Ashford and St. Peter's Hospitals
NHS Foundation Trust

BRONCHIOLITIS

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Guideline History		
Date	**Comments**	**Approved By**
25/06/2021		Paediatric Committee
15/11/2021	Addition of step down plan to Cubicle P1	Consultant body
17/07/2024	In line with STPN guidelines. CPAP guidelines updated	Paediatric guidelines committee

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1. Bronchiolitis Guidelines

Introduction

This guideline covers diagnosing and managing bronchiolitis in babies and children. It aims to help healthcare professionals diagnose bronchiolitis and identify if babies and children should be cared for at home or in hospital. It describes treatments and interventions that can be used to help with the symptoms of bronchiolitis.

Bronchiolitis is a viral infection of the lower respiratory tract infection and affects 1 in 3 infants <12months. RSV virus is implicated in nearly 80% of cases.

Admission criteria

Diagnosis:

- Typical history of coryzal prodrome lasting 1-3 days followed by:
  - Persistent cough **and**
  - Either tachypnoea or chest recession (or both) **and**
  - Either wheeze or crackles on chest auscultation (or both)
  - Other common bronchiolitis symptoms include fever, poor feeding
  - Apnoeas may be a feature in younger infants

Differentials to consider:

- **Pneumonia** – consider if:
  - high fever (over 39°C) **and/or**
  - persistently focal crackles
- **Pertussis**
- **Congenital cardiac disease**
- **Inhaled foreign body**
- In older infants and young children, consider **viral induce wheeze/early onset asthma** if they have:
  - persistent wheeze without crackles
  - recurrent episodic wheeze
  - personal or family history of atopy

Investigations:

- **Do** measure oxygen saturation in every child presenting with suspected bronchiolitis
- **Do** a respiratory viral panel (RSV, COVID, Influenza) in children being admitted to help inform IPC measures
- **Do not** routinely perform blood tests in the assessment of a child with bronchiolitis
- **Do not** routinely perform chest X-ray in children with bronchiolitis
  - Chest X-ray is appropriate when considering critical care

Admission required if the child has any of the following:

- Apnoea (observed or reported)
- Persistent oxygen saturation (when breathing air) of:
  - Less than 90%, for children aged 6 weeks and over
  - Less than 92%, for babies under 6 weeks or children of any age with underlying health conditions
- Persisting severe respiratory distress e.g., marked chest recession, RR >70, grunting
- Inadequate oral fluid intake (<50% usual volume)
- Reduced level of consciousness
- Consider a lower threshold to admit a child with risk factors for severe disease (see below)
- Consider factors that may impact carers' ability to look after the child and return if concerns (see below)

Risk factors for severe disease or requirement for respiratory support:

- Infants less than 3 months
- Premature birth (especially under 32 weeks)
- Neuromuscular disorders
- Pre-existing respiratory condition eg chronic lung disease or cystic fibrosis
- Immunodeficiency
- Haemodynamically significant congenital heart disease.

Always consider the carer's ability to look after a child with bronchiolitis:

- Social circumstances
- Distance to healthcare in case of deterioration
- Confidence in being able to spot red flag symptoms

Inpatient Management

Oxygen Supplementation:

Give O2 supplementation via **nasal cannula** if saturations persistently <90% for children 6 weeks and over or <92% for babies under 6 weeks or children of any age with underlying health conditions.

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Target SpO2 >92% (unless underlying cardiac/pulmonary abnormality) and reduced work of breathing.

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If SpO2 <92% with nasal cannula but no apnoeas consider **high flow O2 therapy**. (See page 7)

↓

SpO2 remains <92% or no improvement in heart rate, respiratory rate, or respiratory effort within 2 hrs.

↓

Consider CPAP at 5-7cm and FiO2 40% (titrate FiO2 as required).

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Anaesthetics review and alert STRS.

↓

Anaesthetics review and escalate to PICU (see page 9) if signs of impending respiratory failure or oxygen saturations not maintained.

