Bedfordshire, Luton and Milton Keynes Health and Care Partnership

NHS Bedfordshire, Luton and Milton Keynes Integrated Care Board

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Paediatric Asthma Guidelines (for children ≤16 years)

Updated October 2024

These guidelines are designed for use across all healthcare settings in Bedfordshire Luton and Milton Keynes by NHS healthcare professionals.

Contents

INTRODUCTION

Asthma affects 1.1 million children in the UK.[1] Many more pre-school children experience acute wheeze each year with viral infections. Asthma is commonly misdiagnosed, as it may present with a range of symptoms and physical examination may be normal.[2] Objective tests may also be normal when the person is not experiencing a flare of symptoms.

Asthma is dangerous. In Bedfordshire, Luton and Milton Keynes there are over 20 deaths (adults and children) due to asthma every year.[3] BLMK also has a relatively high rate of asthma-related admissions for children and young people (under 19,) at 108 per 100,000 hospital admissions for asthma (in 2020/21) compared to England average of 73.1 per 100,000. [3]

The NRAD report noted particularly in children and young people that their lower perception of risk of adverse outcomes was an avoidable factor in asthma mortality.[4] With a subsequent recommendation for improved education, including 'how,' 'why' and 'when' to use asthma medication, recognising when asthma is not controlled and knowing when and how to seek emergency advice.

The management of asthma should be collaborative, support self-management and include the provision of a personalised action plan.

What's new?

This update contains a revision and update of the treatment pathways. A maintenance and reliever therapy regime for children aged 12 and over should be considered, as per Global initiative for asthma (GINA) guidelines 2023.[5]

New joint NICE / BTS / SIGN guidance is due in 2024 – watch this space.

For any comments on the guidelines, please contact the Bedfordshire, Luton and Milton Keynes (BLMK) Medicines Optimisation team.

BLMK ICB Medicines Optimisation Team: blmkicb.medsopt@nhs.net

BLMK Medicines Optimisation website: https://medicines.bedfordshirelutonandmiltonkeynes.icb.nhs.uk/

N.B. 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 Diagnosis

The diagnosis of asthma in children is based on the recognition of a characteristic pattern of respiratory symptoms, signs and test results, the absence of any alternative explanation for these and response to asthma therapies.

