Paediatric Wheeze and Asthma Guidelines
(Children Aged 16 and Under)

September 2018

These guidelines are designed for use across all healthcare settings in Bedfordshire by any suitably trained healthcare professional.
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INTRODUCTION AND ACKNOWLEDGMENTS

These guidelines aid healthcare professionals in Bedfordshire to manage paediatric wheeze and diagnose and manage asthma in children aged 16 years and under.

These guidelines support local implementation of:

- BTS/SIGN 153 British Guideline on the management of asthma 2016
- NICE Guideline NG80 Asthma: Diagnosis, monitoring and chronic asthma management 2017
- National Review of Asthma Deaths 2014 (NRAD)
- Global Initiative for Asthma 2018 (GINA)

In the absence of national consensus in relation to the diagnosis and management of chronic asthma, we aim to support a local pragmatic approach for children aged under 5 (section A) and between 5-16 years (section B). The management of acute asthma is covered in section C and inhaler and spacer device options are summarised in section D.

Many thanks to all individuals who have supported the development of these new guidelines. In particular, we would like to acknowledge the contribution of members of the guidelines development group: Dr Beryl Adler, Dr Uzma Sarwar, Dr Hetal Talati, Dr Anne Ingram, Dr Dayo Kuku, Dr Oseiwa Kwapong, Lynn Fanning, Colette Seddon, Catherine Arden and Dona Wingfield.

We hope that health care professionals find these guidelines useful. We would welcome any comments on the guidelines, please contact the guidelines author:

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This guidance is written in the following context

This guidance and associated tools were arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. The guidance does not, however, override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or parent, guardian or carer.
Asthma affects 1.1 million children in the UK. Many more pre-school children experience acute wheeze each year with viral infections. Acute wheeze is one of the commonest reasons for attendance to the emergency department and admission to hospital in children. Up to 75% of these admissions are thought to be avoidable. Evidence-based clinical pathways and guidelines have been shown to improve outcomes for children with acute wheeze and asthma, and reduce hospitalisation.

Unfortunately there are still a small number of avoidable deaths in children and young people from asthma every year. The UK has third highest risk of death from childhood asthma in the Organisation for Economic Co-operation and Development (OECD) nations.

This guideline recognises the difficulties in diagnosing asthma in children, particularly in the under 5s. It aims to reinforce the importance of making robust objective asthma diagnoses, checking adherence and inhaler device technique at every opportunity and routinely using Personalised Asthma Action Plans as part of a supported self-management programme.

One of the key recommendations from NRAD (Why Asthma Kills: the National Review of Asthma Deaths Report 2014) is that every NHS hospital and general practice should have a designated, named lead clinician for Asthma services, responsible for formal training in the management of acute asthma and routine care. In general practice, it is essential to support the whole practice team to improve the care of children with asthma through training and use of evidence based guidance.

We highly recommend these guidelines to all health care professionals across Bedfordshire to reduce local variation and improve the quality of paediatric asthma care locally.

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Luton Clinical Commissioning Group

Dr Hetal Talati  
Clinical Director Children & Primary Care Development  
Luton Clinical Commissioning Group
SECTION A WHEEZE AND SUSPECTED ASTHMA IN CHILDREN UNDER 5 YEARS

A1 INITIAL ASSESSMENT IN CHILDREN AGED UNDER 5 YEARS\textsuperscript{1,2,3}

The diagnosis of asthma in children is based on the recognition of a characteristic pattern of respiratory symptoms, signs and test results and the absence of any alternative explanation for these. It can be difficult to diagnose and confirm asthma in very young children.

In children under 5 years, it is important to differentiate between viral induced wheeze, other causes of wheeze and asthma. Nearly one third of pre-school children will wheeze on at least one occasion when they have a cold. Most children with viral induced wheeze will stop wheezing when they get older and will not develop asthma. After clinical assessment treat episodes of wheeze according to the most severe feature. Reassure and advise parents/carers and supplement verbal instructions with written information or discharge plans.

For children under 5 with suspected asthma, treat symptoms based on observation and clinical judgement and review the child on a regular basis. Use code ‘suspected asthma’ and advise parents/carers and provide supplementary written information. Asthma diagnosis should be confirmed when the child is able to undergo objective testing.

A2 CLINICAL ASSESSMENT IN CHILDREN AGED UNDER 5 YEARS

\begin{table}[h]
\centering
\begin{tabular}{|c|p{10cm}|p{10cm}|}
\hline
\multicolumn{3}{|c|}{Child aged under 5 years presenting with symptoms of asthma:} \\
\multicolumn{3}{|c|}{Wheeze, cough, breathlessness, chest tightness} \\
\hline
\hline
\textbf{Clinical history} & Specifically check for: & Look for: \\
& Wheeze, cough or breathlessness and any daily or seasonal variation in these symptoms & Recurrent episodes of symptoms \\
& Any triggers that make symptoms worse & Absence of symptoms of alternative diagnosis \\
& A personal or family history of atopy & Recorded observations of wheeze \\
\hline
\textbf{Physical examination} & Examine child to identify expiratory polyphonic wheeze and signs of other causes of respiratory symptoms. Use clinical assessment tool for children aged under 5 years. & Do not offer following diagnostic tests: \\
& & Skin prick tests to aeroallergens \\
& & Serum IgE \\
\hline
\end{tabular}
\caption{Structured clinical assessment}
\end{table}

Do treat symptoms based on observation and clinical judgement and review the child on a regular basis. Options are watchful waiting or monitored initiation of treatment. For acute management see section A3–A5. Consider maintenance treatment if recurrent episodes of multiple trigger wheeze/atopy - see section A6.

Factors associated with developing persistent asthma are:

\textbf{Age at presentation} The natural history of wheeze is dependent on age at first presentation. In general, the earlier the onset of wheeze, the better the prognosis.

\textbf{Severity and frequency of previous wheezing episodes} Frequent or severe episodes of wheezing in childhood are associated with recurrent wheeze that persists into adolescence.

\textbf{Coexistence of atopic disease} A history of other atopic conditions such as eczema and rhinitis increases the probability.

\textbf{Family history of atopy} A family history of atopy is the most clearly defined risk factor for atopy and asthma in children.

\textit{Parents and parents-to-be should be advised of the many adverse effects which smoking has on their children including increased wheezing in infancy and increased risk of persistent asthma}
### A3 ACUTE WHEEZE: PRIMARY CARE CLINICAL ASSESSMENT TOOL FOR CHILDREN AGED UNDER 5 YEARS

#### History
- Breathless/wheeze/cough
- Viral or allergic trigger
- Previous episodes or interval symptoms
- FH or personal history asthma, eczema or atopy
- Current/previous treatment and response

#### Clinical Assessment

<table>
<thead>
<tr>
<th>Examination</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Feeding and speech</td>
<td></td>
</tr>
<tr>
<td>• Respiratory rate</td>
<td></td>
</tr>
<tr>
<td>• Chest wall expansion and movement</td>
<td></td>
</tr>
<tr>
<td>• Use of accessory muscles</td>
<td></td>
</tr>
<tr>
<td>• Auscultation of chest – reduced air entry, wheeze, prolonged expiration</td>
<td></td>
</tr>
<tr>
<td>• Oxygen saturation (Sats)</td>
<td></td>
</tr>
</tbody>
</table>

Consider other diagnosis:
- Pneumonia
- Bronchiolitis in under 2 years
- Croup
- Foreign body
- Severe anaphylaxis

#### Moderate
- Able to feed or talk
- Moderate use of accessory muscles
- Audible wheeze
- Sats≥92% in air
  - <1 year: RR≤30/min HR 95-110/min
  - 1-2 years: RR≤35/min HR 100-150/min
  - 2-5 years: RR≤40/min HR 110-150/min

- Give salbutamol 2-10 puffs via spacer + facemask (one puff every 30-60 seconds)
- Increase by 2 puffs every 2 minutes up to 10 puffs according to response
- Assess response and repeat if necessary
- Consider stat dose soluble prednisolone (if special factors such as previous high dependency episode)

#### Severe
- Previous attack within last 2 weeks
- Too breathless to feed or talk
- Marked use of accessory muscles and wheeze
- Sats <92% in air
  - <1 year: RR>40/min HR >160/min
  - 1-2 years: RR>35/min HR >150/min
  - 2-5 years: RR>30/min HR >140/min

- Call 999
  - Give high flow oxygen via fitted mask aim for Sats 94-98%
  - Give nebulised salbutamol 2.5mg (using 6L-8L oxygen if available)
  - Reassess and repeat at 20-30 minute intervals or as necessary
  - Give stat dose soluble prednisolone 10mg for <2 yr, 20mg for 2-5 yr
  - Consider nebulised ipratropium bromide 250mcg (using 6L-8L oxygen if available). Repeat every 20-30 minutes

#### Life Threatening
- Sats <92% in air plus any of the following:
  - Silent chest
  - Poor respiratory effort
  - Exhausted and unresponsive
  - Coma/agitation
  - Cyanosis
  - Bradycardia
  - Apnoea
  - Respiratory arrest

- Call 999
  - Commence resuscitation
  - Give high flow oxygen via fitted mask aim for Sats 94-98%
  - Give back to back nebulised salbutamol 2.5mg (using 6L-8L oxygen if available)
  - Give stat dose soluble prednisolone 10mg for <2 yr, 20mg for 2-5 yr
  - Give nebulised ipratropium bromide 250mcg (using 6L-8L oxygen if available)
  - Repeat every 20-30 minutes

#### Treat according to most severe feature

<table>
<thead>
<tr>
<th>Moderate</th>
<th>Severe</th>
<th>Life Threatening</th>
</tr>
</thead>
<tbody>
<tr>
<td>No – treat as below</td>
<td>Yes - seek expert help</td>
<td></td>
</tr>
</tbody>
</table>

#### Good response
- Reassess within 1 hour
- Subtle or no use of accessory muscles
- Minimum wheeze
- Sats>92% in air

#### Poor response
- Reconsider diagnosis or treat as severe or life threatening episode

#### Ambulance transfer pathway
- Continue to administer oxygen driven nebulised salbutamol if symptoms severe whilst transferring the child to ED

#### Discharge from hospital and GP
- Patients must be stable, have minimal recession with Sats>94% and manage 3-4 hourly between doses of inhaler
- Discharge on salbutamol via spacer + mask. Complete a 3 day course of prednisolone 10mg or 2mg/kg if appropriate
- Give acute wheeze discharge plan (appendix 1) and arrange a GP review within 48 hours

Full Respiratory Assessment in 7-14 days in Primary Care
**A4 Acute Wheeze: Secondary Care Clinical Assessment Tool for Children Aged Under 5 Years**

### History
- Breathless/wheeze/cough
- Viral or allergic trigger
- Previous episodes or interval symptoms
- FH or personal history asthma, eczema or atopy
- Current/previous treatment and response

