GIG CYMRU NHS WALES | Bwrdd Iechyd Addysgu Powys | Powys Teaching Health Board

A **Protocol**

for the administration of

Oxygen

for emergency situations

by Registered Healthcare Professionals

in Powys Teaching Health Board

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Do not print this document. The latest version will be accessible via the intranet. If the review date has passed please contact the Author for advice.

Disclaimer

Powys teaching Health Board is the operational name of Powys teaching Local Health Board
Bwrdd Iechyd Addysgu Powys yw enw gweithredol Bwrdd Iechyd Lleol Addysgu Powys

Protocol authorisation

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Appendix A provides a Staff Permitted to use Protocol Signature Sheet. Individual practitioners must be authorised by name to work to this protocol.

Version Control

Version	Summary of Changes/Amendments	Issue Date
PLT 009	Initial issue	20/01/2003
PLT 009-A	Review	01/09/2010
PLT 009-B	Review	01/03/2014
MMPr009-C	Review issue: to include dosing update, broadening settings to PTHB-wide, oxygen information and formatting changes.	6/6/2022
MMP 405 (new number)	Minor amendment to remove reference to MMPr 003, which has been withdrawn. Updated section 5.8.7 to incorporate Resuscitation Council UK advice for the vaccination setting. Updated safeguarding information, training recommendations, and audit responsibilities. Format change to appendix A. Appendix C added.	08/11/2023

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ENGAGEMENT & CONSULTATION

Key Individuals/Groups Involved in Developing this Document

Role / Designation
Senior Pharmacist Governance and Training
Advanced Clinical Pharmacist – Medicines Management & Medicines Optimisation

Circulated to the following for Consultation

Date	Role / Designation
16/5/22	Joanne Allen, Respiratory Clinical Lead

Evidence Base

Please list any National Guidelines, Legislation or Health and Care Standards relating to this subject area

- British National Formulary
- NICE Oxygen – treatment summary
- NICE CKS Dyspnoea – Oxygen - Prescribing information
- BTS Guideline for Oxygen Use In Adults In Healthcare And Emergency Settings; Thorax An International Journal Of Respiratory Medicine, June 2017 Volume 72 Supplement 1

IMPACT ASSESSMENTS

Equality Impact Assessment Summary

	No impact	Adverse	Differential	Positive
Age	x			
Disability	x			
Gender	x			
Race	x			
Religion/ Belief	x			
Sexual Orientation	x			
Welsh Language	x			
Human Rights	x			

Statement

Please remember policy documents are published to both the **intranet** and **internet.**

The version on the internet must be translated to Welsh.

Risk Assessment Summary

Have you identified any risks arising from the implementation of this policy / procedure / written control document?
No risks identified as long as protocol directive is followed.
If yes, note the risk/s and action taken to mitigate.
Protocol awareness training and signature of line manager who must confirm that the registered practitioner is competent to administer oxygen under this protocol.

Have you identified any Information Governance issues arising from the implementation of this policy / procedure / written control document?
No governance issues identified.

Have you identified any training and / or resource implications as a result of implementing this?

Target audience will be registered general nurses or agreed registered allied health professionals working within Powys Teaching Health Board. Compliance with this Protocol will be monitored – see details below. This audit may be conducted by the department lead or Medicines Management team.

1. Protocol Statement & Introduction

This protocol provides a framework to support registered healthcare professionals to administer oxygen in emergency situations without a prescription. The most recent and in date final signed version of the protocol should be used.

This protocol applies to administration of oxygen by registered healthcare professionals (who have the appropriate authorisation – see Appendix A) only in Powys Teaching Health Board.

Patients should be informed that they are being treated within a protocol, and where possible consent should be obtained before commencing the procedure.

Oxygen supplementation is an essential element of appropriate management of particular clinical conditions. Due to the nature of selected clinical conditions oxygen is one of the most common medicines used in medical emergencies and should be initiated as soon as possible to achieve a normal or near to normal oxygen saturation. Oxygen saturation considered as normal is between 94% and 98%.
Normal oxygen saturations are:

- In adults less than 70 years of age at rest at sea level 96% - 98% when awake;
- Aged 70 and above at rest at sea level greater than 94% when awake;
- Patients of all ages may have transient dips of saturation to 84% during sleep.