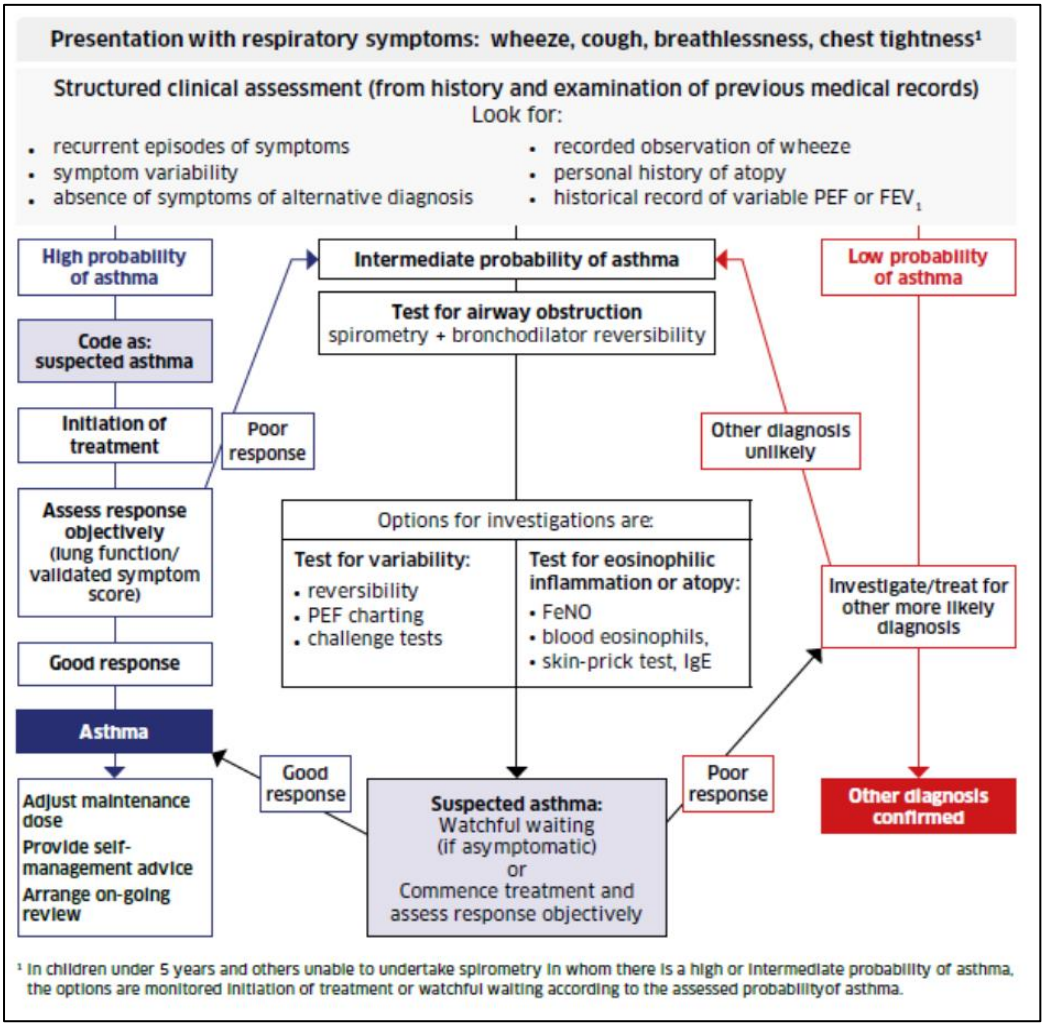
For children unable to perform objective tests, treat on objective measures and clinical judgement with regular review until the child is able to perform objective tests. Use code 'suspected asthma.'

For children under 5, viral induced pre-school wheeze is common – see asthma or pre-school wheeze?

Structured Clinical Assessment

Clinical history	Specifically check for day to day symptoms: Wheeze, cough or breathlessness Variation in symptoms. Usually symptoms are worse: at night, early in the morning, with exertion. Any triggers that make symptoms worse A personal or family history of atopy Absence of symptoms of alternative diagnosis	Previous exacerbations: Any history of acute attacks and potential triggers During an attack, there is symptomatic and objective improvement with treatment.
Physical examination	Examine child to identify expiratory polyphonic wheeze and signs of other causes of respiratory symptoms.	

British Thoracic Society Diagnostic Algorithm[6]



This diagnostic algorithm may be used to guide the diagnostic process. For a detailed NICE diagnostic summary click here[7]

Investigations

Objective tests have significant false positive and false negative rates. Tests are more likely to be positive when the person is symptomatic. Ideally objective tests for asthma should be performed before treatment with ICS is started, but do not delay treatment in symptomatic people if objective tests are not available.
A summary of the common objective tests is given in the table below:

Objective Test	What does it test?	Positive threshold for diagnosis?	Notes
Quality assured Spirometry	Obstruction	FEV1/FVC ratio <70%.	
Bronchodilator reversibility (BDR)	Reversibility	FEV1 increase ≥ 12%	
Fractional exhaled nitric oxide (FeNO)	Inflammation	≥35ppb	Consider if there is diagnostic uncertainty, eg. normal spirometry or negative BDR.
Peak Expiratory Flow Rate (PEFR) monitoring	Reversibility	Variability >20%	Repeatable PEFR is usually possible in children over age 8 years. Each reading best of 3 hard and fast blows. Twice daily or more for at least 2 weeks. Use charts and check patients can plot correctly, available from: Asthma and Lung UK Watch this short video for help calculating PEFR variability

Do not offer the following as diagnostic tests: Skin prick tests, serum IgE (total or specific,) blood eosinophil count.
(These types of tests may be used to help identify triggers once a diagnosis has been made.)