### Clinical Assessment

<table>
<thead>
<tr>
<th>History</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Breathless/wheeze/cough</td>
<td>• Feeding and speech</td>
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<tr>
<td>• Viral or allergic trigger</td>
<td>• Respiratory rate</td>
</tr>
<tr>
<td>• Previous episodes or interval symptoms</td>
<td>• Chest wall expansion and movement</td>
</tr>
<tr>
<td>• FH or personal history asthma, eczema or atopy</td>
<td>• Use of accessory muscles</td>
</tr>
<tr>
<td>• Current/previous treatment and response</td>
<td>• Auscultation of chest – reduced air entry, wheeze, prolonged expiration</td>
</tr>
</tbody>
</table>

#### Consider other diagnosis:
- Pneumonia
- Bronchiolitis in under 2 years
- Croup
- Foreign body
- Severe anaphylaxis

#### Treat according to most severe feature

**Moderate**
- Able to feed or talk
- Moderate use of accessory muscles
- Audible wheeze
- Sats≥92% in air
  - <1 year: RR≤40/min HR 110-160/min
  - 1-2 years: RR≤35/min HR 100-150/min
  - 2-5 years: RR≤30/min HR 95-140/min

- Give salbutamol 2-10 puffs via spacer + facemask (one puff at a time)
- Increase by 2 puffs every 2 minutes up to 10 puffs according to response
- Assess response and repeat if necessary
- Consider stat dose soluble prednisolone (if special factors such as previous high dependency episode)

**Severe**
- Previous attack within last 2 weeks
- Too breathless to feed or talk
- Marked use of accessory muscles and wheeze
- Sats <92% in air
  - <1 year: RR<40/min HR >160/min
  - 1-2 years: RR<35/min HR >150/min
  - 2-5 years: RR<30/min HR >140/min

- Give high flow Oxygen via fitted mask
- Aim for Sats 94-98%
- Give nebulised salbutamol 2.5mg and ipratropium 250mcg (using 6L-8L oxygen)
- Reassess and repeat at 20-30 minute intervals or as necessary
- Consider magnesium sulfate nebulus
- Give stat dose soluble prednisolone 10mg for <2yr, 20mg for 2-5yr
- Repeat dose if patient vomits, or consider IV Hydrocortisone 4mg/Kg
- Poor response see life-threatening
- Discuss with senior clinician or Paediatrician or PICU team

**Life Threatening**
- Sats <92% in air plus any of the following:
  - Silent chest
  - Poor respiratory effort
  - Exhausted and unresponsive
  - Coma/agitation
  - Cyanosis
  - Bradycardia
  - Apnoea
  - Respiratory arrest

- Commence resuscitation ABC
- Give high flow Oxygen via mask

#### PAEDIATRIC CARDIAC ARREST CALL
- Give back to back nebulised salbutamol 2.5mg and ipratropium 250mcg (using 6L-8L oxygen)
- Give stat dose soluble prednisolone 10mg for <2yr, 20mg for 2-5yr
- Repeat dose if patient vomits, or consider IV Hydrocortisone 4mg/Kg
- Consider nebulised magnesium sulfate

#### Poor Response
- Consider IV salbutamol and/or Magnesium and/or aminophylline
- Consider Chest X-Ray
- Arrange PICU/ITU admission

### Discharge from hospital and GP
- Patients must be stable, have minimal recession with Sats>94% and manage 3-4hourly between doses of inhaler.
- Discharge on salbutamol via spacer + mask. Complete a 3 day course of prednisolone 10-20mg or 2mg/kg if appropriate
- Give acute wheeze discharge plan ([appendix 1](#)) and arrange a follow-up GP/asthma nurse review within 48 hours

### Full Respiratory Assessment in 7-14 days in Primary Care
Table 1 Community Children’s Nursing Team

Luton and South Bedfordshire
Children’s Community Nursing Team 0333 405 0079

Luton
Children’s Community Asthma Nurse - 0333 405 0079
Children’s Rapid Response Team - 07966025787

Bedford and North Bedfordshire
Children’s Community Nursing Team 01234 310103

Table 2 Secondary Care Referrals

Luton & Dunstable Hospital
Switchboard 01582 491166: Paediatric Registrar bleep 733
GP Urgent Connect (Monday-Friday 9-5pm)
01865 922008 for referrals and advice

Bedford General Hospital
Switchboard 01234 355122: Paediatric Registrar bleep 208

Table 3 Normal Paediatric Values

Respiratory Rate at Rest:
- 0-1 years: 30-40 breaths/min
- 1-2 years: 25-35 breaths/min
- 2-5 years: 25-30 breaths/min

Heart Rate:
- 0-1 years: 110-160 bpm
- 1-2 years: 100-150 bpm
- 2-5 years: 95-140 bpm

Systolic Blood Pressure:
- 0-1 years: 80-90 mmhg
- 1-2 years: 85-95 mmhg
- 2-5 years: 85-100 mmhg

Table 4 Inhalers vs Nebulisers

- For moderate asthma, use an inhaler and spacer.
- Indications for nebulisers:
  - Low saturations <92%
  - Unable to use inhaler and spacer (not compliant)
  - Significantly low Sats despite inhaler and spacer use
  - Severe and life-threatening respiratory distress
  - Nebulisers are generally not recommended for home use

Nebulised drug doses

<table>
<thead>
<tr>
<th>Drug</th>
<th>Under 5 years</th>
<th>5 years and over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salbutamol</td>
<td>2.5mg</td>
<td>5mg</td>
</tr>
<tr>
<td>Ipratropium</td>
<td>250mcg</td>
<td>500mcg</td>
</tr>
</tbody>
</table>

Table 5 Prednisolone

- Give prednisolone by mouth
- Three days is usually sufficient but can be increased/tailored to the number of days necessary to bring about recovery
- Weaning is unnecessary unless the course of steroids exceeds 14 days.

Child under 12 years: 1–2 mg/kg once daily (max. per dose 40 mg) for up to 3 days, longer if necessary. If child has been taking oral steroid for more than a few days give 2 mg/kg once daily (max. per dose 60 mg) for up to 3 days, longer if necessary.

Child 12–17 years: 40–50 mg daily for at least 5 days

Give hydrocortisone IV 4mg/kg if vomiting
**A6 PRIMARY CARE PHARMACOLOGICAL TREATMENT PATHWAY FOR CHILDREN AGED UNDER 5 WITH SUSPECTED ASTHMA**

Evaluate: symptom control, inhaler technique and adherence to treatments at all stages.  
Think TTT – adherence with Therapy, inhaler Technique, elimination of Triggers

<table>
<thead>
<tr>
<th>Offer a SABA as reliever</th>
<th>Trial ICS</th>
<th>Review ICS at 8 weeks and Monitor</th>
<th>Add-on therapy</th>
</tr>
</thead>
</table>
| **Ventolin/ Salbutamol inhaler via spacer** | Consider 8 week trial of paediatric moderate dose ICS* in children with symptoms indicating need for maintenance therapy  
  e.g. asthma symptoms >3 times/week  
  Suspected asthma uncontrolled with SABA  
  Waking at night with asthma symptoms | If symptoms not resolved consider alternative diagnosis  
  If symptoms resolved STOP ICS and monitor  
  If symptoms reoccur within 4 weeks of stopping ICS start paediatric low dose ICS* | If symptoms not resolved with paediatric low dose ICS*  
  Consider adding oral LTRA |
| **Clenil Modulite® 100mcg 1-2 puffs bd via spacer** | **Clenil Modulite® 50mcg 1 puff bd or Clenil Modulite 100mcg 1 puff bd via spacer** | If symptoms reoccur after 8 weeks repeat 8 week trial | Montelukast  
  6 months-5 years:  
  4mg daily in the evening (granules or chewable tablet) |

**Inhaler Devices**

- A pressurised metered dose inhaler and spacer (with face mask if needed) is the preferred delivery device.
- Prescribe inhalers only after the patient, parents or carers have been trained in their use and demonstrate adequate inhaler technique.
- Choice of device and spacer should be governed by specific need, good compliance and then by cost.
- Spacers should be cleaned once a month with mild detergent and allowed to air dry and replaced every 6 to 12 months.

*Paediatric low dose ICS: less than or equal to 200micrograms total daily dose of budesonide/beclomethasone dipropionate
Paediatric moderate dose ICS: more than 200micrograms to 400micrograms total daily dose of budesonide/beclomethasone dipropionate (see section D2)*

**Refer**

If symptoms not resolved with paediatric low dose plus LTRA

Or

Red Flags:
- Symptoms since birth
- Failure to thrive
- Unexplained clinical findings (e.g. focal signs, abnormal voice or cry, dysphagia, inspiratory stridor, murmur, clubbing)
- Excessive vomiting or possetting
- Severe upper respiratory tract infection
- Persistent wet or productive cough
- Family history of unusual chest disease
- Nasal polyps
SECTION B ASTHMA DIAGNOSIS AND MANAGEMENT IN CHILDREN AGED 5–16 YEARS

B1 INITIAL CLINICAL ASSESSMENT IN CHILDREN AGED 5–16 YEARS

The diagnosis of asthma in children is based on the recognition of a characteristic pattern of respiratory symptoms, signs and test results and the absence of any alternative explanation for these. Objective tests need to be used in conjunction with a structured clinical assessment to assess the probability of asthma.

It can be difficult to confirm asthma in young children. Use code ‘suspected asthma’ and advise parents/carers. Asthma diagnosis should be confirmed when the child is able to undergo objective testing.

B2 ALGORITHM FOR INITIAL CLINICAL ASSESSMENT IN CHILDREN AGED 5-16 YEARS

<table>
<thead>
<tr>
<th>Child aged 5-16 years presenting with symptoms of asthma:</th>
<th>Wheeze, cough, breathlessness, chest tightness</th>
</tr>
</thead>
</table>

**Structured clinical assessment**

<table>
<thead>
<tr>
<th>Clinical history</th>
<th>Specifically check for: Wheeze, cough or breathlessness and any daily or seasonal variation in these symptoms Any triggers that make symptoms worse A personal or family history of atopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Look for: Recurrent episodes of symptoms Absence of symptoms of alternative diagnosis Recorded observations of wheeze</td>
<td></td>
</tr>
<tr>
<td>Physical examination</td>
<td>Examine child to identify expiratory polyphonic wheeze and signs of other causes of respiratory symptoms</td>
</tr>
</tbody>
</table>

Initial treatment and objective tests for acute symptoms at presentation
Treat people immediately if they are acutely unwell at presentation (see section C1-3)

Do not offer following diagnostic tests:
Skin prick tests to aero allergens Serum IgE Blood eosinophil count

Factors associated with developing persistent asthma are:

**Age at presentation** The natural history of wheeze is dependent on age at first presentation. In general, the earlier the onset of wheeze, the better the prognosis.

**Severity and frequency of previous wheezing episodes** Frequent or severe episodes of wheezing in childhood are associated with recurrent wheeze that persists into adolescence.