The target concentration of oxygen required depends on clinical situation and condition treated. A higher target is required in cardiac arrest and carbon monoxide poisoning, and a lower target of 88-92% oxygen saturation for patients at risk of hypercapnic respiratory failure.
Oxygen is a treatment for hypoxaemia, not breathlessness. Oxygen has not been proven to have any consistent effect on the sensation of breathlessness in non-hypoxaemic patients.

The aim of this protocol is to guide the administration of oxygen without a prescription in emergency situations according to a target saturation range.

2. Objective.

This protocol describes the identification of hypoxia and administration of oxygen.

The objective of this protocol is to ensure all staff are aware of the safety procedures required for administration of oxygen to hypoxic patients and also the procedure for the safe storage of cylinders in Powys THB community hospitals.

The guideline recommends aiming to achieve normal or near-normal oxygen saturation for all acutely ill patients.

Every registered healthcare professional must adhere to their appropriate professional code of conduct and the Royal Pharmaceutical Society Professional Guidance on the Administration of Medicines (2019).

Each registered professional is professionally accountable for their individual practice.

3. Definitions and abbreviations.

ABG	Arterial blood gases
BTS	British Thoracic Society
GSL	General Sales List
MC Mask	Medium Concentration Mask (also known as simple face mask)
RR	Respiratory Rate
SpO2	Arterial oxygen saturation measured by pulse oximetry

4. Role and responsibilities

4.1. Nursing staff and allied healthcare professionals:

- To assess patient's oxygen saturation level and requirement and their care plan
- To have an awareness and understanding of the BTS guideline for oxygen use in adults in healthcare and emergency settings.
- Must be familiar with the use of oxygen, including knowledge of its actions and uses, contra-indications, adverse effects, hazards and the correct operating procedures for oxygen cylinders.
- To discuss the treatment to be administered with the patient, if possible and/or with the carer and obtain consent.
- To manage patients and administer oxygen for the duration of time specified in the protocol and recognise that the authorisation is invalid after this time.
- To monitor the effect of oxygen supplementation and review patient's response to treatment.
- To record the assessment, any intervention and arrangement for review in the nursing notes, care plan or care pathway.
- To complete the e-Learning for Healthcare course: The safe use, storage and set up of medical gases and cylinders used in healthcare. This can be found on the NHSE e-Learning for Healthcare hub (e-lfh.org.uk)
- Must have current competence in assessing capacity and follow the Mental Capacity Act guidance regarding consent to treatment.
- Must be competent in the recognition and management of recognised adverse reactions, including anaphylaxis.
- Must be competent in the administration of adrenaline and have up to date at least Basic Life Support (BLS) skills.

- Must recognise their limitations and seek medical advice if they are concerned about the patient's overall condition or if oxygen supplementation has been ineffective.
- Report any serious adverse reactions via the MHRA Yellow Card Scheme and via Once for Wales Reporting System.
- Must work in line with professional guidelines and standards

The administration task cannot be delegated and so the registered healthcare professional making the decision to administer a medicine under this protocol must carry out the administration to the patient.

4.2. Head of the department

Must:

- Ensure all staff read and understand this protocol
- Arrange regular audit of the use of this protocol through annual review of records and documentation to monitor compliance

4.3. Senior Nurse:

Has responsibility for:

- arranging their yearly e-learning update via the NHSE e-Learning for Healthcare hub (e-lfh.org.uk)

4.4. Line Managers

Have a responsibility to:

- ensure registered healthcare professionals have completed the e-Learning course: The safe use, storage and set up of medical gases and cylinders used in healthcare, before they commence administration of oxygen according to this protocol. This course can be found on the NHSE e-Learning for Healthcare hub (e-lfh.org.uk) and should be included as part of the induction process for new appointees.
- ensure the staff complete the Basic Life Support mandatory training and attend relevant updates. Records should be kept via ESR
- ensure staff report untoward incidents using the Once for Wales Reporting System
- sign off the schedule of staff authorised to use this protocol (See Appendix A) and retain a copy of the protocol and the details of staff authorised to work to the protocol for 25 years.

4.5. The Medicines Management Team

Has a responsibility to:

- Update and review this protocol and advise on any major changes.
- Ensure robust systems are in place for the safe and secure management of oxygen.

5. Oxygen administration process.

In an emergency, oxygen should be given first and prescribed afterwards. Oxygen should be given immediately.