Consider a referral to specialist services, for assessment, when the child or young person has symptoms of asthma, but all investigations are negative.

Refer for specialist opinion, if a child or young person has obstructive spirometry but no bronchodilator reversibility and normal FeNO.

Asthma or Pre-school Wheeze?[8]

It is important in young children to differentiate between viral induced wheeze, other causes of wheeze and asthma. Most children with viral induced wheeze will stop wheezing when they get older and will not develop asthma.

The below decision aid can be used to help:

Yes	Does the child have interval symptoms when they do not have viral infections?	**No**
Yes	Are the exacerbations severe and / or frequent?	**No**
Yes	Are any of the following markers present? • Atopy (personal or first degree relative) • Eosinophilic inflammation (serum, FeNO, BAL) • Sensitisation (IgE / RAST / skin prick test)	**No**

More like pre-school asthma

Less like asthma, more like pre-school episodic wheeze

Children should be coded as 'suspected asthma' or 'episodic wheeze' and further testing should be performed when the child is able. For further information on pre-school wheeze, see the following link: Beat asthma – Pre-school Wheeze resources.

For management see Pharmacological Management in the under 5s.

Asthma Management – Non-Pharmacological

Self-care	Access to healthcare
Education	Understanding asthma and how the treatment works is an important aspect of care. See here for resources for people with asthma.	People with asthma who are reviewed regularly have a lower risk of exacerbation. They should be reviewed at least annually, and after dose changes and exacerbations.	GP practice review
PAAPs	PAAPs should be collaboratively agreed, regularly updated and include advice on daily management and how to seek help if needed.	Continuity within a practice team helps build relationships and trust and improves asthma care.	Continuity
Smoking, passive smoking and vaping	Ask about smoking / smoke exposure, including vaping. Offer smoking cessation advice and support.	Check for flu vaccination. Offered annually through schools. Offer other vaccinations when applicable.	Vaccination
Adherence and technique	Nonadherence may underlie poor asthma control. Ask about adherence and check inhaler prescriptions. Support good technique with education and resources.	Asthma plans should include details of when and where to access urgent care. Review with GP or community asthma team within 48hrs of A&E visit / hospital discharge.	Emergency care
Exercise	Aim for asthma to be managed to support regular exercise. Children with poor asthma control may avoid exercise so that their asthma appears controlled. However regular exercise can improve overall asthma control, as well as providing multiple other health benefits.	Specialist referral is indicated if: • >2 exacerbations requiring oral steroids in past 12 months • Asthma is not controlled despite maximum dose (as specified below) treatment with good adherence and inhaler technique. • Life-threatening asthma attack / admission for asthma attack.	Specialist care

Co-morbidities	Environment
Atopic conditions	Manage hay fever and allergic rhinitis. Use low steroid nasal spray and educate regarding technique. Optimise eczema care.	Children with asthma should try to avoid busy roads and vigorous outdoor exercise on high pollution days	Outdoor pollution
		Damp, mould issues and burning wood, candles and incense may adversely affect asthma. 'Chemical free' or 'allergy friendly' household products limit asthma triggers.	Indoor pollution
Obesity	Weight-loss interventions (including dietary and exercise-based programmes) can be considered for overweight and obese children with asthma to improve asthma control	Triggers include pollen, smoke, emotion, weather changes and pets. Recognising and mitigating triggers reduces risk of attacks and improves control.	Triggers
Depression and anxiety	Adverse asthma outcomes are associated with depression, anxiety and panic disorder. Consider psychological wellbeing and offer suitable support.	Using inhalers as prescribed with the correct technique reduces waste, improves control, and reduces need for unplanned care. Non-propellant inhalers, eg. DPIs have a lower carbon footprint and can be used by most children ≥12 years old. They require a greater inspiratory effort.	Inhalers

Management of Chronic Asthma

Pharmacological Management Under 5 years

See link in diagnostics for: Preschool wheeze or asthma?