**Coexistence of atopic disease** A history of other atopic conditions such as eczema and rhinitis increases the probability

**Family history of atopy** A family history of atopy is the most clearly defined risk factor for atopy and asthma in children. The strongest association is with maternal atopy.

**Abnormal lung function** Persistent reductions in baseline airway function and increased airway responsiveness during childhood are associated with having asthma in adult life.

*Parents and parents-to-be should be advised of the many adverse effects which smoking has on their children including increased wheezing in infancy and increased risk of persistent asthma*
B3 OBJECTIVE TESTS TO SUPPORT ASTHMA DIAGNOSIS

NICE recommends that the following objective tests are performed in children to confirm diagnosis of asthma.

**Spirometry** - Offer spirometry to young people and children aged 5 and over if a diagnosis of asthma is being considered. Regard a forced expiratory volume in 1 second/forced vital capacity (FEV1/FVC) ratio of less than 70% (or below the lower limit of normal if this value is available) as a positive test for obstructive airway disease (obstructive spirometry). If the child cannot reliably perform spirometry, consider other objective test as stated below, treat based on history and clinical judgement and review ability to perform tests every 6-12 months.

**Bronchodilator reversibility** - Consider a BDR test in children and young people (aged 5 to 16) with obstructive spirometry (FEV1/FVC ratio less than 70%). Regard an improvement in FEV1 of 12% or more as a positive test.

**Fractional exhaled nitric oxide (FeNO)** is an objective test for asthma recommended by NICE for patients > 5 years of age due to its high specificity and high selectivity. It is currently being considered locally. It is not yet available in primary care. The introduction of FeNO testing is likely to be a phased implementation due to the investment and training required. Primary care services have been advised by NICE to implement what they can of the NG80 guideline using currently available diagnostic tools until the infrastructure is in place.

**Peak Flow Variability**: Peak expiratory flow (PEF) is widely available and simple to use. Issue a peak flow meter to all children. Teach them how to use it proficiently record using chart or diary. The number of readings and degree of patient coaching affects the values. Although normal ranges are available, these do not encompass ethnic diversity. Changes in PEF are more meaningful than absolute values. Do not use peak flow variability alone to diagnose asthma.

Consider referral for specialist assessment if a child repeatedly cannot perform objective tests and is not responding to treatment.

Table Supporting Asthma Diagnosis in Children

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spirometry</strong></td>
<td>FEV1/FVC ratio &lt;70%</td>
</tr>
<tr>
<td><strong>Bronchodilator Reversibility</strong></td>
<td>Improvement in FEV1 of 12% or more</td>
</tr>
<tr>
<td><strong>FeNO</strong></td>
<td>FeNO level of 35ppb or more</td>
</tr>
<tr>
<td><strong>Peak Flow Variability</strong></td>
<td>Peak Expiratory Flow Variability &gt;20% over a 2-4 week period</td>
</tr>
</tbody>
</table>

See NICE algorithm (Section B4) on page 8 for further information.
B4 ALGORITHM FOR OBJECTIVE TESTS FOR ASTHMA IN CHILDREN AGED 5-16 YEARS²

Algorithm B Objective tests for asthma in children and young people aged 5 to 16

---

**Order of tests**
- Perform spirometry in children and young people with symptoms of asthma
- Consider BDR test if spirometry shows an obstruction

**If a child is unable to perform objective tests:**
- Treat based on observation and clinical judgement
- Try doing the tests again every 6 to 12 months

**If diagnostic uncertainty remains after spirometry and BDR, consider FeNO**

**If diagnostic uncertainty remains after FeNO, monitor peak flow variability for 2 to 4 weeks**

---

**Interpretation of test results for children and young people aged 5 to 16 with symptoms suggestive of asthma**

- Does spirometry show an obstruction?
  - No
    - Are FeNO levels 35 ppb or more?
      - No
        - Is there variability in peak flow readings?
          - No: Consider alternative diagnoses and referral for specialist assessment
          - Yes: Refer for specialist assessment
      - Yes: Consider asthma and review diagnosis after treatment
  - Yes: Diagnose with asthma

- Is there reversible airflow obstruction?
  - Yes: Diagnose with asthma
  - No: Are FeNO levels 35 ppb or more?
    - No: Is there variability in peak flow readings?
      - No: DIY
      - Yes: Refer for specialist assessment
    - Yes: Consider asthma and review diagnosis after treatment

---

**Positive test thresholds:**
- Obstructive spirometry: FEV1/FVC ratio less than 70% (or below the lower limit of normal if available)
- FeNO: 35 ppb or more
- BDR: improvement in FEV1 of 12% or more
- Peak flow variability: variability over 20%

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**B5 Pharmacological Management of Asthma in Children aged 5 – 16 years**

The primary objective of treatment is to achieve complete control of asthma, defined as:

- No daytime symptoms.
- No night-time awakening due to asthma.
- No need for rescue medicine.
- No asthma attacks.
- No limitations on activity including exercise.
- Normal lung function (in practical terms FEV1 and/or PEF >80% predicted or best).
- Minimal side effects from medication.

**Key principles**

- Start treatment at the step most appropriate to the initial severity of the patient’s asthma.
- Advise the patient, parents or carers to monitor symptoms and return to the clinic if no improvement.
- Check concordance, adherence and reconsider diagnosis if response to treatment is unexpectedly poor.
- Aim of treatment is to achieve early control and maintain it at the lowest dose required, consider stepping up or down accordingly.
- Increased reliever usage is a sign of poor control. Step-up if ordering more than 2 short acting beta agonist inhalers per year (4 maximum if require spare inhalers).
- Use of more than 12 short acting bronchodilators over a 12 month period should be urgently assessed and measures taken to improve asthma control.
- Provide patients, parents or carers with a self-management plan which includes a personalised patient action plan supported by a regular professional review at least annually.

**Devices**

- In addition to considering therapeutic need, prescribers should also take in to account the ability to maintain and develop effective technique, lifestyle, portability, convenience and preference.
- A pressurised metered dose inhaler and spacer is the recommended first-line delivery device for inhaled medication.
- Prescribe inhalers only after the patient has been trained in their use and demonstrates adequate inhaler technique.
- Only if more than one device is appropriate for the patient then the device with the lowest overall cost should be chosen.
- Spacers should be cleaned once a month with mild detergent and allowed to air dry and replaced every 6 to 12 months.
- Click link to Luton CCG inhaler training videos, Beds CCG inhaler videos
- Click link to Asthma UK Help your child use their inhaler

**NRAD recommendations**

- Inhaler technique should be routinely undertaken and documented
- Urgent review for all with more than 12 SABA inhalers in previous 12 months
- Patients should not be prescribed LABA alone
**B6 PRIMARY CARE PHARMACOLOGICAL TREATMENT PATHWAY FOR CHILDREN AGED 5-16 YEARS WITH ASTHMA**

Before initiating new treatment or stepping up check:
- Adherence with Therapy
- Inhaler Technique
- Elimination of Trigger factors

<table>
<thead>
<tr>
<th>STEPPING UP/STEPPING DOWN</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Regularly review the need for treatment. Treatment should be at the minimum level required.</td>
</tr>
<tr>
<td>- Stepping down should be considered when control is stable for at least 3 months to prevent over treating.</td>
</tr>
<tr>
<td>- Stepping down inhaled steroids should be slow, 25 – 50% dose reduction every 3 months. After stepping down, review in 3 months</td>
</tr>
<tr>
<td>- Advise the parents or carers to return to clinic with the patient before 3 months if symptoms return after stepping down.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SABA as reliever</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Offer ICS</strong></td>
</tr>
<tr>
<td>Offer a paediatric low dose of an ICS* as the first-line maintenance therapy</td>
</tr>
<tr>
<td>e.g. Clenil Modulite® 50 1-2 puffs bd</td>
</tr>
<tr>
<td>• for symptoms at presentation that clearly indicate the need for maintenance therapy (for example, asthma-related symptoms 3 times a week or more, or causing waking at night)</td>
</tr>
<tr>
<td>or</td>
</tr>
<tr>
<td>• for asthma that is uncontrolled with a SABA alone</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LTRA plus ICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add montelukast in addition to the ICS and review the response to treatment in 4 to 8 weeks.</td>
</tr>
<tr>
<td>Child 5-14 years montelukast 5mg od at night (chewable tablet)</td>
</tr>
<tr>
<td>Adolescents 15 years and over montelukast 10mg od at night (tablet)</td>
</tr>
<tr>
<td><strong>Check inhaler adherence/technique and triggers and discuss benefits and potential side-effects of treatment</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ICS/LABA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop the LTRA if ineffective after 6-8 weeks</td>
</tr>
<tr>
<td>Start a LABA in combination with the paediatric low dose ICS*.</td>
</tr>
<tr>
<td>Use combination inhaler based on ability of child and preference</td>
</tr>
<tr>
<td>Eg Seretide 50® 1 puff bd</td>
</tr>
<tr>
<td>Consider MART regimen in children over 12 years who can understand and comply with MART regimen.</td>
</tr>
<tr>
<td><strong>Check inhaler adherence/technique and triggers and discuss benefits and potential side-effects of treatment</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Consider Increasing ICS dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase the ICS to a paediatric moderate dose* (either continuing on a MART regimen or changing to a fixed-dose of an ICS and a LABA, with a SABA as a reliever therapy).</td>
</tr>
<tr>
<td><strong>Check inhaler adherence/technique and triggers and discuss benefits and potential side-effects of treatment</strong></td>
</tr>
</tbody>
</table>

| Consider referring to specialist if child cannot perform objective tests and is not responding to treatment |
| Add Referral |
| Seek advice from a healthcare professional with expertise in asthma and consider either: |
| Increasing the ICS dose to paediatric high dose (only as part of a fixed dose regimen, with a SABA used as reliever) OR |
| a trial of an additional drug (eg theophylline) |

---

*Daily Paediatric ICS Doses for Children/young people ≤16 years (see section D2)*

<table>
<thead>
<tr>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 200micrograms budesonide or equivalent per day</td>
<td>&gt;200 to 400 micrograms budesonide or equivalent per day</td>
<td>&gt;400 micrograms budesonide or equivalent per day</td>
</tr>
</tbody>
</table>
**B7 Preferred Inhalers in Primary Care**

Prescribe by brand and inhaler type. Generic prescribing of inhalers should be avoided as this might lead to people with asthma being given an unfamiliar inhaler device which they are not able to use properly.

Prescribing mixed inhaler types may cause confusion and lead to increased errors in use. Using the same type of device to deliver preventer and reliever treatments may improve outcomes. Refer to SPC and BNF for further information on licensed doses in specific age ranges.