A senior clinician may decide to use CPAP first, rather than HFNC, depending on the clinical situation

Fluid Replacement:

- Indication for nasogastric tube (NGT):
  - Not tolerating oral feeds, oral feeds <50%
  - Commencing HFNC or CPAP
- Consider 2 hourly or 1 hourly feeds at 2/3 maintenance
- NG feeding is preferable to IV fluids if tolerated
- Indication for IV fluids
  - Not tolerating NGT feeds
  - Signs of impending respiratory failure
- Give 0.9% saline with 5% dextrose at 2/3 maintenance.
- If signs of shock; give a 10ml/kg fluid bolus and reassess.

Suctioning:

- Suctioning secretions not routine
- Consider if nasal secretions impeding feeds
- Always suction during an apnoea

Chest Physio: Not routinely recommended

Escalation to HDU:

- SpO2 < 92% despite O2 therapy
- Evidence of tiring baby
- Signs of respiratory distress
- Documented apnoea >10 seconds
- Low threshold in high-risk patients (see page 9)

Stepdown from HDU:

- Self-ventilating on nasal cannula
- See weaning HFNC on page 8

Investigations:

- *Nasopharyngeal aspirate for respiratory viruses:* informs IPC decisions eg cohorting
- *Chest x-ray:* not routinely indicated unless requiring HFNC or CPAP
- *Blood gas:* unhelpful in directing need for respiratory support.

Signs of impending respiratory failure:

- Signs of exhaustion e.g. listlessness / decreased respiratory effort.
- Recurrent apnoea
- Failure to maintain adequate oxygen saturation despite oxygen supplementation.

Medications not indicated:

- Antibiotics
- Hypertonic saline
- Nebulised adrenaline
- Salbutamol
- Montelukast
- Ipratropium bromide
- Systemic or inhaled corticosteroids

Escalation to Heated Humidifed High Flow Nasal Cannula Therapy (e.g. Vapotherm)

If SpO2 <92% with nasal cannula and no apnoeas consider high flow O2 therapy. Use flow rate according to weight. Titrate FiO2 as required.

When to Escalate:

- SpO2 <92%
- Requiring O2 >2L/min low flow nasal cannula
- Signs of respiratory distress

Contraindications for HFNC:

- Nasal obstruction / craniofacial abnormalities
- Trauma/surgery to nasopharynx
- Recurrent apnoea
- Respiratory arrest or peri-arrest state
- Undrained pneumothorax
- Caution in drained pneumothorax and upper airway obstruction.

Flow Rate According to Weight:

<12 kg	2 l/kg/min
13-15 kg	20-30 l/min
16-30 kg	25-35 l/min
31-50 kg	30-40 l/min
>50 kg	40-50 l/min

All patients requiring HFNC or CPAP must be admitted to HDU.

Alert attending / on call consultant.

Patients requiring CPAP require anaesthetics review and alert STRS

How to Escalate:

Select interface according to age and weight. Interface size should not exceed 50% nares

Observe patient for comfort and compliance – if necessary, the flow can be increased to reach max flow rate for weight over 5 mins.

Titrate FiO2 to maintain SpO2 >92%.

SpO2 remains <92% / no improvement in heart rate, respiratory rate, or respiratory effort within 2 hrs.

Consider CPAP at 5-7cm and FiO2 40% (titrate FiO2 as required).

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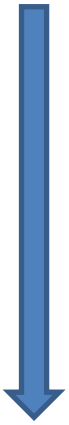
Anaesthetics review and alert STRS.



Anaesthetics review and escalate to PICU (see page 9) if signs of impending respiratory failure or oxygen saturations not maintained.

A senior clinician may decide to use CPAP first, rather than HFNC, depending on the clinical situation

Weaning High Flow Nasal Cannula (e.g. Vapotherm)

High flow nasal cannula (HFNC) weaning must be initiated by ST3 and above with plan documented in the notes.

When to Wean:

Consider weaning HFNC when clinical condition improving:

- Decreased work of breathing
- Normal or improved respiratory rate
- Return to normal cardiovascular parameters.

Monitor in HDU (or cubicle P1) for **4 hours** after stopping HFNC.

If weaning not tolerated restart at weaning flow rate.

How to Wean:

1 Wean FiO2 before flow:
- Wean FiO2 by 5-10% every 4 hours
- If SpO2 >92% and respiratory condition improving, then continue to wean.

