

Prescription, Administration and Monitoring of Oxygen in Adults Policy

V5.0

June 2025

Summary

ACTION	ACCOUNTABILITY
<p>Except in an emergency</p> <p>All patients requiring oxygen therapy will have a prescription for oxygen therapy incorporating a target saturation recorded on the JAC EPMA system.</p>	<p>Medical Staff</p> <p>Consider certain groups of patients require different target ranges for their oxygen saturation. See Appendix 3: Tables 1-4.</p>
<p>The appropriate oxygen delivery system for the patient should be chosen.</p>	<p>Nursing and Medical staff.</p>
<p>When starting oxygen saturations should be measured for at least 5 minutes.</p> <p>Oxygen administration should be recorded on JAC EPMA at each drug round.</p>	<p>Nursing staff</p>
<p>Oxygen flow rate should be recorded alongside the oxygen saturation on Nervecentre</p>	<p>Nursing staff</p>
<p>Saturations higher than target specified</p>	
<p>Step down oxygen therapy as per guidance for delivery</p>	<p>Nursing staff</p>
<p>Consider discontinuation of oxygen therapy.</p>	<p>Nursing and Medical staff</p>
<p>Saturations lower than target specified</p>	
<p>Check all elements of oxygen delivery system for faults or errors.</p>	<p>Nursing staff</p>
<p>Step up oxygen therapy as per guidance.</p> <p>Any sudden fall in oxygen saturation should lead to clinical evaluation and in most cases measurement of blood gases.</p>	<p>Nursing staff</p>
<p>Check and ensure that the patient is well perfused.</p>	<p>Nursing staff</p>
<p>Saturation within target specified</p>	
<p>Continue with oxygen therapy and monitor patient to identify appropriate time for stepping down therapy once clinical condition allows.</p>	<p>Nursing staff</p>
<p>A change in delivery device (without an increase in O₂ therapy) does not require review by the medical team.</p>	<p>Nursing staff</p>
<p>Oxygen delivery methods</p>	
<p>The Trust's recommended delivery devices will be utilised to ensure a standardise approach to oxygen delivery.</p>	<p>Nursing staff</p>

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Data Protection Act 2018 (UK General Data Protection Regulation – GDPR) Legislation.

The Trust has a duty under the Data Protection Act 2018 and UK General Data Protection Regulations 2016/679 to ensure that there is a valid legal basis to process personal and sensitive data. The legal basis for processing must be identified and documented before the processing begins. In many cases we may need consent; this must be explicit, informed, and documented. We cannot rely on opt out, it must be opt in.

Data Protection Act 2018 and UK General Data Protection Regulations 2016/679 is applicable to all staff; this includes those working as contractors and providers of services.

For more information about your obligations under the Data Protection Act 2018 and UK General Data Protection Regulations 2016/679 please see the Information Use Framework Policy or contact the Information Governance Team.

Royal Cornwall Hospital Trust rch-tr.infogov@nhs.net

1. Introduction

1.1. The administration of supplemental oxygen is an essential element of appropriate management for a wide range of clinical conditions. Following a NPSA Rapid Response Report in 2009¹, it is now mandatory for oxygen to be prescribed in all but emergency situations. Failure to administer oxygen appropriately can potentially 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.

1.2. This version supersedes any previous versions of this document.

2. Purpose of this Policy/Procedure

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 the British Thoracic Society Emergency Oxygen Therapy National Guidelines (Ref 2).
- Oxygen is prescribed according to a target saturation range. The system of prescribing target oxygen saturation aims to achieve specific outcome rather than specifying the oxygen delivery method alone.
- The multidisciplinary team will administer and monitor the patient in keeping with the target saturation rate.

3. Scope

This policy is intended for all healthcare professionals initiating, delivering and monitoring oxygen.

4. Definitions / Glossary

- ABG Arterial blood gas.
- NIV Non-invasive ventilation.
- IPPV Invasive positive pressure ventilation.
- BiPAP Bilevel positive pressure ventilation.
- CPAP Continuous positive pressure ventilation.
- COPD Chronic obstructive pulmonary disease.
- ICU Intensive care unit.
- HDU High dependency unit.
- pH Acidity or alkalinity.
- PaO₂ Arterial oxygen tension.

- PaCO₂ Arterial carbon dioxide tension.
- PtCO₂ Transcutaneous carbon dioxide.
- HR Heart rate.
- RR Respiratory rate.
- FiO₂ Fraction of inspired oxygen.
- SpO₂ Oxygen saturations measured by pulse oximetry.

5. Ownership and Responsibilities

This policy has been endorsed by the Medical Gases Group.

5.1. Role of the Managers

Line managers are responsible for ensuring the policy is adhered to.

5.2. Role of the Medication Practice Committee and Medical Gases Group/Committee

5.2.1. The Medication Practice Committee (MPC)

The MPC is the committee responsible for the approval and oversight of this policy and its implementation.

5.2.2. Medical Gases Group

The Medical Gases group is responsible for ensuring the policy is adhered to:

- Ensuring there is sufficient and available training to facilitate the above
- Ensuring all critical incidences relating to oxygen are investigated and acted upon.

5.3. Role of Individual Staff

All staff members are responsible for ensuring the policy is adhered to.

6. Standards and Practice

6.1. Identifying appropriate target saturations

Guidance on identifying appropriate saturations for patients is provided for the medical staff and other prescribers in Section 6.14. In summary oxygen should be prescribed to achieve a target saturation of 92-96 % for most acutely unwell patients, and 88-92% for those at risk of hypercapnic respiratory failure ([Appendix 3](#), Table 3).

