Bronchiolitis Guideline

Guideline information

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Summary of document:
The purpose is designed to provide information and support to staff in the management of children presenting with Bronchiolitis.

Scope:
This guideline covers diagnosing and managing bronchiolitis in children. It aims to help healthcare professionals diagnose bronchiolitis and identify if 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.

To be read in conjunction with:
149 - Hand Hygiene Policy
151 - Personal Protective Equipment PPE Policy
692 - Admission of Children to the Paediatric Units within HDUHB Policy
917 - High Dependency Care of Children Guideline
960 - Management of a Child Requiring Non-invasive Ventilation Procedure
190 - Written Control Documentation Policy
230 - Management of Blood and Body Fluid Spillages Policy
232 - Environmental Cleaning Policy
236 - Outbreak Management Policy
258 - Waste Management Policy
268 - Medicines Policy (Acute, Mental Health, Learning Disabilities and Community Services)
354 - Standard Infection Prevention and Control Precautions SICPS Policy
353 - Transmission Based Precautions TBP Policy on Contact/Airborne/Droplet Precautions

Patient information:
Include links to Patient Information Library

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Bronchiolitis, Pneumonia, Apnoea, Coryzol, Wheeze, Hypoxia, Chest Recession

Glossary of terms
RCPCH – royal college of paediatrics child health
PACU – paediatric Ambulatory Care Unit
PPE – Personal protective equipment
PICU – Paediatric Intensive care Unit
PEEP –positive end expiratory pressure
WATCh - Wales and West Acute Transport for children service

Term	Definition
Bronchiolitis	Bronchiolitis is a common lower respiratory tract infection that affects babies and young children under two years old.
Pneumonia	Pneumonia is swelling (inflammation) of the tissue in one or both lungs. It's usually caused by a bacterial infection.
Apnoea	Apnoea is when your breathing stops and starts while you sleep
Chest recessions	Recession is a clinical sign of respiratory distress which occurs as increasingly negative intrathoracic pressures cause in drawing of part of the chest
Respiratory rate	The respiratory rate is the rate at which breathing occurs.
Coryzal	A viral infection that causes inflammation of the respiratory tract lining. It is often accompanied by a runny nose, sore throat, sneezing, and headaches
CPAP	Continuous positive airway pressure (CPAP)
Wheeze	A wheeze is a continuous, coarse, whistling sound produced in the respiratory airways during breathing.
Hypoxia	Hypoxia, a dangerous condition that happens when your body doesn't get enough oxygen.

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Introduction

Bronchiolitis

Bronchiolitis is a seasonal respiratory viral illness affecting babies and children under two and is more prevalent in the first year of life, peaking between 3-6 months. The incidence is highest from October to March in the UK. Symptoms usually peak from 3-5 days of the illness but can persist for 14 days or more.

It is important that all clinical staff are aware of the common signs and symptoms of bronchiolitis so that a diagnosis is made promptly This Bronchiolitis pathway is an All wales Guidance and can be used alongside the RCPCH National guidance for the management of Bronchiolitis which offers guidance for management infants presenting with classical symptoms of bronchiolitis.

Scope

The scope is the guidelines that covers diagnosing and managing bronchiolitis in children.

Aim

The aim of this document is to:

- Help healthcare professionals diagnose bronchiolitis and identify if children should be cared for at home or in hospital.

Objectives

The aim of this document will be achieved by the following objectives:

- It describes treatments and interventions that can be used to help with the symptoms of bronchiolitis. The guideline covers children with bronchiolitis, but not those with other respiratory conditions, such as recurrent viral induced wheeze or asthma.

Assessment and Diagnosis

When diagnosing bronchiolitis, take into account that it occurs in children under 2 years of age and most commonly in the first year of life, peaking between 3 and 6 months.

When diagnosing bronchiolitis, take into account that symptoms usually peak between 3 and 5 days, and that cough resolves in 90% of infants within 3 weeks.

Diagnose bronchiolitis if the child has a coryzal prodrome lasting 1 to 3 days, followed by:

- Persistent cough
- Tachypnoea or chest recession (or both)
- Wheeze or crackles on chest auscultation (or both).

When diagnosing bronchiolitis, take into account that the following symptoms are common in children with this disease:

- Fever (in around 30% of cases, usually of less than 39°C)
- Poor feeding (typically after 3 to 5 days of illness).

