Clinical Guideline

Home Oxygen Therapy Management in Neonates

Sites where Clinical Guideline applies	All Newborn Service sites in HNELHD
This Clinical Guideline applies to:	
1. Adults	No
2. Children up to 16 years	Yes (infants up to 2 years of age)
3. Neonates – less than 29 days	Yes
Target audience	All clinicians caring for infants with chronic lung disease and/or a need for home oxygen therapy
Description	Provides guidance to clinicians when assessing suitability for infants to be discharged home on oxygen therapy

Hyperlink to Guideline

Keywords	Neonate, chronic lung disease, CLD, oxygen, respiratory, therapy, JHCH, NICU, SCU, home, RSV, palivizumab, newborn.
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Replaces existing document?	Yes
Registration number and dates of superseded documents	HNELHD CG 20_18 Version One from 16 April 2020; JHCH_NICU_12.16 – Home Oxygen for Infants with Chronic Lung Disease (CLD) in NICU

Related Legislation, Australian Standard, NSW Ministry of Health Policy Directive or Guideline, National Safety and Quality Health Service Standard (NSQHSS) and/or other, HNE Health Document, Professional Guideline, Code of Practice or Ethics:

- NSW Health Policy Directive 2017_032 Clinical Procedure Safety
- NSW Health Policy Directive PD 2017_013 Infection Prevention and Control Policy
- HNELHD Policy Compliance Procedure PD 2019_020: PCP 1 Clinical Handover - ISBAR

Position responsible for Clinical Guideline Governance and authorised by	Dr Paul Craven, Executive Director, Children, Young People and Families Services
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PURPOSE AND RISKS

This document has been developed to provide instruction to the health clinician and to ensure that the risks of harm to the infant associated with home oxygen delivery and management of chronic lung disease (CLD) are prevented, identified and managed.

The risks are:

- *Hypoxia*
- *Hyperoxia*

The risks are minimised by:

- *Appropriate selection and screening of infants suitable to go home on oxygen therapy*
- *Clinicians seeking assistance if caring for these infants is outside their scope of practice*
- *Following the instructions set out in the clinical guideline*
- *Notification and management of the complications/risks to the patient*

Any unplanned event resulting in, or with the potential for injury, damage or other loss to infants/staff/family as a result of this management must be reported through the Incident Information Management System (IIMS) and managed in accordance with the NSW Health Policy Directive PD2019_034: Incident Management Policy. This would include unintended injury that results in disability, death or prolonged hospital stay.

Risk Category*:* *Clinical Care & Patient Safety*

Staff Preparation

It is mandatory for staff to follow relevant: "Five moments of hand hygiene", infection control, moving safely/safe manual handling, documentation practices and to use HAIDET for patient/carer communication: **H**and hygiene **A**cknowledge, **I**ntroduce, **D**uration, **E**xplanation, **T**hank you or closing comment.

CLINICAL PROCEDURE SAFETY LEVEL

Every clinician involved in the procedure is responsible for ensuring the processes for clinical procedure safety are followed. The following level applies to this procedure (click on the link for more information):

Level 1 procedure

OUTCOMES

1.	Appropriate selection and screening of infants requiring home oxygen.
2.	Parents will be informed, educated and supported throughout the process.
3.	Respiratory syncytial virus (RSV) prevention management pathways considered for babies with chronic lung disease.

CONTENT

GUIDELINE

While not requiring mandatory compliance, staff must have sound reasons for not implementing standards or practices set out within guidelines issued by HNE Health, or for measuring consistent variance in practice.

Introduction

Preterm infants who require oxygen or respiratory support at or beyond 36 weeks postmenstrual age (PMA) are considered to have chronic neonatal lung disease (CLD). Both, hypoxia and hyperoxia are harmful to neonates. Hypoxia in infants with CLD results in increased hospital readmission rates, suboptimal growth, impaired sleep quality, pulmonary hypertension with cor pulmonale, increased apparent life-threatening events and has adverse effects on their long-term neurodevelopment. On the other hand, hyperoxia leads to prolonged hospitalisation, increased use of medications such as diuretics and increased frequency of exacerbations of CLD and chest infections after discharge, likely secondary to toxic effects of oxygen on the alveolar epithelium.