6.2. Prescribing oxygen

Oxygen must be prescribed on the JAC EPMA system for all patients. The appropriate target saturation must be indicated (or if target saturations are not indicated this should be stated). The starting device and flow rate should be stated. For almost all patients, oxygen therapy should be administered on an “as required” (prn) basis.

6.3. Administering oxygen

Once the target saturation rate 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 Appendices 5 and 7. Personnel who may administer oxygen are shown in [Appendix 8](#).

6.4. Monitoring and recording oxygen.

The patient’s oxygen saturation and oxygen delivery system should be recorded on Nervecentre alongside other physiological variables.

At every drug round nursing staff must ensure that every patient receiving oxygen is within the documented target saturation range. If not, 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). Nursing staff need to remain with the patient until the target saturation range is achieved. See [Appendix 7](#) for more details. Medical staff should be informed if there is a significant increase in oxygen requirement ([Appendix 7](#)). Patients should be monitored accurately for signs of improvement or deterioration. Nurses should also monitor skin colour for peripheral cyanosis and respiratory rate.

6.5. Emergency situations

- 6.5.1. In an emergency situation (peri-arrest and critically ill patients) an oxygen prescription is not required. Oxygen should be given to the patient immediately without a formal prescription or drug order but should be documented later in the patient’s medical record.
- 6.5.2. All peri-arrest and critically ill patients should be given high flow oxygen (15L/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 urgent blood gas results, after which these patients may need controlled oxygen therapy or supported ventilation if there is severe hypoxaemia and/or hypercapnia with respiratory acidosis.
- 6.5.3. All patients who have cardiac or respiratory arrest should have high flow oxygen provided along with basic/advanced life support.

- 6.5.4. 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.
- 6.5.5. Any qualified nurse/health professional can commence oxygen therapy in **an emergency situation. This is in line with local policies within relevant clinical areas.**

6.6. Exclusions

- 6.6.1. Patients admitted to specialist areas with a specialist oxygen prescribing policy (see section 6.7).
- 6.6.2. Patients receiving oxygen as part of palliative care, or patients on the end of life care pathway (in which case the prescriber should choose “target saturations not indicated” on the JAC EPMA system).

6.7. Specialist areas

- 6.7.1. This policy is for general use within general wards and departments. Where specific clinical guidelines are required oxygen administration within specialist areas, they must be approved via the appropriate clinical governance forum. They should reflect wherever possible the principles within this policy.
- 6.7.2. Patients transferring from specialist areas must be transferred with a prescription for their oxygen therapy utilising target saturation if the clinical indication is ongoing. If a patient transfers from an area not utilising the target saturation system, their oxygen should be administered as per the transferring area’s prescription until the patient is reviewed and transferred over to the target saturation scheme and this should occur as soon as possible.

6.8. Indications

- 6.8.1. 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.
- 6.8.2. Oxygen is not a treatment for breathlessness and other causes of tissue hypoxia e.g. Anaemia, ischaemia must be addressed. Indications for oxygen therapy are listed in [Appendix 3](#).

6.9. Contra-indications

There are no absolute contra-indications 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 should be administered with caution in patients suffering from paraquat poisoning and with acid inhalation or previous bleomycin lung injury.

6.10. Cautions

6.10.1. Oxygen induced hypercapnia

A subgroup of patients with chronic obstructive pulmonary disease will develop oxygen induced hypercapnia. Other at risk groups include neuromuscular disorders, morbid obesity and chest wall deformities.

All patients admitted with COPD and these high risk patients must have a target saturation range of 88-92% and an ABG should be performed to monitor PaCO₂.

6.10.2. Other complications of oxygen therapy

- Coronary and cerebral artery vasoconstriction.
- Pulmonary toxicity.
- Drying of the nasal and pharyngeal mucosa.
- Skin irritation.
- Fire hazard.
- Pressure sores resulting from the delivery device.

6.11. Transfer and transportation of patients receiving oxygen

6.11.1. 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 one area not utilising the target saturation system (see specialist areas above) their oxygen should be administered as per the transferring areas prescription until the patient is reviewed and transferred to the target saturation scheme and this should occur as soon as possible.

6.11.2. Patients requiring oxygen therapy while being transferred from one area to another should have oxygen therapy reviewed prior to leaving the clinical area and on return by trained nursing staff. Clear instructions must be provided for personnel involved in the transfer of the patient, which must include delivery device and flow rate and JAC EPMA should be referred to. Please also refer to the Policy for Medical Gas Pipeline and Cylinder Management.

6.12. Peri-operative and immediately post operatively.

Theatres and recovery follow the AAGBI guidelines 3,4 with respect to oxygen administration. However, when patients are transferred back to the ward from recovery, oxygen should be prescribed on the JAC EPMA system as discussed in Section 6.2.

6.13. Nebulised therapy and oxygen

- 6.13.1. When nebulised therapy is administered to patients at risk of hypercapnic respiratory failure (see Section 6.10.1.), it should be driven by compressed air. If necessary, supplemental oxygen should be given concurrently by nasal prongs at 1-4 litres per minute to maintain an oxygen saturation of 88-92% or their specified target range.
- 6.13.2. All patients requiring 35% or greater oxygen therapy should have their nebulised therapy by oxygen at a flow rate of >6 litres per minute.

6.14. Normal oxygen saturations:

- In adults less than 70 years of age at rest at sea level 96-98% when awake.
- Age 70 and above at rest at sea level greater than 94% when awake.
- Patients of all ages may have transient dips of saturation to mid-80s% during sleep.