When diagnosing bronchiolitis, take into account that young infants with this disease (in particular those under 6 weeks of age) may present with apnoea without other clinical signs.

Consider a diagnosis of pneumonia if the child has:

- High fever (over 39°C) **and/or**
- Persistently focal crackles.
- Consider alternative Diagnosis –

High Fever (>39C or >38C in age <3/12)
Poor capillary refill
Think bacterial infection:

- Pneumonia
- Sepsis
- Meningitis

Review
NICE NG143 Guideline: Fever in under 5s Traffic light system for serious illness.

Think about a diagnosis of viral-induced wheeze or early-onset asthma rather than bronchiolitis in older infants and young children if they have:

- Persistent wheeze without crackles **or**
- Recurrent episodic wheeze **or**
- A personal or family history of atopy.

Take into account that these conditions are unusual in children under 1 year of age.

Measure oxygen saturation in every child presenting with suspected bronchiolitis, including those presenting to primary care with pulse oximetry (as per Bronchiolitis primary care management of Bronchiolitis).

Recommend face to face assessment to make diagnosis and assess severity.
Include oxygen saturation monitoring in your assessment.
Consider remote assessment with safety netting but offer all children a face to face assessment and see all children where the parent requests it.

Ensure healthcare professionals performing pulse oximetry are appropriately trained in its use specifically in infants and young children.

Suspect impending respiratory failure, and take appropriate action as these children may require High Dependency Care if any of the following are present:

- Signs of exhaustion, for example listlessness or decreased respiratory effort
- Recurrent apnoea
- Failure to maintain adequate oxygen saturation despite oxygen supplementation.

When to Refer

Immediately refer children with bronchiolitis for emergency hospital care as per Bronchiolitis pathway for Primary Care management of Bronchiolitis (see Appendix 1).

When deciding whether to refer a child to secondary care, take into account factors that might affect a carer's ability to look after a child with bronchiolitis, for example:

- Social circumstances
- The skill and confidence of the carer in looking after a child with bronchiolitis at home
- Confidence in being able to spot red flag symptoms
- Distance to healthcare in case of deterioration.

Initial Assessment Emergency Department or Paediatric Ambulatory Care Unit

Please refer to the initial assessment section of the Pathway for mild, moderate and severe categories in accordance with the pathway and utilise the guidance on the presenting symptoms, risk factors for severe disease, threshold for oxygen therapy , use of chest X ray and escalation for respiratory support as per All Wales Guidance (Appendix 1).

Risk factors for severe disease

- Congenital heart disease
- Chronic lung disease
- Preterm (born < 32 weeks gestation)
- Neuromuscular disorder
- Immunodeficiency

Low threshold for admission and individualised management.

When considering discharge from hospital it is important to explain the diagnosis of bronchiolitis including the natural history of symptoms such as cough, to prevent unnecessary concern and healthcare usage. A discussion of red flag signs and symptoms of deterioration is

vital, especially in the early stages of illness, and this should be accompanied by sensible advice regarding rapid access for a clinical review if required.

Documentation
All infants admitted with Bronchiolitis should be commenced on the Bronchiolitis medical clerking proforma , this will follow through to inpatient care delivery and management of care.

Discharge from Emergency Unit or PACU
Explain diagnosis

- Explain expected time course
- Explain red flags suggesting deterioration
- Address parental smoking
- Give information leaflet
- Give 24 hour open access (longer if early stage of illness)

In accordance with Bronchiolitis pathway admit for assessment and 2- 4 hours observation and decide to Admit as per clinical condition and provide oxygen therapy and feeding plan (see page 3 of pathway).

For Infants requiring Hi –Flo, CPAP please refer to the pathway and for the initiation guidance on Hi Flo (Appendix 2) and refer to 960 - Management of a Child Requiring Non-invasive Ventilation Procedure.

Infection prevention and Control
Please ensure that all staff wear the correct PPE requirements as per Infection control policies and procedure in view of RSV bronchiolitis and red Pathways for COVID-19 including use of FFP3 masks for all Aerosol Generating procedures (AGP) until full point of Care testing is completed to ensure full infection control is adhered to.

