BACKGROUND

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

DIAGNOSIS

Bronchiolitis is a clinical diagnosis. History and examination include -

- Cough
- Coryzal symptoms
- Widespread inspiratory crackles and expiratory wheeze
- Symptoms of respiratory distress including: head bobbing, nasal flaring, tracheal tug, subcostal, intercostal and sternal recession, grunting
- Reduced oxygen saturation
- Tachypnoea
- Reduced feeding
- Increased vomiting post feeds
- Reduced urine output
- Pyrexia, though may be afebrile

Consider the following alternative diagnoses

- Sepsis, especially if temperature ≥39°C
- Underlying cardiac condition, particularly if: absent femoral pulses, murmur, hepatomegaly, sweating
- Recurrent viral wheeze
- If under 2 months, febrile and there is diagnostic uncertainty consider checking urine
Any child whose condition is triggering concern via Paediatric Early Warning (PEW) score escalate to the medical team and Children’s Critical Care Outreach Team. Consider a rapid review for deteriorating patients. In a medical emergency situation call 2222 and ask for the paediatric medical emergency team (MET).
ADMISSION CRITERIA

- Tachypnoea with moderate to severe increased work of breathing (refer to PEW scoring)
- Hydration / nutrition support required
- O2 Sats <90% in air for babies over 6 weeks with no co-morbidities, therefore requiring Oxygen. (If O2 Sats are 90-92% observe for a minimum 4 hours before discharge).
- O2 Sats <92% in air for babies under 6 weeks or with co-morbidities, therefore requiring Oxygen, or if uncertain diagnosis
- Apnoeas

Lower threshold for admission

- Age <6 weeks (corrected gestational age)
- Premature (<35 weeks)
- Low birth weight (<2.5kg)
- Pre-existing lung disease
- Congenital heart disease (CHD)
- Neuromuscular weakness
- Immunodeficiency
- Trisomy 21
- Psychosocial concerns or re-attender (require senior review)

If not admitted, parents must be provided with key safety information to take away for reference. This should cover how to recognise developing “red flag” symptoms. (Parents guide to bronchiolitis).

INVESTIGATIONS

These are not routinely needed for confirmation of diagnosis

- If admitted, a nasopharyngeal aspirate (NPA) or viral throat swab should be sent for Polymerase Chain Reaction (PCR) to identify Respiratory Syncytial Virus (RSV) or other viruses to enable cohort nursing
- Consider point of care / rapid testing as available
- Consider Capillary blood gas (CBG) if requiring FiO2 ≥0.4, severe respiratory distress or exhaustion. CBG only gives information from the time it is performed, and should be interpreted in the context of the patient. A normal CBG is not indicative of severity
- A chest X-ray should only be considered if there is diagnostic concern e.g. persistent pyrexia or FiO2 ≥0.5
- Blood tests have a monitoring role if intravenous fluids are being used or if there is diagnostic uncertainty.

MANAGEMENT

Treatment of bronchiolitis is primarily supportive in nature. Minimal handling is the cornerstone of care.

Respiratory

- Maintain saturations ≥90% (92% if under 6 weeks or comorbidities)
- Medical gases have a drying effect. Drying of mucous membranes can cause airway damage, increase work of breathing and can lead to thickened secretions which may
cause airway obstruction.

- Oxygen should be humidified either via headbox or face mask (in an emergency or short term ≤1 hour this can be via a non-rebreather mask)
- Heat Humidified High Flow Nasal Cannula Therapy (HFNC) (Optiflow) is a well-tolerated form of respiratory support suitable for use on the wards or in a High Dependency Unit (HDU). It should be considered in patients with moderate and severe bronchiolitis as measured by a respiratory component of the PEW score of 3 or more.
- HFNC therapy is not recommended in patients with respiratory acidosis and a pH <7.3, apnoea, air leak (pneumothorax or pneumomediastinum) or multi-organ failure. These patients need to be discussed with Paediatric Intensive Care Unit (PICU) for consideration of transfer for formal respiratory support.
- Patients requiring FiO2 of 50% and / or have a respiratory component of the PEW score of 3 or more despite maximal HFNC therapy may benefit from Continuous Positive Airway Pressure (CPAP). These patients should be managed on HDU.
- Patients who require ventilation must be managed on PICU.