<table>
<thead>
<tr>
<th>Type of Inhaler</th>
<th>SABA Reliever</th>
<th>ICS paediatric low dose* ≤200mcg beclometasone dipropionate/budesonide</th>
<th>ICS/LABA paediatric low dose* ≤200mcg beclometasone dipropionate/budesonide</th>
<th>ICS/LABA paediatric moderate dose* &gt;200 to 400mcg beclometasone dipropionate/budesonide</th>
<th>ICS/LABA paediatric high dose* &gt;400mcg beclometasone dipropionate/budesonide</th>
</tr>
</thead>
<tbody>
<tr>
<td>pMDI pressurised Metered Dose Inhaler</td>
<td>Salbutamol Ventolin® Evohaler 100mcg With spacer</td>
<td>Clenil® Modulite 50mcg inhaler 1 or 2p bd</td>
<td>From 4 yrs Seretide® (pMDI + spacer) 50mcg/25mcg 1 puff bd</td>
<td>From 4 years Seretide® (pMDI+ spacer) 50mcg/25mcg 2puffs bd</td>
<td>Secondary care</td>
</tr>
<tr>
<td>DPI Dry Powder inhaler</td>
<td>Salbutamol Easyhaler® Salbutamol 100mcg</td>
<td>Pulmicort® Turbohaler 100mcg 1 puff bd</td>
<td>From 6 yrs Symbicort® Turbohaler 100mcg/6mcg 1 puff bd</td>
<td>From 4 yrs Seretide® Accuhaler 100mcg/50mcg 1 puff bd</td>
<td></td>
</tr>
<tr>
<td>MART Regimen Maintenance and Reliever Therapy</td>
<td></td>
<td></td>
<td></td>
<td>From 6 years Symbicort® Turbohaler 100mcg/6mcg 2 puffs bd</td>
<td></td>
</tr>
</tbody>
</table>

*MART Regime for suitable patients (12 years and older): Symbicort 100/6 2 puffs per day, either as one 1 puff bd or 2 puffs in either the morning or evening. 1 additional inhalation as needed in response to symptoms. If symptoms persist after a few minutes, an additional inhalation should be taken. Max 8 puffs/24 hours.

(*see section D2 for additional information on ICS doses)
**B8 Monitoring in children in primary care**

- Conduct a routine clinical review at least annually.
- When assessing asthma control ask closed questions.
- Monitor and record:
  - Symptom score, e.g. Children’s Asthma Control Test, Asthma Control Questionnaire,
  - asthma attacks,
  - oral corticosteroid use,
  - time off school,
  - inhaler technique, adherence,
  - possession of and adherence to a self-management plan,
  - exposure to tobacco smoke,
  - growth (height and weight centile) at least annually.

**B9 Asthma symptom control tools for children**

In children, assessment of asthma symptom control is based on symptoms, limitation of activities and use of rescue medication.

Careful review of the impact of asthma on a child’s daily activities, including sports, play and social life is important. Many children with poorly controlled asthma avoid strenuous exercise so their asthma appears well controlled. This may lead to poor fitness and a higher risk of obesity.

Children vary considerably in the degree of airflow limitation observed before they complain of dyspnoea or use their reliever therapy, and marked reduction in lung function is often seen before it is recognised by parents. Parents may report irritability, tiredness and changes with mood in their child as the main problems when the child’s asthma is not well controlled. Parents may have a longer period of recall than children, who may recall only the last few days; therefore it is important to include both the parent’s and child’s information when the level of symptom controlled is being assessed. Table B10 provides more detail about assessing asthma control in children.

Several numeric asthma control scores have been developed for children. These include:

- Childhood Asthma Control Test (c-ACT) with separate sections for parent and child to complete (see appendix 3a)
- Asthma Control Test for older children and adolescents (see appendix 3b)

---

**NRAD recommendation (see appendix 5 for further information)**

<table>
<thead>
<tr>
<th>Patient self-management should be encouraged to reflect their known triggers, eg increasing medication before the start of the hay-fever season, avoiding non-steroidal anti-inflammatory drugs or by the early use of oral corticosteroids with viral- or allergic-induced exacerbations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A history of smoking and/or exposure to second-hand smoke should be documented in the medical records of all people with asthma. Current smokers should be offered referral to a smoking-cessation service.</td>
</tr>
<tr>
<td>Parents and children, and those who care for or teach them, should be educated about managing asthma. This should include emphasis on ‘how’, ‘why’ and ‘when’ they should use their asthma medications, recognising when asthma is not controlled and knowing when and how to seek emergency advice.</td>
</tr>
<tr>
<td>Efforts to minimise exposure to allergens and second-hand smoke should be emphasised, especially in young people with asthma.</td>
</tr>
</tbody>
</table>
### Asthma symptom control

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day symptoms</td>
<td>How often does the child have cough, wheeze, dyspnoea or heavy breathing (number of times per week or day? What triggers the symptoms? How are they handled?</td>
</tr>
<tr>
<td>Night symptoms</td>
<td>Cough, awakenings, tiredness during the day? (if the only symptom is cough, consider rhinitis or gastroesophageal reflux disease)</td>
</tr>
<tr>
<td>Reliever use</td>
<td>How often is reliever medication used? (Check the date on inhaler or last prescription). Distinguish between pre-exercise use (sports) and use for relief of symptoms.</td>
</tr>
<tr>
<td>Level of activity</td>
<td>What sports/hobbies/interests does the child have, at school and in their spare time? How does the child’s level of activity compare with their peers or siblings? Try to get an accurate picture of the child’s day from the child without interruption from the parent/carer?</td>
</tr>
</tbody>
</table>

### Future risk factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exacerbations</td>
<td>How do viral infections affect the child’s asthma? Do symptoms interfere with school or sports? How long do the symptoms last? How many episodes have occurred since their last medical review? Any urgent doctor/emergency department visits? Is there a written action plan?</td>
</tr>
<tr>
<td>Lung function</td>
<td>Check curves and technique. Main focus is on FEV₁ and FEV₁/FVC ratio. Plot these values as percent predicted to see trends over time</td>
</tr>
<tr>
<td>Side-effects</td>
<td>Check the child’s height at least yearly, as poor controlled asthma can affect growth and growth velocity may be lower in the first 1-2 years of ICS treatment. Ask about frequency and dose of ICS and OCS.</td>
</tr>
</tbody>
</table>

### Treatment factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhaler technique</td>
<td>Ask the child to show how they use their inhaler. Compare with a device specific checklist.</td>
</tr>
<tr>
<td>Adherence</td>
<td>On how many days does the child use their preventer in a week (e.g. 0, 2, 4, 7 days)? Is it easier to remember to use it in the morning or evening? Where is inhaler kept – is it in plain view to reduce forgetting? Check date on inhaler?</td>
</tr>
<tr>
<td>Goals/concerns</td>
<td>Does the child or their parent/carer have any concerns about their asthma (e.g fear of medication, side-effects, interference with activity)? What are the child’s/parent’s/carer’s goals for asthma treatment?</td>
</tr>
</tbody>
</table>

### Co-morbidities

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergic rhinitis</td>
<td>Itching, sneezing, nasal obstruction? Can the child breathe through their nose? What medication are being taken for nasal symptoms?</td>
</tr>
<tr>
<td>Eczema</td>
<td>Sleep disturbance, topical corticosteroids?</td>
</tr>
<tr>
<td>Food allergy</td>
<td>Is the child allergic to any foods? A confirmed food allergy is a risk factor for asthma related deaths.</td>
</tr>
<tr>
<td>Obesity</td>
<td>Check age-adjusted BMI. Ask about diet and physical activity.</td>
</tr>
</tbody>
</table>
**B11 SUPPORTED SELF-MANAGEMENT**

- All people with asthma (and/or their parents or carers) should be offered self-management education which should include a written personalised asthma action plan (PAAP) and be supported by regular professional review.

- Written PAAPs are crucial components of effective self-management education. Written personalised asthma action plans based on symptoms are generally preferable for children (for example, those for children from Asthma UK, available at www.asthma.org.uk appendix 2a and appendix 2b).

- Strategies that have been used to support effective self-management include:
  - the use of proactive triggers to ensure routine reviews
  - support of community pharmacists
  - telephone calls to provide ongoing support and advice
  - involvement of community workers to support clinical teams in deprived and/or ethnic minority communities

**B12 NON-PHARMACOLOGICAL MANAGEMENT**

- Maternal food allergen avoidance during pregnancy and lactation is not recommended as a strategy for preventing childhood asthma. Breastfeeding should be encouraged for its many benefits, including a potential protective effect in relation to early asthma.

- Parents and parents-to-be should be advised of the many adverse effects which smoking has on their children including increased wheezing in infancy and increased risk of persistent asthma.

- Weight-loss interventions (including dietary and exercise-based programmes) can be considered for overweight and obese children with asthma to improve asthma control.

**B13 ASTHMA IN ADOLESCENTS**

Adolescents are defined by World Health Organisation (WHO) as young people between the ages 10 and 19 years of age. During consultations, the adolescent should be seen separately from parent/carer such as smoking, adherence and mental health can be discussed privately and agreed as well as exploring health beliefs such as complementary therapies.

Medication regimes should be tailored to the adolescent’s needs and lifestyle, reviews should be arranged regularly so that medication regime can be adjusted for changing needs. The ACQ and ACT have been validated in adolescents with asthma.

Adolescents may be concerned about the impact of treatment on their physical and sexual capabilities as well as their entry into the workplace. These aspects should be discussed with the patient as appropriate. As well as checking inhaler technique it is important to enquire about factors that may affect inhaler device use and adherence in real life settings, such as school.