NB. It is the responsibility of the administering practitioner to ensure that the patient is within the inclusion criteria, and that there are no reasons for exclusion before proceeding with the treatment. If there is any reason for concern, seek medical advice.

5.1. Clinical situation and indications.

- To treat or prevent hypoxia/hypoxaemia whilst awaiting medical / paramedic support.
- Oxygen is a drug and must therefore normally be prescribed, however oxygen can be administered without prescription in an emergency by following this protocol.

NB. Pulse oximetry must be available at all locations where emergency oxygen therapy is used.

Refer to Appendix B – Flowchart for oxygen administration.

5.2. Inclusion criteria.

- Hypoxia from any cause
- SpO_2 < 94-98% (88-92% Type 2 respiratory failure) and/or SpO_2 unrecordable (assume <94%)
- Cardiac or respiratory arrest
- Respiratory distress or compromise (including chronic obstructive pulmonary disease [COPD])
- Acute asthma
- Sudden or unexplained loss of consciousness / neurological deficit
- Circulatory compromise
- Cardiac chest pain or insufficiency
- Significant trauma including head injury
- Epileptic seizure
- Severe haemorrhage
- Airway obstruction
- Collapse
- Coma
- Anaphylaxis
- Burns and Scalds
- Shock
- Medical and drug history taken, no reason for exclusion.
- Informed consent obtained, if possible.

Consent to treatment - if the patient is unable to give consent due to a life-threatening situation, or if parents or guardians are not present, oxygen should be administered where treatment is judged to be in the best interests of the patient.

In the context of the clinical scenario described in this Protocol the patient may not be able to make an informed choice nor consent to treatment. Therefore, the practitioner should act in the best interests of the patient at all times and within their professional competency and code of conduct.

NB Refer to PTHB Consent to Treatment and Examination Policy.

5.3. Exclusion criteria

- Patient/guardian refuses treatment (see 5.7 below).
- Individuals for whom valid consent, or 'best-interests' decision, in accordance with the Mental Capacity Act 2005, has not been obtained or received. Refer to sections "Action to be taken if the patient is excluded" and "Action to be taken if the patient or carer declines treatment".
- Conditions outside of the clinical situations criteria
- Patients receiving oxygen as part of palliative care
- Patients on the end-of-life care pathway are excluded from this protocol. For further information, refer to BTS guideline for oxygen use in healthcare and emergency settings
- There are no absolute clinical contraindications to oxygen therapy if indications for treatment are judged to be present.
- Poisoning with Paraquat or Bleomycin
- Explosive environments
- Oxygen should be discontinued prior to defibrillation (see resuscitation guidelines)
- SpO_2 >98%

5.4. Cautions

- Ask if the patient has ever received mechanical ventilation in the past – this may allude to CO_2 retention in COPD patients (they may have an oxygen alert card and their own mask): see dosage section.
- Medical/paramedic support should be sought as appropriate for all patients requiring emergency oxygen administration.
- The use of higher levels of oxygen can increase the risk of pulmonary toxicity in patients who have been administered bleomycin, amiodarone and nitrofurantoin (or similar antibiotics). In these cases, oxygen should be administered with caution and at levels kept as low as possible.

5.5. Safety information

- Smoking is prohibited when using compressed medical oxygen.
- Fire Hazard: Any cylinders must be stored securely in a well-ventilated area, free from flammable materials or sources of ignition and smoking.
- When using oxygen cylinders, it is important that no part of the cylinder valve or equipment is either lubricated or contaminated with oil or grease. This is due to the risk of spontaneous combustion that can occur with high-pressure gases in the presence of hydrocarbon. Special care is needed with the use of hand creams as this could provide sufficient contamination to the cylinder to cause ignition when the valve is turned on.

- Check that hands are clean and free from any oils or grease before handling
- Where alcohol gels are used, ensure that all alcohol has evaporated before handling compressed medical oxygen cylinders or equipment.

5.6. Action to be taken if patient the excluded

- Explain reason to the individual, if possible
- If the patient is excluded from treatment under this protocol, call 999 and ensure that the reason for exclusion is included in the handover given to the paramedics and receiving hospital.
- Record reason and any advice given and seek medical advice urgently.