6.15. 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 or JAC EPMA system. NB: Exceptions – see emergency situations.	Oxygen should be regarded as a drug and should be prescribed. BTS National Guidelines (2008) British National Formulary (2012).
The prescription will incorporate a target saturation that will be identified by the clinician prescribing the oxygen in accordance with the Trust's oxygen guideline.	Certain groups of patients require different target ranges for their oxygen saturation. See Appendix 3 : Tables 1-4. Certain groups of patients are at risk of hyperoxaemia, 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 oxygen delivery system and flow rate.
The administration of oxygen should be recorded at every drug round either on the drug chart or the JAC EPMA system.	To ensure that the patient is receiving oxygen, and that oxygen saturation is within the target range.

ACTION	RATIONALE
Once oxygen is in situ the nurse will monitor observations in line with Trust policy. All patients should have their oxygen saturation observed for at least 5 minutes after starting oxygen therapy.	To identify if oxygen is maintaining the target saturation or if an increase or decrease in oxygen therapy is required.
Oxygen flow rate should be recorded alongside the oxygen saturation on Nervecentre.	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. If the patient falls outside of the target saturation range the oxygen therapy will be adjusted accordingly, the saturations should be monitored 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.

Saturations higher than target specified	
Step down oxygen therapy as per guidance for delivery.	The patient will require weaning down for current oxygen delivery system. See Appendix 7 .
Consider discontinuation of oxygen therapy.	The patient's clinical condition may have improved negating the need for supplementary oxygen.
Saturations lower than target specified	
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 should be excluded.
Step up oxygen therapy as per protocols in Appendix 7 . any sudden fall in oxygen saturation should 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 cause of deteriorating oxygen level.
Monitor National Early Warning Score (NEWS) and respiratory rate for further clinical signs of deterioration.	Patient safety.

Check and ensure that the patient is well perfused.	Measurements of oxygen saturation are reliant upon adequate arterial perfusion of the patient.
Saturation within target specified	
Continue with oxygen therapy and monitor patient to identify appropriate time for stepping down therapy once clinical condition allows.	
A change in delivery device (without an increase in O ₂ therapy) does not required review by the medical team.	(The change may be made in stable patients due to patient preference or comfort).
Oxygen delivery methods	
The Trust's recommended delivery devices will be utilised to ensure a standardise approach to oxygen delivery see Appendix 5 .	Previous audits have demonstrated wide variations in delivery devices across clinical areas, potentially increasing the risk of adverse incidents.

6.16. Humidification

Humidification may be required for some patient groups but is not essential, even for patients on prolonged therapy. See [Appendix 9](#).

7. Dissemination and Implementation

- 7.1. It is mandatory that all non-medical staff administering oxygen complete the Oxygen Therapy module via [clinicalskills.net](#). The competency can be found on ESR.
- 7.2. All medical students and doctors should be taught about the oxygen policy. This will be facilitated through regular junior doctor teaching, departmental meetings and Grand Rounds.
- 7.3. Regular audits are being performed in clinical areas. Additionally, the Trust will take part in the National BTS audit to benchmark our practice against the rest of the country.
- 7.4. The British Thoracic Society has appointed oxygen champions in all Trusts to help introduce the Guideline. Dr M Wijesinghe is the Oxygen champion for RCHT.

8. Monitoring compliance and effectiveness

Information Category	Detail of process and methodology for monitoring compliance
Element to be monitored	Oxygen prescription and monitoring.
Lead	Dr Meme Wijesinghe.

Information Category	Detail of process and methodology for monitoring compliance
Tool	British Thoracic Society Annual Emergency Oxygen Audit.
Frequency	Annually.
Reporting arrangements	Medical Gases Group, Medication Practice Committee.
Acting on recommendations and Lead(s)	Dr Meme Wijesinghe.
Change in practice and lessons to be shared	Results will be fed back to Ward Managers/Sisters and Matrons.

9. Updating and Review

- 9.1. This section covers information regarding the review process. All policy documents should be reviewed no less than every three years. Where appropriate, the author may set a shorter review date.
- 9.2. Revisions can be made ahead of the review date when the procedural document requires updating. Where the revisions are significant and the overall policy is changed, the author should ensure the revised document is taken through the standard consultation, approval, and dissemination processes.
- 9.3. Where the revisions are minor for amended job titles or changes in the organisational structure, approval can be sought from the Executive Director responsible for signatory approval and can be re-published accordingly without having gone through the full consultation and ratification process.
- 9.4. Any revision activity is to be recorded in the Version Control Table as part of the document control process.

10. Equality and Diversity

- 10.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the [Equality Diversity And Inclusion Policy](#) or the [Equality and Diversity website](#).
- 10.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.

