

Local Guideline



John Hunter
Children's Hospital
CHILDREN, YOUNG PEOPLE AND FAMILIES



Health
Hunter New England
Local Health District

Bronchiolitis in NICU

Sites where Local Guideline applies	Neonatal Intensive Care Unit JHCH
This Local Guideline applies to:	
1. Adults	No
2. Children up to 16 years	Yes
3. Neonates – less than 29 days	Yes
Target audience	All clinicians caring for infants in NICU with bronchiolitis
Description	Provides information to clinicians for assessment and management of infants with bronchiolitis
National Standard	Comprehensive Care

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Keywords	Bronchiolitis, RSV, Respiratory support
Document registration number	
Replaces existing document?	No
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:	<p>NSW Health GL2018_001 Infants and Children- Acute Management of Bronchiolitis</p> <p>HNELHD PD2013_043:PCP 31 Medication Safety in HNE Health</p> <p>NSW Health Policy Directive PD2017_013 Infection Prevention & Control Policy</p> <p>NSW Health Policy Directive PD2017_032 Clinical Procedure Safety</p>
Prerequisites (if required)	N/A
Local Guideline note	This document reflects what is currently regarded as safe and appropriate practice. The guideline section does not replace the need for the application of clinical judgment in respect to each individual patient but the procedure/s require mandatory compliance . If staff believe that the procedure/s should not apply in a particular clinical situation they must seek advice from their unit manager/delegate and document the variance in the patient's health record.
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This document contains advice on therapeutics	No
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PURPOSE AND RISKS

This local guideline has been developed to provide direction to staff to ensure evidenced based care for paediatric patients with bronchiolitis who are at risk of deteriorating.

The risks are minimized by:

1. Following general principles of care including oxygen delivery and hydration
2. Avoiding suctioning due to risk of bronchospasm and bradycardia
3. Responding adequately to deterioration with appropriate nursing and medical interventions

Risk Category: Clinical Care & Patient Safety

GLOSSARY

Acronym or Term	Definition
NP	Nasal Prongs
URTI	Upper respiratory tract infection
LRTI	Lower respiratory tract infection
HFNC	High Flow Nasal Cannula
WOB	Work of breathing
CLD	Chronic Lung Disease
BPD	Broncho-pulmonary dysplasia
IV	Intravenous
OG / NG	Orogastric / Nasogastric
RSV	Respiratory syncytial virus

GUIDELINE

This Guideline does not replace the need for the application of clinical judgment in respect to each individual patient.

Definition / Epidemiology

Bronchiolitis is an acute viral infection of the lower respiratory tract (LRTI). It generally affects children less than 12 months of age and it is the most frequent cause of hospitalisation in infants under 6 months of age. There is a higher risk of severe bronchiolitis in babies <6 weeks of age.

It is usually preceded by an Upper Respiratory Tract Infection (URTI) and is characterised by cough, tachypnea, poor feeding, wheeze, crackles, apnoea, mucus production and inflammation causing obstruction at the level of the bronchioles. Bronchiolitis is generally seasonal, appearing most frequently in epidemics during the winter months.

The illness typically peaks around day 3 to 5 with a resolution of the wheeze and respiratory distress over 7 – 10 days. The cough may continue for up to 4 weeks. Bronchiolitis may occur repeatedly in infants as infection does not induce lasting immunity.

Bronchiolitis is a self-limiting condition, but can be life-threatening in infants who are premature or have underlying respiratory, cardiac, neuromuscular or immunological conditions. Bronchiolitis is generally a disease with high morbidity, but low mortality (1.8 per 100 000).

Pathophysiology

Respiratory syncytial virus (RSV) is the most common virus involved in infants with bronchiolitis. It accounts for 60-80% of bronchiolitis cases. Rhinovirus is the second most common, followed by enterovirus, adenovirus and influenza viruses.

The infection starts in the upper respiratory tract, spreading to the lower airways within a few days. Inflammation of the bronchioles is characterised by oedema of the submucosa. This, with mucous secretion and damage of airway epithelium can cause airway obstruction, air trapping, atelectasis and ventilation-perfusion mismatch. This leads to increased WOB and hypoxemia.

Clinical Characteristics

Bronchiolitis often starts with rhinorrhea and fever, gradually increasing with signs of a LRTI including tachypnoea, wheezing and cough. Infants with a history of prematurity may present with apnoea as an early symptom. Poor feeding is also common.