5.7. Action to be taken if the patient/carer/representative declines treatment

- Explain consequences of refusing treatment.
- If patient has capacity to consent and refuses treatment then follow locally agreed pathway.
- In the unlikley situation, if patient's carer/representative refuses treatment for the patient, the decision would be overridden by a *decision to treat* in the individual's best interests in accordance with the Mental Capacity Act 2005.
- Advise the patient or parent/guardian to seek immediate medical advice or emergency ambulance. Call 999 as appropriate.
- Document refusal and any advice given.

5.8. Oxygen information

5.8.1. Legal category:

GSL

5.8.2. Form:

Medical gas, compressed

5.8.3. Route of administration:

- Inhalation

  Because oxygenation is reduced in the supine position, if otherwise clinically appropriate the patient should ideally be allowed to maintain the most upright posture comfortably possible.

5.8.4. Method of administration:

Cylinders and maximum duration of administration (also see Appendix C):

Cylinder size	Cylinder colour	Duration of cylinder at 15 litres per minute
Size CD	All white	30 minutes
Size DD	All white	30 minutes
Size ZX	All white	202 minutes
Size F	Black with a white collar	90 minutes

Flow rate for specific percentage of oxygen (O_2%) delivered:

- via a Venturi face mask

Litres/min	2	4	6	8	10	15
O2%	24%	28%	31%	35%	40%	60%
Mask colour	blue	white	orange	yellow	red	green

- via a 100% non-rebreather facemask:

Litres/min	15
O_2%	100%

- nebuliser face mask: 6 litres per minute via oxygen supply – electrically driven via a nebuliser machine.
- Nasal cannula: 1 -4 litres per minute: O_2 = 24 – 40%
  Simple/semi rigid facemask: 5 – 10 litres per minute: O_2=40 – 60%

5.8.5. Dosage.

See Appendix B.

High levels of supplemental oxygen are required for adults with critical illnesses. See table 1 below from the BTS guideline for oxygen use in adults in healthcare and emergency settings 2017.

Table 1 Critical illness requiring high levels of supplemental oxygen

Section 8.10

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

	Additional comments	Recommendations
Cardiac arrest or resuscitation	Refer to resuscitation guidelines for choice of delivery device during active resuscitation. Give highest possible inspired oxygen concentration during CPR until spontaneous circulation has been restored.	Recommendation E1
Shock, sepsis, major trauma, drowning, anaphylaxis, major pulmonary haemorrhage, status epilepticus	Also give specific treatment for the underlying condition	Recommendations E2–E4
Major head injury	Early tracheal intubation and ventilation if comatose	Recommendation E5
Carbon monoxide poisoning	Give as much oxygen as possible using a bag-valve mask or reservoir mask. Check carboxyhaemoglobin levels. 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 PO2 will also be normal in these cases (despite the presence of tissue hypoxia).	Recommendation E6

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

Administer the initial oxygen dose until the vital signs are normal then, reduce oxygen dose. To aim for target saturation within the range of SpO_2 94-98%. Give 15 litres per minute by Reservoir mask (non-rebreathe mask).

Moderate levels of supplemental oxygen for adults with serious illnesses if the patient is hypoxaemic.

Administer the initial oxygen dose until a reliable SpO_2 measurement is available then adjust oxygen flow.

To aim for target saturation within the range of 94-98%.

- If SpO_2 <85% give 10-15 litres per minute by Reservoir mask (non-rebreathe mask).
- If SpO_2 >85-93% give 2-6 litres per minute by Nasal Cannulae or 5-10 litres per minute by Simple Face Mask
- Note: Some patients, especially >70 years old, may not achieve a SpO_2 >94%

Controlled or low-dose supplemental oxygen is required for adults with COPD and other conditions (such as advanced cystic fibrosis, severe non-cystic fibrosis bronchiectasis, severe kyphoscoliosis or severe ankylosing

spondylitis, severe lung scarring caused by tuberculosis, musculoskeletal disorders with respiratory weakness, overdose of medication causing respiratory depression, or severe obesity) requiring controlled or low-dose oxygen therapy. Administer the initial oxygen dose until a reliable SpO_2 measurement is available then adjust oxygen flow. To aim for target saturation within the range of 88-92% or pre-specified range (e.g. documented on a patient held alert card). Then maintain with, for example, 4 litres per minute by 28% Venturi mask.