Consider treatment with an ICS in both scenarios. Review after 8-12 week trial of low dose ICS, stop treatment trial and see if symptoms return – if they do, continue treatment and review 6 monthly. Code 'suspected asthma.' Refer if no improvement or if diagnosis is in doubt. Asthma diagnosis should be confirmed when the child is able to undertake objective tests.

STEP 1 **Low dose ICS** (or consider Montelukast if unable to take ICS)	**Step 2** Add **Montelukast**. Trial 3 months. Stop if no effect or not tolerated.	**Step 3**
Clenil 50 pMDI (with spacer) 2 puffs BD + Salamol pMDI (with spacer) 2 puffs PRN	**Montelukast chewable tablets or granules (for youngest,)** 6 months -5yrs: 4mg in the evening. Patient information on Montelukast -include details on side effects including diarrhoea, stomach-ache and sore throat and less commonly sleep disturbance and mental distress.* **Or** Increase to **Clenil 100 pMDI** (with spacer) 2 puffs BD (as per BTS) + Salamol pMDI (with spacer) 2 puffs PRN	**Refer to specialist care.**
If still symptomatic; • Check inhaler technique • Check adherence to treatment • Check exposure to environmental souce, eg. second hand smoke, mould in the home, cold housing. **If still symptomatic go to Step 2**	**If still symptomatic;** • Check inhaler technique • Check adherence to treatment • Check exposure to environmental souce, eg. second hand smoke, mould in the home, cold housing. • Review diagnosis. **If still symptomatic refer to specialist – Step 3**	

*Montelukast – MHRA risk of neuropsychiatric reactions

PHARMACOLOGICAL MANAGEMENT 5-11 YEARS

Improving symptoms. Review and correct inhaler technique, confirm adherence before stepping up. Consider step down once good control for 3 months. Worsening symptoms.

	Step 1	Step 2	Step 3	Step 4	Step 4
Choose between MDI and DPI #	**Low dose ICS**	**Consider trial of Montelukast**	**ICS/LABA low dose**	**ICS/ LABA medium dose**	
MDI Preferred in most patients	**Clenil pMDI 50** (with spacer) 2 puffs BD + Salamol pMDI (with spacer) 2 puffs PRN	**Montelukast chewable tablets** (Trial for 12 weeks. Stop if no effect or not tolerated.) 5 years: 4mg in the evening 6-11 years: 5mg in the evening Patient information on Montelukast - include details on side effects including diarrhoea, stomach-ache and sore throat and less commonly sleep disturbance and mental distress.*	**Seretide pMDI 50/25** (with spacer) 1 -2 puffs BD	**Seretide pMDI 50/25** (with spacer) 2 puffs BD	**Refer to specialist care**
DPI Some older children with support	**Pulmicort Turbohaler 100** 1 dose BD + SABA PRN SABA options include: **Salbutamol Easyhaler** 100mcg 1-2 puffs PRN		**Symbicort Turbohaler 100/6** 1 dose BD	**Symbicort Turbohaler 100/6** 2 doses BD **OR** **Seretide accuhaler 100** 1 dose BD	
			Consider Montelukast trial if not already tried.	Consider Montelukast trial if not already tried.	

Choose between pMDI (propellant) and DPI (non-propellant) inhaler

For most children in this age group a pMDI inhaler with a spacer is the most appropriate choice. Some older children will have sufficient inspiratory force to use a DPI. Use an In-Check device to assess and follow up to ensure good inhaler technique. A DPI may also be an option where appropriate, when an older child does not want to carry a spacer.

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Click for other ICS equivalent dose products.

