

Oxygen Therapy

Contents

Indications.....	1
Policy.....	1
Exclusions.....	2
Scope/Audience	2
Definitions.....	2
Associated documents.....	2
1.1 Prescribing Oxygen	2
1.2 Administering Oxygen.....	3
1.3 Monitoring and Recording Oxygen.....	3
1.4 Recommended NZEWS Modifications of Oxygen Saturations in patients with chronic hypoxaemia.....	4
1.5 Contra-indications.....	4
1.6 Emergency Situations.....	4
1.7 Blood Gas Monitoring in Adult Patients only.....	5
1.8 Transferring and Transportation of Patients Receiving Oxygen	5
1.9 Nebuliser therapy	5
1.7 Humidification.....	6
Reasons for use.....	6
References	7

Indications

Oxygen therapy is administered to prevent cellular hypoxia, caused by hypoxaemia (low PaO₂) which can cause irreversible damage to vital organs.

Policy

- Oxygen will be prescribed according to a target saturation range to achieve a specified outcome, rather than solely specifying a delivery device and flow rate.
- Those who administer oxygen therapy will monitor the Patient to maintain the Patient's target saturation range.

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- People who require supplementary oxygen therapy will receive therapy that is appropriate to their clinical condition and in line with national and international guidance.
- Oxygen should be used to treat hypoxia, not dyspnoea or breathlessness.

Exclusions

- Patients admitted to specialist areas with a specialised oxygen prescribing policy
- Patients receiving oxygen as part of palliative care and/or end of life care. It should then be indicated by the prescriber that a target saturation is not required.

Scope/Audience

Medical Practitioners, Nurses and Midwives, Student Nurses/Midwives as per Students Responsibility Policy Vol 12, Physiotherapists

Definitions

For the purposes of this policy when the term EWS is used, this encompasses the New Zealand Early Warning Score, Modified Early Obstetric Warning Score and Paediatric Early Warning Score.

Associated documents

- CDHB EWS Management Protocol
- Oxygen and Infusions Prescription Chart
- Adult Oxygen Therapy Self Learning Package – healthLearn
- <http://bluebook.streamliners.co.nz>
- Fisher & Paykel MR850 Humidifier Operators Manual
- Respiratory Services Protocols and Guidelines
<http://respiratory.streamliners.co.nz/>
- Child Health-Volume Q 3.2 Pulse Oximetry for Infants and Children
- Cardiology IV Medication & IV Infusion Protocols handbooks page

1.1 Prescribing Oxygen

- Oxygen is prescribed by an Authorised or Delegated prescriber to achieve a specific target saturation range. It is accepted that a single target range cannot be applied to all adults taking into

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account the wide ranges of age, acute medical conditions and co-morbidities. Available evidence suggests target ranges of

- 92-96% for adult Patients
- 88-92% for adult Patients with COPD or other conditions associated with chronic respiratory failure
- A prescription for Oxygen therapy will be prescribed on the Oxygen and Infusions Chart and must include
 - Indication
 - Target saturation range
 - Starting device and flow rate/FiO₂
 - PRN/Continuous route

1.2 Administering Oxygen

- The goal of oxygen therapy is to achieve adequate tissue oxygenation using the lowest possible FiO₂.
- The Patient will be informed of why they are on oxygen therapy and given information on how to manage the delivery device and when to ask for assistance.
- Oxygen will be delivered with the most appropriate delivery interface to maintain the Patient's target saturation range and comfort.
- Refer to the Adult Oxygen Therapy Self Learning Package on HealthLearn for guidance on appropriate device selection.

1.3 Monitoring and Recording Oxygen

- All areas where oxygen is used must have pulse oximetry available and Patients on oxygen should have regular pulse oximetry measurements.
- Medical review will be guided as per EWS pathway or clinical concern in the absence of a high EWS.
- People who are critically ill should have their oxygen saturations monitored continuously.
- If the Patient's saturations are outside of the target saturation range, the oxygen therapy will be adjusted / stopped accordingly. SpO₂ should be monitored continuously for at least 5 minutes to ensure the Patient maintains the desired saturation range.
- It is important to recognise that transient drops in oxygen saturations will often be recorded in;

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- People as they sleep – ACTION: allow the Patient to rouse then re-measure saturations
- People with chronic disease (e.g. Heart failure, COPD) post mobilisation – ACTION: allow the Patient to settle and “regain their breath” then re-measure saturations
- Pulse oximetry will continue as the Patient is being weaned from oxygen and recorded within the clinical notes.
- Patients receiving oxygen therapy are not permitted to smoke with oxygen insitu.