Assessment for Home Oxygen

Top

Suitability of Home Oxygen Therapy

The decision about discharge of a baby on home oxygen therapy should be multidisciplinary, involving a range of the following:

- Neonatologist or Paediatrician
- The Respiratory Consultant and/or the Paediatric Respiratory team
- Neonatal nursing staff caring for the patient
- The parents/carers of the patient
  and/or (where applicable)
- Liaison Nurse
- Social Worker

Issues such as feeding, weight gain and amount of oxygen required play a central role in deciding suitability for home oxygen therapy. No specific exclusion criteria for home oxygen can be set but parents expressed or assessed inability to cope with home oxygen may require the infant to stay in hospital until weaned off oxygen.

Assessment Criteria (at 36 weeks CGA):

- Clinical condition
- Overnight oximetry run with printout (download)
- A recent blood gas and previously satisfactory bloods (FBC, UEC, LFTs)
- A recent CXR (within 7 days)
- Growth chart assessment

- Echocardiograph (to rule out co-existing cardiovascular condition and determine degree of shunt)
- Interim summary of neonatal course

Referral to the Respiratory Service

Top

Referral Criteria

The Respiratory Service should be involved from 36 weeks CGA when:

- There has been significant lung disease (to rule out possibility of an alternative diagnosis)
- The infant is expected to require home oxygen therapy
- The infant is being discharged on caffeine therapy for apnoea

Referral Process

A referral is made to the on service Respiratory Consultant via clinical handover at:

- ≥36 weeks CGA

Parent Information and Education

Top

Ideally, both parents/carers and a support person are asked to undertake a home oxygen education session.
This education session covers:

- **Routine care of the oxygen at home, including:**
  - Oxygen set-up
  - Concentrator use
  - Re-ordering of cylinders
  - Nasal cannula care
  - Safety aspects of oxygen
- **What to do in an emergency, including:**
  - Infant resuscitation
  - Safe sleeping
  - Smoking practices

Discharge Planning

Top

For Infant

- Following the decision for home oxygen, the oxygen flow rate is set at **120 mL/min** as a minimum.
- If the infant remains on a SpO_2 monitor, the upper alarm limit can be turned off at this time. This should be documented in the patient's medical record.

For Parents/Carers

- Parents and/or carers attend education regarding managing/caring for the nasal cannula and home oxygen set-up. A carer's allowance form is completed by parents/carers and the managing clinical team.
- Should be provided with a home oxygen care pack that includes:
  - Spare sets of nasal cannulas
  - Securing items such as colloid dressing and suitable tapes
  - Contact information and numbers for the home oxygen provider

For Clinicians

- Infants should have had a minimum of 48 hours of clinical stability in the Neonatal Unit off the oximeter before going home.
- A prescription for home oxygen needs to be ordered by the Neonatologist or Paediatrician. The Respiratory Physician will prescribe the home oxygen amount. This prescription is then sent to the appropriate department (as per local processes) for processing of request.
- Medications should be prescribed and dispensed prior to discharge.
- Education regarding the importance of appropriate vaccinations for family members as well as discussion regarding RSV prevention strategies.
- Smoking cessation planning should be discussed for all members of the family, including offer of quit support if applicable.
- Care by parent for 1–2 nights prior to discharge lets the parent/s or carer/s become familiar with the equipment they will use at home and provides teams an opportunity to address potential issues.

Outpatient Follow-up Top

- Neonatologist/Paediatrician – follow-up clinic appointment within 2 weeks of discharge (subsequent visits determined by follow-up clinician)
- Referral to Respiratory Physician by discharging hospital
- Respiratory Consultant – polysomnography (sleep study) is booked at 48 weeks PMA with an outpatient clinic review prior to the study
- Child and Family Health Nurse home visit, via Universal Health Home Visit (UHHV
- When suitable, Paediatric Hospital in the Home (pHITH or Liaison Nurse may attend home visit within the first 48 hours of discharge

Weaning of Home Oxygen Top

Home oxygen is only weaned by the respiratory team, after the follow-up sleep study. Once the sleep study has been processed and the infant's clinical condition and growth status have been assessed, the respiratory team follow-up with the family to discuss the plan for weaning.

Respiratory Syncytial Virus Prevention in Chronic Lung Disease Top

Respiratory Syncytial Virus (RSV)

RSV is a highly contagious virus and causes an acute respiratory tract illness. RSV disease severity varies dependent on the health status of the individual.

RSV infection is common in infants less than 2 years of age and can lead to significant morbidity and mortality in this age group. The impact is more pronounced in the high-risk population of infants, including those with a history of CLD, congenital heart disease (CHD), Trisomy 21, neuromuscular disorders and airway anomalies.

