Whittington Health NHS

OXYGEN THERAPY:

SAFE OXYGEN THERAPY IN ADULT PATIENTS

Subject:	Oxygen therapy in adult patients
Policy Number	N/A
Ratified By:	Clinical Guidelines Committee
Date Ratified:	June 2009, reviewed with minor change August 2015
Version:	2.0
Policy Executive Owner:	ICAM Divisional Director
Designation of Author:	Consultant Respiratory Physician Respiratory Nurse Specialist
Name of Assurance Committee:	As above
Date Issued:	August 2015
Review Date:	3 years hence
Target Audience:	All clinical staff
Key Words:	Oxygen, respiratory failure, oxygen equipment, arterial blood gases

Version Control Sheet

Version	Date	Author	Status	Comment
1.0	June 2009	Dr L Restrick, Dr S Gillis, B Gilbride, C Ward	OFF LINE	New guideline approved at CGC
2.0	August 2015	Dr L Restrick C Ward	LIVE	Reviewed with amendments: • Presciption chart change • Additional section on home oxygen therapy aligned with BTS Home Oxygen Guidance 2015 • Alignment with London Responsible Respiratory Prescribing messages 2015

Please refer to the following London and BTS documents which are appended to this guideline:

Appendix 1: London Clinical Oxygen Network (LCON) Responsible Oxygen Prescribing Messages (Adults)

Table 1 Critical illnesses that may require high levels of supplemental oxygen to correct hypoxaemia;
Table 2 Serious illnesses that may require moderate levels of supplemental oxygen if the patient is hypoxaemic;
Table 3 COPD and other conditions that may require controlled or low levels of supplemental oxygen;
Table 4 Conditions for which patients should be monitored closely but oxygen therapy is not required unless the patient is hypoxaemic;
Chart 1 Oxygen prescription for acutely hypoxaemic patients in hospital.

➢ Guideline Aims

The aim of this protocol is to ensure that:

- All patients who require supplemental oxygen therapy receive therapy that is appropriate to their needs and in line with national guidance.
- Oxygen is prescribed according to a target oxygen saturation range.
- Those who administer oxygen therapy monitor the patient, adjust therapy and if necessary, escalate care to keep patients safe by staying within the target oxygen saturation range.
- There is effective and safe prescribing, administering, and supplying of oxygen and safe and effective storage and disposal of equipment.

➢ Introduction

The recognition of hypoxaemia and the administration of supplemental oxygen is an essential component of appropriate management for a wide range of clinical conditions associated with hypoxaemia.

The appropriate administration of oxygen should be in addition to diagnosing and treating the underlying cause.

Oxygen is a drug and must therefore be prescribed in all but emergency situations.

Failure to administer oxygen appropriately can result in serious harm to patients - both from undertreating hypoxaemia and from overtreating patients who are oxygen sensitive.

See *Appendix 1*: London Clinical Oxygen Network Responsible Oxygen Prescribing Messages (Adults) 2015.

	Please see Whittington Health Guidelines: ***COPD Admission Proforma*** ***Non-Invasive Ventilation (NIV) in acute exacerbations of COPD*** ***Continuous Positive Airway Pressure (CPAP)*** ***Tracheostomy*** ***CAP Bundle/ Sepsis Bundle/ Severe Sepsis Pathway*** ***Pleural and pneumothorax guidelines***

➢ Indications

The rationale for oxygen therapy is prevention of cellular hypoxia as a result of hypoxaemia (low oxygen level in the blood measured as PaO_2), and thus prevention of potentially irreversible damage to vital organs.

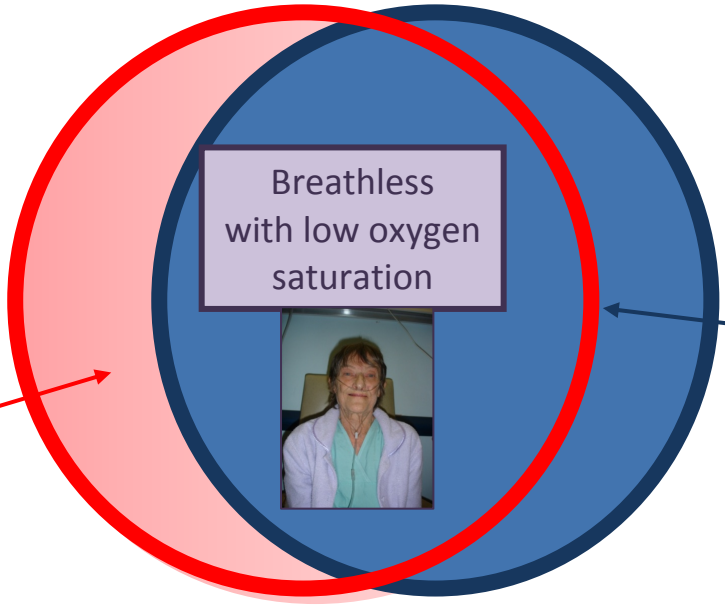
The symptom of breathlessness and signs of increased respiratory rate and altered pattern of breathing should alert staff to assess for the presence of respiratory failure/hypoxaemia by measuring oxygen saturation (SaO_2) with a pulse oximeter. However, the symptom of breathlessness may be present both with and without associated hypoxaemia.

Breathlessness and respiratory failure: How they fit together

Breathlessness = care at home **provided** correct diagnosis made, correct treatment started **and** patient feels in control of breathlessness

Breathlessness (symptom)

Respiratory Failure (low oxygen saturation)



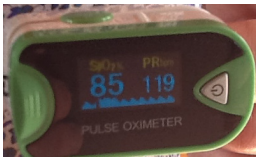
New or worsening respiratory failure = diagnosis and treatment in hospital

Low oxygen saturation but not breathless

Breathless with normal oxygen saturation

Ask and listen

Measure



Measuring oxygen saturation (SaO_2) with a pulse oximeter is the immediate screening test for detecting hypoxaemia and determines the initial need for oxygen therapy, but accurate assessment requires arterial blood gas analysis.

All clinical staff involved in the assessment and care of patients presenting with breathlessness should carry a pulse oximeter or alternatively, have immediate access to one.

For a patient who is acutely deteriorating with likely, or demonstrated hypoxaemia, high flow oxygen therapy should be initiated immediately and urgent medical review sought.

Oxygen is indicated in: **(see Tables 1- 4)**

Critical illnesses and the suddenly acutely unwell patient where high flow supplemental oxygen is recommended as part of initial treatment, including severe sepsis.

- Serious illnesses requiring moderate levels of supplemental oxygen when the patient is hypoxaemic.
- COPD and other conditions where controlled or low flow oxygen therapy is required to correct hypoxaemia.
- Some other conditions that may be associated with hypoxaemia.

In practice, the most common reasons for prescription and use of oxygen therapy are:

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

Other indications include:

- **Pneumothorax** – High flow oxygen may increase the rate of resolution of pneumothorax in patients for whom a chest drain is not indicated.

  There is some evidence tosuggest a decreased incidence of post operative wound infections with oxygen therapy following bowel surgery in hypoxaemic patients.
- **Post operative state** – **first 48 hours** General anaesthesia can lead to decrease in functional residual capacity, especially following thoracic or abdominal surgery resulting in hypoxaemia (Ferguson 1999).