Allow at least 5 minutes at a flow rate before adjusting oxygen rates upwards or downwards (except when there is a major and sudden fall in saturation).

5.8.6. Period of administration/duration of treatment.

- Treatment is to be commenced as soon as the patient deterioration is identified.
- If necessary call 999 to summon a medical / paramedic support as appropriate
- Continue until passing responsibility of patient care to a paramedic or a doctor.

5.8.7. Monitoring oxygen administration.

- All patients should have pulse oximetry measured (NB. If administering oxygen as part of the management of anaphylaxis in the vaccination setting, do not delay giving oxygen while waiting for a pulse oximeter).
- Any sudden fall in oxygen saturation should lead, if possible to clinical evaluation of the patient and in most cases, measurement of blood gases.
- Frequency depends on the condition – follow departmental procedure.
- Skin colour, respiratory rate and vital signs should also be monitored.

6. Complications and risk associated with oxygen therapy:

- Drying of nasal and pharyngeal mucosa
- Skin irritation
- Oxygen toxicity:
  - Absorption atelectasis
  - Coronary and cerebral vasoconstriction
  - Reduced cardiac output
  - Damage from oxygen free radicals
  - Increased systemic vascular resistance
- Fire hazard
- Potentially inadequate flow due to high inspiratory demand or inappropriate oxygen delivery device or equipment faults
- Patients given high flow oxygen inappropriately may result in hypoventilation (see dosage section)

7. Adverse reactions

- Refer for medical advice as appropriate if an adverse reaction occurs.
- Report any suspected adverse reactions at handover of care to paramedic or medical staff
- If serious adverse effects are noted, report to the CHM, by completing a Yellow Card (found in the BNF) or submit online through the MHRA website www.mhra.gov.uk/yellowcard.
- All significant adverse drug reactions and any administration errors must be recorded via Once for Wales Reporting System incident reporting system.

8. Supply and storage.

- Medical gas cylinders shall only be procured via nominated supplier under NHS contract for provision of medical gases.
- Medical gas cylinders should be stored undercover, securely, in a well ventilated, dedicated central store (away from heat), free from flammable materials. They will be distributed to departments/wards as required. Cylinders should be chained to the wall or kept in a purpose designed storage trolley. The room should display appropriate signage to indicate the presence of compressed gas. A fire extinguisher should be readily available.
- The cellophane wrapping seal on full cylinders shall remain intact until the cylinder is ready for use.
- Cylinder stocks shall be rotated to ensure the oldest cylinder refill is used first and no cylinder shall be kept for more than three years. Oxygen has a "use by" life of three years and cylinders require periodic pressure tests by the manufacturer to confirm cylinder integrity.

NB. Wards should have a back up cylinder for the emergency trolley in case of delayed attendance.

9. Safety checks.

- Staff must ensure that there is sufficient oxygen in all cylinders, at least ¾ full, if a cylinder on the resuscitation trolley is below ¾ full a second cylinder must be ordered from the central storage department.
- Once the initial cylinder is empty the second cylinder will become the main cylinder, staff must notify the Facilities department to arrange collection and replacement of the empty cylinder. Cylinder suppliers do not take cylinders which contain gas so the above instructions must be followed.
- Appropriate masks must be available for use.

10. Drug Interactions

The use of higher levels of oxygen can increase the risk of pulmonary toxicity in patients who have been administered bleomycin, amiodarone and nitrofurantoin (or similar antibiotics). In these cases, oxygen should be administered with caution and at levels kept as low as possible.

11. Written/verbal advice for patients/carers.

- Explain why oxygen is being used and its effects.
- Advise that smoking is prohibited when using compressed medical oxygen

- Give the patient/carer verbal instructions on how to use the mask, mouthpiece or delivery device

12. Follow up and referral.

Pulse oximetry should continue to be monitored for 5 min after stopping oxygen therapy.

Patients may be referred to PTHB Respiratory and oxygen services.

Give appropriate advice dependant on the clinical condition of the patient and if transfer to a DGH is necessary.

If patient transfer is not necessary, continued oxygen administration will need to be prescribed on the patient medication administration chart, including target oxygen saturation.

