

## Referral Support Service

## Paediatrics

### PA02 Bronchiolitis

#### Definition

A lower respiratory infection affecting babies and children under two years. It is characterised by epithelial cell destruction, cellular oedema, and airway obstruction by inflammatory debris and mucus.

Paediatric Normal Values (adapted from APLS)			
Age	Resp Rate	Heart Rate	Systolic BP
Neonate <4w	40-60	120-160	>60
Infant <1 y	30-40	110-160	70-90
Toddler 1-2 yrs	25-35	100-150	75-95
2-5 yrs	25-30	95-140	85-100

It usually presents with 1-3 day history of coryzal symptoms followed by the appearance of cough, fever and progression to respiratory distress. Peak of illness is typically 3-5 days.

#### Exclude Red Flag Symptoms

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

#### Low Threshold for Admission

- Chronic lung disease
- Haemodynamically significant congenital heart disease
- Age < 12 weeks (corrected)
- Premature birth, particularly under 32 weeks
- Neuromuscular disorders
- Immunodeficiency
- Cigarette smoke exposure
- Duration of illness <3 days with amber symptoms (see assessment box)
- Re-attendance

#### General Points

- Most common reason for admission in first year of life.
- In the UK, the peak incidence is reported between November and March.
- Respiratory syncytial virus (RSV) accounts for the majority of cases.
- Rhinovirus, human metapneumovirus, influenza, parainfluenza and adenovirus can all cause bronchiolitis.
- Most children recover without sequelae, however, up to 40% may have subsequent wheezing episodes up to age five and 10% after age five.

Presenting Features

Bronchiolitis is a clinical diagnosis based entirely on history and clinical examination with a classic triad of diffuse inspiratory crepitations, expiratory wheeze and hyperinflation.

History	Examination
<ul style="list-style-type: none"> <li>• Preceding rhinorrhoea and cough</li> <li>• Exposure to an individual with an upper respiratory tract infection</li> <li>• Wheeze</li> <li>• Difficulty in breathing</li> <li>• Tachypnoea</li> <li>• Cyanosis</li> <li>• Apnoeas*</li> <li>• Poor feeding</li> </ul>	<ul style="list-style-type: none"> <li>• Low SpO<sub>2</sub></li> <li>• +/- Fever (usually low grade)</li> <li>• Cyanosis/colour change or apnoea</li> <li>• Signs of respiratory distress:               <ul style="list-style-type: none"> <li>○ Tachypnoea</li> <li>○ Intercostal/subcostal/sternal recessions</li> <li>○ Tracheal tug and grunting</li> <li>○ Accessory muscle use (nasal flaring and head bobbing)</li> </ul> </li> <li>• Auscultation: widespread fine inspiratory crackles +/- wheeze</li> </ul>

\* Young infants aged under 6 weeks can present with apnoeas without other clinical signs

**Differential Diagnoses**

- Other pulmonary infections, e.g. pneumonia
- Laryngotracheomalacia
- Foreign body aspiration
- Gastroesophageal reflux
- Vascular ring
- Allergic reaction
- Cystic fibrosis
- Mediastinal mass
- Tracheoesophageal fistula

Features that may indicate diagnoses other than bronchiolitis

- The classic triad of diffuse inspiratory crepitations, expiratory wheeze and hyperinflation are key to the clinical diagnosis.
- All other features mentioned above could be seen in many other pathologies.
- Absence of one of the classic triad may prompt further consideration of other differentials.