- **Chronic hypoxaemic lung disease** – oxygen needs to be continued for patients with chronic hypoxaemia who are on home oxygen (usually controlled or low flow) when admitted to hospital.

In all cases the management of the underlying cause of the hypoxaemia and the need for oxygen therapy must be identified and treated.

Role of the Critical Care Outreach Team (CCOT):

If a patient is requiring high fraction (percentage) of inspired oxygen (FiO_2), has low oxygen saturation (SaO_2) or abnormal respiratory rate then this may necessitate referral to CCOT and escalation to one of the medical teams responsible for the patient.

Please refer to the Outreach Triggers Escalation Flow Chart, which is found on the reverse of the adult observation chart, for advice on what to do in this situation.

For greater information please refer to the Deteriorating Patient Policy, which can be found on the intranet under the Clinical Policies header.

	**Please see Whittington Health Policy** *Deteriorating Patient* http://whittnet/document.ashx?id=5863

➢ Prescribing oxygen safely

Identifying appropriate target saturations

Oxygen should be prescribed to achieve a target saturation of 95 – 98% for most acutely ill patients and to achieve 88 – 92% for those at risk of hypercapnic respiratory failure.

Anyone with a raised serum bicarbonate (above 28mmol/l) on either a venous blood sample or arterial blood gas sample should have a prescrobed target saturation range of 88 – 92%.

For patients where there is concern about a possible, but not confirmed, risk of hypercapnic respiratory failure, it is reasonable to use a target saturation of 90 - 94%.

Further guidance on identifying appropriate saturations for patients is provided for medical staff and other prescribers in BTS Tables 1 – 4 and Chart 1.

Prescribing target saturation ranges

Every medical patient admitted to the Whittington Hospital must have a single drug chart, complete with patient name, data of birth and hospital number **and** the appropriate target saturation range circled in the designated section of the paper drug chart on a *'what-if'* basis.

Prescribing oxygen

For those patients who are hypoxaemic on admission, or who are felt to be at high risk of becoming hypoxaemic, a range of oxygen flows or percentages should also be prescribed to enable the target saturations set to be achieved safely.

Example below:

OXYGEN (O_2) PRESCRIPTION Target saturation 88-92% ☐ 90-94% ☐ 95-98% ☐ Other: ☐

Doctors oxygen should be prescribed as a range, e.g. N 0.5 – 1L/min, V35-40%

General instructions If oxygen saturation drops **below** target range, on prescribed O_2 pt needs review by Dr. If oxygen saturation **above** target range, on prescribed O_2, reduce or remove O_2 and ask Dr to review/discontinue oxygen prescription next time they see the patient

Start Date / time	Change date / time	Change Date / time	Time	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
Device*	Device*	Device*	0800														
% or L/min	% or L/min	% or L/min	1200														
Drs sign	Drs sign	Drs sign	1800														
Print name	Print name	Print name	2200														

Device key * N = nasal cannula, V = Venturi, H = Humidified, RM = Reservoir mask, OTH = other

Nurses by initialling in the boxes above you are confirming that the O_2 the patient is receiving is in the prescribed range and O_2 sats are within the target range. N.B. record sats, O_2, and RR on adult obs chart.

➢ Emergency situations

In an emergency, an oxygen prescription **is not** required. Oxygen should be provided to the patient immediately without the need for a formal prescription. Oximetry should be used to guide oxygen therapy whenever possible.

All peri-arrest and critically ill patients on whom information is not available should be given 85 - 90% oxygen (15 l/m reservoir mask) whilst awaiting immediate medical review.

Patients with documented oxygen sensitivity (all patients with raised bicarbonate including those with severe COPD and and some patients with morbid obesity) who develop *critical illness* must be treated using their previously agreed target oxygen saturation range.

All patients who have had a cardiac or respiratory arrest must have 100% oxygen provided along with basic/advanced life support.

It is the responsibility of the clinician requesting oxygen therapy, to document the emergency oxygen therapy that has been given to every patient alongside the recording of all other emergency treatment. If oxygen therapy is being continued, a target oxygen saturation range and oxygen prescription with a range of flows or percentages must be completed as part of ongoing care.

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

NB (see Chart 1 for oxygen prescription for acutely hypoxaemic patients in hospital)

Classification and oxygen and supportive therapy for respiratory failure based on arterial blood gases in the acute situation
(NB in addition to diagnosis and treatement of underlying cause)

	PaO_2	$PaCO_2$	HCO_3	pH	**Action:** **Oxygen therapy**	**Action:** Suggested Respiratory support if needed
Type I respiratory failure	Low - less than 8 kPa	Normal 4.5 - 6.2 kPa	Normal 22 –28 mmol/l	Normal 7.35 – 7.45 Or less than 7.35 with associated metabolic acidosis.	Oxygen to achieve target saturation range of 95 – 98%.	Refer to CPAP guideline. http://whittnet/document.ashx?id=1300
Acute type II respiratory failure	Low - less than 8 kPa	High - more than 6.6 kPa	Normal 22 –28 mmol/l	Low – less than 7.35  'Acute' type II respiratory failure is often a combination of chronic type II respiratory failure and metabolic acidosis	Asthma: Oxygen to achieve target saturation range of 95 – 98%. Chronic lung disease: Oxygen to achieve target saturation range of 88 – 92% if known oxygen sensitivity (bicarbonate > 28 mmol/l). At risk of hypercapnic respiratory failure use oxygen target saturation range of 90 - 94%	Asthma: Consider intubation and ventilation Chronic lung disease: Consider Non-Invasive Ventilation (NIV) **on HDU/ICU** or intubation and ventilation.
Acute on chronic type II respiratory failure	Low – less than 8 kPa	High – more than 6.6 kPa	High - more than 28 mmol/l	Low – less than 7.35	Oxygen to achieve target saturation range of 88 – 92%.	Refer to NIV guideline. http://whittnet/document.ashx?id=3384
Chronic type II respiratory failure	Low – less than 8 kPa	High – more than 6.6 kPa	High - more than 28 mmol/l	Normal 7.35 – 7.45	Oxygen to achieve target saturation range of 88 – 92%.	NIV not indicated acutely unless patient is on home NIV. Patients on home NIV should continue treatment with NIV as usual (if possible, their own machine). New diagnosis of respiratory failure, refer to respiratory team for assessment including diagnosis and Patient Specific Protocol (PSP). Known diagnosis, ensure patient has a PSP.

➢ Administering oxygen safely

The following staff are authorised to administer prescribed and emergency oxygen therapy:

- Level 1 and level 2 registered nurse and registered midwife;
- A registered medical practitioner or dentist;
- Other professional staff groups e.g. operation department assistant (ODA)/operating department practitioner (ODP), physiotherapist, dietician, radiographer, speech and language therapist and pharmacist.

Students may administer oxygen therapy only under the supervision of a registered member of staff who is trained and competent in oxygen therapy.

Those who administer oxygen must ensure that they have regular and ongoing training so that they are able to monitor and respond to a patient's oxygen saturations according to the patient's agreed management plan.

➢ Infection control

- Hands must be washed before and after oxygen therapy equipment is handled.
- All oxygen tubing, masks, nebuliser units are single patient use only.
- All equipment must be disposed of after use in a yellow clinical waste bag bin.
- If equipment becomes soiled it should be disposed of immediately in an orange clinical waste bin.