PHARMACOLOGICAL MANAGEMENT 12-16 YEARS – SABA FREE REGIME (GINA & LOCALLY PREFERRED REGIMEN)

Click for further information on asthma in adolescence

1. Choose between propellant (pMDI) and non-propellant (DPI) inhaler	2. Choose between SABA-free and SABA pathway	3. Choose step. Step 1 for mild asthma with infrequent symptoms. Consider start at step 2 if symptoms most days or waking with asthma ≥ once a week.	4. Choose inhaler - Support personal choice

Improving symptoms. Review and correct inhaler technique, confirm adherence before stepping up. Consider step down once good control for 3 months. Worsening symptoms.

	Step 1. As needed anti-inflammatory (ICS / formoterol) reliever	Step 2. Low dose ICS / formoterol (MART)	Step 3. Moderate dose ICS / formoterol (MART)		Step 4. High dose ICS / LABA (NOT MART)
DPI	**Symbicort Turbohaler** 200/6 1 puff PRN (up to 8 puffs daily – rarely 12 puffs) **Or** **DuoResp Spiromax** 160/4.5 1 puff PRN (up to 8 puffs daily – rarely 12 puffs)	**Symbicort Turbohaler** 200/6 1 puff BD and PRN (up to 8 puffs daily – rarely 12 puffs) **Or** **DuoResp Spiromax** 160/4.5 1 puff BD and PRN (up to 8 puffs daily – rarely 12 puffs) **Or** **Fobumix Easyhaler** 160/4.5 1 puff BD and PRN (up to 8 puffs daily – rarely 12 puffs)	**Symbicort Turbohaler** 200/6 2 doses BD and PRN (up to 8 puffs daily – rarely 12 puffs) **Or** **DuoResp Spiromax** 160/4.5 2 puffs BD and PRN (up to 8 puffs daily – rarely 12 puffs **Or** **Fobumix Easyhaler** 160/4.5 2 puffs BD and PRN (up to 8 puffs daily – rarely 12 puffs)	Consider **Montelukast.** Trial for 12 weeks, withdraw if not tolerated / effective. Especially for CYP with atopy. Dose 12-14 years: 5mg ON ≥15 years: 10mg ON Counsel for side effects.*	***REFER FOR SPECIALIST CARE AT THIS STEP *** Consider trial of high dose ICS/LABA + SABA PRN. **High doses should only be used after referral.** Consider Montelukast if not previously tried. **Symbicort Turbohaler** 400/12 2 puffs BD# **+ SABA PRN** **Or** **Seretide accuhaler** 500 1 dose BD *Everyone on high-dose ICS should receive a steroid emergency card.*
MDI					**Seretide evohaler** 250 2 puffs BD + **SABA PRN**

A SABA-free regimen reduces the risk of asthma exacerbations and SABA over-use.
People can switch between SABA-free and traditional regimens if required; always consider if the person is on the right regimen

#At this age Symbicort 400/12 is only licensed for 1 dose BD

In some instances, people may retain an in date SABA (and spacer) for ***emergency use*** only, however most people should be SABA free.

For emergency treatment of acute asthma, people may take up to 6 puffs of ICS / formoterol at any one time (at one minute intervals) – as per PAAP.

MART
If applicable, stop SABA and remove from repeats.
See MART further information
Seek medical advice if using additional rescue doses (above usual maintenance dose persistently)

*Montelukast – MHRA risk of neuropsychiatric reactions

PHARMACOLOGICAL MANAGEMENT 12-16 YEARS – TRADITIONAL SABA REGIMEN

1. Choose between propellant (pMDI) and non-propellant (DPI) inhaler	2. Choose between SABA-free and SABA pathway	3. Choose step Start at step 1. Step up if uncontrolled despite good adherence and technique.	4. Choose inhaler - Support personal choice

Improving symptoms. Review and correct inhaler technique, confirm adherence before stepping up. Consider step down once good control for 3 months. Worsening symptoms.