On examination, the major finding in most infants is fine respiratory crackles on auscultation, increased respiratory rate, increased chest movement, prolonged expiration, chest recession, use of accessory muscles and decreased general condition. (Oymar et al, 2014)

No formal scoring system exists, but a suggestion for grading infants into mild, moderate and severe bronchiolitis based on guidelines from New Zealand may be helpful (See table below)

	Mild Bronchiolitis	Moderate Bronchiolitis	Severe Bronchiolitis
Feeding	Normal	Less than usual	Not interested
Respiratory Rate	>50/min	>60/min	>70/min
Chest Wall Recession	Mild	Moderate	Severe
Nasal Flare or Grunting	Absent	Absent	Present
SpO2	>92%	88-92%	<88%
General Behaviour	Normal	Irritable	Lethargic

*Modified from New Zealand guidelines and SIGN guidelines for infants <12 months. Not all criteria need to be met to classify as 'severe' bronchiolitis.

Risk factors for bronchiolitis are:

- Male gender
- History of prematurity
- History of CLD
- Congenital heart disease
- Exposure to environmental tobacco smoke
- Gestation at birth <37 weeks
- Young maternal age
- Short duration of, or no, breastfeeding
- Maternal asthma
- Poor socioeconomic factors
- Chronological age <10 weeks
- Indigenous ethnicity

Assessment

Once diagnosis is made, risk factors for a severe disease course should be recognised, including young chronological age, which is associated with increased risk of apnoea, hypoxemia, and need for ventilation.

Pulse oximetry should form part of the clinical assessment as it can detect hypoxemia not suspected by clinical examination.

Investigations

Apart from oximetry, no routine diagnostic tests have been shown to have a substantial impact on the clinical course of bronchiolitis.

Chest X-Ray – not routinely indicated. May lead to unnecessary treatment with antibiotics. If infant requires ventilation, may then be required.

Blood tests (including Full Blood Count or Blood Culture) – have no role in management.

Blood gases – may be useful for respiratory management, and identification of respiratory failure.

Virological testing (including nasopharyngeal swabs/aspirates) – have no role in clinical management, however may be required to appropriately cohort patients admitted.

Urine microscopy/culture – may be considered to identify a urinary tract infection if temperature >38 degrees in infants < 2 months corrected with bronchiolitis.

Management

Management of acute bronchiolitis is generally supportive, as no medical treatment has shown to improve important clinical outcomes. A conservative, “minimal handling” approach seems beneficial, especially for infants. A prone position may improve oxygenation and is suggested for infants if they are carefully observed and monitored.

Respiratory Support

- Oxygen therapy should be used when oxygen saturations are persistently <92%. Brief episodes of mild desaturation are expected with bronchiolitis.
- Oxygen should be discontinued when saturations are persistently >92%.

- Humidified HFNC can be considered as first line of treatment where saturations are persistently <92% and WOB increased.

Monitoring

- Observations as per Neonatal Intensive Care Unit flowchart.
- Continuous oximetry for infants with severe bronchiolitis.

Hydration/Nutrition

- Where non-oral hydration is necessary, intravenous or nasogastric hydration are appropriate.

Nasal suction

- Not routinely recommended, unless used to assist with feeding.

Parental Education

- Provide advice on the expected course of the illness, and support as required.

Infection Control

- Adequate frequent hand washing and use of hand gel by all staff and parents/carers to minimise cross infection.
- Personal protective equipment should be worn and isolation or cohorting should be maintained.
- Avoid nursing infants with bronchiolitis in rooms with high risk infants.

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.

Implementation, monitoring compliance

1. Approved clinical guideline will be uploaded to the PPG and communication of updated 'Bronchiolitis in NICU' clinical guideline to NICU staff will be via email and message on the HUB.
2. Incident investigations associated with this Guideline and Procedure will include a review of process.
3. The Guideline and Procedure will be amended in line with the recommendations.
4. The person or leadership team who has approved the Guideline and Procedure is responsible for ensuring timely and effective review of the Guideline and Procedure.
5. Evaluation will include a review of the most current evidence as well as a consideration of the experience of Neonatal staff at JHCH in the implementation of the Guideline and Procedure.

References

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Oymar,K; Skjerven,H; Mikalsen,I. (2014) Acute Bronchiolitis in Infants, a Review. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* Apr. Vol 22

Paediatric Research in Emergency Departments International Collaborative.(2016) Australasian Bronchiolitis Guideline.

[https://www.rch.org.au/rchcpg/hospital_clinical_guideline_index/Bronchiolitis Ongoing Management/](https://www.rch.org.au/rchcpg/hospital_clinical_guideline_index/Bronchiolitis_Ongoing_Management/) accessed Aug 2018

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FEEDBACK

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