Under Section 128 and 130 of the Social Services and Wellbeing (Wales) Act 2014, staff have a duty to inform the Local Authority if they have reasonable cause to suspect that an adult or child is at risk. Any vulnerable adult or child protection concerns should be referred to Safeguarding and the PTHB safeguarding policies followed. Consider discussing with GP.
Any safeguarding concerns need to be directed to Safeguarding Hub:

- to generic email address: PowysTHB.Safeguarding@wales.nhs.uk and
- Central Safeguarding number: 01686 252806.
- Out of hours: 0345 0544847

Advice can also be sought from local Safeguarding Leads.

13. Record keeping

Records should include:

- Date and time oxygen therapy started
- Symptoms making patient eligible for treatment under this protocol.
- Reason for administering under this protocol, including saturation value.
- If a mask or nasal cannulae were used, if mask, specify type used.
- Patient's target saturation.
- Flow rate used.
- Dose and frequency administered.
- That valid informed patient consent to treatment was obtained or a decision to treat was made in the individual's best interests in accordance with the Mental Capacity Act 2005. Record name of representative who gave consent if appropriate – refer to PTHB Consent to Treatment and Examination Policy.
- If medical/paramedic support was required.
- Oxygen saturations, respiratory rate, skin colour and vital signs
- Medical and drug history taken, including ay allergies and previous adverse events.
- Any reasons for exclusion or referral, including actions taken. Any advice received from medical cover and advice given to patient / carer.

- If the patient has refused treatment, and any advice given in this circumstance.
- That the drug is being administered or supplied in accordance with a protocol, record protocol title, number and version.
- For inpatients record administration in the 'once only' section of the medication administration chart.
- Batch number and expiry date
- Details of any adverse reactions and actions taken
- Effectiveness of treatment
- Any advice taken, who from and what the advice was.
- If there is handover to any external services - that medication has been given in accordance with this protocol and details of what was given.
- Any advice given to the patient, including recommendations for ongoing symptoms and when and who to refer to if symptoms are ongoing or worsen.
- Printed name, signature or electronic annotation of registrant responsible for the administration
- All records should be clear, legible and contemporaneous.
- A record of all individuals receiving treatment under this Protocol should be kept for audit purposes in accordance with local policy.

14. Training

Initial training:

- Completion of the e-Learning for Healthcare course: The safe use, storage and set up of medical gases and cylinders used in healthcare. This can be found on the NHSE e-Learning for Healthcare hub (e-lfh.org.uk.
- Identification and management of hypoxia.
- The use of oxygen including knowledge of its actions and uses, contraindications, adverse effects and hazards.

N.B. Teaching aides are available from www.brit-thoracic.org.uk

- The management and reporting of adverse drug reactions.
- The management of anaphylaxis, including the administration of adrenaline, and up to date BLS skills.
- Must have current competence in assessing capacity and follow Mental Capacity Act guidance regarding consent to treatment in emergency situation.
- Must have undertaken and completed Safeguarding of Children, Young People and Vulnerable Adults - Training and Competency Passport, as applicable to the role.

THE DECISION TO ADMINISTER ANY MEDICATION RESTS WITH THE INDIVIDUAL REGISTERED PRACTITIONER WHO MUST ABIDE BY THIS PROTOCOL.

Competency assessment

- Evidence of ongoing protocol training to be submitted to Line Manager annually.
- Practitioners must be competent, recognise their own limitations and personal accountability and act accordingly.

- Practitioners must make a self-declaration of competency in their Personal Appraisal and Development Review (PADR).

Individuals operating under this protocol are personally responsible for ensuring they remain up to date with the use of oxygen included in this protocol - if any training needs are identified these should be discussed with the senior individual responsible for authorising individuals to act under the protocol and further training provided as required.

Ongoing training and competency

- Update annually, or earlier in response to new local/national guidance
- Practitioners must ensure they are up to date with relevant issues and clinical skills and management of anaphylaxis, BLS, with evidence of appropriate Continued Professional Development (CPD).
- Evidence of appropriate Continued Professional Development (CPD) must be retained and made available on request.

15. Monitoring Compliance and audit.

Compliance with this protocol will be monitored by annual retrospective audit of 10% of patients recorded each month in locations, where this protocol has been used. Over a 12 month period a minimum of 10 records where this protocol has been used will be included.

Records will be reviewed for rationale behind administering oxygen, that administration was in accordance with the relevant monograph and that clear documentation is in place.

This audit will be conducted by the departmental manager.