Humidified oxygen therapy equipment must only be used for a maximum of 24 hours. Condensation in the tubing must be treated as potentially infectious. Sterile water must always be used in humidification systems.

➢ Procedure for the safe administration and monitoring of oxygen therapy

The prescription for oxygen must be checked and signed at every drug round.

All patients requiring oxygen therapy must have a prescription for oxygen therapy recorded on the drug chart. N.B exceptions - see emergency situations.
Check that the oxygen has been prescribed on the drug chart. It must state: • **A range** of oxygen percentages (for Venturi mask) or flow (for nasal cannulae) • Target saturation range • The device to be used • Date and signature.
Wash hands according to the hand hygiene guideline.
Assemble equipment required: • Nasal cannulae, Venturi mask with appropriate Venturi barrel and oxygen tubing • Oxygen source – cylinder or piped, with flow meter. • Check pulse oximetry being recorded and review saturation before starting oxygen.
Explain to the patient that they have a low oxygen level which means that they need supplemental oxygen as part of their treatment and that **oxygen is not a treatment for breathlessness.** Explain about how oxygen is administered and monitored. Explain about risks of oxygen therapy including fire hazard and risk of oxygen sensitivity for some patients.
Ensure patency of airway. Position the patient as upright as possible unless treatment plan indicates otherwise. Monitor pulse oximetry according to patient plan.
Connect nasal cannulae/ mask, tubing to flow meter at oxygen source.
Turn oxygen on at flow meter to prescribed flow.
Nasal cannulae – Position tips of nasal cannulae in patient's nose. If curved cannulae, place with concavity towards the patient. If possible ask the patient to hold the cannulae in position, whilst placing the tubing over the ears (ie like spectacles), and tighten under the chin as necessary. Ensure that the cannulae are secure but comfortable. **Venturi mask** - Place the mask over the patient's mouth and nose and adjust elastic straps as needed. Entrained with Ward Non-Invasive Ventilation (NIV) – Set up by Physiotherapists. Titrate prescribed flow to achieve target range saturation and monitor according to NIV Guideline.
Check that the patient is comfortable and tolerating the oxygen therapy and has either a drink or a mouthwash within reach. Ensure no unnecessary pressure from oxygen tubing/ straps especially behind the ears. Check patient's ears, bridge of the nose and nostrils for redness and soreness from the oxygen tubing/straps every four hours.
All patients must have their oxygen saturation observed for at least five minutes after starting oxygen therapy.
Wash hands according to hand hygiene policy
The oxygen delivery device and oxygen flow should be recorded next to the oxygen saturation on the bedside observation chart and for patients on NIV on the NIV monitoing chart.

➢ Procedure for administration and monitoring of oxygen therapy (continued)

Oxygen saturations must always be interpreted in the context of the patient's clinical status, in particular respiratory rate. Oxygen saturation is one component of the Modified Early Warning Score (MEWS) used to ensure early detection of deterioration. For hypoxaemic acute medical patients use continuous oxygen saturation monitoring.
Repeat arterial blood gases after 20 minutes to one hour in all patients with type II respiratory failure and any patient with type I respiratory failure and metabolic acidosis who is deteriorating. Patients with type I respiratory failure without metabolic acidosis do not need repeat arterial blood gases and can be monitored safely using oximetry.
If the patient's oxygen saturation falls outside the target saturation range, the oxygen therapy must be adjusted accordingly. Oxygen saturation must be monitored continuously for at least 5 minutes after any increase or decrease in oxygen % or flow to ensure that the patient achieves the desired saturation range.
Oxygen saturation higher than target specified or above 98% • Step down oxygen therapy as per guidance • Consider stopping oxygen therapy. • Record change on prescription chart and observation chart. • Re-check oximetry after each step down and when oxygen is stopped.
Oxygen saturation lower than target specified; • Check all elements of oxygen delivery system for faults or errors. • Inform Ward Manager and request urgent medical review. • Any sudden fall (≥ 3%) in oxygen saturation also needs urgent medical review **even if within target range.** • **If advice given is to increase oxygen % or flow, ensure new prescription with target range written and signed**.
Oxygen saturation within target specified:
• Continue with oxygen therapy, and monitor patient to identify appropriate time for stepping down therapy, once clinical condition allows.
Wean off oxygen therapy gradually, maintaining saturations within the target range. The oxygen prescription must be rewritten each time the flow or % of oxygen therapy is reduced below the existing range.
Dispose of equipment in yellow clinical waste bag.
Wash hands according to the hand hygiene policy.

➢ Oxygen equipment

There are a variety of devices that deliver oxygen including nasal cannulae and masks. Devices can deliver either a variable or accurate percentage of oxygen. The device shoud be selected to meet the oxygen needs of the patient and to take account of patient preference where possible.

- **Nasal Cannulae – *usually preferred by patients***

The percentage of oxygen a patient receives via nasal cannulae is not accurate and is dependent upon a patient's breathing pattern. Nasal cannulae should be used at flows between 0.5-4 l/min, which will deliver between approximately 22.5 - 40% oxygen.

Nasal cannulae can be used for an acutely ill patient, provided the target saturation range can be achieved with flows between 0.5 – 4 l/min.

Once a patient requires less than 0.5 l/min to achieve their target saturation range, they should have a trial without oxygen, rather than reducing flow below 0.5 l/min.

Flow l/min	Approximate % of oxygen therapy
0.5 l/min (NB paediatric flow meter)	22.5%
1 l/min	24%
2 l/min	28%
3 l/min	32%
4 l/min	Up to 40%

Nasal cannulae are generally better tolerated for any length of time than a mask.

They should also be used by patients prescribed oxygen with a Venturi mask, while eating and drinking and using a nebuliser, in order to minimise desaturations during these activities.

The flow through nasal cannulae is limited to 0.5 - 4 l/min as higher flows cause discomfort from drying of the nasal mucosa. Flows above 3 l/min should not be used for longer than 4 hours.

- **Venturi Masks (fixed performance mask) –** ***used for all medical patients needing oxygen via mask***

These masks provide a **constant and precise** concentration of oxygen, which is independent of a patient's breathing pattern. They should be used in all cases where it is important to know the **actual percentage** of oxygen that a **patient** is receiving.

The mask incorporates a Venturi barrel, which has holes through which air is entrained into the flow of oxygen through the barrel, to create the accurate percentage of oxygen. The barrels are colour coded and the minimum flow required is printed on the barrel.

Venturi Mask Colour	%	Minimum flow
Blue	24%	2 l/min
White	28%	4 l/min
Yellow	35%	8 l/min
Red	40%	10 l/min
Green	60%	15 l/min

Ensure the flow at the meter correlates with the recommended flow for the Venturi valve .

NB The Venturi manufacturer recommends that the flow should be doubled if respiratory rate is greater than 30 per minute. If target saturation range is still not achieved, will need to change to a higher percentage Venturi, again on double the standard recommended flow.

Humidified oxygen (see below) is an alternative for patients needing 35% or above oxygen and should be used for any patient needing 35% or above for more than four hours.

Patients prescribed oxygen via a Venturi mask will also need a prescription via nasal cannulae for eating, drinking, using a nebuliser etc.