**B14 TRANSITION TO ADULT SERVICES**

Transition is the process of moving from children’s to adults’ services; it refers to the full process including initial planning, the actual transfer between services, and support throughout planning early for young people in out-of-authority placements. A good transition plan gives the young person plenty of time to prepare before they eventually transfer. A formal transition process is recommended for young people who see a consultant paediatrician in an asthma clinic. Transition planning should involve young people, build independence and involve parents and carers. The majority of children with asthma are managed solely in general practice. Preparing the young person for adulthood is equally important in primary care to support them to manage their condition independently as an adult.
# Section C  Acute Asthma Management in Children Aged 5-16 Years

## C1 Acute Asthma Management: Community Clinical Assessment Tool for Children Aged 5-16 Years

### 1. Assessment by appropriate healthcare professional (doctor/nurse)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturation</td>
<td>Consider other diagnosis if any of the following: Febrile, inspiratory stridor, excessive vomiting, breathlessness with light headedness and peripheral tingling (hyperventilation)</td>
</tr>
<tr>
<td>Auscultation of chest</td>
<td></td>
</tr>
<tr>
<td>Peak flow (if possible)</td>
<td></td>
</tr>
<tr>
<td>Use of accessory muscle</td>
<td></td>
</tr>
<tr>
<td>Breathlessness</td>
<td>Yes – it may not be asthma seek expert help</td>
</tr>
<tr>
<td>Record vital signs</td>
<td>No – Assess severity and treat as below</td>
</tr>
</tbody>
</table>

### 2. Moderate exacerbation

- **Sats >92% in air**
- **Mild to moderate use of accessory muscles**
- **Breathlessness on exertion only**
- **Moderate wheeze**
- **Peak flow >50% best/predicted**

### 3. Severe exacerbation

- **Sats <92% in air**
- **HR >125 bpm, RR >30 breaths/min**
- **Marked use of accessory muscles**
- **Too breathless to talk**
- **Marked wheeze**
- **Peak flow ≤33-50% best/predicted**

### 4. Life Threatening

- **Sats <92% in air**
- **SILENT CHEST/POOR RESPIRATORY EFFORT**
- **Exhausted and unresponsive**
- **Confusion/Coma**
- **Cyanosis**
- **Extreme tachycardia/bradycardia or arrhythmias**
- **Hypotension**
- **Peak flow ≤33% best/predicted**

### 5. If all green features and no amber or red:

- Give 10 puffs of 100mcg salbutamol MDI via spacer (tidal breathing, 1 puff to every 5 breaths)
- Reassess 20-30 minutes post intervention
- Consider giving 3 day course of prednisolone 1mg/kg (max 40mg)
- Those already receiving maintenance oral steroid give 2mg/kg (max 60mg)

### 6. Good response?

- **Subtle or no use of accessory muscles**
- **Can complete sentences**
- **Minimal wheeze**
- **Saturations >94%**

### 7. Discharge Plan

- Before discharge review overall asthma control, inhaler technique, medication and ask about smoking parent and child (if >11 yrs).
- If yes offer quit smoking support.
- Check understanding of condition and signpost to further resources
- Give asthma discharge plan [appendix 1](#)
- Advise parents to book a GP/practice nurse review within 48-72 hours.
- Complete a three day course of prednisolone

### 8. If all amber features and no red:

- Give 10 puffs of 100mcg salbutamol MDI via spacer (tidal breathing, 1 puff to every 5 breaths)
- Or 5mg salbutamol via oxygen driven nebuliser if available
- Give high flow oxygen if available
- Reassess 20 minutes post intervention
- Repeat treatment every 20 minutes if necessary
- Give 3 day course of prednisolone 1mg/kg (max 40mg). Those already receiving maintenance oral steroid give 2mg/kg (max 60mg)
- Reassess 1 hour post starting

### 9. Good response? Green features:

- **Subtle or no use of accessory muscles**
- **Can complete sentences**
- **Minimal wheeze**
- **Saturations >94%**

### 10. Refer to hospital

- **Consider ambulance +/- 999.**
- **Stay with child until ambulance arrives**
- **Contact duty paediatric registrar**
- **Continue oxygen and salbutamol**
- **Send written assessment with patient**

### 11. If any red features:

- **Dial 999**
- **Immediate medical assessment by a doctor**
- **Give high flow oxygen if available**
- **Give 5mg salbutamol and ipratropium 250mcg via oxygen driven nebuliser if available or 10 puffs of 100mcg salbutamol MDI via spacer (tidal breathing, 1 puff to every 5 breaths)**
- **Repeat treatment every 10-20 minutes if necessary**
- **Reassess 20 minutes post intervention**
- **Give soluble prednisolone 1mg/kg (max 40mg). Those already receiving maintenance oral steroid give 2mg/kg (max 60mg)**

### 12. Post hospital

- **Stay with child until ambulance arrives**
- **Contact duty paediatric registrar**
- **Continue oxygen and salbutamol**
- **Send written assessment with patient**

### Referral to Secondary Care if:

- Diagnosis unclear or in doubt
- Excessive vomiting or possetting
- Failure to thrive
- Nasal polyps
- Symptoms present from birth or perinatal lung problem
- Persistent wet or productive cough
- Family history of unusual chest disease

### Referral to Secondary Care if:

Unexpected Clinical findings eg focal signs, abnormal voice or cry, dysphagia inspiratory stridor, Failure to respond to conventional treatment (particularly inhaled corticosteroids above beclomethasone 400mcg/day or equivalent or frequent use of steroid tablets).
1. **Assessment by appropriate healthcare professional (doctor/nurse)**
   - Saturations
   - Auscultation of chest
   - Use of accessory muscles
   - Peak flow (if possible)
   - Breathlessness
   - Record vital signs

2. **Moderate**
   - Sats ≥ 92% in air
   - HR ≤ 125 bpm, RR ≤ 30 breaths/min
   - Mild to moderate use of accessory muscles
   - Breathless on exertion only
   - Moderate wheeze
   - Peak flow ≥ 50% best/predicted*

3. **Severe**
   - Sats < 92% in air
   - HR > 125 bpm, RR > 30 breaths/min
   - Marked use of accessory muscles
   - Too breathless to talk
   - Marked wheeze
   - Peak flow 33-50% best/predicted*

4. **Life Threatening**
   - Sats < 92% in air
   - Silent chest/poor respiratory effort
   - Exhausted and unresponsive
   - Confusion/Coma
   - Cyanosis
   - Extreme tachycardia/bradycardia or arrhythmias
   - Hypotension
   - Peak flow < 33% best/predicted*

5. If all green features and no amber or red
   - Give 10 puffs of 100mcg salbutamol MDI via spacer (tidal breathing, 1 puff to every 5 breaths)
   - Reassess 20-30 minutes post intervention
   - Consider giving 3 day course of prednisolone 1mg/kg
   - Those already receiving maintenance oral steroid give 2mg/kg (max 60mg)

6. **Good response?**
   - Subtle or no use of accessory muscles
   - Can complete sentences
   - Minimal wheeze
   - Saturations > 94%

7. **Poor response?**
   - Deterioration? Consider if now amber or red

8. **Discharge Plan**
   - Before discharge review overall asthma control, inhaler technique, medication and ask about smoking parent and child (if > 11 yrs). If yes offer quit smoking support.
   - Give asthma discharge plan (appendix 1)
   - Complete a three day course of prednisolone
   - Check understanding of condition and signpost to further resources
   - Advise parents to book a GP/practice nurse review within 48-72 hours

9. **Poor response?**
   - Poor clinical response but all green features:
     - Give 10 puffs of salbutamol via spacer
     - Inform paediatric team to review

10. If all amber features and no red
    - Give oxygen via face mask/nasal prongs to achieve SpO₂ 94-98%
    - Give 10 puffs of 100mcg salbutamol MDI via spacer (tidal breathing, 1 puff to every 5 breaths) or 5mg salbutamol via oxygen driven nebuliser if available
    - Consider adding Magnesium sulfate to initial salbutamol nebs if SaO₂ < 92%
    - Give oral prednisolone or IV hydrocortisone 4mg/kg if vomiting
    - If poor response give nebulised ipratropium driven by oxygen
    - Repeat salbutamol and ipratropium nebs every 20 minutes for 2 hours according to response
    - Repeat treatment every 20 minutes if necessary

11. **Good response?**
    - Green features:
      - Subtle or no use of accessory muscles
      - Can complete sentences
      - Minimal wheeze

12. **Poor response?**
    - Consider if amber or red

13. **Discuss further management with paediatric registrar**
    - Consider lower threshold for admission circumstances (box 16)

14. **Continue oxygen and nebulisation therapy**
    - Fast bleep paed registrar to arrange review and admission to ward

15. If any red features
    - FAST BLEEP PAED REGISTRAR and ANAESTHETIC REGISTRAR
    - Give oxygen via facemask to achieve SpO₂ 94-98%
    - Give 5mg salbutamol and ipratropium 250mcg via oxygen driven nebuliser
    - Consider adding Magnesium sulfate to initial salbutamol nebs if SaO₂ < 92%
    - Repeat treatment every 10-20 minutes if necessary
    - Reassess 20 minutes post intervention
    - Give oral prednisolone or IV hydrocortisone 4mg/kg if vomiting
    - Use hospital asthma guidelines for further management including IV medications
    - Continually assess the child after each intervention

16. **Lower threshold for admission if**
    - Attack in the late afternoon or at night
    - Recent hospital admission or previous severe attack
    - Concern over social circumstances or ability to cope at home
Table 1 Community Children’s Nursing Team

Luton and South Bedfordshire
Children’s Community Nursing Team 0333 405 0079

Luton
Children’s Community Asthma Nurse - 0333 405 0079
Children’s Rapid Response Team - 07966025787

Bedford and North Bedfordshire
Children’s Community Nursing Team 01234 310103

Table 2 Secondary Care Referrals

Luton & Dunstable Hospital
Switchboard 01582 491166: Paediatric Registrar bleep 733
GP Urgent Connect (Monday–Friday 9–5pm)
01865 922008 for referrals and advice

Bedford General Hospital
Switchboard 01234 355122: Paediatric Registrar bleep 208

Table 3 Normal Paediatric Values

<table>
<thead>
<tr>
<th>Respiratory Rate at Rest:</th>
<th>5-12 years</th>
<th>12 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20-25 breaths/min</td>
<td>15-20 breaths/min</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Heart Rate</th>
<th>5-12 years</th>
<th>&gt;12 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80-120 bpm</td>
<td>60-100 bpm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Systolic Blood Pressure</th>
<th>5-12 years</th>
<th>&gt;12 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>90-110 mmhg</td>
<td>100-120 mmhg</td>
</tr>
</tbody>
</table>

Table 4 Predicted Peak Flow:

<table>
<thead>
<tr>
<th>Height (m)</th>
<th>Height (ft)</th>
<th>Predicted EU PEFR (L/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.85</td>
<td>2'9&quot;</td>
<td>87</td>
</tr>
<tr>
<td>0.90</td>
<td>2'11&quot;</td>
<td>95</td>
</tr>
<tr>
<td>0.95</td>
<td>3'1&quot;</td>
<td>104</td>
</tr>
<tr>
<td>1.00</td>
<td>3'3&quot;</td>
<td>115</td>
</tr>
<tr>
<td>1.05</td>
<td>3'5&quot;</td>
<td>127</td>
</tr>
<tr>
<td>1.10</td>
<td>3'7&quot;</td>
<td>141</td>
</tr>
<tr>
<td>1.15</td>
<td>3'9&quot;</td>
<td>157</td>
</tr>
<tr>
<td>1.2</td>
<td>3'11&quot;</td>
<td>174</td>
</tr>
<tr>
<td>1.25</td>
<td>4'1&quot;</td>
<td>192</td>
</tr>
</tbody>
</table>

Table 5 Inhalers vs Nebulisers

- For moderate asthma, use an inhaler and spacer.
- If >5 years old use the mouthpiece rather than mask (providing their technique is good)

Indications for nebulisers:
- Low saturations <92%
- Unable to use inhaler and spacer (not compliant)
- Significantly low Sats despite inhaler and spacer use
- Severe and life-threatening respiratory distress
- Nebulisers are generally not recommended for home use

Nebulised drug doses

<table>
<thead>
<tr>
<th>Drug</th>
<th>Under 5 years</th>
<th>5 years and over</th>
<th>12 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salbutamol</td>
<td>2.5mg</td>
<td>5mg</td>
<td>250mcg</td>
</tr>
<tr>
<td>Ipratropium</td>
<td>500mcg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6 Prednisolone

- Give prednisolone by mouth
- Three days is usually sufficient but can be increased/tailored to the number of days necessary to bring about recovery
- Weaning is unnecessary unless the course of steroids exceeds 14 days.