	Step 1. As needed low dose ICS + SABA	Step 2. Low dose ICS / LABA + SABA	Step 3. Moderate dose ICS / LABA + SABA		Step 4. High dose ICS / LABA + SABA
DPI	ICS options include: **Budesonide Easyhaler** 100mcg 1-2 doses BD or **Budesonide Turbohaler** 100mcg 1-2 doses BD SABA options include: **Salbutamol Easyhaler** 100mcg 1-2 puffs PRN	**Symbicort Turbohaler** 200/6 1 dose BD Or **Seretide accuhaler** 100 1 dose BD **+ SABA PRN**	**Symbicort Turbohaler** 200/6 2 doses BD Or Seretide accuhaler 250 1 dose BD **+ SABA PRN**	Consider **Montelukast.** Trial for 12 weeks, withdraw if not tolerated / effective. Especially for CYP with atopy. Dose 12-14 years: 5mg ON ≥15 years: 10mg ON Counsel for side effects.*	**REFER TO SPECIALIST CARE AT THIS STEP ***** Consider trial of high dose ICS/LABA + SABA PRN. **See previous page for choices.** *Everyone on high-dose ICS should receive a steroid emergency card*
MDI	ICS options include: **Clenil modulite** 100mcg 2 puffs BD SABA options include: **Salamol 2 puffs PRN**	**Seretide evohaler** 125 1 puff BD **+ SABA PRN**	**Seretide evohaler** 250 1 puff BD **+ SABA PRN**		

Click for other ICS equivalent dose products.

*Montelukast – MHRA risk of neuropsychiatric reactions

ICS EQUIVALENT DOSES – NICE NOMENCLATURE

(The BTS guideline nomenclature is different, ie. 'very low, low or moderate' dose.)

The following is based on information from GINA 2023[5], and NICE[7]. NICE recommend ICS dose equivalencies for children aged 5-11 and adolescents / adults from ≥17 years. This reflects age categories in most UK marketing authorisations. They note in practice that for children aged 12-16, a prescriber will choose dosages based on disease severity and person's size related to average for the age. GINA dose 12-16 year olds as adults.

ICS dosages for adults and adolescents (12 years and older)			
Inhaled corticosteroid (alone or in combination with LABA)	Total daily ICS dose (mcg)		
	Low	**Medium**	**High**
Beclometasone dipropionate			
Standard particle pMDI Eg. Clenil,	200-500	600-800	≥1000
Extra-fine particle pMDI or DPI Eg. Qvar	100-200	300-400	≥500
Budesonide			
Standard particle, DPI or pMDI Eg. Symbicort, Pulmicort, Budesonide Easyhaler	200-400	600-800	≥1000
Fluticasone proprionate			
DPI or pMDI Eg. Seretide evohaler or accuhaler, Flixotide evohaler or accuhaler	100-250	300-500	≥600
Fluticasone furoate			
DPI, eg. Relvar	Not available	100	200

ICS dosages for children 5-11 years			
Inhaled corticosteroid (alone or in combination with LABA)	Total daily ICS dose (mcg)		
	Paediatric Low	**Paediatric Medium**	**Paediatric High**
Beclometasone dipropionate			
Standard particle pMDI Eg. Clenil,	100-200	300-400	500-800
Extra-fine particle pMDI Eg. Qvar	100	150-200	300-400
Budesonide			
Standard particle, DPI or pMDI Eg. Symbicort, Pulmicort, Budesonide Easyhaler	100-200	300-400	500-800
Fluticasone proprionate			
DPI or pMDI Eg. Seretide evohaler or accuhaler, Flixotide evohaler or accuhaler	100	150-200	250-400

ASTHMA MANAGEMENT – INHALER DEVICES

INHALER CHOICE: prescribe by brand

Consider patient's ability to use:

- Most people ≥12 years old have sufficient inspiratory force to use DPIs. See technique required below.
- InCheck® or placebo devices can help inform choice
- In children <5 years a pMDI plus spacer is preferred. A face mask should be worn until the child is old enough to reliably form a seal on the mouthpiece (generally around 5 years old.)
- Try to maintain device type for consistency, ie. 2 x pMDI or 2 x DPI.