- **Universal/Hudson/Simple Mask –** ***not for use in medical patients***

These masks deliver a variable concentration of oxygen, depending on the patient's rate and depth of breathing. Information on the packaging gives approximate percentage, related to flow used. These masks should not be used for anyone with chronic respiratory disease or for very breathless patients. Their use should be limited to occasions where the actual percentage of oxygen delivered to the patient is not crucial. Flow should not be less than 5 l/min with this device. Universal masks are currently used in perioperative care.

- **Reservoir mask/Non-rebreathe mask – use in peri-arrest and resuscitation ONLY**

This mask has a valve incorporated to reduce the amount of air being entrained and is attached to a reservoir bag, which **MUST** be filled with oxygen before use. The initial flow should be set at 15 l/min.

When the patient breathes in they breathe oxygen from the flow meter, from the reservoir bag and only a small amount of entrained air. All exhaled air is vented through a port in the mask and a one-way valve between the bag and mask prevents re-breathing.

Used in this way a reservoir mask delivers a high percentage of oxygen at greater than 85%. When the patient no longer requires such a high percentage of oxygen, this device should be exchanged for humidified oxygen via mask.

Reservoir mask/Non-rebreathe mask, delivering very high flow oxygen, should not be used in other clinical situations than peri-arrest or resusictation because:

- patients truly requiring 15 l/min oxygen to keep within their target saturation range, are very sick and need additional respiratory support (CPAP or intubation and ventilation).
- for other patients this very high flow oxygen is surplus to requirements and results in '100% oxygen saturation on non-rebreathe mask'. Anyone, whether or not they have underlying hypoxaemia, will have '100% oxygen saturation' on very high flow oxygen! Assessment of hypoxaemia requires patients to be managed within their target saturation range, the upper limit of which is never greater than 98%.

- **Tracheostomy mask for patients with tracheostomy or laryngectomy**

Variable performance mask designed for "neck breathing patients". Fits comfortably over tracheostomy or tracheotomy. Exhalation port on front of mask. See Tracheostomy guideline.

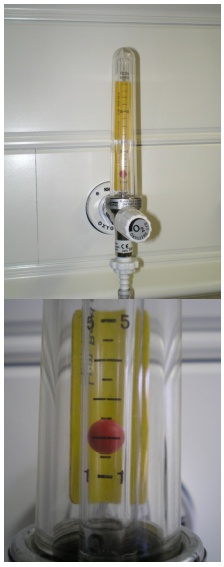
- **Oxygen Flow Meter and paediatric oxygen flow meter**

Oxygen Flow Meter
Device to allow the delivery of an accurate flow of oxygen, usually between 1 and 15 l/min.

Paediatric oxygen flow meter
Device to allow the delivery of an accurate lower flow of oxygen, between 0.1 and 2 l/min. For adult patients, a paediatric flow meter should be used for any patient requiring less than 1 l/min. Once an adult patient requires less than 0.5 l/min to achieve their target saturation range, they should have a trial without oxygen, rather than reducing flow below 0.5 l/min.

Flow meters may be wall-mounted or on a cylinder.

Take special care when using an oxygen outlet next to an air outlet that tubing is connected to oxygen outlet.

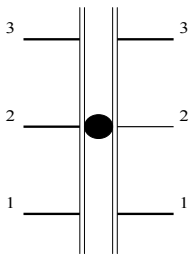


USING AN OXYGEN FLOW METER:
Attach the oxygen tubing to the nozzle on the flow meter.

Turn the finger-valve to obtain the desired flow.

The CENTRE of the ball shows the correct flow.

The diagrams shows the correct setting to deliver 2 l/min.



➢ Humidification

Normally inspired air is warmed, moistened and filtered as it passes through the nose and upper airway. This natural process is by-passed by an endotracheal or tracheostomy tube and may be impaired by disease or systemic dehydration. In addition oxygen therapy itself has a drying effect on the airway. As a result pulmonary secretions may become stickier and more difficult to expectorate.

The addition of humidification to oxygen therapy is therefore recommended for all patients with:

- A tracheostomy;
- An endotracheal tube in situ.

The Critical Care Outreach Team (CCOT) will change patients needing more than 35% oxygen for more than four hours to humidified oxygen. Humidification can also be considered for patients using oxygen at a flow greater than 4 l/min via a mask.

Any patient who has been on more than 28% oxygen via a mask for longer than 24 hours, should have the need for humidification discussed with the ward physiotherapist.

Systemic hydration should be optimised for every patient on oxygen therapy.

Humidification of oxygen therapy can also be considered for patients on lower flows of oxygen where there are clinical or patient concerns about one or more of the following:

- Difficulty clearing airway secretions or mucus
- Clinical dehydration
- Subjective dryness.

The options for humidification are:

- **Cold water humidifier - multi-fit nebuliser**

This is a large volume nebuliser that incorporates a Venturi system. The multi-fit nebuliser is attached directly to the oxygen flow meter. A bottle of sterile water screws directly onto this. A length of no more than 6 units of elephant (wide bore) tubing connects this to the mask. **Bubbling should be observed in the nebuliser chamber and the main outlet.** The dial on the multi-fit nebuliser should be turned to the prescribed percentage of oxygen (this should be written on observation chart, not the flow rate via the flowmeter) and the flow of oxygen set accordingly.

- **Heated humidification**

This may be used for patients with tracheostomies or very copious secretions. If you think a patient may require heated humidification please discuss with CCOT.

Sweedish nose

For patients with a tracheostomy a Sweedish nose (heat moisture exchanger) may be used. This is placed directly onto a tracheostomy tube. It should be generally used for patients requiring FiO_2 0.21 – 0.28, with minimal secretions. However it may be used intermittently for patients with more frequent suction requirements temporarily eg for patient transport etc.

➢ Peri-operative and post-operative oxygen therapy

The usual procedure for prescribing oxygen therapy in these areas should be used, using an oxygen target saturation range and prescribed range of flows and percentages.

If a patient is transferred back to a ward from Theatres on oxygen therapy and does not have a prescribed oxygen target saturation range, the on-call doctor with responsibility for the patient, must be contacted urgently to review the need for ongoing oxygen therapy and the appropriate oxygen target saturation range. If oxygen therapy is to be continued, it must be prescribed with a oxygen target saturation range and prescribed range of flows and percentages.

➢ Nebulised therapy for patients on oxygen

When nebulised therapy is administered to patients at risk of hypercapnic respiratory failure, it should be driven by compressed air. If necessary, supplemental oxygen should be given concurrently by nasal cannulae at 0.5 - 2 l/min to maintain an oxygen target saturation range of 88 - 92% or other specified target range (see COPD proforma).

All patients requiring 35% or greater oxygen therapy must have their nebulised therapy by oxygen at a flow of 6 - 8l/min.

➢ Provision of cylinders and flow meters

Requests for oxygen cylinders should be made via Facilities (ext. 3320) specifying size of cylinder.

Requests for purchase of flow meters should be made via Medical Physics (ext. 5428)

➢ Additional Trust responsibility for safe oxygen therapy

- Order medical gases for the Trust **(Pharmacy and the Medical Gases Committee)**
- Responsible for the safe testing of piped gases including oxygen **(Pharmacy and the Medical Gases Committee)**
- Advise on the safe storage of cylinders **(Facilities Department)**
- Responsible for systems that enable safe oxygen prescribing **(Pharmacy and the Drug and Therapeutics Committee)**
- Responsible for audit and quality improvement of systems to ensure safe oxygen prescribing **(Pharmacy and the Drug and Therapeutics Committee).**

➢ Cautions

- **Fire Hazard**

Oxygen enhances the flammable properties of other materials.
A strict no smoking policy and no naked flame in the vicinity of oxygen therapy must be employed.

