheostomy patients (“neck-breathing patients”)
3. Cystic Fibrosis patients
4. Bronchiectasis patients
5. Patients with a chest infection retaining secretions

Can be given by warm or cold humidifier systems (warm humidifier systems are mainly used in critical care areas).

Appendix F a) Oxygen cylinder run times



FULL Oxygen Cylinder Run Times (BOC)

Flow = ltrs/min

Size → Flow ↓	D (340 ltrs)	CD/DD (460 ltrs)	E (680 ltrs)	F/AF (1360 ltrs)	HX (2300 ltrs)	G (3400 ltrs)	J (6800 ltrs)
0.25	22h 40min	30h 40min	45h 20min	90h 40min	153h 20min	226h 40min	453h 20min
0.5	11h 20min	15h 20min	22h 40min	45h 20min	76h 40min	113h 20min	226h 40min
0.75	7h 33min	10h 13min	15h 6min	30h 13min	51h 6min	75h 33min	151h 6min
1	5h 40min	7h 40min	11h 20min	22h 40min	38h 20min	56h 40min	113h 20min
2	2h 50min	3h 50min	5h 40min	11h 20min	19h 10min	28h 20min	56h 40min
3	1h 53min	2h 33min	3h 46min	7h 33min	12h 46min	18h 53min	37h 46min
4	1h 25min	1h 55min	2h 50min	5h 40min	9h 35min	14h 10min	28h 20min
5	1h 8min	1h 32min	2h 16min	4h 32min	7h 40min	11h 20min	22h 40min
6	56min	1h 16min	1h 53min	3h 46min	6h 23min	9h 26min	18h 53min
7	48min	1h 5min	1h 37min	3h 14min	5h 28min	8h 5min	16h 11min
8	42min	57min	1h 25min	2h 50min	4h 47min	7h 5min	14h 10min
9	37min	51min	1h 15min	2h 31min	4h 15min	6h 17min	12h 35min
10	34min	46min	1h 8min	2h 16min	3h 50min	5h 40min	11h 20min
12	28min	38min	56min	1h 53min	3h 11min	4h 43min	9h 26min
15	22min	30min	45min	1h 30min	2h 33min	3h 46min	7h 33min

Nov 16

Time = Hours: Minutes

b) Portable (CD size) cylinder usage



PORTABLE (CD size) OXYGEN CYLINDER

Flow	Hour & Minutes
1	7h 40min
2	3h 50min
3	2h 33min
4	1h 55min
5	1h 32min
6	1h 16min
7	1h 5min
8	57min
9	51min
10	46min
12	38min
15	30min



CHECK EXPIRY DATE OF CYLINDER



TURN THE CYLINDER ON BY ROTATING THE HAND WHEEL ANTI-CLOCKWISE



CHECK THE CONTENTS GAUGE BEFORE USE AND AT REGULAR INTERVALS TO ENSURE SUFFICIENT GAS



SET THE PRESCRIBED FLOW BY ROTATING THE DIAL FLOW SELECTOR. STORE AT "0" WHEN NOT IN USE

Appendix G

Regulator and Flowmeter Competency Assessment For HCA's

The trainee is to be assessed by an expert user (see SOP) against the following criteria:

Performance Criteria	Knowledge and / or Action	Observed <input type="checkbox"/>
Safety Checks Before Use Flowmeters & Regulators (Medical Gas Bottles)	Knowledge of identifying the contents of gas cylinder..... Identifies all information on collar of cylinder..... Identify correct combination of Regulator and gas cylinder..... Ensure the gas cylinder is safely stored in cradle..... Inspects the Flowmeter and Regulator for defects/leaks..... Identifies how much gas remains in the cylinder.....	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Safety Checks Before Use Wall Flowmeters	Correct Wall Flowmeter (Oxygen /Air)..... Knowledge of Flowmeter position when in use..... Inspects the Wall Flowmeter for defects / leaks.....	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Correct Insertion of Wall Flowmeter	Demonstrates insertion / removal of Flowmeter into Wall Outlet / performs tug test.....	<input type="checkbox"/>
Correct Operation	Demonstrates operation and setting of Flowmeter / Dial Regulator..... Knowledge of consumables used to deliver gas to patient.....	<input type="checkbox"/> <input type="checkbox"/>
Transfer from Cylinder to Wall Flowmeter	Demonstrates ability to transfer delivery of oxygen from cylinder to Wall Flowmeter and back to cylinder as required.....	<input type="checkbox"/>
Reporting Procedure	Knowledge of who / where / when to report defective equipment.....	<input type="checkbox"/>
Identification of Patient Deterioration	Able to discuss what action to be taken if the patient deteriorates during transfer, to maintain patient safety and summon early help.....	<input type="checkbox"/>