All incidents involving oxygen will be reported via Once for Wales Reporting System and monitored via incidents reports.

16. Review.

This document will be reviewed after three years or earlier should audit results or changes to legislation/practice within PTHB indicate otherwise.

17. References

- National Patient Safety Agency NPSA/2009/RRR006
- British Thoracic Society (BTS) Guidelines for emergency Oxygen use in adult patients
- British Thoracic Society (BTS) Summary Guidelines for prescribing oxygen in hospital. O'Driscoll BR, et al. Thorax 2017;72:i1–i90
- Summary of Product Characteristics, Compressed medical oxygen, Medical Gas Data Sheet BOC 8/5/19

Appendix A: Staff Permitted to use Protocol Signature Sheet

Department/ward name:_____

Authorising Manager: I confirm that the practitioners named below have declared themselves suitably trained and competent to work under this protocol. I am confident that they have the required competencies to work to this protocol. I give authorisation on behalf of Powys Teaching Health Board for the named healthcare professionals below who have signed the protocol to work under it.
The authorising manager may wish to use the competency checklist (below).

Practitioner: By signing this **protocol** you are indicating that you agree to its contents and that you will work within it. Protocols do not remove inherent professional obligations or accountability. It is the responsibility of each professional to practise only within the bounds of their own competence and professional code of conduct.

I confirm that I have read and understood the content of this Protocol and that I am willing and competent to work to it within my professional code of conduct.

Printed name of health professional	Signature of health professional	Printed name of senior representative authorising health professional (Authorising Manager)	Signature of senior representative authorising health professional (Authorising Manager)	Date

The authorising manager should retain a copy of the list for 25 years for audit and investigation purposes.

The healthcare professional should retain a copy of the document after signing.

Competency check list for manager or senior team lead to use as part of the authorising process for health professionals to work to a Protocol.
Review of authorisation will take place on each Protocol update and at the individual's annual PADR.

Name: **Role:**		Sign / Initial	Further training identified (Y/N) Specify in " comments	Comments
1	The Protocol sign off is for the following Protocol:(document the exact title and Protocol number) _____			
2	We have discussed the expiry of the Protocol and are using a version accessed electronically			
3	The member of staff has the appropriate qualifications and professional registration as outlined in the Protocol			
4	The Protocol has been read in full by the staff member			
5	The identified training has been completed as specified in the Protocol and is in date			
6	We have discussed some examples of inclusion criteria and exclusion criteria			
7	The staff member is confident in the administration method and doses			

Staff member print & sign name		Date
Manager or senior team lead to print & sign name		Date

Please send a copy of this completed form to individual's line manager, to the staff member, and a copy of this form should also be kept by service lead in the training file.

Appendix B. Flowchart for Oxygen Administration.

Oxygen administration is guided by respiratory rate and oxygen saturation (SpO2).

Target saturations:

- Most patients: 94-98%
- Lower: 88 – 92% in case of following patients:
  - Severe cardiorespiratory disease
  - Documented oxygen sensitivity
  - Neuromuscular diseases
  - most patients with known chronic obstructive pulmonary disease (COPD)
  - patients at risk of hypercapnic respiratory failure:
    - morbid obesity, BMI>40
    - cystic fibrosis
    - chest wall deformities
    - fixed airflow obstruction associated with bronchiectasis)

Titrate oxygen up or down to maintain the target oxygen saturation.
Allow at least 5 minutes at each dose before adjusting further upwards or downwards, except with major or sudden fall in saturation >3%

Seek medical advice if patient appears to need increasing oxygen

All Patients must have ABG/Earlobe blood gases within 1hour of requiring increased oxygen dose.

Venturi 24% 2-3 L/min

Venturi 28% 4-6 L/min

Venturi 35% 8-12 L/min

Venturi 40% 10-15 L/min

Venturi 60% 12-15 L/min

Nasal cannulae 1 L/min

Nasal cannulae 2 L/min

Nasal cannulae 4 L/min

Nasal cannulae or simple face mask at 5-6 L/min

Simple face mask at 7-10 L/min

Reservoir mask at 15 L/min oxygen flow

If Reservoir mask required, seek senior medical input immediately.