Patients and staff must be aware of the fire risk from charging electronic cigarettes in the vicinity of oxygen.

See Department of Health safety alert: E-cigarettes, batteries and chargers, June 2014 https://www.cas.dh.gov.uk (Ref: EFA/2014/002)

During defibrillation oxygen therapy should be removed at least 1.5 metres away from the patient. Store cylinders in a dry and well-ventilated area.

Patients who are tobacco dependent and are needing oxygen in hospital should be offered evidence based support to stop smoking including referral to a Quit Smoking Advisor and prescribed nicotine replacement therapy during hospital admission.

- **Oxygen administration & Chronic type II respiratory failure - oxygen sensitivity**

For patients with a raised bicarbonate, reflecting chronic carbon dioxide retention, oxygen administration may cause further increases in carbon dioxide in the blood ($PaCO_2$) 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 $PaCO_2$ during oxygen therapy in patients with hypercapnic respiratory failure (see BTS Acute Oxygen guideline, for details of patho physiology).

Chronic type II respiratory failure (carbon dioxide retention) should be suspected in patients who have high serum bicarbonate levels (more than 28 mmol/l) on admission or on previous stable arterial blood gases or venous blood samples. Following a period of intubation patients may also have an appropriately raised serum bicarbonate as a result of ventilation using permissive hypercapnoea.

Chronic type II respiratory failure may be masked in patients who are acutely unwell with a metabolic acidosis.

- **Oxygen Toxicity**

Prolonged use of high concentrations of oxygen, ie greater than 50% oxygen for more than 24 hours, can result in pulmonary toxicity although individual susceptibility appears to be very variable.

Oxygen prescriptions must be regularly reviewed by prescribers, as well as those who administer oxygen, to ensure step-wise reduction in percentage and flow as the patient's condition allows.

Signs of oxygen toxicity are reported to include: dry irritable cough, central chest pain, increased respiratory rate, decreased tidal volume and increasing hypoxaemia. This is thought to reflect decreasing lung compliance as a result of interstitial haemorrhage, intra-alveolar oedema and ultimately lung fibrosis. However, oxygen toxicity can be difficult to detect as this clinical picture is also seen as a consequence of underlying diseases that cause respiratory failure.

- **Retrolental fibroplasia**

This is a disease affecting premature babies under 1200g if they are exposed to high concentrations of oxygen.

- **Other complications and cautions of oxygen therapy**

1. Drying of nasal and pharyngeal mucosa.
2. Absorption atelectasis.
3. Skin irritation.
4. Psychological dependence if patient believes that oxygen is being used as a treatment for breathlessness rather than hypoxaemia.
5. Supplemental oxygen should be administered with caution in patients with paraquat poisoning (BNF 2009), acid inhalation or previous bleomycin lung injury.

Adults requiring provision of home oxygen therapy (see BTS Guidelines 2015 in References)

Long term oxygen therapy (LTOT) is provided as an evidence-based treatment for patients with chronic hypoxaemia and COPD as a life prolonging treatment. By extrapolation it is also used as a treatment for other patients with chronic hypoxaemia due to chronic respiratory diseases.
If an in-patient has been optimally treated and remains hypoxic on air, they may require LTOT to be organised before discharge.
All these patients first need to be assessed by a Respiratory SpR/consultant. They will require the following steps to have been taken:

1. Full respiratory history
2. Confirmed respiratory diagnosis
3. Evidence that the patient is fully optimised
4. Confirmation that not a current smoker and not tobacco dependent
5. Recent chest x-ray
6. ABG on air

Following this assessment, if oxygen is still felt to be appropriate by the medical team, call the Respiratory Nurse Specialist (Bleep 2960) for confirmation of appropriateness and risk assessment, so that the patient and their carers/ family are provided with information and guidance on safe oxygen therapy and so that the appropriate equipment may be organised and delivered.

The only exception to the above process will be a direct request from the hospital palliative care team for patients who are receiving end of life care who are also hypoxaemic (oxygen saturation less than 92% on air at rest).

Any patient discharged from hospital on oxygen therapy must have information on their oxygen prescription included in the medication information in the discharge summary. This information must include underlying diagnosis, indication for oxygen, whether oxygen sensitive, prescribed flow or percentage and hours of use, arrangements for review, and whether anticipated to be long term treatment.

➢ References

BTS Guidelines for Home Oxygen Use in Adults. M Hardinge (Chair), J Annandale, S Bourne, B Cooper, on behalf of The British Thoracic Society Home Oxygen Group. Thorax June 2015 Vol 70, (Supplement 1)
https://www.brit-thoracic.org.uk/document-library/clinical-information/oxygen/home-oxygen-guideline-(adults)/bts-guidelines-for-home-oxygen-use-in-adults/

BTS Guideline for Emergency Oxygen Use in Adult Patients. O'Driscoll B R, Howard L S, Davison A G on behalf of The British Thoracic Society. Thorax 2008; 63(Suppl VI) – BTS to publish updated guidance 2015-16

Cahill K, Heath J (1990) Sterile water used for humidification in low-flow oxygen therapy: Is it necessary? American Journal of infection control. Vol. 18, No 1, 13-17.

Deakin CD, McLaren RM, Petley GW, Clewlow F, Dalympole-Hay MJR. Effects of positive end-expiratory pressure on transthoracic impedance – implication for defibrillation. Resuscitation 1998; 37: 9-12.

Koss JA, Conine TA, Eitzen HE, LoSasso AM 1979, Bacterial contamination potential of sterile, prefilled humidifiers and nebuliser reservoirs. Heart and Lung Vol. 8, No. 6.

Robertshaw H, McAnulty G. Ambient oxygen concentrations during simulated cardiopulmonary resuscitation. Anaesthesia 1998; 53; 634-7.

Steel S, Peacock R. 2005 .How frequently should oxygen tubing and oxygen masks be changed in order to minimise the risk of infectious disease to patients? Critically Appraised Topic, Whittington Critical Evidence Scheme.
http://whittnet.whittington.nhs.uk/Documents/Oxy1cat_7758.pdf

➢ Compliance with this guideline (how and when the guideline will be monitored e.g. audit and which committee the results will be reported to)

Teaching aides are available on www.brit-thoracic.org/emergencyoxygen.
Compliance with this guideline will continue to be monitored through participation in the National BTS Oxygen Audits. Results will continue to be shared via the medical audit and other departmental meetings as appropriate.