**Nutrition and Hydration**

- Routine suctioning of the nose and mouth is not indicated. In some patients suctioning pre feeds may clear secretions to aid oral feeding.
- When a patient is not tolerating adequate intake orally (<2/3 of feeds), nasogastric (NG) or orogastric (OG) feeds can be safe and effective, when inserted and used in accordance with trust policy.
- Feeds may be reduced to 100mls/kg or as medically directed, and given 2 – 3 hourly. Smaller feeds require less energy and effort to consume and digest. Larger volumes may affect respiratory effort by putting pressure on the diaphragm, affecting lung expansion.
- Strict fluid input / output to be documented on appropriate diet record or fluid chart and fluid balance recorded and escalate accordingly.
- Patients with worsening or severe respiratory distress should be considered for intravenous fluids. The minimum requirements are:
  - Plasma-Lyte with glucose please refer to [Paediatric fluid administration guidelines](#)
  - Infuse at 80% maintenance requirements
  - Check U&Es and glucose at onset of intravenous therapy and 24 hourly (risk of hyponatraemia)
- Consider comfort feeds (via NG) for those Nil by mouth (NBM). These must only be given in agreement with the medical and nursing teams.
- Fluid overload or dehydration will have significant implications on the patients clinical condition and must be addressed and treated early to prevent deterioration or development of associated complications.
- Consideration can be given to training of parents in NG feeding if suitable (see short-term home NG feeding in bronchiolitis guideline).

**Handling & Posture**

- Nurse infants prone (on their tummies) with minimal handling and the cot inclined at a 45° angle.
- Cluster patient cares together to minimise disturbances – i.e. nappy changes, observations & investigations.
- Consider environmental factors such as noise and harsh lighting to promote rest.
Medication

- Consider regular analgesia if signs of discomfort
- There is no role for bronchodilators, adrenaline, antibiotics, steroids, antivirals or physiotherapy in uncomplicated bronchiolitis.
- Nebulised hypertonic saline is not recommended practice because of associated risks and the minimal benefit for our inpatient population.

MONITORING

- At a minimum saturations and heart rate should be monitored continuously until the patient is in air and stable for 4 hours including a period of sleep.
- Children requiring HFNC therapy should have continuous Electrocardiograph (ECG) and saturation monitoring.
- Children requiring HFNC therapy may require High Dependency care. (See HFNC guideline)
- Children with a history of apnoea, or at risk of apnoea should have continuous saturation and ECG monitoring.
- Ensure the saturation probe is moved a minimum of 4 hourly, document this on the observation chart. Leaving the probe in the same position can cause pressure injuries or burns.

INFECTION CONTROL

- Bronchiolitis viruses are highly contagious and barrier nursing procedures should be implemented.

DISCHARGE CRITERIA

- Stable and improving
- Stable continuously monitored oxygen saturations maintained ≥90% in air for a period of 4 hours including a period of sleep for babies over 6 weeks with no co-morbidities.
- Stable continuously monitored oxygen saturations maintained ≥92% in air for a period of 4 hours including a period of sleep for babies under 6 weeks or those with co-morbidities or those considered for short-term home NG feeding.
- Feeding at 2/3 normal feeds or more
- Infants admitted with apnoea must have period of observation of at least 12 hours following last witnessed apnoea
- Family confident in their ability to manage patient at home
- When appropriate use the Bronchiolitis Criteria Led Discharge (CLD) form

DISCHARGE ADVICE

- Avoid Passive Smoke
- Symptoms may persist for 10-14 days
- Re-infection may occur
- Importance of handwashing
- Increased risk of wheezing after bronchiolitis
- Bronchiolitis parent advice leaflet including safety net advice
RELATED DOCUMENTS