2 Begin to wean flow when FiO2 30% and respiratory effort stable with SpO2 >92%.
- Half the flow rate
- At this point the patient is suitable to step down from HDU to cubicle P1 if available.

3 If no deterioration after 4 hours – HFNC can be discontinued.

Indications for escalation to PICU in Bronchiolitis

Severe bronchiolitis definition:

- Saturations <92% despite oxygen
- Respiratory rate >70 breaths/minute
- Signs of severe respiratory distress

High risk groups:

- Prematurity and neonates
- Pre-existing respiratory condition
- Congenital heart disease

diate escalation
llowing signs:

- Severe respiratory distress or risk of respiratory arrest
- Lack of clinical improvement or deterioration on non-invasive respiratory support
- Oxygen requirement >= 60% to maintain saturations >=90%
- Persistent or recurrent apnoeas
- Lack of improvement in level of consciousness
- Neuromuscular patients may not be able to increase their work of breathing (may need to consider blood gas)
- Seizures

Baseline investigations recommended by STRS for children requiring PICU:

- NPA aspirate for respiratory viruses (RSV)
- Baseline CXR
- FBC with differential (pertussis-lymphocytosis)
- Electrolytes (including plasma sodium)
- Blood gas – though unhelpful in directing need for respiratory support (apart from neuromuscular disorders). You should not delay treatment escalation based on a normal blood gas.

Alert attending/on-call consultant

STRS REFERRAL NUMBERS

Emergency line

020 7188 5000

Discharge Criteria

A child can be discharged when:

- Has maintained an oxygen saturations in air at the following levels for 4 hours, including a period of sleep:
    - over 90% for children aged 6 weeks and over
    - over 92% for babies under 6 weeks or children of any age with underlying conditions
- Feeding well, receiving greater than 70% of their daily fluid requirements
- Carer's confidence in their ability to look after child at home
- Carer safety netted and **advice leaflet given**

Further carer factors to consider:

- Social circumstances
- Confidence in being able to spot red flag symptoms
- Distance to healthcare in case of deterioration

Key safety information for carers on discharge:

- Recognising red flags
    - Worsening work of breathing (grunting, nasal flaring, chest recession)
    - Fluid intake <50% of normal, or no wet nappies for 12 hours
    - Apnoea or cyanosis
    - Exhaustion (for example not responding normally to social cues, wakes only with prolonged stimulation)
- How to get help
- Follow up arrangements
- Preventative methods e.g. avoiding passive smoke, frequent handwashing
- **Provide an advice leaflet to all carers**

2. Supporting References

Bronchiolitis in children: diagnosis and management. NICE guideline (NG9). Published June 2015. Last updated August 2021.

Clinical Guidelines: Paediatric critical care: Severe Bronchiolitis. South Thames Retrieval Service, Evelina Hospital. September 2022. Available from: https://www.evelinalondon.nhs.uk/our-services/hospital/south-thames-retrieval-service/clinical-guidelines.aspx [Accessed June 2024]

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BMJ Best Practice: Bronchiolitis. October 2021

Clinical Guidelines: Bronchiolitis outside of critical care. Evelina Children's Hospital Guideline 2023. Accessed June 2024.

Clinical Guidelines: Bronchiolitis ward management. The Royal Children's Hospital Melbourne. October 2018

Clinical Guidelines: Bronchiolitis. Paediatrics. Chelsea and Westminster Hospital. January 2020.

Farley R, Hough J, Jardine L. Cochrane review. Strategies for the discontinuation of humidified high flow nasal cannula (HHFNC) in preterm infants (Review). 2015

3. Supporting relevant trust guidelines

2. Guideline Governance

a. Scope

This guideline is relevant to all staff caring for all children from 0-18 years old across the emergency department, inpatient ward and outpatient department.

b. Purpose

i. This guidelines aims to facilitate a common approach to the management of children. At times deviation from the guideline may be necessary, this should be documented and is the responsibility of the attending consultant.

ii. This guideline is subject to regular review to ensure ongoing evidence based practice.

c. Duties and Responsibilities

All healthcare professionals responsible for the care of all children 0-18years should be aware of practice according to this guideline.