Appendix 1

London Respiratory Network: Collective clinical leadership for respiratory health
www.networks.nhs.uk/nhs-networks/london-lungs
@London Lungs

NHS England
London Strategic Clinical Networks

London Clinical Oxygen Network (LCON)

Responsible Oxygen Prescribing Messages (Adults)

1. Oxygen is a treatment for hypoxia not breathlessness.
2. Oxygen is a medicine that should always be planned, prescribed and reviewed by staff trained in oxygen prescription and use.
3. Acute oxygen prescription must include the target oxygen saturation range and state the appropriate interface and range of flow rates to achieve this. Oxygen saturations must be monitored according to an agreed management plan.
4. Long term oxygen treatment (15-24 hours per day) should only be prescribed after specialist review and risk assessment.
5. Those who administer oxygen should have regular and ongoing training so that they are able to monitor and respond to a patient's oxygen saturations within an agreed management plan.
6. Patients who may benefit from ambulatory oxygen should have a specialist assessment with access to the full range of relevant equipment to meet their individual needs and maximise their independence.
7. Patients who smoke should not be considered for long term oxygen therapy. Hypoxic patients who smoke should be offered clear communication of the reasons oxygen therapy cannot safely be offered to them whilst they smoke, individualised information about the benefits of smoking cessation for them, treatment for tobacco dependence and planned follow up.
8. Specialist oxygen assessment and follow up should include individualised patient and carer education about oxygen treatment, comprehensive risk assessment and carbon monoxide monitoring. Patients should be informed of their responsibility to use oxygen safely, including abstinence from smoking and of the reasons for this. Time should be allowed to check patients' understanding of this information.
9. Patients on long term oxygen therapy at risk of harm from excessive oxygen should be identified and their care plan shared with their GP and local hospitals as well as ambulance and out of hours services.
10. Home Oxygen Service Assessment and Review (HOSAR) services are vital to ensure evidence based patient centred care and optimal value for money. They should be integrated with local respiratory services to be effective.

Irem Patel and Debbie Roots
Co-Leads for the London Clinical Oxygen Network
June 2015

Appendix 2a:
Table 1. Critical illnesses requiring high levels of supplemental oxygen.

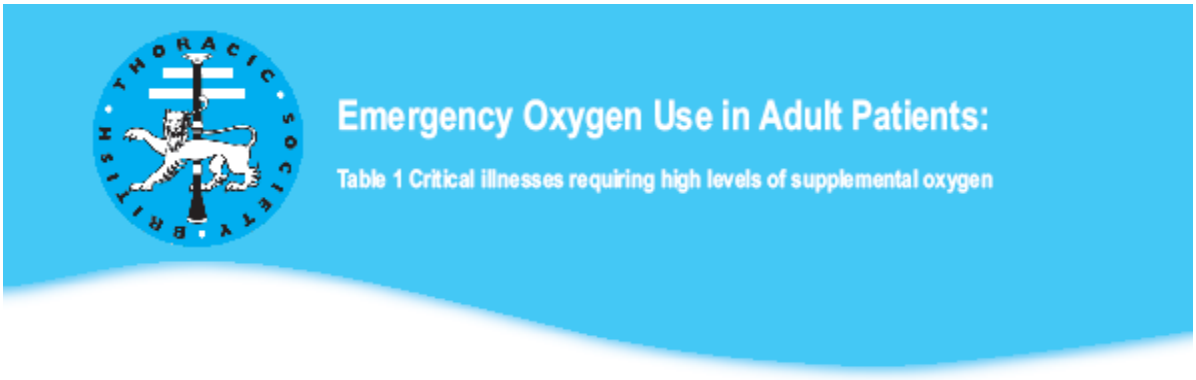


Table 1 Critical illnesses requiring high levels of supplemental oxygen (see section 8.10)

- The initial oxygen therapy is a reservoir mask at 15 l/min.
- Once stable, reduce the oxygen dose and aim for target saturation range of 94–98%
- If oximetry is unavailable, continue to use a reservoir mask until definitive treatment is available.
- Patients with COPD and other risk factors for hypercapnia who develop critical illness should have the same initial target saturations as other critically ill patients pending the results of blood gas measurements, after which these patients may need controlled oxygen therapy or supported ventilation if there is severe hypoxaemia and/or hypercapnia with respiratory acidosis.

	Additional comments	Grade of recommendation
Cardiac arrest or resuscitation	Use bag-valve mask during active resuscitation Aim for maximum possible oxygen saturation until the 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 absorbances. The blood gas Pao_2 will also be normal in these cases (despite the presence of tissue hypoxia)	Grade C

COPD, chronic obstructive pulmonary disease; Pao_2, arterial oxygen tension.

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

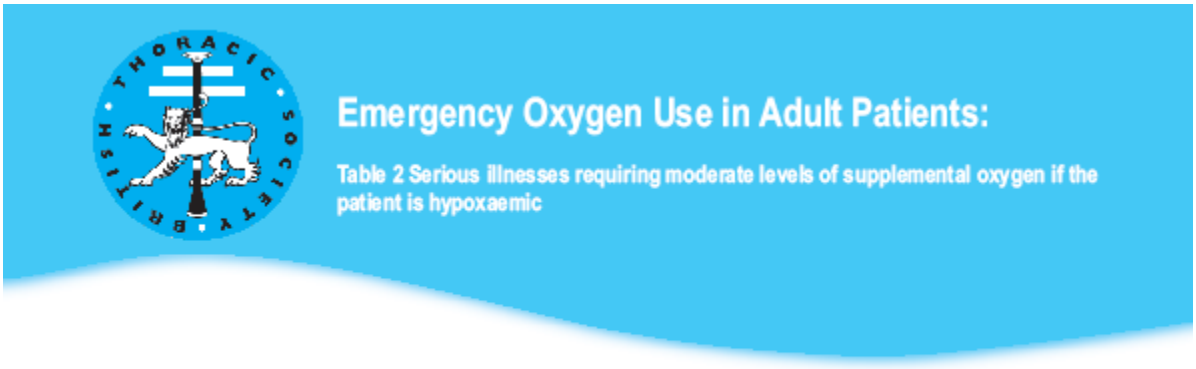


Table 2 Serious illnesses requiring moderate levels of supplemental oxygen if the patient is hypoxaemic (section 8.11)

- The initial oxygen therapy is nasal cannulae at 2–6 l/min (preferably) or simple face mask at 5–10 l/min unless stated otherwise.
- For patients not at risk of hypercapnic respiratory failure who have saturation <85%, treatment should be commenced with a reservoir mask at 10–15 l/min.
- The recommended initial oxygen saturation target range is 94–98%.
- If oximetry is not available, give oxygen as above until oximetry or blood gas results are available.
- Change to reservoir mask if the desired saturation range cannot be maintained with nasal cannulae or simple face mask (and ensure that the patient is assessed by senior medical staff).
- If these patients have 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 94–98% if the $Paco_2$ is normal (unless there is a history of previous hypercapnic respiratory failure requiring NIV or IPPV) and recheck blood gases after 30–60 min.

	Additional comments	Grade of recommendation
Acute hypoxaemia (cause not yet diagnosed)	Reservoir mask at 10–15 l/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
Postoperative 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 require 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 therapy	Grade D
Pneumothorax	Needs aspiration or drainage if the patient is hypoxaemic. Most patients with pneumothorax are not hypoxaemic and do not require oxygen therapy Use a reservoir mask at 10–15 l/min if admitted for observation. Aim at 100% saturation (oxygen accelerates clearance of pneumothorax if drainage is not required)	Grades C and D
Deterioration of lung fibrosis or other interstitial lung disease	Reservoir mask at 10–15 l/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	Grades B and D
Sickle cell crisis	Requires oxygen only if hypoxaemic (below the above 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; NIV, non-invasive ventilation; $Paco_2$, arterial carbon dioxide tension; Spo_2, arterial oxygen saturation measured by pulse oximetry.