Child under 12 years: 1–2 mg/kg once daily (max. per dose 40 mg) for up to 3 days, longer if necessary. If child has been taking oral steroid for more than a few days give 2 mg/kg once daily (max. per dose 60 mg) for up to 3 days, longer if necessary.

Child 12–17 years: 40–50 mg daily for at least 5 days

Give hydrocortisone IV 4mg/kg if vomiting

Table 7 Poor Asthma Control

- Frequent use of reliever
- Stopping daily activities
- Poor sleep, cough
- Frequent exercise induced symptoms
- Frequent admissions or attendances

Difficult Asthma

Difficult asthma is defined as persistent symptoms and/or frequent exacerbations despite treatment at step 4 or 5.
C4 FOLLOW–UP OF ACUTE ASTHMA IN CHILDREN REQUIRING EMERGENCY DEPARTMENT CARE, ADMISSION OR URGENT MEDICAL CARE

It is essential that the patient's primary care practice is informed within 24 hours of discharge from the emergency department or hospital following an asthma attack.

• Keep patients who have had a near-fatal asthma attack under specialist supervision indefinitely

• Hospital asthma clinic should follow up in 4–6 weeks if second or subsequent attack in past 12 months

• Follow-up after treatment or discharge from hospital:
  • GP review within 2 working days
  • Monitor symptoms and PEF
  • Check inhaler technique
  • Written personalised asthma action plan
  • Modify treatment according to guidelines for chronic persistent asthma
  • Address potentially preventable contributors to admission

At the time of developing this guidance, BCCG do not commission community children’s asthma services. See appendix 5 for Luton CCG pathway.

NRAD recommendation: see appendix 4 for further information

Every NHS hospital and general practice should have a designated, named clinical lead for asthma services, responsible for formal training in the management of acute asthma

Patients with asthma must be referred to a specialist asthma service if they have required more than two courses of systemic corticosteroids, oral or injected, in the previous 12 months or require management using British Thoracic Society (BTS) stepwise treatment 4 or 5 to achieve control.

Follow-up arrangements must be made after every attendance at an emergency department or out-of-hours service for an asthma attack. Secondary care follow-up should be arranged after every hospital admission for asthma, and for patients who have attended the emergency department two or more times with an asthma attack in the previous 12 months.
# SECTION D INHALER AND SPACER DEVICES

## D1 Inhaler Devices (refer to BNF and SPCs for specific dosing information)

**Avoid generic prescribing of inhalers** - this might lead to people with asthma being given an unfamiliar inhaler device which they are not able to use properly.

Prescribing mixed inhaler types may cause confusion and lead to increased errors in use.

**Using the same type of device** to deliver preventer and reliever treatments may improve outcomes.

In children, a pMDI and spacer are the preferred method of delivery of β2-agonists or inhaled corticosteroids. A face mask is required until the child can breathe reproducibly using the spacer mouthpiece.

In children aged 5–12, a pMDI + spacer is as effective as any other hand-held inhaler.

Further information on inhaler devices is available at [www.rightbreathe.com](http://www.rightbreathe.com/)

### Short-acting beta₂-agonist (SABA) inhalers

<table>
<thead>
<tr>
<th>Inhaler</th>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salbutamol 100mcg/dose</td>
<td>CFC-free MDI +/- spacer</td>
<td>One or two puffs up to four times daily.</td>
</tr>
<tr>
<td>Terbutaline Turbohaler 500mcg per inhalation</td>
<td></td>
<td>One inhalation up to four times a day.</td>
</tr>
</tbody>
</table>

### Inhaled Corticosteroid (ICS) inhalers

<table>
<thead>
<tr>
<th>Inhaler</th>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clenil Modulite® CFC-free aerosol inhaler (beclometasone dipropionate)</td>
<td>50 micrograms per dose +/- spacer</td>
<td>One puff twice daily (BDP 100micrograms per day) = Paediatric Low Dose ICS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Two puffs twice daily (BDP 200micrograms per day) = Paediatric Low Dose ICS</td>
</tr>
<tr>
<td>Clenil Modulite® CFC-free aerosol inhaler (beclometasone dipropionate)</td>
<td>100 micrograms per dose +/- spacer</td>
<td>One puff twice daily (BDP 200 micrograms per day) = Paediatric Low Dose ICS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Two puffs twice daily (BDP 400 micrograms per day) = Paediatric Moderate Dose ICS</td>
</tr>
<tr>
<td>Clenil Modulite® CFC-free aerosol inhaler (beclometasone dipropionate)</td>
<td>200 micrograms per dose +/- spacer</td>
<td>One puff twice daily (BDP 400 micrograms per day) = Paediatric Moderate Dose ICS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Two puffs twice daily (BDP 800 micrograms per day) = Paediatric High Dose ICS</td>
</tr>
</tbody>
</table>

### Inhaled Corticosteroid (ICS)/Long Acting Bronchodilator (LABA) combination inhalers

<table>
<thead>
<tr>
<th>Inhaler</th>
<th>Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbicort 100/6 Turbohaler®</td>
<td>(budesonide 100 micrograms/formoterol fumarate dihydrate 6 micrograms per dose) dry powder inhaler</td>
<td>One puff twice daily (budesonide 200micrograms per day) = Paediatric Low Dose ICS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Two puffs twice daily (budesonide 400micrograms per day) = Paediatric Moderate Dose ICS</td>
</tr>
<tr>
<td>Seretide 50 Evohaler®</td>
<td>(Fluticasone propionate 50micrograms/salmeterol 25 micrograms) pMDI</td>
<td>One puff twice daily (fluticasone 100micrograms per day) = Paediatric Low Dose ICS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Two puffs twice daily (fluticasone 200micrograms per day) = Paediatric Moderate Dose ICS</td>
</tr>
<tr>
<td>Seretide 100 Accuhaler®</td>
<td>(Fluticasone propionate 100mcg/salmeterol) dry powder inhaler</td>
<td>One puff twice daily (fluticasone 200micrograms per day) = Paediatric Moderate Dose ICS</td>
</tr>
</tbody>
</table>
NRAD recommendation: see appendix 4 for further information

All asthma patients who have been prescribed more than 12 short-acting reliever inhalers in the previous 12 months should be invited for urgent review of their asthma control, with the aim of improving their asthma through education and change of treatment if required.

An assessment of inhaler technique to ensure effectiveness should be routinely undertaken and formally documented at annual review, and also checked by the pharmacist when a new device is dispensed.

Non-adherence to preventer inhaled corticosteroids is associated with increased risk of poor asthma control and should be continually monitored.

Where long-acting beta agonist (LABA) bronchodilators are prescribed for people with asthma, they should be prescribed with an inhaled corticosteroid in a single combination inhaler.
**Spacers**

<table>
<thead>
<tr>
<th>Spacer</th>
<th>Features</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volumatic ® Spacer</td>
<td>Large volume spacer. Available with or without mask. Solid adaptor only fits specific MDIs including all Chiesi and GSK devices Perceivable value movement</td>
<td>£3.88</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With paediatric mask £6.83</td>
</tr>
<tr>
<td>A2A ® Spacer</td>
<td>Universal adaptor (all MDIs) Collapsible, pocket sized Available with or without mask Compatible with all pMDIs Low static properties Perceivable valve movement 210ml</td>
<td>£4.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With small or medium mask £6.68</td>
</tr>
<tr>
<td>Able ® Spacer</td>
<td>Available with or without mask Low static properties Perceivable valve movement 210ml</td>
<td>£4.39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With small (infant) or medium (child) mask £7.16</td>
</tr>
<tr>
<td>Space Chamber Plus ®</td>
<td>Fits most MDIs Perceivable valve movement Standard and compact sizes With or without facemask (small, medium large)</td>
<td>Space Chamber Plus or Space Chamber Compact Plus £4.26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With mask (small/med/large) £6.98</td>
</tr>
<tr>
<td>Aerochamber Plus Flow-Vu Antistatic®</td>
<td>Antistatic Visible value movement One size chamber With or without facemask small (0-18m), medium (1-5 years), small adult, large adult</td>
<td>£5.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With mask (small, medium, small adult, large adult) £8.72</td>
</tr>
</tbody>
</table>

Explain the benefits of using spacer devices to parents/carers and children to increase uptake and correct use.

www.rightbreathe.com/

1. Spacers make it easier to get right amount of medicine (increase airways deposition)
2. Using a spacer makes it easier to take asthma medicine (no need to coordinate actuation and inspiration).
3. Using spacer may mean you need less medicine and is easier to use in emergency.
4. Using spacer reduces risk of side effects.

Ensure that children and parents are shown how to use the spacer correctly, how to clean and to replace every 6-12 months.
REFERENCES

2. NICE Guideline [NG80]November 2017 Asthma: Diagnosis, monitoring and chronic asthma management. Available at https://www.nice.org.uk/guidance/ng80
5. https://www.asthma.org.uk/about/media/facts-and-statistics/ accessed June 2018
8. NICE Guideline [NG43] February 2016 Transition from children’s to adults’ services for young people using health or social services. Available at https://www.nice.org.uk/guidance/ng43

GLOSSARY

(c)ACT (childhood) Asthma Control Test
ACQ Asthma Control Questionnaire
BNF British National Formulary
BTS/SIGN British Thoracic Society/Scottish Intercollegiate Guidelines Network
DPI Dry Powder Inhaler
ED Emergency Department
GINA Global Initiative for Asthma
ICS Inhaled corticosteroid
LABA Long acting beta2 agonist
LTRA Leukotriene Receptor Antagonists
MART Maintenance and reliever therapy
NICE National Institute for Health and Care Excellence
NRAD National Review of Asthma Deaths
PAAP Personalised Asthma Action Plan
PEF Peak Expiratory Flow
pMDI Pressurised metered dose inhaler
SABA Short-acting beta2 agonist
SPC Summary of Product characteristics (https://www.medicines.org.uk/emc/)

USEFUL WEBSITES/RESOURCES FOR HEALTHCARE PROFESSIONALS AND PATIENTS/CARERS

www.asthma.org.uk/advice/child/
www.itchysneezywheezy.co.uk
www.rightbreathe.com/
Inhaler Training Videos:
Luton CCG inhaler training videos https://www.lutonccg.nhs.uk/page/?id=4124
https://www.asthma.org.uk/advice/inhalers-medicines-treatments/using-inhalers/
Appendix 1 Example Paediatric Wheeze/Asthma Discharge Plan