Use Asthma and Lung UK, Beat asthma, or Rightbreathe resources to support inhaler and spacer choice, technique and care.

Offer face to face contact for support with new inhalers. Only change inhalers after discussion and agreement.

Inspiratory technique required when using inhaler

pMDI — **Slow and Steady**

DPI — **Fast and Deep**

Refer patients to community pharmacy for New Medicines Service when starting a new inhaler to reinforce inhaler technique and support adherence.

SUSTAINABILITY

Context	**Actions** – Aim for complete control - Good respiratory care is green respiratory care
• Well controlled asthma has the lowest carbon footprint • The UK has a high carbon footprint from inhalers due to relatively high use of pMDIs. • Non-propellant inhalers, (DPIs) have a substantially lower carbon footprint than pMDIs. DPIs require a higher inspiratory effort than pMDIs and may not be appropriate for some people, eg. children < 12 years.	• Ensure asthma diagnosis is correct • Provide information to support low carbon alternatives wherever possible and suitable. • Watch for SABA over-reliance • Optimise inhaler technique • Encourage people to return inhalers to their pharmacy for environmentally friendly disposal. • Advise people not to reduce their inhaler usage due to any environmental concerns. Address any such concerns if present.

SPACER

Children usually need a face mask until around 5 years old (when they can reliably form a seal on the mouthpiece.) Personalise to need.

Aerochamber Plus Flow-Vu Antistatic is the most commonly used spacer in BLMK.

See link for instructions on use and cleaning instructions. The device will make a whistle sound if the inhalation is too fast, (if there is a good seal.)

Other choices include:

Volumatic Spacer	**A2A spacer**
	
(Large volume spacer)	Collapsible, pocket sized

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

MAINTENANCE AND RELIEVER THERAPY (MART) REGIMES – FURTHER INFORMATION

Consider MART if suboptimal asthma control and frequent need for reliever inhaler or if adherence is a problem.

Stop SABA inhaler on repeat. Some people using MART may retain an in-date SABA pMDI (plus spacer) reserved for emergency use only, however most patients should be SABA free.

Careful education of people with asthma is required for this treatment strategy. Although licensed maximum daily doses vary, anyone using more than 8 inhalations daily of any MART inhaler should be strongly recommended to seek medical advice and their maintenance therapy should be reconsidered.

MART regimes are not licensed for high-dose ICS inhalers, eg. Symbicort 400/12 or Fostair 200/6. Current licensed ages for use are given below.

Licensed MART inhalers

Inhaler	Licensed Age	Dose	Max dose
Symbicort Turbohaler (DPI)	≥12yrs	200/6 - either 1 dose twice daily plus PRN or 2 doses twice daily plus PRN	Up to 8 puffs daily , rarely 12 puffs.
DuoResp Spiromax (DPI)	≥12yrs	160/4.5 - either 1 dose twice daily plus PRN or 2 doses twice daily plus PRN	Up to 8 puffs daily , rarely 12 puffs.
Fobumix Easyhaler (DPI)	≥12yrs	160/4.5 - either 1 dose twice daily plus PRN or 2 doses twice daily plus PRN	Up to 8 puffs daily , rarely 12 puffs.
Fostair NEXThaler (DPI) or Fostair MDI	≥18yrs	100/6 - 1 dose twice daily plus PRN	Up to 8 puffs daily
Luforbec MDI	≥18yrs	100/6 - 1 dose twice daily plus PRN	Up to 8 puffs daily

Even in people using a MART regime, a persistent requirement for PRN doses of their inhaler more than twice per week indicates poor asthma control and should prompt a review of therapy.