Prevention: Palivizumab

Palivizumab (Synagis) is a humanised monoclonal antibody against RSV. It is not a vaccine. Palivizumab provides a passive immunoprophylaxis against RSV infection. It is administered via injection and is currently the only product available for prevention of RSV. It has been shown to reduce RSV hospitalisations and intensive care admissions by half in at-risk cohorts.

Recommendations for Palivizumab

Top

Palivizumab is listed on the formulary for John Hunter Children's Hospital for patients who are:

- **Born extremely prematurely (≤29 weeks gestation) and**
- **On home oxygen which is initiated for CLD**

Dosing commences in the high-risk period from May through September (only administered over these 5 months) for those babies <12 months chronological age at the start of the RSV season. The course is still to be completed if the baby turns 12 months of age during the RSV season.

Babies based in regional centres will need approval for the supply of palivizumab through their regional hospital processes.
There may be an occasional baby with an individual high-risk situation outside of this group (e.g. neonate with a neuromuscular disorder on home oxygen) where palivizumab may be recommended by the treating consultant.
An Individual Patient Use (IPU) request is required in these cases.

Dosage

- Please refer to manufacturer's guideline for preparation and administration details
- **15 mg/kg per dose via intramuscular (IM) injection, once a month**
- Give 5 doses from May to September in babies <12 months of age (chronological age)
- Communication with parents prior to appointment may be necessary, to ensure correct dose is available (palivizumab is available in 50 mg and 100mg vials and dose will increase as baby grows)

Adverse Events

- An adverse event is any untoward medical occurrence that follows medication administration
- The most serious adverse event is anaphylaxis. Staff administering the injection must be aware of anaphylaxis management

- **Common (>1%):** fever, rash, rhinitis, wheeze, cough, diarrhoea, injection site reaction, cyanosis (in children with CHD)
- **Infrequent (0.1–1%):** anaemia, elevated liver enzymes
- **Rare (<0.1%):** hypersensitivity (including anaphylaxis)

Documentation Requirements

- The palivizumab treatment plan should be documented in the neonate's/infant's medical record
- After the dose has been given, the dose should be recorded in the infant's Child Health Record (Blue Book)

IMPLEMENTATION PLAN

The clinical guideline will be:

- Circulated to General Managers and Sector Managers.
- Circulated to the clinicians via Tiered Neonatal Network/Newborn Services and Children Young People and Families Services, and the Women's Health and Maternity Network.
- Made available on the intranet (PPG) and HNEKidshealth website.
- Presented at facility/unit meetings and tabled for staff to action.

MONITORING AND AUDITING PLAN

- The person or leadership team who has approved the clinical guideline is responsible for ensuring timely and effective review of the guideline.
- Evaluation will require a review of the most current evidence as well as consideration of the experience of HNELHD staff in the implementation of the clinical guideline.
- Data derived from monitoring and evaluation should inform the review of the clinical guideline either as required or scheduled.
- Implementation, education support and monitoring compliance be completed by local Clinical Educators and Managers.
- Amendments to the guideline will be ratified by the Manager and Head of Newborn Services and WHaM Networks prior to final sign off by the Children Young People and Families Services.

CONSULTATION WITH KEY STAKEHOLDERS

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APPENDICES

1. Abbreviations & Glossary

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OTHER USEFUL LINKS

Palivizumab (Synagis) summary, Australian Injectable Drugs Handbook, 7th Edition

FEEDBACK

Any feedback on this document should be sent to the Contact Officer listed on the front page.

APPENDIX ONE

ABBREVIATIONS AND GLOSSARY

Acronym or Term	Definition
CHD	Congenital Heart Disease
CGA	Corrected Gestational Age
CLD	Chronic Lung Disease
CNC	Clinical Nurse Consultant
CXR	Chest X-Ray
CYPFS	Children, Young People and Families Services
FBC, UEC, LFTs	Blood Investigations: Full Blood Count, Urea and Electrolytes, Liver Function Tests
JHCH	John Hunter Children's Hospital
IM	Intramuscular
IPU request	Individual patient use request
NICU	Neonatal Intensive Care Unit
PMA	Postmenstrual age
pHITH	Paediatric Hospital in the Home
RSV	Respiratory Syncytial Virus
SCU	Special Care Unit
SpO_2	Peripheral capillary oxygen saturation
UHHV	Universal Health Home Visit