- My Child Has Been Admitted To Hospital With Bronchiolitis A Guide For Parents And Carers – Patient information leaflet
- Parents guide to Bronchiolitis
- High Humidity High Flow Nasal Cannula Oxygen therapy (AIRVO2 / Neonatal Optiflow) – Clinical Guideline
- The Acutely Ill Child Parental Patient Involvement In Escalation Of Clinical Care – SOP (standard operating procedure)
- Paediatric Medical Emergency Calls SOP
- UHBristol Fluid (Paediatric) Clinical guideline
- Clinical protocol for recording and acting upon physiological observations in paediatric in patient areas – on clinical guidelines pages under ‘R’
- Enteral feeding policy
- Short term home NG feeding in patients with bronchiolitis
- Infection control
- Oxygen Therapy Nursing Guidelines
- Respiratory Failure Nursing Guidelines

AUTHORISING BODY
Paediatric Medical Governance

SAFETY
If there are unusual or unexpected safety concerns (to staff or patient), emphasize them here

QUERIES
Acute Medical team Bleep 2943
Children’s Critical Care Outreach Team Bleep 2968
Clinical Site Team Bleep 3217
HDU team 20921
PICU 28018
Appendix 1 – Setting up Headbox Oxygen

MR810 HUMIDIFIER
High flow oxygen administered for more than 1 hour must be humidified. This helps to prevent drying of the nasal/oral mucosa and secretions.

NOTES
If administering oxygen via the MR810 humidifier;
- Set the temperature to full (all three bars lit)
- Ensure that water bag is not empty and that the water is in the chamber
- Always turn off the heater first before turning off the oxygen supply

HEADBOX OXYGEN
DESCRIPTION
Boxes come in three sizes and can be useful in infants up until approximately nine months of age. Humidified oxygen can be delivered up to a maximum of 50 -60 %

LIST OF ITEMS NEEDED
Setting Up Head box
- Head box
- Oxygen analyzer
- Bag of sterile water for ventilation
- RT408 Breathing Circuit pack
- MR810 Humidifier mounted on pole
- Oxygen Connector Tubing with connectors
- Double oxygen point

*if double point not available, 2nd source of oxygen must be available at bed side, i.e. a portable cylinder, this must be at least 2/3rds full.

STORAGE
Head boxes are stored in the Medical Equipment Library (Penguin Ward), on Caterpillar Ward and in the Emergency Department.
Analysers are stored in the Medical Equipment library and on Caterpillar Ward.

All other supplies are held by the wards. The MR810 Humidifier units tend to be spread around the wards and additional units are kept in equipment library.

All wards should have some double oxygen points.

**SETTING UP**

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td>Slide water chamber into MR810 humidifier</td>
</tr>
<tr>
<td>2.</td>
<td>Attach bag of sterile water for inhalation via prong and hang from stand.</td>
</tr>
<tr>
<td>3.</td>
<td>Place clear oxygen tubing on top of grey flowmeter, and connect to wall oxygen. Adjust flow between 5 and 15 litre 30 – 50% oxygen using the dial</td>
</tr>
<tr>
<td>4.</td>
<td>Attach Blue tubing with integral heater wire to the left side of the chamber and pointed to back of dome. Connect grey electric heater wire (as shown).</td>
</tr>
<tr>
<td>5.</td>
<td>Connect the tubing from the humidifier to the circular hole in the head box (usually on the back or the side of the head box) and secure with adaptor.</td>
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</tbody>
</table>
Turn Humidifier on and set temperature to full, (i.e. ensure 3 lights are lit), if not on full, to increase temperature press temperature button until all three lights lit.

- Turn the oxygen on to 5litre = 30% – 10litres= 40% 15litre = 50%. Escalate treatment if child is needing > 50% headbox oxygen.
- Turn the flow meter on the chamber to desired % level using the red indicator
- Regularly check the water bag is not empty and that the water is running

7.

- Position oxygen analyser outside the head box with the sensor inside and turn on.
- The machine will perform a self-calibration then will be ready for use. This machine gives you the accurate reading of the amount of oxygen present in the head box. This is known as the fraction of inspired oxygen (Fi02) reading, this should be recorded regularly on the observation chart.
- This reading is what you should be guided by as this is the actual level of oxygen your patient is receiving, not necessarily what you have set on the mixer on the humidification unit.