Appendix 1. Governance Information

Information Category	Detailed Information
Document Title:	Prescription, Administration and Monitoring of Oxygen in Adults Policy V5.0
This document replaces (exact title of previous version):	Prescription, Administration and Monitoring of Oxygen in Adults V4.0
Date Issued / Approved:	May 2025
Date Valid From:	June 2025
Date Valid To:	June 2028
Author / Owner:	Dr. Meme Wijesinghe, Consultant, Respiratory Medicine.
Contact details:	01872 252593
Brief summary of contents:	Policy for the prescription, administration and monitoring of emergency oxygen in adults.
Suggested Keywords:	Oxygen, reservoir mask, hypercapnic, respiratory, oxygen therapy, oximetry, saturation.
Target Audience:	RCHT: Yes CFT: No CIOB ICB: No
Executive Director responsible for Policy:	Chief Medical Officer
Approval route for consultation and ratification:	Respiratory Governance Meeting. Medication Practice Committee. Medical Gases Group.
Manager confirming approval processes:	Rachael Pearce
Name of Governance Lead confirming consultation and ratification:	Paul Evangelista
Links to key external standards:	CQC Outcome 9 Medicines Management NHSLA

Information Category	Detailed Information
Related Documents:	<ul style="list-style-type: none"> • NPSA Oxygen safety in hospital Rapid Response Report (NPSA/2009/RRR06) BTS guideline for emergency oxygen use in adult patients (2008). • National Patient Safety Agency Rapid Response Report: Oxygen Safety in Hospitals. NPSA/2009/RRR006. • O'Discoll BR, Howard LS, Davison AG; British Thoracic Society. Thorax. 2008 Oct; 63 Suppl 6: vi1-68. BTS guideline for emergency oxygen use in adult patients. • aagbi.org/sites/default/files/postanaes Immediate Post Anaesthetic Recovery AAGBI 2002. • Recommendations for Standards of Monitoring during Anaesthesia and Recovery.
Training Need Identified:	Yes
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet and Intranet
Document Library Folder/Sub Folder:	Clinical / Respiratory

Version Control Table

Date	Version Number	Summary of Changes	Changes Made by
05/05/09	V1.0	Initial issue	
05/11/12	V2.0	Complete review – changes made to formatting and content	Dr M Wijesinghe (Respiratory Consultant)
12/02/17	V3.0	Updated for current BTS guidelines Amended responsibilities for non-nursing staff.	Dr M Wijesinghe (Respiratory Consultant) Alison Hill (Chair Medical Gases Group)
26/04/21	V4.0	Full update and transposed to new template.	Dr M Wijesinghe (Respiratory Consultant)

Date	Version Number	Summary of Changes	Changes Made by
September 2024	V5.0	Full update and transposed to new template.	Dr M Wijesinghe (Respiratory Consultant)

All or part of this document can be released under the Freedom of Information Act 2000.

All Policies, Strategies and Operating Procedures, including Business Plans, are to be kept for the lifetime of the organisation plus 6 years.

This document is only valid on the day of printing.

Controlled Document.

This document has been created following the Royal Cornwall Hospitals NHS Trust [The Policy on Policies \(Development and Management of Knowledge Procedural and Web Documents Policy\)](#). It should not be altered in any way without the express permission of the author or their Line Manager.

Appendix 2. Equality Impact Assessment

Section 1: Equality Impact Assessment (EIA) Form

The EIA process allows the Trust to identify where a policy or service may have a negative impact on an individual or particular group of people.

For guidance please refer to the Equality Impact Assessment Policy (available from the document library) or contact the Equality, Diversity, and Inclusion Team
rcht.inclusion@nhs.net

Information Category	Detailed Information
Name of the strategy / policy / proposal / service function to be assessed:	Prescription, Administration and Monitoring of Oxygen in Adults Policy V5.0
Department and Service Area:	Respiratory -Acute and Emergency Medicine
Is this a new or existing document?	Existing
Name of individual completing EIA (Should be completed by an individual with a good understanding of the Service/Policy):	Dr M Wijesinghe, Respiratory Consultant
Contact details:	01872 252593

Information Category	Detailed Information
1. Policy Aim - Who is the Policy aimed at? (The Policy is the Strategy, Policy, Proposal or Service Change to be assessed)	To ensure that all activities relating to the prescription, administration and monitoring of emergency oxygen use in adults comply with accepted standards of good practice.
2. Policy Objectives	To provide evidence based guidelines on the prescription, administration and monitoring of emergency oxygen to adults.
3. Policy Intended Outcomes	All activities connected with the prescription, administration and monitoring of emergency oxygen to adults comply with accepted standards of good practice.
4. How will you measure each outcome?	Periodic clinical audit
5. Who is intended to benefit from the policy?	Patients receiving oxygen therapy

Information Category	Detailed Information
6a. Who did you consult with? (Please select Yes or No for each category)	<ul style="list-style-type: none"> • Workforce: Yes • Patients/ visitors: No • Local groups/ system partners: No • External organisations: No • Other: No
6b. Please list the individuals/groups who have been consulted about this policy.	Please record specific names of individuals/ groups: Respiratory Governance Meeting Medication Practice Committee Medical Gases Group
6c. What was the outcome of the consultation?	Agreed
6d. Have you used any of the following to assist your assessment?	National or local statistics, audits, activity reports, process maps, complaints, staff, or patient surveys: No.

7. The Impact

Following consultation with key groups, has a negative impact been identified for any protected characteristic? Please note that a rationale is required for each one. Where a negative impact is identified without rationale, the key groups will need to be consulted again.

Protected Characteristic	(Yes or No)	Rationale
Age	No	This policy is applied irrespective of adult patient age.
Sex (male or female)	No	This policy describes therapies not affected by gender.
Gender reassignment (Transgender, non-binary, gender fluid etc.)	No	
Race	No	This policy describes activities not race or ethnic groups.
Disability (e.g. physical or cognitive impairment, mental health, long term conditions etc.)	No	This policy is applied to patients irrespective of any disability.
Religion or belief	No	This policy describes activities not related to faith and belief.

Protected Characteristic	(Yes or No)	Rationale
Marriage and civil partnership	No	This policy describes therapies not affected by marriage or civil partnership.
Pregnancy and maternity	No	This policy describes therapies not affected by pregnancy/maternity.
Sexual orientation (e.g. gay, straight, bisexual, lesbian etc.)	No	This policy describes therapies not affected by sexual orientation.