Management of Bronchiolitis for Hospital Inpatient Management

Please use the bronchiolitis care pathway proforma for all documentation

Refer to the guidance with particular reference to the assessment including:

- Oxygen therapy
- Feeding plan
- Escalation to High- Flow
- Escalation to CPAP

Do not perform chest physiotherapy on children with bronchiolitis who do not have relevant comorbidities (for example spinal muscular atrophy, severe tracheomalacia).

Consider requesting a chest physiotherapy assessment in children who have relevant comorbidities (for example spinal muscular atrophy, severe tracheomalacia) when there may be additional difficulty clearing secretions.

Evidence based medicine:

Do not administer

- Bronchodilators
- Anticholinergics
- Inhaled steroids
- Oral steroids
- Adrenaline
- Hypertonic saline
- Physiotherapy

Do not routinely carry out

- Intravenous access
- Blood tests
- Blood gas
- Chest X-ray

Indications: Chest X-ray and/or Antibiotics

- Haemodynamically unstable
- Persistent fever >39°C
- Protracted clinical course (>5 days)
- Consider if on CPAP

Give oxygen supplementation to children with bronchiolitis if their oxygen saturation is persistently less than 92%.

Consider early us of Hi-flow therapy

Consider continuous positive airway pressure (CPAP) in children with bronchiolitis who have impending respiratory failure as per NIV guidance (960)
If oxygen saturations <92% despite nasal flow rate ≥2L/min or signs of severe respiratory distress change to Hi-flow.

Do not routinely perform upper airway suctioning in children with bronchiolitis.

Consider upper airway suctioning in children who have respiratory distress or feeding difficulties because of upper airway secretions.

Perform upper airway suctioning in children with bronchiolitis presenting with apnoea even if there are no obvious upper airway secretions.

Do not routinely carry out blood gas testing in children with bronchiolitis.

Consider carrying out capillary blood gas testing in children with severe worsening respiratory distress (when supplemental oxygen concentration is greater than 50%) or suspected impending respiratory failure.

Give fluids by nasogastric or orogastric tube in children with bronchiolitis if they cannot take enough fluid by mouth (as per pathway guidance).

Give intravenous isotonic fluids to children who do not tolerate nasogastric or orogastric fluids **or** have impending respiratory failure.

Escalation of respiratory support

Low flow oxygen therapy via nasal cannulae is well tolerated in young infants. A maximum of 2L/min can be provided in this way before humidification of the oxygen is required.

Hi-flow humidified oxygen has been shown to reduce work of breathing in infants with bronchiolitis and a recent large randomised controlled trial has suggested that hi-flow, used early in the disease, may reduce the need for escalation of care and transfer to PICU.

However, there is no evidence that hi-flow use reduces length of oxygen treatment, or length of hospital stay.

Early use of Hi-flow in this way in a stable infant group can safely take place on the general paediatric ward but failure of treatment should be regularly assessed to swiftly identify those infants needing admission to critical care.

Franklin et al. (NEJM 2018) have shown Hi flow can be safely commenced at 2L/kg/min for all infants with no increased risk of complications such as pneumothorax. A positive response to Hi-flow (reduced work of breathing, reduced oxygen requirement, reduced heart rate) should be seen within 2 hours of initiation.

As infants recover, they may be switched back directly to low flow oxygen from Hi-flow when they have oxygen saturations >90% in an FiO2 of less than 30%. Feeding by mouth on Hi-Flow risks aspiration. Early switch back to low flow oxygen enables quicker establishment of oral feeds as the infant improves.

Hi-flow is not a replacement for CPAP. Airway oedema and increased secretions caused by bronchiolitis leads to patchy atelectasis in the small airways casing hypoxia. An oxygen requirement of >60% on hi-flow therapy designates failure of therapy and support should be escalated to CPAP or invasive ventilation.

PEEP generated by CPAP can help open blocked small airways and improve symptoms and oxygenation. CPAP should be considered early in young infants with apnoeas, early in infants with severe disease, and if no response is seen after 2 hours of Hi Flow therapy.

Feeding

Any illness such as bronchiolitis that increases work of breathing in young infants usually impacts an infant's ability to feed. Shortness of breath will naturally lead to slower feeding and reduced fluid intake. An infant's frequency of feeding may therefore increase to maintain daily fluid volumes. As the disease progresses fluid intake may fall. Daily volumes of between 50 to 75% of normal may helpfully reduce lung secretions. However, volumes less than 50% risk the development of significant dehydration. Infants not maintaining a minimum safe daily volume should have their feeding supported.