**Paediatric Wheeze/Asthma Discharge Plan**

**Admission peak flow:**
- **Name:**
- **This is your discharge plan for the next 1-2 weeks.**
- **Please make an appointment to see your GP/Practice Nurse/Asthma Nurse 48 hours after your discharge.**

**Discharge peak flow:**
- **You may have been given Prednisolone, take this as prescribed.**
- **If your child takes a brown, orange or purple inhaler continue this twice a day even when well.**

(Ensure good dental hygiene is maintained while on steroid inhalers)

**How much of your blue inhaler to give for the next few days:**

<table>
<thead>
<tr>
<th>DAY</th>
<th>No of puffs of salbutamol (blue inhaler)</th>
<th>Times per day</th>
<th>INCLUDING AT NIGHT TIME AND DURING SCHOOL, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>10 puffs</td>
<td>Every 4 hours</td>
<td></td>
</tr>
<tr>
<td>Two</td>
<td>8 puffs</td>
<td>Every 4 hours</td>
<td></td>
</tr>
<tr>
<td>Three</td>
<td>6 puffs</td>
<td>Every 6 hours</td>
<td></td>
</tr>
<tr>
<td>Four</td>
<td>4 puffs</td>
<td>Every 8 hours</td>
<td></td>
</tr>
<tr>
<td>Five</td>
<td>2 puffs</td>
<td>As required</td>
<td></td>
</tr>
</tbody>
</table>

**Normal dose of asthma treatment when your child is well:**

(Day 8 onwards, if unwell see GP)

**Inhaler Medicine**

<table>
<thead>
<tr>
<th>No of Puffs/Dose</th>
<th>Times per day</th>
<th>Amendments to medication e.g.: New/Old / Dose Changes/Stopped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliever</td>
<td>Up to 10 puffs</td>
<td>As required</td>
</tr>
<tr>
<td>Preventer (strong)</td>
<td>Morning &amp; Evening</td>
<td>Changes/Stopped</td>
</tr>
</tbody>
</table>

**Medication reviewed by:**

- Name: ____________________ Signature: ____________________ Date: ____________

**Inhaler technique checked by:**

---

**DANGER**

- Your child’s condition is getting worse if:
  - Your blue inhaler is not helping.
  - Your breathing is hard and fast.
  - You can’t talk or walk properly.
  - You are getting tired.

**You need emergency help please phone 999 or go straight to the nearest Accident and Emergency Dept.**

**If your child is using more of their blue reliever inhaler than stated in the discharge management plan and you are concerned**

**You need to see your GP. Urgent care call your asthma or rapid response nurse TODAY.**

**Your child is using the management plan but you have concerns, they may be having some time off school or be unable to take part in normal levels of activity**

**What to do in an emergency**

1. Take 2 puffs of your reliever inhaler (usually blue)
2. Sit up and loosen tight clothing
3. If no improvement, continue to take one puff/dose of reliever inhaler every minute for five minutes or until symptoms improve
4. If your symptoms do not improve in five minutes—or if you are in doubt—call 000 or go to the nearest A & E department
5. Continue to take one puff of your reliever inhaler every minute until help arrives

After an emergency you should call your GP, surgery and ask for an urgent appointment (even if you feel better) do not ignore worsening condition - get medical help immediately, day or night.

**GIVING YOUR INHALER**

Steps 1-5 needs to be followed for each puff e.g., if asked to give 2 puffs; repeat the whole process twice.

You may be given different coloured inhaler or chambers. The process is the same for all colours. Below are some examples of different coloured inhalers and chambers.

---

**1. Shake your inhaler**

**2. Place your child in an upright and comfortable position.**

**3. Place the mask securely over their mouth and nose.**

**4. Press inhaler once to give one puff and count two breaths.**
APPENDIX 2A EXAMPLE PERSONALISED ASTHMA ACTION PLAN FOR CHILDREN AGED 5-12 YEARS

My Asthma Plan

1. My daily asthma medicines
   - My preventer inhaler is called ________ and its colour is ________.
   - I take ________ puffs of my preventer inhaler in the morning and ________ puffs at night. I do this every day even if I feel well.
   - Other asthma medicines I take every day:
     - My reliever inhaler is called ________ and its colour is ________.
     - I take ________ puffs of my reliever inhaler (usually blue) when I wheeze or cough, my chest hurts or it's hard to breathe.
     - My best peak flow is ________.

2. When my asthma gets worse
   - I'll know my asthma is getting worse if:
     - I wheeze or cough, my chest hurts or it's hard to breathe.
     - I'm waking up at night because of my asthma, or
     - I'm taking my reliever inhaler (usually blue) more than three times a week.
   - My peak flow is less than ________.

   If my asthma gets worse, I should:
   - Keep taking my preventer medicines as normal.
   - And also take ________ puffs of my blue reliever inhaler every four hours.
   - If I'm not getting any better doing this I should see my doctor or asthma nurse today.

3. When I have an asthma attack
   - I'm having an asthma attack:
     - My blue reliever inhaler isn't helping, or
     - I can't talk or walk easily, or
     - I'm breathing hard and fast, or
     - I'm coughing or wheezing a lot, or
     - My peak flow is less than ________.

   When I have an asthma attack, I should:
   - Sit up — don't lie down. Try to be calm.
   - Take one puff of my reliever inhaler every 30 to 60 seconds up to a total of 10 puffs.

   Even if I start to feel better, I don't want this to happen again, so I need to see my doctor or asthma nurse today.

   If I still don't feel better and I've taken ten puffs, I need to call 999 straight away. If I am waiting longer than 15 minutes for an ambulance I should take another ________ puffs of my blue reliever inhaler every 30 to 60 seconds (up to 10 puffs).

   Make sure you have your reliever inhaler (usually blue) with you. You might need it if you come into contact with things that make your asthma worse.

Parents — get the most from your child's action plan
   Make it easy for you and your family to find it when you need it:
   - Take a photo and keep it on your mobile (and your child's mobile if they have one).
   - Stick a copy on your fridge door.
   - Share your child's action plan with school, grandparents and babysitter (a printout or a photo).

You and your parents can get your questions answered:
   - Call our friendly expert nurses
     - 0300 222 5800
   - Get information, tips and ideas
     - www.asthma.org.uk
**APPENDIX 2B EXAMPLE PERSONALISED ASTHMA ACTION PLAN FOR ADOLESCENTS AND ADULTS**

### Every day asthma care:

- **My asthma is being managed well:**
  - With this daily routine I should expect to have no symptoms.
  - If I've not had any symptoms or needed my reliever inhaler for at least 2 weeks, I can ask my GP or asthma nurse to review my medicines in case they can reduce the dose.
  - **My personal best peak flow is**

- **My daily asthma routine:**
  - **Preventer inhaler** (insert name/colour):
    - I need to take my preventer inhaler every day even when I feel well.
    - I take _____ puff(s) in the morning and _____ puff(s) at night.
  - **Reliever inhaler** (insert name/colour):
    - I take my reliever inhaler only if I need to.
    - I take _____ puff(s) of my reliever inhaler if any of these things happen:
      - I'm wheezing.
      - My chest feels tight.
      - I'm finding it hard to breathe.
      - I'm coughing.

- **Other medicines and devices (eg spacers) I use for my asthma every day:**

### When I feel worse:

- **My asthma is getting worse if I’m experiencing any of these:**
  - My symptoms are coming back (wheezing, tightness in my chest, feeling breathless, cough).
  - I’m waking up at night.
  - My symptoms are interfering with my usual daily-to-day activities (e.g. work, exercising).
  - I’m using my reliever inhaler three times a week or more.
  - My peak flow drops to below

### In an asthma attack:

- **I’m having an asthma attack if I’m experiencing any of these:**
  - My reliever inhaler is not helping or I need it more than every four hours.
  - I find it difficult to walk or talk.
  - I find it difficult to breathe.
  - I’m wheezing a lot or I have a very tight chest or I’m coughing a lot.

- **My peak flow is below**

### How to use it

Your written asthma action plan can help you stay on top of your asthma.

To get the most from it, you could...

1. **Put it somewhere easy for you and your family to find** – like your fridge door, noticeboard, or bedside table.
2. **Keep a photo of it on your mobile phone or tablet** – so you can check it whenever you see. You can also send it to a family member or friend, so they know what to do if your asthma symptoms get worse.
3. **Check it in with it regularly** – put a note on your calendar, or a monthly reminder on your phone to reread through. Ask you remembering to use your day-to-day asthma medicines to you know what to do if your symptoms get worse.
4. **Take it to every healthcare appointment about your asthma** – including your GP or asthma nurse to update it if their advice for you changes.

### Your asthma action plan

Fill this in with your GP or nurse

---

**Your asthma action plan**

- **Name:**
- **Phone number:**

**Other advice from my GP about my asthma to use (e.g. SMARTIN’ STAR) tablets:**

**GP/asthma nurse contact**

- **Name:**
- **Phone number:**

**Out-of-hours contact number**

(exclude your GP surgery who to call when they are closed)

- **Name:**
- **Phone number:**

---

**How to use your action plan:**

- **When you have an asthma attack:**
  - Use your reliever inhaler as needed.
  - Take your preventer inhaler as normal.
  - Speak to your specialist asthma nurse about how to manage your asthma or call 0300 222 5800.
  - Follow us on Facebook for news and tips about your asthma: www.facebook.com/asthma
  - Follow us on Twitter for news and tips about your asthma: @asthmauk

**What if you need help:**

- **Call NHS 111**
- **Go to A&E**

**Health & Care Information Trust**

NHS information for patients and carers is provided by the Health & Care Information Trust.


---

**Conclusion:**


---

**Additional information:**

- **Get more advice and support from Asthma UK:**
  - Speak to a specialist asthma nurse about managing your asthma on 0300 222 5800.
  - Follow us on Facebook for news and tips about your asthma: www.facebook.com/asthma
  - Follow us on Twitter for news and tips about your asthma: @asthmauk
Appendix 3a Childhood Asthma Control Test for Children Aged 4-11 years

click here

Childhood Asthma Control Test

The Childhood Asthma Control Test is designed for use with children from 4 to 11 years of age. It offers an assessment of how well you/your child’s asthma has been controlled over the previous month. Asthma is a condition which varies from day to day and month to month so you/your child’s level of control may not always be the same. It is a good idea to carry out this assessment every now and again especially if you/your child have been having more asthma symptoms than usual.

If you/your child’s asthma is not well controlled you/your child may be at risk of having an asthma attack

How to take the Childhood Asthma Control Test

Step 1: Let your child respond to the first four questions (1 to 4). If your child needs help reading or understanding the question, you may help, but let your child select the response. For each question, make sure your child considers all four possible answers before choosing the best one for him or her.

Step 2: Complete the remaining three questions (5 to 7) on your own and without letting your child’s response influence your answers. There are no right or wrong answers. For each question, make sure you consider all six possible answers before choosing the best one.

Step 3: Add up the score from each answer.

Your child should complete these questions.