A robust rationale must be in place for all protected characteristics. If a negative impact has been identified, please complete section 2. If no negative impact has been identified and if this is not a major service change, you can end the assessment here.

I am confident that section 2 of this EIA does not need completing as there are no highlighted risks of negative impact occurring because of this policy.

Name of person confirming result of initial impact assessment: Dr M Wijesinghe, Respiratory Consultant.

If a negative impact has been identified above OR this is a major service change, you will need to complete section 2 of the EIA form available here:
[Section 2. Full Equality Analysis](#)

Appendix 3. Indications for oxygen therapy

The British Thoracic Society divide patients into four different groups depending on their diagnosis and oxygen requirements.

- Critical illness requiring high levels of supplementary oxygen.
- Serious illness requiring moderate levels of supplemental oxygen if the patient is hypoxaemic.
- COPD and or other condition requiring controlled low-dose oxygen therapy.
- Conditions for which patients should be monitored closely but oxygen therapy is not required unless the patient is hypoxaemic.

The following tables set out how oxygen should be administered and the grades of evidence supporting oxygen use in these conditions.

Table 1: Critical illnesses requiring high levels of supplemental oxygen.

- The initial oxygen therapy is a reservoir mask 15L/min.
- Once stable, reduce the oxygen dose and aim for target saturation range 92-96%.
- If oximetry is unavailable, continue to use reservoir mask until definitive treatment is available.
- Patients with COPD and other patients at risk of hypercapnia who develop critical illness should have the same initial target saturations as other critically ill patients pending the results of blood gas measurements, after which these patients may need controlled oxygen therapy or supported ventilation if there is severe hypoxaemia and/or hypercapnia with respiratory acidosis.

Condition	Additional comments	Grade of recommendation
Cardiac arrest or resuscitation.	Use bag-valve mask during active resuscitation. Aim for maximum possible oxygen saturation until patient is stable.	Grade D
Shock, sepsis, major trauma, near-drowning, anaphylaxis, major pulmonary haemorrhage.	Also give specific treatment for the underlying condition.	Grade D
Major head injury	Early intubation and ventilation if comatose.	Grade D
Carbon monoxide poisoning	Give as much oxygen as possible using a bag-valve mask or reservoir mask. Check carboxyhaemoglobin levels. A normal or high oximetry reading should be disregarded because saturation monitors cannot differentiate between carboxyhaemoglobin and oxyhaemoglobin owing to their similar absorbencies. The blood gas PaO ₂ will also be normal in these cases (despite the presence of tissue hypoxia).	Grade C

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

- The initial oxygen therapy is a 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 saturations <85%, treatment should be commenced with a reservoir mask at 10-15L/min
- The recommended initial oxygen saturation target range is 92-96%
- 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 the patient is assessed by senior medical staff).
- If these patients have co-existing COPD or other risk factors for hypercapnic respiratory failure, aim at a saturation of 88%-92% pending blood gas results but adjust to 92-96% if the PaCO₂ is normal (unless there is a history of previous hypercapnic respiratory failure requiring NIV or IPPV) and recheck blood gases after 30-60 minutes.

Condition	Additional comments	Grade of recommendation
Acute hypoxaemia (cause not yet diagnosed)	Reservoir mask at 10-15L/min if initial SpO ₂ <85%, otherwise nasal cannulae or simple face mask. Patients requiring reservoir mask therapy need urgent clinical assessment by senior staff.	Grade D
Acute asthma		Grade C
Pneumonia		Grade C
Lung cancer		Grade C
Post-operative breathlessness	Management depends on underlying cause.	Grade D
Acute heart failure	Consider CPAP or NIV in cases of pulmonary oedema.	Grade D
Pulmonary embolism	Most patients with minor pulmonary embolism are not hypoxaemic and do not required oxygen therapy.	Grade D
Pleural effusions.	Most patients with pleural effusions are not hypoxaemic. If hypoxaemic treat by draining the effusion as well as giving oxygen	Grade D

Condition	Additional comments	Grade of recommendation
	therapy.	
Pneumothorax.	Needs aspiration or drainage if patient is hypoxaemic. Most patients with pneumothorax are not hypoxaemic and do not require oxygen therapy. Use a reservoir mask at 10-15L/min if admitted for observation, aim at 100% saturation as oxygen accelerates clearance if pneumothorax if drainage is not required.	Grade D
Deterioration of lung fibrosis or other interstitial lung disease.	Reservoir mask at 10-15L/min if initial SpO ₂ <85%, otherwise nasal cannulae or simple face mask.	Grade D
Severe anaemia.	The main issue is to correct the anaemia. Most anaemic patients do not require oxygen therapy.	Grade B and D
Sickle cell crisis.	Require oxygen only if hypoxaemic (below the target ranges or below what is known to be normal for the individual patient). Low oxygen tension will aggravate sickling.	Grade B

COPD (chronic obstructive pulmonary disease); CPAP (continuous positive airway pressure); IPPV (intermittent positive pressure ventilation); PaCO₂ (arterial carbon dioxide tension); SPO₂ (arterial saturation measured by pulse oximetry).

Table 3: COPD and other conditions requiring controlled or low-dose oxygen therapy.