1.4 Recommended NZEWS Modifications of Oxygen Saturations in patients with chronic hypoxaemia

- For a Patient who is known or judged clinically to be chronically hypoxic, it may be appropriate to modify the EWS saturations parameter if their “normal” (when well) saturation range will trigger an inappropriate response
- These modifications can only be authorised by a Registrar or SMO

SPO ₂ %	RECOMMENDED MODIFICATION TO NZEWS SCORE
>= 90	0
88-89	1
86-87	2
=< 85	3 (red single trigger)
MODIFICATION OUTSIDE OF THIS RANGE IS AN SMO ONLY DECISION	

1.5 Contra-indications

- There are no absolute contra-indications to oxygen therapy if indication for use is judged to be present.
- Supplemental oxygen therapy should be administered with caution in Patients suffering from Paraquat poisoning, with acid inhalation or previous bleomycin lung injury.
- In Patients with chronic carbon dioxide retention, oxygen administration may cause further increases in carbon dioxide and respiratory acidosis.

1.6 Emergency Situations

- Oxygen does not need to be prescribed in an emergency situation.

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- Oxygen should be administered to the Patient immediately by any nurse or other qualified health professional and recorded in the Patient's clinical notes.
- 100% oxygen (15 l/m via reservoir mask) should be given to all critically ill Patients whilst requesting immediate medical review.
- Patients with COPD and other risk factors for hypercapnia who acutely deteriorate should have the same initial treatment as other critically ill Patients, pending the results of an urgent Arterial Blood Gas (ABG). If severe hypoxaemia and/or hypercapnia with respiratory acidosis is confirmed, controlled oxygen therapy or supported ventilation may be required.

1.7 Blood Gas Monitoring in Adult Patients only

Arterial blood gases are the gold standard for monitoring ventilation and should be checked in the following situations:

- Unexpected or inappropriate hypoxaemia
- Any Patient with risk factors for hypercapnic respiratory failure who develops acute breathlessness, deteriorating oxygen saturation, drowsiness or other symptoms of CO₂ retention.
- Acutely breathless or critically ill Patients with poor peripheral circulation in whom a reliable oximetry signal cannot be obtained.

1.8 Transferring and Transportation of Patients Receiving Oxygen

- Patients who are transferred from one area to another must have a clear handover of their oxygen prescription and of their target saturation.
- Staff must ensure that Patients maintain their prescribed target saturations during transfers and whilst Patients are in diagnostic departments.
- Medically unstable adult Patients and Patients who require oxygen above 40% FiO₂ and/or 6 l/m whilst being transferred should be accompanied by a Registered Nurse (RN)/Midwife.
- All children requiring oxygen therapy requiring transfer/transport are to be accompanied by an RN.
- All oxygen cylinders must be appropriately restrained at all times including in transit.

1.9 Nebuliser therapy

- Patients at risk of hypercapnia respiratory failure should have nebulised therapy administered via compressed air.

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- If supplementary oxygen is required, this should be administered concurrently by nasal prongs at 1-4 litres per minute to maintain an oxygen saturation of 88-92%, or other specified target saturation range.
- All Patients requiring 35% oxygen or greater should have their nebuliser therapy by oxygen at a flow rate of > 6 litres per minute.

1.7 Humidification

Reasons for use

Humidified oxygen is helpful to improve Patient comfort and tolerance of therapy and to maintain optimal mucocilliary clearance in the airways. It is indicated in the following situations.

Circumstance	Reason for use of heated humidification
High concentration oxygen. (FiO ₂ > 40%)	Some Patients find the effects of prolonged treatment (>24hours) with high inspired oxygen concentration uncomfortable, because of drying of the upper airway.
Conditions affecting mucociliary transport	Patients with severe inflammatory conditions of the oropharyngeal mucosa may obtain comfort from humidification therapy even in the absence of high inspired oxygen concentrations. Example: Patients with head and neck cancers undergoing radiation or chemotherapy treatment who develop Mucositis
Hypothermia	In cases of hypothermia heating inspired gas may help increase core body temperature in some Patients if used in conjunction with other devices.
Endotracheal Intubation New Tracheostomy	Humidification of inspired gas during mechanical ventilation is mandatory Tracheostomy and Laryngectomy stoma Patients requiring supplementary oxygen must have humidification provided.

Paediatric Considerations

Humidification for infants/children is to be used when Oxygen Therapy is required for extended period more than 24 hours at >2 litres per minute
If the child is too hot, a blue extension set can be added to the circuit between the Patient end and mask.
If humidification is required for infants, use Fisher & Paykel humidifier continuous low flow circuit as this circuit is designed for gas flows between 0.3-7 litres per minute.

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References

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Policy Owner	CNS General Medicine and CD ICU
Policy Authoriser	Chief Medical Officer & Executive Director of Nursing
Date of Authorisation	19 January 2015

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