Continues over the page.....

In order to be fully competent an observation of FIVE correct transfers from Wall to Cylinder and Cylinder to wall oxygen needs to be undertaken

Wall to cylinder			Cylinder to wall		
Date	Signed & Stamped by assessor	Comments	Date	Signed & Stamped by assessor	Comments

Name..... **ESR Number**.....

Is up to date with their Basic Life Support training. **Date Completed**

Has been observed by an expert user and been assessed against the above “Assessment Criteria” for HCA’s in the safe use of “Regulators and Flowmeters” in a clinical area, they are now deemed competent in its use.

Ward Assessor (Stamp).....

Ward Assessor (Signature).....

Date.....

I have received training on the safe use of the Regulators and Flowmeters and now feel competent to use this device.

Trainee (Stamp).....

Trainee (Signature).....**Date**.....

Once complete please contact the Medical Device Trainers on Ext 5530 to arrange collection

Operational Guidance for Healthcare Assistant (HCA) and Associate Nurses Oxygen Competency

Procedure Statement

Guidelines for Health Care Support Worker's (HCA, Bands 2 & 3) and trainee Associate Nurses (band 3) competency to enable them to transfer a patient from a wall based flow meter to an oxygen cylinder and back again.

This will assist with patient transfers whilst maintaining patient safety.

Rationale

It is recognised that not all patients require a registered nurse when being transferred from ward to ward or when escorting for investigations. The escort policy (OP67) appendices 1 & 2 identify what level of escort is required.

Patients who require oxygen therapy for a chronic illness / long term treatment/ receiving no more than 2 litres - can be safely escorted by a HCA or an Associated Nurse.

Following a competency based assessment it is acknowledged that HCA's or Associated Nurses could safely undertake this process and this will improve patient care and maintain patient safety. The competency includes a question on what action to be taken if the patient deteriorates.

Process of Assessment

- The HCA or associated Nurse is required to have an up to date Basic Life Support Training. It is suggested that the competency is completed in the same month as the BLS training for easy of monitoring and updating.
- HCA's or Associate Nurses will be assessed as per the attached competency document and will be observed a minimum of five times attaching a patient to wall oxygen and five times to a cylinder before they are deemed to be safe to undertake this task autonomously.

Who Can Assess in Wards/Departments?

- Each ward will have an agreed assessor/expert user (this can be more than one person) and will be a Registered Nurse.
- This assessor will either be nominated by the area/ward Lead Nurse, or who has volunteered and the Lead Nurse agrees that it is a suitable role for them to undertake.
- This assessor will have been deemed competent against the attached competency by a Medical device Trainer prior to undertaking the role of 'Expert User'.

Who Can Assess Bank Staff?

- Nurse Bank staff can be assessed to be competent in this skill; it will be the responsibility of the individual to gain assessment while in a clinical environment.
- The Nurse Bank will require a copy of the competency and will ensure this is uploaded on to Health Roster.
- It is the responsibility of the ward to ensure that the member of staff has completed the competency and it is still up to date before asking the member of staff to escort a patient on oxygen – this can be verified via Health Roster.

Student Nurses

Should not be undertaking the role of escorting patients and therefore they are excluded from this process.

Maintaining the Competency

- Staff will be required to be re-assessed every 12 months to ensure their knowledge remains current and they are safe to undertake the task.
- It is the responsibility of the individual to maintain their competency.

Appendix I

HEALTH AND SAFETY

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 must be stored in an area designated as no smoking.
3. Electrical appliances must 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.
5. Store unused cylinders in a dry well ventilated place.