- Prior to availability of blood gases, use 28% Venturi mask at 3 L/min and aim for an oxygen saturation of 88%-92% for patients with risk factors for hypercapnia but not prior history of respiratory acidosis.
- Aim at a pre-specified saturation range (from alert card) in patients with a history of previous respiratory acidosis. These patients may have their own Venturi mask. In the absence of an oxygen alert card but with a history of previous respiratory failure (use NIVE or IPPV), treatment should be commenced using a 28% oxygen mask at 4 L/min in pre-hospital care or a 24% Venturi mask at 2-4 L/min in a hospital settings with an initial target saturation of 88%-92% pending urgent blood gas results.
- If the saturation remains below 88% in pre-hospital care despite a 28% Venturi mask, change to nasal cannulae at 2-6 L/min or a simple mask at 5 L/min with a target saturation of 88-92%. All at risk patients with alert cards, previous NIV or IPPV or with saturation <88% in the ambulance should be treated with high priority. Alert the Emergency Department that the patient requires immediate senior assessment on arrival at the hospital.
- If the diagnosis is unknown, patients aged >50 years who are long-term smokers with a history of chronic breathlessness on minor exertion, such as walking on level ground and no other known cause of breathlessness should be treated as if having COPD for the purposes of this guideline. Patients with COPD may also use terms such as chronic bronchitis and emphysema to describe their condition but may sometimes mistakenly use "asthma". FEV1 should be measured on arrival in hospital if possible and should be measured at least once before discharge from hospital in all cases of suspected COPD.
- Patients with a significant likelihood of severe COPD or other illness that may cause hypercapnic respiratory failure should be triaged as very urgent and blood gases should be measured on arrival at hospital.
- Blood gases should be rechecked after 30-60 minutes (or if there is clinical deterioration) even if the initial PaCO₂ measurement was normal.
- If the PaCO₂ is raised by pH is ≤7.35 ([H⁺] ≤45nmol/L), the patient has probably got long standing hypercapnia; maintain target range of 88%-92% for these patients. Blood gases should be repeated at 30-60 minutes to check for rising PaCO₂ or falling pH.
- If the patient is hypercapnic (PaCO₂ >6 KPa or 45 mmHg) and acidotic (pH <7.35 or ([H⁺] <= 45nmol/L) consider non-invasive ventilation, especially if acidosis has persisted for more than 60 minutes despite appropriate therapy.

Condition	Additional Comments	Grade of Recommendation
COPD	May need lower range if acidotic or if known to be very sensitive to oxygen therapy. Ideally use alert cards to guide treatment based on previous blood gas results. Increase flow by 50% if respiratory rate is >30.	Grade C

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

If hypoxaemic, the initial oxygen therapy is nasal cannulae at 2-6L/min or simple face mask at 5-10 L/min unless saturation is <85% (use reservoir mask) or if at risk from hypercapnia (see below).

- The recommended initial target saturation range, unless stated otherwise, is 92-96%.
- 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 the saturation of 88%-92% pending blood gas results but adjust to 92-96% if the PaCO₂ is normal (unless there is a history of respiratory failure requiring NIV or IPPV) and recheck blood gases after 30-60 minutes.

Condition	Additional comments	Grade of recommendation
Myocardial infarction and acute coronary syndrome.	Most patients with acute coronary artery syndromes are not hypoxaemic and the benefits/harms of oxygen therapy are unknown in such cases.	Grade D
Stroke	Most stroke patients are not hypoxaemic. Oxygen therapy may be harmful for non-hypoxaemic patients with mild to moderate strokes.	Grade B
Pregnancy and obstetric emergencies.	Oxygen therapy may be harmful to the foetus if the mother is not hypoxaemic.	Grades A-D
Hyperventilation or dysfunctional breathing	Exclude organic illness. Patients with pure hyperventilation due to anxiety or panic attacks are unlikely to require oxygen therapy. Rebreathing from a paper bag may cause hypoxaemia and is not recommended.	Grade C

Condition	Additional comments	Grade of recommendation
Most poisonings and drug overdoses (see table 1 for carbon monoxide poisoning)	Hypoxaemia is more likely with respiratory depressant drugs, give antidote if available (eg. naloxone for opiate poisoning). Check blood gases to exclude hypercapnia if a respiratory depressant drug has been taken. Avoid high blood oxygen levels in cases of acid aspiration as there is theoretical evidence that oxygen may be harmful in this condition. Monitor all potentially serious cases of poisoning in a level 2 or level 3 environment (high dependency unit or ICU).	Grade D
Poisoning with paraquat or bleomycin	Patients with paraquat poisoning or bleomycin lung injury may be harmed by supplemental oxygen. Avoid oxygen unless the patient is hypoxaemic Target saturation is 88%-92%.	Grade C
Metabolic and renal disorders	Most do not need oxygen (tachypnoea may be due to acidosis in these patients).	Grade D
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.	Grade C

Appendix 4. Oxygen prescription on EPMA

POE - Prescriber Order Entry [Mrs Alison Hill]

TEST FIVE EPMA Caution: Patient with similar name on Ward Retain Ward Retain Consultant PHM JAC

Consultant: DR DOCTOR DOCTOR Ward: BOTOX WARD (ZCO) Patient Assessment:

Hospital No. C910848 Nat. No. Date of Birth 22-Mar-1978 Age 39 yrs Height 150 cm Weight 48.000 kg BSA 1.41 sq m

Details Allergies: raspberry Sensitivities: *Nuts

Active Medications Discontinued Medications

Status	Drug Name	Dose (at Dose Rate)	Frequency	Route	Start Date/Time	Stop Date/Time	BNF
As required (PRN) Medications							
R	OXYGEN (Target Sats 88-92%) ADULT USE ONLY	1 Variable (1-15L/min)	CONT 02 - Continuous C	nasal cannulae	19-Apr-2017 22:02		Respiratory s