1. How is your asthma today?

<table>
<thead>
<tr>
<th>Score</th>
<th>Very bad</th>
<th>Bad</th>
<th>Good</th>
<th>Very good</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

2. How much of a problem is your asthma when you run, exercise or play sports?

<table>
<thead>
<tr>
<th>Score</th>
<th>It’s a big problem, I can’t do what I want to do.</th>
<th>It’s a problem and I don’t like it.</th>
<th>It’s a little problem but it’s okay.</th>
<th>It’s not a problem.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Do you cough because of your asthma?

<table>
<thead>
<tr>
<th>Score</th>
<th>Yes, all of the time.</th>
<th>Yes, most of the time.</th>
<th>Yes, some of the time.</th>
<th>No, none of the time.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Do you wake up during the night because of your asthma?

<table>
<thead>
<tr>
<th>Score</th>
<th>Yes, all of the time.</th>
<th>Yes, most of the time.</th>
<th>Yes, some of the time.</th>
<th>No, none of the time.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please complete the following questions on your own.

5. During the last 4 weeks, how many days did your child have any daytime asthma symptoms?

<table>
<thead>
<tr>
<th>Score</th>
<th>Not at all</th>
<th>1-3 days</th>
<th>4-10 days</th>
<th>11-18 days</th>
<th>19-24 days</th>
<th>Everyday</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
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<td></td>
<td></td>
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<tr>
<td>2</td>
<td></td>
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<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. During the last 4 weeks, how many days did your child wheeze during the day because of asthma?

<table>
<thead>
<tr>
<th>Score</th>
<th>Not at all</th>
<th>1-3 days</th>
<th>4-10 days</th>
<th>11-18 days</th>
<th>19-24 days</th>
<th>Everyday</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. During the last 4 weeks, how many days did your child wake up during the night because of asthma?

<table>
<thead>
<tr>
<th>Score</th>
<th>Not at all</th>
<th>1-3 days</th>
<th>4-10 days</th>
<th>11-18 days</th>
<th>19-24 days</th>
<th>Everyday</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Asthma Control Test is a trademark of QualityMetric Incorporated. Adapted from *the Childhood Asthma Control Test which was developed by GSK.
**APPENDIX 3B ASTHMA CONTROL TEST FOR ADULTS AND ADOLESCENTS**

**click here**

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**Asthma Control Test™**

**Name:**

**Date:**

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Please note: Any data captured in this form will not be passed on to any third party. It will only be used by your healthcare professional.

There are 4.1 million people in the UK with asthma.¹

By taking control of their asthma, most people's day-to-day lives should be free from disruption such as troubled sleep or not being able to exercise.

**Why take the Asthma Control Test™?**

The Asthma Control Test is one way to quickly assess your asthma control, giving you a simple score out of 25. Your healthcare professional may ask you additional questions during a consultation.

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**Are you in control of your asthma? Or is your asthma in control of you? Here's how to find out**

**Step 1:** Read each question below carefully, circle your score and write it in the box.

**Step 2:** Add up each of your five scores to get your total Asthma Control Test™ score.

**Step 3:** Use the score guide to learn how well you are controlling your asthma.

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<table>
<thead>
<tr>
<th>Q1</th>
<th>During the past 4 weeks, how often did your asthma prevent you from getting as much done at work, school or home?</th>
<th>Score:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All of the time</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Most of the time</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Some of the time</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>A little of the time</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>None of the time</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q2</th>
<th>During the past 4 weeks, how often have you had shortness of breath?</th>
<th>Score:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>More than once a day</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Once a day</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3-6 times a week</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1-2 times a week</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q3</th>
<th>During the past 4 weeks, how often did your asthma symptoms (wheezing, coughing, chest tightness, shortness of breath) wake you up at night or earlier than usual in the morning?</th>
<th>Score:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 or more times a week</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2-3 nights a week</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Once a week</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Once or twice</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q4</th>
<th>During the past 4 weeks, how often have you used your reliever inhaler (usually blue)?</th>
<th>Score:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 or more times a day</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1-2 times a day</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2-3 times a week</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Once a week or less</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Not at all</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q5</th>
<th>How would you rate your asthma control during the past 4 weeks?</th>
<th>Score:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not controlled</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Poorly controlled</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Somewhat controlled</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Well controlled</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Completely controlled</td>
<td>5</td>
</tr>
</tbody>
</table>

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**Total Score**

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**What does your score mean?**

**Score: 25—WELL DONE**

- Your asthma appears to have been UNDER CONTROL over the last 4 weeks.
- However, if you are experiencing any problems with your asthma, you should see your doctor or nurse.

**Score: 20 to 24—ON TARGET**

- Your asthma appears to have been REASONABLY WELL CONTROLLED during the past 4 weeks.
- However, if you are experiencing symptoms your doctor or nurse may be able to help you.

**Score: less than 20—OFF TARGET**

- Your asthma may NOT HAVE BEEN CONTROLLED during the past 4 weeks.
- Your doctor or nurse can recommend an asthma action plan to help improve your asthma control.

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References: 1. JOF Database UK 2014 (accessed 23 January 2015), http://www.gpcontract.co.uk/browse/UK/Asthma/14

UK/SFC/0365/12(3) 43459943 December 2015
APPENDIX 4 RECOMMENDATIONS FROM WHY ASTHMA KILLS: THE NATIONAL REVIEW OF ASTHMA DEATHS REPORT (NRAD) MAY 2014

Organisation of NHS services

Every NHS hospital and general practice should have a designated, named clinical lead for asthma services, responsible for formal training in the management of acute asthma.

Patients with asthma must be referred to a specialist asthma service if they have required more than two courses of systemic corticosteroids, oral or injected, in the previous 12 months or require management using British Thoracic Society (BTS) stepwise treatment 4 or 5 to achieve control.

Follow-up arrangements must be made after every attendance at an emergency department or out-of-hours service for an asthma attack. Secondary care follow-up should be arranged after every hospital admission for asthma, and for patients who have attended the emergency department two or more times with an asthma attack in the previous 12 months.

A standard national asthma template should be developed to facilitate a structured, thorough asthma review. This should improve the documentation of reviews in medical records and form the basis of local audit of asthma care.

Electronic surveillance of prescribing in primary care should be introduced as a matter of urgency to alert clinicians to patients being prescribed excessive quantities of short-acting reliever inhalers, or too few preventer inhalers.

A national ongoing audit of asthma should be established, which would help clinicians, commissioners and patient organisations to work together to improve asthma care.

Medical and professional care

All people with asthma should be provided with written guidance in the form of a personal asthma action plan (PAAP) that details their own triggers and current treatment, and specifies how to prevent relapse and when and how to seek help in an emergency.

People with asthma should have a structured review by a healthcare professional with specialist training in asthma, at least annually. People at high risk of severe asthma attacks should be monitored more closely, ensuring that their personal asthma action plans (PAAPs) are reviewed and updated at each review.

Factors that trigger or exacerbate asthma must be elicited routinely and documented in the medical records and personal asthma action plans (PAAPs) of all people with asthma, so that measures can be taken to reduce their impact.

An assessment of recent asthma control should be undertaken at every asthma review. Where loss of control is identified, immediate action is required, including escalation of responsibility, treatment change and arrangements for follow-up.

Health professionals must be aware of the factors that increase the risk of asthma attacks and death, including the significance of concurrent psychological and mental health issues.

Prescribing and medicines use

All asthma patients who have been prescribed more than 12 short-acting reliever inhalers in the previous 12 months should be invited for urgent review of their asthma control, with the aim of improving their asthma through education and change of treatment if required.

An assessment of inhaler technique to ensure effectiveness should be routinely undertaken and formally documented at annual review, and also checked by the pharmacist when a new device is dispensed.

Non-adherence to preventer inhaled corticosteroids is associated with increased risk of poor asthma control and should be continually monitored.

The use of combination inhalers should be encouraged. Where long-acting beta agonist (LABA) bronchodilators are prescribed for people with asthma, they should be prescribed with an inhaled corticosteroid in a single combination inhaler.

Patient factors and perception of risk

Patient self-management should be encouraged to reflect their known triggers, eg increasing medication before the start of the hay-fever season, avoiding non-steroidal anti-inflammatory drugs or by the early use of oral corticosteroids with viral- or allergic-induced exacerbations.

A history of smoking and/or exposure to second-hand smoke should be documented in the medical records of all people with asthma. Current smokers should be offered referral to a smoking-cessation service.

Parents and children, and those who care for or teach them, should be educated about managing asthma. This should include emphasis on ‘how’, ‘why’ and ‘when’ they should use their asthma medications, recognising when asthma is not controlled and knowing when and how to seek emergency advice.

Efforts to minimise exposure to allergens and second-hand smoke should be emphasised, especially in young people with asthma.
**APPENDIX 5 L AND D PATHWAY FOR LCCG PATIENTS**

1. **Asthma ED Notifications (see pathway below)**
   a. All notification of children attending ED with a confirmed acute exacerbation of asthma should be forwarded to the community asthma nurse within an appropriate time-frame
   b. Asthma nurse to assess and apply criteria:
   c. If criteria not met, notification to be sent to appropriate service e.g. health visitors or school nurses
   d. If criteria met, asthma nurse to offer appropriate follow up within two weeks of attendance. This could be
      - Patient advice/information letter
      - Telephone followup
      - Face to face intervention (home visit)

2. **Referrals to the Children’s Community Asthma Nurse Specialist (CCN) Team**
   a. Referral may be appropriate in the following:
      - Require specialist nursing intervention/support: Asthma Management
      - Difficult or poorly controlled asthma despite normal GP intervention.
      - On high BTS steps wise approach.
      - Omalizumab patient or candidate.
      - Consultant/ Paediatrician patient requiring community support.
      - Recurrent asthma exacerbations (seen in primary or secondary care)

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**ED Notification Received**

- Check All Criteria are met
  - 4-16 years of age
  - Has confirmed diagnosis of asthma
  - Attended ED with a confirmed acute exacerbation of asthma
  - Lives in Luton catchment area and registered with a Luton GP
  - Fully discharged from hospital (i.e. not on home leave)

**Follow up patient according to guidance below**

- **Written F/U**
  - First hospital attendance for asthma episode
  - No further concerns noted by triaging professional e.g. management, social or inhaler issues

- **Telephone F/U**
  - More than 3 attendances in the last year
  - Previous asthma nurse involvement
  - Concerns raised on notification slip that are deemed appropriate for intervention
  - Forward patient written advice and information

- **Face to Face Contact**
  - ED nurse led follow up clinic/home/visit
  - All children 5 years and under
  - Multiple admissions recorded (3 or more per year)
  - Concern highlighted, e.g. social, management, not GP etc.

The community Asthma nurse should offer appropriate follow up advice to all children attending ED with a confirmed exacerbation of asthma. The above follow up advice should be used as a guide and the Asthma nurse should triage each notification using their own professional judgement and competency skill.