Policy Directive

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Newborn Infants - Safe Oxygen Administration

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Functional Sub group Clinical/ Patient Services - Baby and child
Clinical/ Patient Services - Maternity
Clinical/ Patient Services - Nursing
Clinical/ Patient Services - Critical care

Summary Describes the directions to be included in local protocols to ensure safe administration of supplemental oxygen in newborn infants admitted to Neonatal Intensive Care Units and Special Care Nurseries.

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Applies to Area Health Services/Chief Executive Governed Statutory Health Corporation, Affiliated Health Organisations - Non Declared, Affiliated Health Organisations - Declared, Public Hospitals

Audience Area Health Service nursing and medical staff

Distributed to Public Health System, Divisions of General Practice, Health Professional Associations and Related Organisations, NSW Ambulance Service, NSW Department of Health, Public Hospitals, Private Hospitals and Day Procedure Centres

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Status Active

Director-General

Compliance with this policy directive is **mandatory**.

NEWBORN INFANTS - SAFE ADMINISTRATION OF OXYGEN

1. Background:

The purpose of this Policy Directive is to set out the minimum content requirements for local policies and procedures governing the safe administration of supplemental oxygen, by any method, to infants cared for by NSW Health facilities. Local policies and procedures for oxygen administration to newborn infants should immediately be reviewed on receipt of this Policy Directive to ensure safe care of infants receiving supplemental oxygen.

Safe administration of supplemental oxygen is essential in newborn infants unable to maintain adequate oxygenation in room air and requiring continuous oxygen therapy. In all newborns, a lack of oxygen (hypoxaemia) can be harmful, and in preterm infants excessive oxygen (hyperoxaemia) is potentially dangerous because of vulnerability of the developing retina. Accurate monitoring and recording of oxygen levels and oxygen administration delivery systems is essential to ensure oxygen levels remain within a safe range, regardless of the method of administration. Oxygen delivery systems, monitoring and nursing observations therefore need to be directed to ensuring that, at all times, babies are receiving appropriate amounts of supplemental oxygen and that the levels in the baby are appropriate[1-7].

The Policy Directive does not discuss the treatment indications or thresholds for oxygen administration; Clinicians will determine the level of oxygenation to be provided to a given infant and the delivery method will vary depending on the equipment available and the infant's requirements. The level of oxygenation and modality of administration should be informed by local clinicians and, policies and procedures in place at each hospital. Resources to assist with development of local policy and procedures are available through guidelines developed locally and overseas[,7].

2. Frequency of infant observations and related documentation:

2.1 The frequency of observations will depend on the method of oxygen administration and the physical condition of the infant.

2.2 Oxygen flow rate, inspired oxygen concentration and/or oxygen saturation of the infant should be **monitored** and **recorded** to prevent hyperoxia and hypoxia, regardless of the delivery system.

- This will be, **at a minimum, hourly** for patients on ventilators and continuous positive airways pressure (CPAP) and may be required less frequently for stable infants receiving oxygen via nasal prongs, head box or incubator; and is recommended to occur at the same time as other patient observations or provision of care, such as feeds and nappy changes.

- Each time there is a change in the oxygen delivery system and / or a change in the gas mixture given to the infant (for example, a change from blender to wall air and / or oxygen), it is recommended **two** staff members check and record the changes.

- It is recommended that **two** staff members check and record the changes and status of the baby at every bedside shift handover.

NOTE

- *Analysers must be used in the circuits of all oxygen delivery systems in nurseries, particularly in the absence of continuous oximeter recording.*
- *The oxygen saturation levels in the baby should be recorded in preference to reliance on settings on blenders.*
- *For oxygen administered via nasal prongs, a low-flow or ultra low-flow oxygen meter should be used to control oxygen flow, instead of a blender*

3. Infant observations and documentation

The following observations are to be carried out and documented on all infants receiving supplemental oxygen **as a minimum** at every bedside shift handover by **two** staff members;

1 Range of oxygen levels that the infant's readings are to be kept between (as measured by oximeter or transcutaneous oxygen monitor);

2 Method of supplemental oxygen administration;

3 Flow rate of supplemental oxygen administered as per the flow meter;

4 Percentage of supplemental oxygen administered via headbox or incubator (measured by an analyser positioned near the infant's airway);

5 Range of oxygen levels in the baby by oxygen saturation monitor or transcutaneous oxygen monitor readings since the previous recording;

6 Physical assessment of the infant and documentation of respiratory/cardiac status;

7 Tolerance of the infant to supplemental oxygen administration during handling, post feeds

NOTE

Local policies must contain provisions for:

- *Notification of medical staff when*
  - *an infant requires frequent changes in oxygen levels;*
  - *there is concern about increasing oxygen requirements*
- *Appropriate documentation in the patient record of changes in the range of oxygen administered*

4. Equipment monitoring and documentation (where applicable):

All unit protocols must include appropriate directions for oxygen monitor alarm limits to ensure hyperoxia or hypoxia will not occur;

4.1 All oxygen delivery systems (including all tubing and gas connections) must be checked by **two** staff members, and the status documented, at least ***once per shift change*** and more frequently when indicated by the condition of the infant. This includes ensuring that the correct tubing is connected to the correct flowmeter (either oxygen or air) and the set flow is correct;

4.2 More frequent checks and documentation of the oxygen delivery system by calibrated analyser are necessary when using Headbox, incubator and bubble CPAP, which are systems susceptible to variation in oxygen concentration. Continuous analysis with an oxygen analyser positioned near the infant's airway is **mandatory** when supplemental oxygen is delivered via these methods.

4.3 When a transcutaneous oxygen monitor is used, calibration and probe site changes are to be documented according to unit policy;

4.4 When oxygen analysers are used they should be calibrated every shift in accord with the manufacturer's instructions and alarm limits are to be set to no more than 5% either side of the ordered/required inspired O_2 concentration. Analyser calibration times and alarm limit settings are to be checked and documented in accord with unit policy.

4.5 All heated oxygen delivery systems must have humidifier temperature and water level continuously monitored and documented hourly. This includes checking and documenting the temperature and the presence of water in the chamber or bags of self-filling humidifier systems as evidence of humidification.

References

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7. Clinical Guidelines: Oxygen therapy and monitoring. *Auckland City Hospital Newborn Service*. http://www.adhb.govt.nz/newborn/Guidelines/Respiratory/Oxygen/OxygenTherapyAndMonitoring.htm