When safe to do so enteral feeding should be continued via a nasogastric or orogastric tube to maintain calorific intake and prevent the need for electrolyte monitoring. Nasogastric/orogastric feeding can be safely continued in infants receiving hi flow therapy who are clinically stable or improving. Oral feeds should be avoided while on Hi-flow oxygen therapy since there is risk of aspiration.

Intravenous fluids should be considered if infants are not tolerating enteral feeds (e.g. significantly increased work of breathing following feeds) or are at risk of impending respiratory failure and artificial ventilation.

The fluid choice should be isotonic and started at 80% of usual IV maintenance volumes. Any child receiving intravenous fluids should have their electrolytes monitored at least once every 24 hours.

Please see WATCh clinical guidance in Appendix 6.

When to discharge

When considering discharge from hospital it is important to explain the diagnosis of bronchiolitis including the natural history of symptoms such as cough, to prevent unnecessary concern and healthcare usage.

Criteria for Discharge from WARD

Oxygen sats >90% (awake and asleep)

- Completed at least 1 oral feed
- Oral intake ≥75% normal

A discussion of red flag signs and symptoms of deterioration is vital, especially in the early stages of illness, and this should be accompanied by sensible advice regarding rapid access for a clinical review if required. Infants requiring CPAP or invasive ventilation on PICU are more likely to have a protracted recovery time, and further admissions to hospital with viral related chest infections.

Consideration should therefore be given to outpatient paediatric follow-up to manage recurrent symptoms.

Key Safety Information for Looking after a Child at Home
Provide key safety information for parents and carers to take away for reference for children who will be looked after at home. This should cover:

How to recognise developing 'red flag' symptoms:

- Worsening work of breathing (for example grunting, nasal flaring, marked chest recession)
- Fluid intake is 50–75% of normal or no wet nappy for 12 hours
- Apnoea or cyanosis
- Exhaustion (for example, not responding normally to social cues, wakes only with prolonged stimulation).

That people should not smoke in the child's home because it increases the risk of more severe symptoms in bronchiolitis.

How to get immediate help from an appropriate professional if any red flag symptoms develop arrangements for follow-up if necessary.

References

https://www.rcpch.ac.uk/resources/national-guidance-management-children-bronchiolitis-during-covid-19#guidance-on-escalating-infection-control-processes