Appendix 2c:
Table 3. COPD and other conditions requiring controlled or low-dose oxygen therapy.

Table 3 COPD and other conditions requiring controlled or low-dose oxygen therapy (section 8.12)

- Prior to availability of blood gases, use a 28% Venturi mask at 4 l/min and aim for an oxygen saturation of 88–92% for patients with risk factors for hypercapnia but no prior history of respiratory acidosis. **[Grade D]**
- Adjust target range to 94–98% if the $Paco_2$ is normal (unless there is a history of previous NIV or IPPV) and recheck blood gases after 30–60 min **[Grade D]**
- Aim at a prespecified 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 of NIV or IPPV), treatment should be commenced using a 28% oxygen mask at 4 l/min in prehospital care or a 24% Venturi mask at 2–4 l/min in hospital settings with an initial target saturation of 88–92% pending urgent blood gas results. **[Grade D]**
- If the saturation remains below 88% in prehospital care despite a 28% Venturi mask, change to nasal cannulae at 2–6 l/min or a simple mask at 5 l/min with 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 as a high priority. Alert the A&E department that the patient requires immediate senior assessment on arrival at the hospital. **[Grade D]**
- 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". FEV_1 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. **[Grade D]**
- 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 in hospital. **[Grade D]**
- Blood gases should be rechecked after 30–60 min (or if there is clinical deterioration) even if the initial $Paco_2$ measurement was normal. **[Grade D]**
- If the $Paco_2$ is raised but pH is ⩾7.35 ($[H^+]$ ⩽45 nmol/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 min to check for rising $Paco_2$ or falling pH. **[Grade D]**
- If the patient is hypercapnic ($Paco_2$ >6 kPa or 45 mm Hg) and acidotic (pH <7.35 or $[H^+]$ >45 nmol/l) consider non-invasive ventilation, especially if acidosis has persisted for more than 30 min despite appropriate therapy. **[Grade A]**

	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 (see recommendation 32)	Grade C
Exacerbation of CF	Admit to regional CF centre if possible; if not, discuss with regional centre or manage according to protocol agreed with regional CF centre Ideally use alert cards to guide therapy. Increase flow by 50% if respiratory rate is >30 (see recommendation 32)	Grade D
Chronic neuromuscular disorders	May require ventilatory support. Risk of hypercapnic respiratory failure	Grade D
Chest wall disorders	For acute neuromuscular disorders and subacute conditions such as Guillain-Barré syndrome (see table 4)	Grade D
Morbid obesity		Grade D

CF, cystic fibrosis; COPD, chronic obstructive pulmonary disease; CPAP, continuous positive airway pressure; IPPV, intermittent positive pressure ventilation; NIV, non-invasive ventilation; $Paco_2$, arterial carbon dioxide tension; Spo_2, arterial oxygen saturation measured by pulse oximetry.

Appendix 2d:
Table 4. Conditions for which patients should be monitored closely but oxygen therapy is not required unless the patient is hypoxaemic.

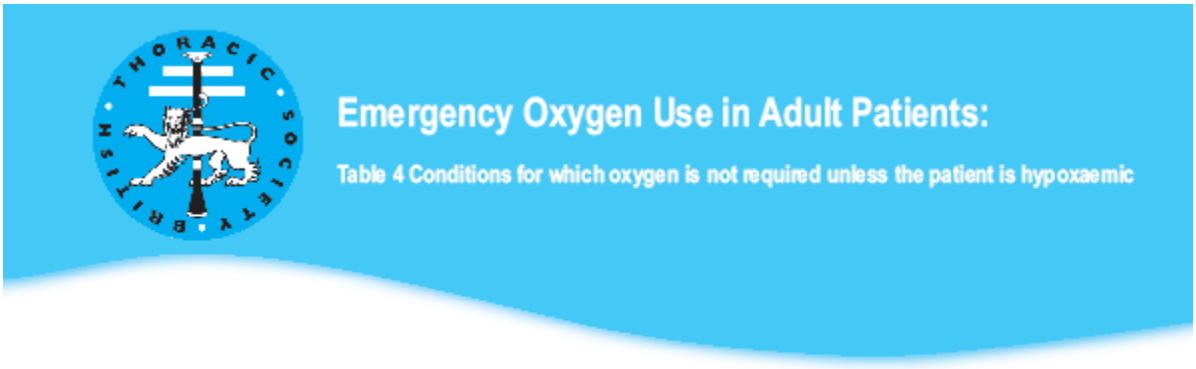


Table 4 Conditions for which patients should be monitored closely but oxygen therapy is not required unless the patient is hypoxaemic (section 8.13)

- If hypoxaemic, the initial oxygen therapy is nasal cannulae at 2–6 l/min or simple face mask at 5–10 l/min unless saturation is <85% (use reservoir mask) or if at risk from hypercapnia (see below).
- The recommended initial target saturation range, unless stated otherwise, is 94–98%
- If oximetry is not available, give oxygen as above until oximetry or blood gas results are available
- If patients have COPD or other risk factors for hypercapnic respiratory failure, aim at a saturation of 88–92% pending blood gas results but adjust to 94–98% if the $Paco_2$ is normal (unless there is a history of respiratory failure requiring NIV or IPPV) and recheck blood gases after 30–60 min

	Additional comments	Grade of recommendation
Myocardial infarction and acute coronary syndromes	Most patients with acute coronary artery syndromes are not hypoxaemic and the benefits/harms of oxygen therapy are unknown in such cases	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 fetus if the mother is not hypoxaemic (see recommendations 14–17)	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	Grade C
	Rebreathing from a paper bag may cause hypoxaemia and is not recommended	
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)	Grade D
	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)	
Poisoning with paraquat or bleomycin	Patients with paraquat poisoning or bleomycin lung injury may be harmed by supplemental oxygen	Grade C
	Avoid oxygen unless the patient is hypoxaemic	
	Target saturation is 88–92%	
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

COPD, chronic obstructive pulmonary disease; ICU, intensive care unit; IPPV, intermittent positive pressure ventilation; NIV, non-invasive ventilation; $Paco_2$, arterial carbon dioxide tension; Spo_2, arterial oxygen saturation measured by pulse oximetry.

Appendix 2e:
Chart for oxygen prescription for acutely hypoxaemic patients in hospital.