**R
P
C
I
T
S**

Select Patient Patient Maint Patient Allergy Conflict Log Notes Add Order Modify Order Verification Discontinue Order Suspend Order Resume Order Close
Patient Details Lab Results Previous Meds. Clinical Info Discharge Short Term Leave Admin. Chart Charting Order Inquiry All Orders Help

Appendix 5. Administering oxygen therapy

	ACTION	RATIONALE
1	Ensure airway is patent.	To promote effective oxygenation.
2	The type of delivery device used will depend on the needs and comfort of the patient. Most stable patients prefer nasal cannulae to masks.	To provide accurate oxygen delivery.
3	Ensure oxygen is prescribed on the JAC/EPMA. The exception to this action would be in an emergency situation where the resuscitation guideline should be followed.	To ensure a complete record is maintained.
4	Ensure that the flow rate or dose of oxygen is clearly stated.	In accordance with the administration of medicines policy.
5	Inform patient 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.	To obtain consent and cooperation.
7	Assemble the oxygen delivery system carefully.	To ensure oxygen is being given as prescribed.
8	Attach oxygen delivery system to oxygen source	To ensure oxygen supply is ready
9	Attach oxygen delivery system to patient in accordance with manufacturers instructions.	To facilitate oxygen delivery to the patient.
10	Turn on flow rate in accordance with manufacturer's instructions and prescription.	To administer correct percentage 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 regularly with general purpose detergent and dry thoroughly. For single patient devices discard after use.	To minimise infection risk.

Appendix 6. Oxygen delivery devices and equipment.

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.

Purpose

Cannulae are preferred to masks by most patients. They have the advantage of not interfering with feeding and are more convenient than masks during coughing and feeding. They are a variable performance device and deliver a flow rate rather than a percentage of oxygen.

	ACTION	RATIONALE
1	When using nasal cannulae position the tips of the device 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 of friction tubing that is too long.
2	Place tubing over the ears and under the chin as described above. Educate the patient with regards prevention of pressure areas on the back of the ear.	To allow optimum comfort for the patient. 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.
4	If the patient is requiring an emollient for the treatment of dry skin secondary to oxygen therapy, a water based product should be used, suitable products include lubricating gel and aqueous cream	Paraffin based products should not be used in any circumstances as they are flammable with oxygen.

Venturi Masks

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.

Purpose

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

	ACTION	RATIONALE
1	When using a Venturi mask connect the mask to the appropriate Venturi barrel attached firmly into the mask inlet.	To ensure that the patient receives the correct concentration of oxygen.
2	Fasten oxygen tubing securely.	Correctly secured tubing is comfortable and prevents displacement of the mask.
3	Assess the patient's condition and functioning of the equipment at regular intervals according to the care plan.	To ensure patient's safety and that oxygen is being administered as prescribed.
4	Adjust the 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.
5	If the patient is requiring an emollient for the treatment of dry skin secondary to oxygen therapy, a water based product should be used, suitable products include lubricating gel and aqueous cream.	Paraffin based products should not be used in any circumstances as they are flammable with oxygen.

Simple Face Mask

Description

The mask has a soft plastic face piece, vent holes are provided to allow air to escape. Maximum 50-60% oxygen delivered at 15 L/min flow.

Purpose

This is a variable performance device. The oxygen delivered will be influenced by the oxygen flow rate and the patient's tidal volume and breathing rate. They should not be used in patients who are at risk of hypercapnic respiratory failure.

	ACTION	RATIONALE
1	If using a simple face mask gently place the mask over the patient's face. Position the strap behind the head and 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.
2	Check that the strap is not across ears and if necessary insert padding between the strap and the head.	To prevent irritation.
3	Adjust the oxygen flow rate. Must never be below 5 L/min.	To ensure patient's safety and that oxygen is being administered as prescribed.
4	Set the flow rate to achieve the desired target oxygen saturation.	To ensure patient's safety and that oxygen is being administered as prescribed.
5	If the patient is requiring an emollient for the treatment of dry skin secondary to oxygen therapy, a water based product should be used, suitable products include lubricating gel and aqueous cream.	Paraffin based products should not be used in any circumstances as they are flammable with oxygen.

Reservoir (non-rebreathe) mask

Description

The 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.

Purpose

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.

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

	ACTION	RATIONALE
1	When using a non rebreathe reservoir masks ensure the reservoir bag is inflated before placing the mask on the patient, this can be maintained by using 10- 15 L/min oxygen.	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 or asphyxiation.
3	If the patient is requiring an emollient for the treatment of dry skin secondary to oxygen therapy, a water based product should be used, suitable products include lubricating gel and aqueous cream.	Paraffin based products should not be used in any circumstances as they are flammable with oxygen.

Tracheostomy Mask

Description

Mask designed for “neck breathing patients”. Fits comfortably over tracheostomy or tracheotomy. There is an exhalation port on the front of the mask. This is a variable performance device.

Purpose

This is a variable performance device for patients with a tracheostomy or tracheotomy. The oxygen delivered will be influenced by the oxygen flow rate and the patient’s tidal volume and breathing rate.

	ACTION	RATIONALE
1	Gently place the 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.
2	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.	To ensure that the correct amount of oxygen is given to keep the patient in the target range.
3	For any prolonged period of oxygen treatment via a tracheostomy mask humidification should be considered either via a cold or heated system.	
4	If the patient is requiring an emollient for the treatment of dry skin secondary to oxygen therapy, a water based product should be used, suitable products include lubricating gel and aqueous cream.	Paraffin based products should not be used in any circumstances as they are flammable with oxygen.