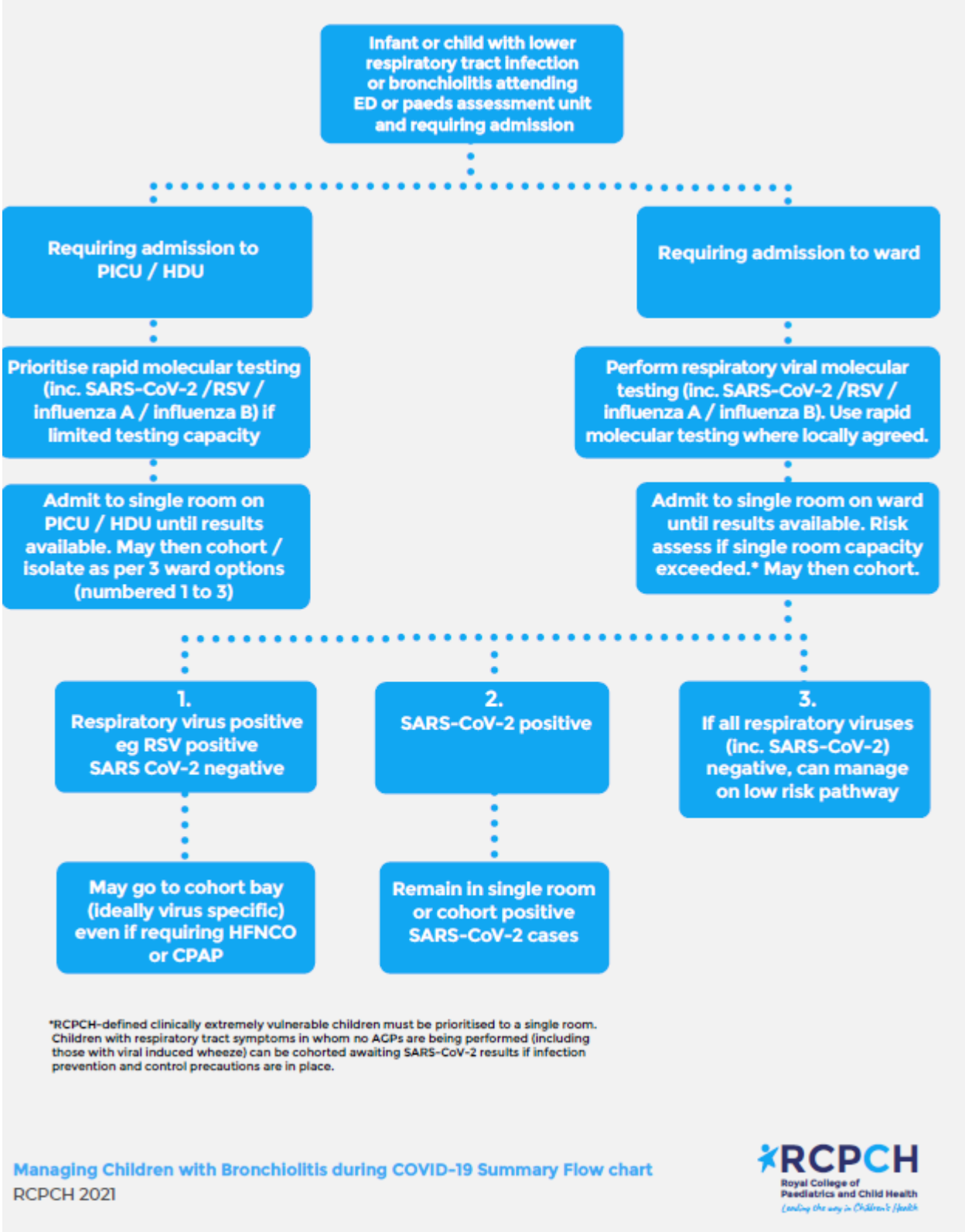
Bronchiolitis in children: diagnose and management .NICE guideline (NG9)

Appendix 1 – NICE Guidance

https://www.nice.org.uk/guidance/ng9/resources/bronchiolitis-in-children-diagnosis-and-management-pdf-51048523717

Appendix 2 - RCPCH National Guidance for the Management of Children with Bronchiolitis

RCPCH National Guidance for the management of children with bronchiolitis


Infant or child with lower respiratory tract infection or bronchiolitis attending ED or paeds assessment unit and requiring admission
Requiring admission to PICU / HDU
Requiring admission to ward
Prioritise rapid molecular testing (inc. SARS-CoV-2 /RSV / influenza A / influenza B) if limited testing capacity
Perform respiratory viral molecular testing (inc. SARS-CoV-2 /RSV / influenza A / influenza B). Use rapid molecular testing where locally agreed.
Admit to single room on PICU / HDU until results available. May then cohort / isolate as per 3 ward options (numbered 1 to 3)
Admit to single room on ward until results available. Risk assess if single room capacity exceeded.* May then cohort.
1. Respiratory virus positive eg RSV positive SARS CoV-2 negative
2. SARS-CoV-2 positive
3. If all respiratory viruses (inc. SARS-CoV-2) negative, can manage on low risk pathway
May go to cohort bay (ideally virus specific) even if requiring HFNCO or CPAP
Remain in single room or cohort positive SARS-CoV-2 cases
*RCPCH-defined clinically extremely vulnerable children must be prioritised to a single room. Children with respiratory tract symptoms in whom no AGPs are being performed (including those with viral induced wheeze) can be cohorted awaiting SARS-CoV-2 results if infection prevention and control precautions are in place.
Managing Children with Bronchiolitis during COVID-19 Summary Flow chart
RCPCH 2021
RCPCH
Royal College of Paediatrics and Child Health

Appendix 3 - Bronchiolitis Pathway 2021

Bronchiolitis Pathway 2021

Appendix 4 - Bronchiolitis Patient Information Leaflet in English and Welsh

Patient information leaflet

Appendix 5 - Bronchiolitis Care Pathway Clerking Proforma

Bronchiolitis Care Pathway Checking Proforma

Appendix 6 - WATCh Clinical Guideline Bronchiolitis

WATch Clinical guideline