8.

Always ensure the oxygen analyser sensor is close to the patients face to ensure accuracy of your readings in relation to your patient.
| 9. | Tilting the cot may facilitate therapeutic positioning of the patient. Always ensure the head box is secure and not slipping down the cot. A rolled up towel blanket underneath your patient's legs/bottom can also prevent them from slipping down the cot. |
Appendix 2: Bronchiolitis Patient Flow Pathway

**Children’s Emergency Department**

- Initial clerking and diagnosis of bronchiolitis.
- Management:
  - Oxygen
  - Nasal cannula
  - Headbox
  - HFNC; see Optiflow guideline
- Hydration:
  - NG tube
  - IV fluids
- Minimal handling
- Prone positioning
- Refer to general paediatric registrar

**Criteria for admission:**
- Respiratory rate > 60 with moderate-severe recession
- Requiring hydration or nutritional support
- Apnoeas Requiring oxygen to maintain:
  - Sats 90%
  - Sats 92%
    - Over 6 weeks
    - Bronchiolitis
    - No co-morbidities
    - All other patients i.e.
      - Under 6 weeks
      - Uncertain diagnosis
      - Co-morbidities

**Medical Ward**

- Clinical reassessment:
  - Continue management
  - Escalate
    - Senior review, outreach
    - Refer to / HDU / PICU
    - Consider CPAP; see guideline
- De-escalate
  - Wean oxygen
  - Oral feeding
- Investigations if required: see Bronchiolitis Guideline

**Bronchiolitis Trust Guideline**

- Discharge planning:
  - Bronchiolitis eDis
  - TTA if required

**Discharge planning i.e ICE, eDis**

- Criteria led discharge form
- Parent education

**Discharge planning**

- Criteria for discharge:
  - SpO2 maintained >90% in air for a period of 4 hours including a period of sleep if over 6 weeks with no co-morbidities. SpO2 >92% if under 6 weeks or co-morbidities.
  - Feeding well (2/3 of normal) and well hydrated
  - Improving
  - Parental education:
    - Refrain from smoking
    - Symptoms may persist for 14-21 days
    - Re-infection may occur
    - Increased risk of wheezing after bronchiolitis

**Nursing**

- Triage including observations
- Oxygen if required
- Insert NG tube if required

**Initial management:**
- Saturation monitoring
- NPA rapid test (if being admitted; to identify need for isolation)
- Provide parents with a Bronchiolitis Information Leaflet

**Continue management:**
- NPA rapid test (if being admitted; to identify need for isolation)
- Complete standardised admission paperwork and swabs including MRSA if required
- Ensure correct staff present for transfer
- Handover to ward / HDU / PICU

**Continue administration of management:**
- Escalate
- Senior review, outreach
- Observations— if signs of clinical improvement alert medical team to initiate de-escalation:
  - Wean oxygen
  - Oral feeding

**Admit to medical ward**

- Book in at CED reception

**Criteria for admission:**
- Respiratory rate > 60 with moderate-severe recession
- Requiring hydration or nutritional support
- Apnoeas Requiring oxygen to maintain:
  - Sats 90%
  - Sats 92%
    - Over 6 weeks
    - Bronchiolitis
    - No co-morbidities
    - All other patients i.e.
      - Under 6 weeks
      - Uncertain diagnosis
      - Co-morbidities
This patient is suitable for criteria-led discharge subject to the following conditions being met:

- There is no deterioration in the patient’s clinical condition
- The criteria detailed below have been met within 24 hours of form completion
- The discharge is undertaken by the nurse-in-charge of the ward, or band 6 or 7 nurse, and another qualified nurse