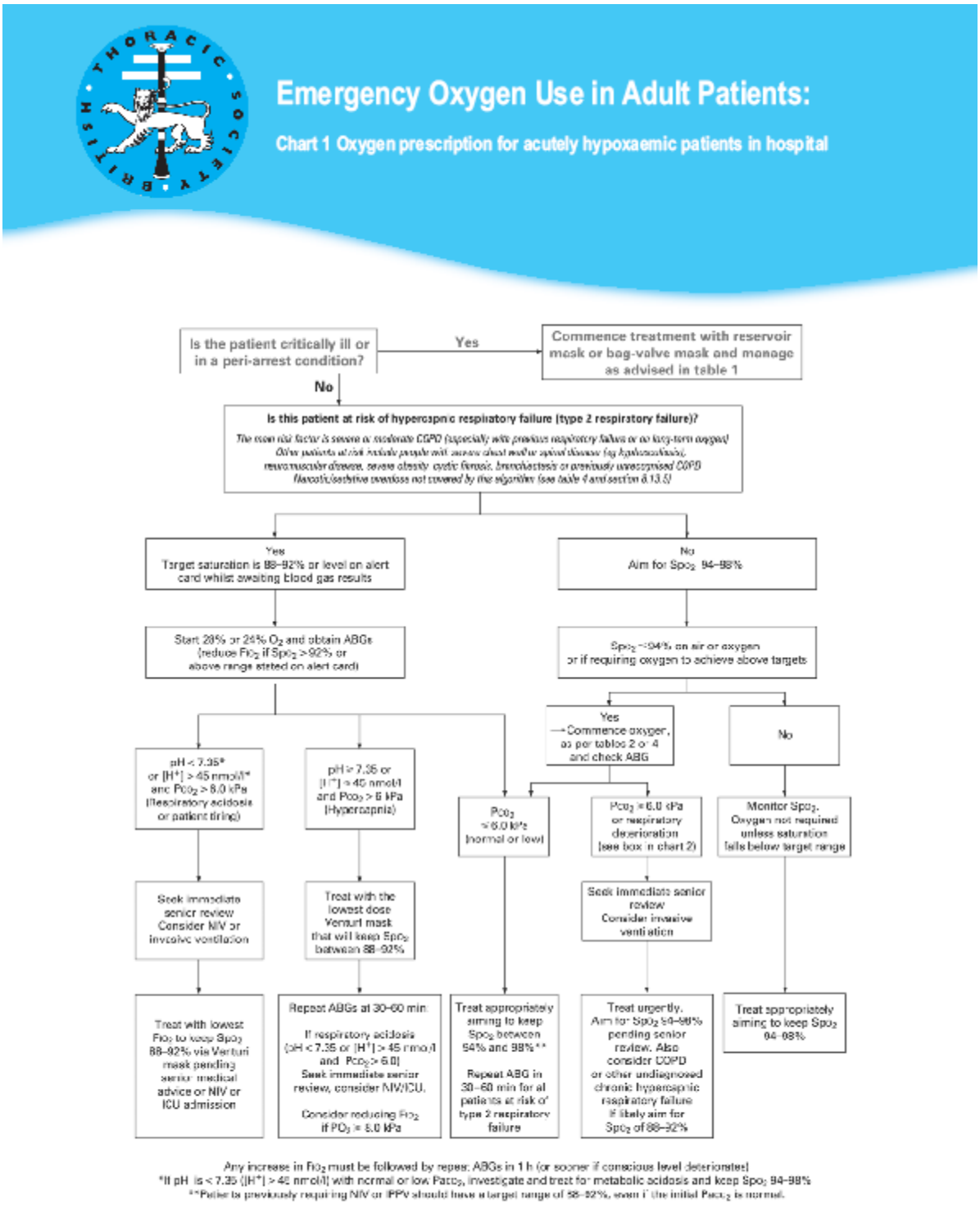


Figure 1 Chart 1: Oxygen prescription for acutely hypoxaemic patients in hospital. ABG, arterial blood gas; COPD, chronic obstructive pulmonary disease; FiO_2, fraction of inspired oxygen; ICU, intensive care unit; NIV, non-invasive ventilation; PCO_2, carbon dioxide tension; SpO_2, arterial oxygen saturation measured by pulse oximetry.

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval

		Yes/No	Comments
1.	**Does the procedural document affect one group less or more favourably than another on the basis of:**		
	• Race	No	
	• Ethnic origins (including gypsies and travellers)	No	
	• Nationality	No	
	• Gender	No	
	• Culture	No	
	• Religion or belief	No	
	• Sexual orientation including lesbian, gay and bisexual people	No	
	• Age	No	
	• Disability - learning disabilities, physical disability, sensory impairment and mental health problems	No	
2.	**Is there any evidence that some groups are affected differently?**	No	
3.	**If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable?**	No	
4.	**Is the impact of the procedural document likely to be negative?**	No	
5.	**If so can the impact be avoided?**	N/A	
6.	**What alternatives are there to achieving the procedural document without the impact?**	N/A	
7.	**Can we reduce the impact by taking different action?**	N/A	

If you have identified a potential discriminatory impact of this procedural document, please refer it to the Director of Human Resources, together with any suggestions as to the action required to avoid/reduce this impact.
For advice in respect of answering the above questions, please contact the Director of Human Resources.

Checklist for the Review and Approval of Procedural Document

To be completed and attached to any procedural document when submitted to the relevant committee for consideration and approval.

	Title of document being reviewed:	Yes/No	Comments
1.	**Title**		
	Is the title clear and unambiguous?	Yes	
	Is it clear whether the document is a guideline, policy, protocol or standard?	Yes	
2.	**Rationale**		
	Are reasons for development of the document stated?	Yes	
3.	**Development Process**		
	Is it clear that the relevant people/groups have been involved in the development of the document?	Yes	
	Are people involved in the development?	Yes	
	Is there evidence of consultation with stakeholders and users?	Yes	
4.	**Content**		
	Is the objective of the document clear?	Yes	
	Is the target population clear and unambiguous?	Yes	
	Are the intended outcomes described?	Yes	
5.	**Evidence Base**		
	Are key references cited in full?	Yes	
	Are supporting documents referenced?	Yes	
6.	**Approval**		
	Does the document identify which committee/ group will approve it?	Yes	
7.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	Yes	
8.	**Document Control**		
	Does the document identify where it will be held?	Yes	
9.	**Process to Monitor Compliance and Effectiveness**		
	Are there measurable standards or KPIs to support the monitoring of compliance with and effectiveness of the document?	Yes	
	Is there a plan to review or audit compliance with the document?	Yes	
10.	**Review Date**		

	Title of document being reviewed:	Yes/No	Comments
	Is the review date identified?	Yes	
	Is the frequency of review identified? If so is it acceptable?	Yes	
11.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for co-ordinating the dissemination, implementation and review of the document?	Yes	

Executive Sponsor Approval			
If you approve the document, please sign and date it and forward to the author. Procedural documents will not be forwarded for ratification without Executive Sponsor Approval			
Name		Date	
Signature			
Relevant Committee Approval			
The Director of Nursing and Patient Experience's signature below confirms that this procedural document was ratified by the appropriate Governance Committee.			
Name		Date	
Signature			
Responsible Committee Approval – only applies to reviewed procedural documents with minor changes			
The Committee Chair's signature below confirms that this procedural document was ratified by the responsible Committee			
Name		Date	
Name of Committee		Name & role of Committee Chair	
Signature			

Tool to Develop Monitoring Arrangements for Policies and guidelines

What key element(s) need(s) monitoring as per local approved policy or guidance?	Who will lead on this aspect of monitoring? Name the lead and what is the role of the multidisciplinary team or others if any.	What tool will be used to monitor/check/observe/Assess/inspect/ authenticate that everything is working according to this key element from the approved policy?	How often is the need to monitor each element? How often is the need complete a report ? How often is the need to share the report?	What committee will the completed report go to?
Element to be monitored	**Lead**	**Tool**	**Frequency**	**Reporting arrangements**
All elements of the guideline	Claire Richardson (Medicines Safety Pharmacist)	Monitoring of DATIX reports relating to oxygen therapy in adults	Ongoing monitoring of reported incidents	Patient Safety Committee and with responsible Departments, as appropriate