Signs of respiratory deterioration:

- Increased RR
- Decreased SpO_2
- Increased oxygen dose needed to keep SpO2 in target range
- Increased trigger/ early warning score

CO_2 retention:

- Drowsiness
- Headache
- Flushed face
- Flapping tremor

Seek medical advice

Appendix C

Oxygen cylinder duration chart

Available at www.namdet.org

National Association of Medical Device Educators and Trainers

Cylinder Size		CD	ZD	E	F	HX	ZX	G	J	CD	ZD	E	F	HX	ZX	G	J	CD	ZD	E	F	HX	ZX	G	J
Contents (litres)		460	605	680	1,360	2,300	3,040	3,400	6,800	230	303	340	680	1,150	1,520	1,700	3,400	115	151	170	340	575	760	850	1,700
Contents (gauge may be colour coded)		Full (100%)								Half Full (50%)								Low (approx. 25%)							
	15	30m	40m	45m	1h31m	2h33m	3h22m	3h47m	7h33m	15m	20m	23m	45m	1h16m	1h41m	1h53m	3h47m	7m	10m	11m	23m	38m	50m	57m	1h53m
	12	38m	50m	57m	1h53m	3h11m	4h13m	4h43m	9h27m	19m	25m	28m	57m	1h35m	2h06m	2h21m	4h43m	9m	12m	14m	28m	48m	1h03m	1h10m	2h21m
Flow Setting (Litres/min)	10	46m	60m	1h08m	2h16m	3h50m	5h04m	5h40m	11h20m	23m	30m	34m	1h08m	1h55m	2h32m	2h50m	5h40m	11m	15m	17m	34m	57m	1h16m	1h25m	2h50m
	8	58m	1h15m	1h25m	2h50m	4h47m	6h20m	7h05m	14h10m	29m	37m	43m	1h25m	2h23m	3h10m	3h33m	7h05m	14m	18m	21m	43m	1h11m	1h35m	1h46m	3h33m
	7	1h06m	1h26m	1h36m	3h14m	5h28m	7h14m	8h05m	16h11m	33m	43m	48m	1h36m	2h44m	3h37m	4h	8h05m	16m	21m	24m	48m	1h22m	1h48m	2h	4h
	6	1h16m	1h40m	1h53m	3h47m	6h23m	8h27m	9h27m	18h53m	38m	50m	57m	1h53m	3h11m	4h13m	4h43m	9h27m	19m	25m	28m	57m	1h35m	2h07m	2h22m	4h43m
	5	1h32m	2h	2h16m	4h32m	7h40m	10h08m	11h20m	22h40m	46m	1h	1h08m	2h16m	3h50m	5h	5h40m	11h20m	23m	30m	34m	1h08m	1h55m	2h32m	2h50m	5h40m
	4	1h55m	2h30m	2h50m	5h40m	9h35m	12h40m	14h10m	28h20m	57m	1h15m	1h25m	2h50m	4h47m	6h20m	7h05m	14h10m	28m	37m	43m	1h25m	2h23m	3h10m	3h33m	7h05m
	3	2h33m	3h21m	3h46m	7h33m	12h46m	16h53m	18h53m	37h46m	1h16m	1h41m	1h53m	3h46m	6h23m	8h27m	9h27m	18h53m	38m	50m	57m	1h53m	3h11m	4h13m	4h43m	9h27m
	2	3h50m	5h	5h40m	11h20m	19h09m	25h20m	28h20m	56h40m	1h55m	2h31m	2h50m	5h40m	9h35m	12h40m	14h10m	28h20m	57m	1h15m	1h25m	2h50m	4h47m	6h20m	7h05m	14h10m
	1	7h40m	10h05m	11h20m	22h40m	38h20m	50h40m	56h40m	113h 20m	3h50m	5h	5h40m	11h20m	19h10m	25h20m	28h20m	56h40m	1h55m	2h31m	2h50m	5h40m	9h35m	12h40m	14h10m	28h20m

Nominal Time left in cylinder (in hours and minutes)

Note: Cylinder times are based on nominal content of cylinders and the nominal flowrate settings, Nominal contents can vary by +/- 5%. Nominal Flowrates can vary by +/- 20% (+/- 30% for 1 lpm) Some times (minutes) may be rounded up and or down

RED = 30 minutes or less | Amber = 31 minutes to an hour | Green = An hour or more

Note; every effort has been made to verify the actual times for each size cylinder. If there are any discrepancies or errors please inform us at enquiries@namdet.org