### Criteria for Discharge

<table>
<thead>
<tr>
<th>Criteria for Discharge</th>
<th>Criteria Met. Date &amp; time</th>
<th>Nurse 1 initials</th>
<th>Nurse 2 initials</th>
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<tbody>
<tr>
<td>Stable oxygen saturations in air requiring no additional support for more than 4 hours, including during sleep</td>
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<tr>
<td>- Sats ≥90% if over 6 weeks and no co-morbidities</td>
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<td></td>
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<tr>
<td>- Sats ≥92% if under 6 weeks or co-morbidities</td>
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<tr>
<td>Tolerating oral feeds to at least 2/3 usual volume and well hydrated</td>
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<tr>
<td>Infant is active and alert, handles normally</td>
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</table>

- Tick to confirm EDIs/Medway letter has been written □

Signed (Cons/ST3+/ENP): ________________________________ Date: ____________
Print Name: ______________________ Designation: ______________

Bronchiolitis information leaflet given and explained
EDIs/Medway letter completed
Family happy with Criteria Led Discharge
Discharged from Medway using criteria led option

I confirm the above criteria were met and the patient was discharged on __________ (Date) at________ (Time)

* Nurse 1: Signed: __________________________ Print Name: __________________________ Designation: __________________________
* Nurse 2: Signed: __________________________ Print Name: __________________________ Designation: __________________________

If the above criteria are not met within 24 hours of completion of this form, please contact the responsible clinical team

**GP letter guidance notes (for CED patients)**
Admitted to Short Stay Unit, observed and maintaining oxygen saturations above 92% in air (over 6 weeks and/or co-morbidities) or above 90% in air (over 6 weeks and no co-morbidities), both awake and asleep without worsening respiratory distress. Tolerating at least 2/3 normal feeds. Discharged with bronchiolitis advice leaflet.
SETTING  
Bristol Royal Hospital for Children

FOR STAFF  
Nursing and medical staff

FOR PATIENTS  
Children and young people for whom the clinical team have agreed that criteria-led discharge is appropriate

Background/Introduction
The purpose of Criteria Led Discharge is to facilitate safe and timely discharge from Bristol Royal Hospital for Children (BRHC). Pre-requisite criteria for a patient being deemed ‘fit for discharge’ are agreed in advance of discharge. The decision to discharge the patient can then be safely undertaken by a delegated practitioner, avoiding delays associated with medical team review.

The responsibility for deciding that a patient has met the safe discharge criteria will be undertaken by the practitioners as below:

**Inpatient wards:** The Nurse in Charge of the Ward, or a band 6 or 7 nurse, in conjunction with a registered nurse with a substantive contract within BRHC.

**Children’s Emergency Department (CED)/The Observatory:** A Band 6 or 7 nurse, in conjunction with a registered nurse with a substantive contract within BRHC.

Criteria Led Discharge Process

1. A patient is identified by an Emergency Nurse Practitioner (CED), ST3+ or Consultant as suitable for criteria-led discharge. Condition-specific criteria-led discharge forms can be found on the BRHC Patient Flow intranet pages.
2. The Clinician completes a criteria-led discharge form, which is stored in the patient’s nursing notes.
3. The Clinician informs the Nurse in Charge, who identifies the patient as criteria-led discharge on the electronic whiteboard.
4. The doctor or ENP completes the discharge summary and TTA, or Medway letter in the CED.
5. Once the discharge criteria have been met, the patient is reviewed by two designated practitioners to ensure all necessary actions have been taken to complete the criteria-led discharge and sign the relevant section of the criteria-led discharge form.
6. The patient is discharged via usual processes, using the ‘Criteria Led’ option on Medway, and the Clinical Site Team is notified of bed availability.
7. If the relevant criteria are not met within 24 hours of the form being completed, the patient should be discussed with the responsible clinical team (or sooner if clinical concerns).

Developing criteria-led discharge proformas

New criteria-led discharge forms may be developed for other patient groups and should be circulated to the relevant clinical team and governance group for consultation before submission to the Nurse Practice Group.

The approved template should then be uploaded to the above Connect page by a member of the Women’s and Children’s Divisional Management team.

**Related Documents**

**Authorising Body**
Nurse Practice Group
Paediatric Medicine Governance group

**Safety**
Any child who does not meet the criteria for criteria-led discharge should be discussed with the responsible clinical team.

**Queries**
Contact the patient’s responsible clinical team.