d. Approval and Ratification

This guideline will be approved and ratified by the Paediatric Guidelines Group.

e. Dissemination and Implementation

i. This guideline will be uploaded to the trust intranet 'Paediatric Guidelines' page and thus available for common use.
ii. This guideline will be shared as part of ongoing education within the Paediatric Department for both medical and nursing staff.
iii. All members of staff are invited to attend and give comments on the guideline as part of the ratification process.

f. Review and Revision Arrangements

a. This policy will be reviewed on a 3 yearly basis by the appropriate persons.
b. If new information comes to light prior to the review date, an earlier review will be prompted.
c. Amendments to the document shall be clearly marked on the document control sheet and the updated version uploaded to the intranet. Minor amendments will be ratified through the Paediatric Guidelines Group. A minor amendment would consist of no major change in process, and includes but is not limited to, amendments to documents within the appendices.

g. Equality Impact Assessment

Background • Who was involved in the Equality Impact Assessment
Dr Kate Irwin and Dr Tatiana Hyde
Methodology • A brief account of how the likely effects of the policy was assessed (to include race and ethnic origin, disability, gender, culture, religion or belief, sexual orientation, age) • The data sources and any other information used • The consultation that was carried out (who, why and how?)
All groups of staff and patients were taken into consideration and there is no bias towards or against any particular group.
Key Findings • Describe the results of the assessment • Identify if there is adverse or a potentially adverse impacts for any equalities groups
There is no evidence of discrimination.
Conclusion • Provide a summary of the overall conclusions
There is no evidence of discrimination.
Recommendations • State recommended changes to the proposed policy as a result of the impact assessment • Where it has not been possible to amend the policy, provide the detail of any actions that have been identified • Describe the plans for reviewing the assessment
This guideline is appropriate for use.

h. Document Checklist

To be completed (electronically) and attached to any document which guides practice when submitted to the appropriate committee for approval or ratification.

Title of the document: Bronchiolitis

Policy (document) Author: Rachel Panniker Dr Tatiana Hyde

Executive Director: N/A

		Yes/No/ Unsure/NA	Comments
1.	**Title**		
	Is the title clear and unambiguous?	**Y**	
	Is it clear whether the document is a guideline, policy, protocol or standard?	**Y**	
2.	**Scope/Purpose**		
	Is the target population clear and unambiguous?	**Y**	
	Is the purpose of the document clear?	**Y**	
	Are the intended outcomes described?	**Y**	
	Are the statements clear and unambiguous?	**Y**	
3.	**Development Process**		
	Is there evidence of engagement with stakeholders and users?	**N/A**	
	Who was engaged in a review of the document (list committees/ individuals)?		**Paediatric Guideline Committee**
	Has the policy template been followed (i.e. is the format correct)?	**Y**	
4.	**Evidence Base**		
	Is the type of evidence to support the document identified explicitly?	**Y**	
	Are local/organisational supporting documents referenced?	**N/A**	

		Yes/No/ Unsure/NA	Comments
5.	**Approval**		
	Does the document identify which committee/group will approve/ratify it?	**Y**	
	If appropriate, have the joint human resources/staff side committee (or equivalent) approved the document?	**N/A**	
6.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	**Y**	
	Does the plan include the necessary training/support to ensure compliance?	**Y**	
7.	**Process for Monitoring Compliance**		
	Are there measurable standards or KPIs to support monitoring compliance of the document?	**N**	
8.	**Review Date**		
	Is the review date identified and is this acceptable?	**Y**	
9.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for coordinating the dissemination, implementation and review of the documentation?	**Y**	
10.	**Equality Impact Assessment (EIA)**		
	Has a suitable EIA been completed?	Y	

Committee Approval (Paediatric Guidelines Group)

If the committee is happy to approve this document, please complete the section below, date it and return it to the Policy (document) Owner			
Name of Chair	**Dr Alexandra Jones**	**Date**	**09/08/2024**
Ratification by Management Executive (if appropriate)			
If the Management Executive is happy to ratify this document, please complete the date of ratification below and advise the Policy (document) Owner			
Date: n/a			