Oxygen Flow Meter

Description

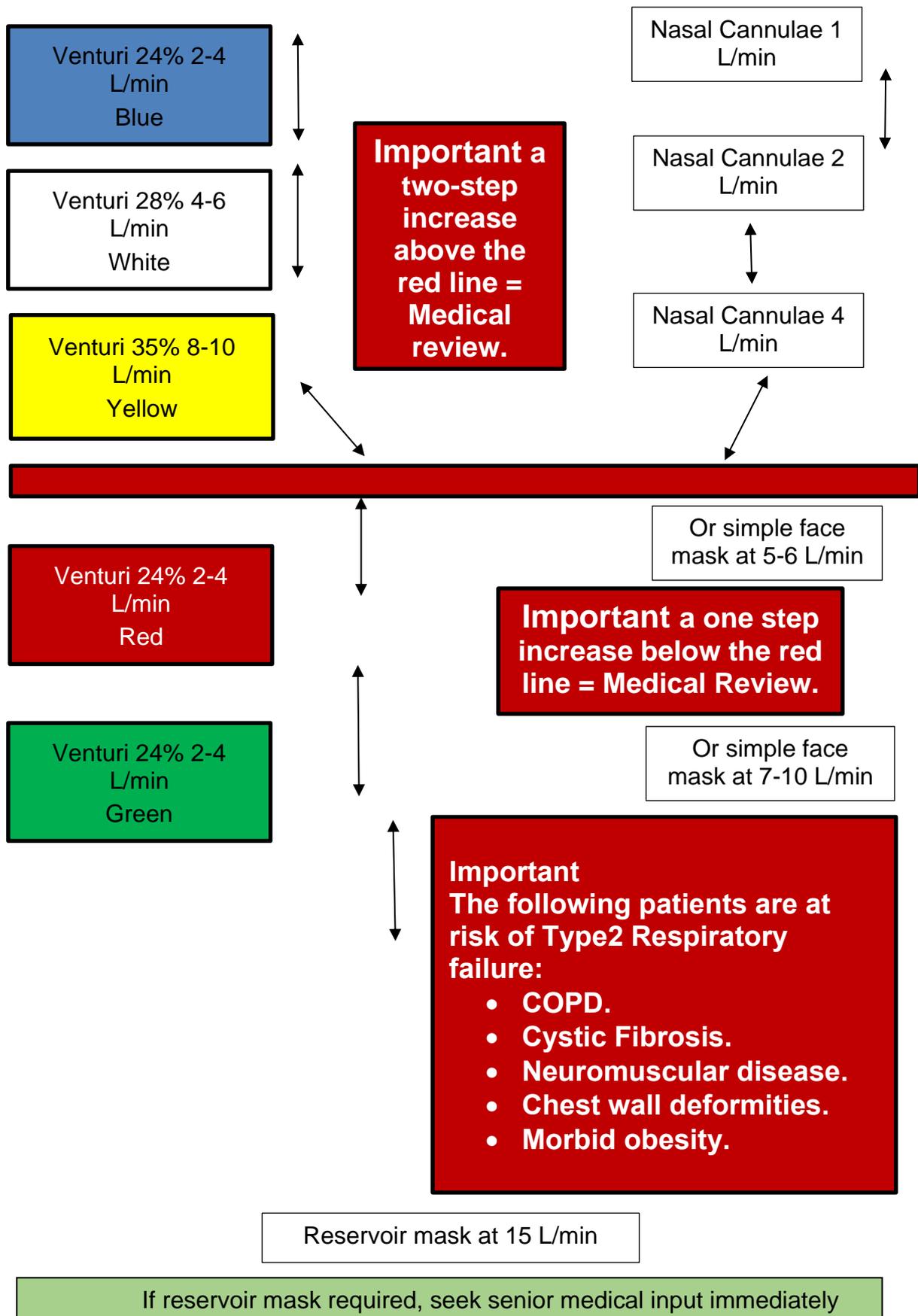
Device to allow the patient to receive an accurate flow of oxygen.

Purpose

To ensure the patient receives the correct amount of oxygen.

	ACTION	RATIONALE
1	Attach the oxygen tubing to the nozzle on the flow meter. Confirm you are connected to the correct gas flow meter and correct gas outlet.	To ensure the optimal flow of oxygen to the patient.
2	Turn the finger valve to obtain the desired flow rate. The CENTRE of the ball shows the correct flow rate.	

Appendix 7. Flowchart for Oxygen Administration



Appendix 8. Personnel who may administer oxygen

Any qualified nurse, doctor, RSCN, RN or physiotherapist, Assistant nursing practitioners and radiographers. In accordance with the policy for administration of medicines and after completion of oxygen training.

Appendix 9. Humidification

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

1. If the flow rate exceeds 4 L/min for several days.
2. Tracheotomy or tracheostomy patients (“neck-breathing patients”).
3. Cystic Fibrosis patients.
4. Bronchiectasis patients.
5. Patients at risk of retained secretions.

Can be given by warm or cold humidifier systems.

(warm humidifier systems are mainly used in critical care areas).

Appendix 10. Health and Safety

	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.	Oxygen can be potentially dangerous when in contact with sources of ignition.
3	Electrical appliances should be kept at least 5' 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 oxygen 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.	To prevent damage to the oxygen cylinders.