Assessment

Traffic light system for identifying severity of illness			
	Green – Low Risk	Amber – Intermediate Risk	Red – High Risk
<b>Activity</b>	<ul style="list-style-type: none"> <li>Responds normally to social cues</li> <li>Content/smiles</li> <li>Stays awake/awakens quickly</li> <li>Strong normal cry</li> </ul>	<ul style="list-style-type: none"> <li>Altered response to social cues</li> <li>No smile</li> <li>Reduced activity</li> </ul>	<ul style="list-style-type: none"> <li>Not responding normally or no response to social cues</li> <li>Unable to rouse or if roused does not stay awake</li> <li>Weak, high pitched or continuous cry</li> <li>Appears ill</li> </ul>
<b>Skin</b>	<ul style="list-style-type: none"> <li>Normal skin colour</li> </ul>	<ul style="list-style-type: none"> <li>Normal skin colour</li> <li>Pallor reported by parent/carer</li> <li>Cool peripheries</li> </ul>	<ul style="list-style-type: none"> <li>Pale, mottled, ashen</li> <li>Cold extremities</li> </ul>
<b>Respiratory</b>	<ul style="list-style-type: none"> <li>No respiratory distress</li> </ul>	<ul style="list-style-type: none"> <li>Tachypnoea</li> </ul>	<ul style="list-style-type: none"> <li>Significant respiratory distress</li> <li>Grunting</li> <li>Apnoeas</li> </ul>
Respiratory rate	<ul style="list-style-type: none"> <li>&lt;12m: &lt;50 breaths/min</li> <li>&gt;12m: &lt;40 breaths/min</li> </ul>	<ul style="list-style-type: none"> <li>&lt;12m: 50-60 breaths/min</li> <li>&gt;12m: 40-60 breaths/min</li> </ul>	<ul style="list-style-type: none"> <li>All ages:&gt;60 breaths/min</li> </ul>
O <sub>2</sub> Sats in air	<ul style="list-style-type: none"> <li>≥ 95%</li> </ul>	<ul style="list-style-type: none"> <li>92-94%</li> </ul>	<ul style="list-style-type: none"> <li>≤ 92%</li> </ul>
Chest recessions	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>Moderate</li> </ul>	<ul style="list-style-type: none"> <li>Severe</li> </ul>
Nasal flaring	<ul style="list-style-type: none"> <li>Absent</li> </ul>	<ul style="list-style-type: none"> <li>May be present</li> </ul>	<ul style="list-style-type: none"> <li>Present</li> </ul>
Circulation	<ul style="list-style-type: none"> <li>Tolerating 75% of fluid</li> <li>Occasional cough induced vomit</li> </ul>	<ul style="list-style-type: none"> <li>50-75% fluid intake over 3-4 feeds</li> <li>Cough induced vomiting</li> <li>Reduced urine output</li> </ul>	<ul style="list-style-type: none"> <li>50% or less fluid intake over 2-3 feeds</li> <li>Cough induced vomiting frequently</li> <li>Significantly reduced urine output</li> </ul>
	<p><b>All green</b></p> <ul style="list-style-type: none"> <li>Can be managed at home</li> <li>Give bronchiolitis information leaflet</li> <li>Explain cough may last 4 weeks</li> </ul>	<p><b>Any amber and no red</b></p> <ul style="list-style-type: none"> <li>Consider same day review</li> <li>If you feel the child is ill, needs O<sub>2</sub> support or will not maintain hydration discuss with paediatrician on-call</li> </ul>	<p><b>If any red</b></p> <ul style="list-style-type: none"> <li>Bleep paediatrician on-call</li> <li>Consider appropriate means of transport</li> <li>If appropriate commence relevant treatment to stabilise child for transfer</li> <li>Consider starting high flow oxygen support</li> </ul>

Measuring O<sub>2</sub> Saturations

- A saturation probe needs to cover a child's finger or toe with a good seal.
- If there is a large gap it will underestimate the child's saturations.
- An adult probe on the big toe of a child could be used in a child 5 years or over.
- Use a paediatric probe in children under 2 years.

## **Management**

### When to Arrange Emergency Hospital Admission

- Apnoea (observed or reported).
- Persistent O<sub>2</sub> saturations in air of ≤ 92%.
- Inadequate oral fluid intake (less than 50-75% of usual volume).
- Persisting severe respiratory distress, e.g. grunting, marked chest recession or a respiratory rate > 60 breaths/minute.

### When to Consider Hospital Admission

- A high respiratory rate;
  - <12m: 50-60 breaths/min
  - >12m: 40-60 breaths/min
- Difficulty with breastfeeding or inadequate oral fluid intake (50-75% or less of usual volume).
- Clinical dehydration.
- Persistent O<sub>2</sub> saturations of 92-94% when breathing air.

### Treatments NOT recommended for bronchiolitis

- Antibiotics
- Inhaled beta-2 agonist bronchodilators (although worth trying if atopic background)
- Oral systemic corticosteroids
- Inhaled corticosteroids

## **Patient information leaflets/ PDAs**

[Patient info/chest-lungs/bronchiolitis-leaflet](#)

[Patient-info/health-advice/paediatric-bronchiolitis-advice-sheet](#)

## **References**

- BMJ Best Practice (2021) Bronchiolitis [Viewed 15 Aug 2021]
- National Institute for Clinical Excellence [NICE] (2021) Bronchiolitis in children: diagnosis and management NICE guidelines [NG9] [Viewed 15 Aug 2021]
- National Institute for Clinical Excellence [NICE] (2021) Management of bronchiolitis. [Viewed 15 Aug 2021]

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