For emergency treatment of acute asthma, people may take up to 6 puffs of ICS/formoterol at any one time, (1 puff at 1 minute intervals.) If this does not relieve symptoms then urgent medical advice should be sought

MONITORING – TEMPLATE FOR ASTHMA REVIEW

A GP practice asthma review should be offered at least once a year (QOF,) after dose changes and within 48 hours of a hospital attendance or admission.

Aim of the review	Improve quality of life. Achieve control, meaning no daytime symptoms or limitation on activity. No disturbed sleep. Minimal side effects from medication.
Assess control and severity	
Control Test	Assess asthma control, eg. Asthma Control Test (cACT (ages 4-11 years,) ACT (≥12 years)), RCP 3 questions. See additional note on asthma symptom control.
Inhaler ratio	Review how many inhalers have been ordered and how many used. Use of <4 ICS or ICS/LABA in 12 months suggest poor adherence to preventer inhaler. Use of more than 3-6 SABA in 12 months – suggests poor control. (Allow for additional inhaler issues, eg. for school, pre-exercise use, etc.) Use of SABA inhaler ≥ 3 times per week as a reliever suggests poor control.
PEFR	Review and record PEFR if available. Record weight and height to support calculating the peak flow rate.
Exacerbations	Acute attacks: Number of attacks since last review, number of steroid courses since last review, number of A&E / admissions since last review.
Review	
Diagnosis	Ensure the evidence for asthma or suspected asthma diagnosis is recorded in the notes. If any uncertainty revisit and refer for objective tests as appropriate.
Understanding	Check child and/or parent's understanding of what asthma is and how it is treated.
Triggers	Check known / possible triggers. Consider ways to mitigate exposure. Eg. pollen, smoke, pets, weather changes, food allergies.
Smoking / passive exposure to smoke	Ask about smoking, including vaping, for the child & / or family members. Document and offer smoking cessation if required. Contact details: Bedfordshire and Milton Keynes: Smokefree Bedfordshire Luton: Total Wellbeing Luton See the below link for facts on vaping and quitting vaping: E-Cigarettes - Smokefree Bedfordshire (thestopsmokingservice.co.uk)
Co-morbidities	***Atopic conditions*** Consider if there is concomitant rhinitis present? In the absence of a cold are there problems with: Blocked nose, sneezing or runny nose? If yes to the above, on any treatment? Antihistamine / intranasal steroid spray. Nasal spray technique reviewed? Optimise eczema care if present. ***Psychological wellbeing***: Explore and offer appropriate support. ***Obesity:*** Consider weight-loss interventions for overweight and obese children with asthma to improve asthma control.
Inhaler technique	Ask the child to show how they use their inhaler. Re-enforce correct technique. Offer inhaler specific training videos. If a spacer is being used re-enforce the benefits for drug delivery, importance of technique, spacer care and when to replace.
Medication	If asthma is poorly controlled despite good adherence and technique, consider a step up in management. Refer to specialist care if poor control despite low dose (BTS) therapies or ≥ 2 exacerbations requiring oral corticosteroids in the last 12 months. If stable for ≥3 months and low risk of exacerbations consider a step down in management.
Side effects	Check the child's height at least yearly, as poorly 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.

Collaboration	
PAAP	Co-create a personalised asthma action plan with the child and / or parent/ carer with asthma to support self-management and update this annually. Templates from Beat asthma asthma action plan / MART asthma action plan (also Arden's template.) Review action plan and check understanding on how to manage an exacerbation and when to seek advice

Additional note on asthma symptom control

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.

Asthma in schools

Resources for supporting schools to look after pupils with asthma can be found on the Beat Asthma and Asthma and Lung UK websites.

Schools - Beat Asthma Asthma at school and nursery | Asthma + Lung UK (asthmaandlung.org.uk)

Asthma in Adolescents

Adolescents are defined by World Health Organisation (WHO) as young people between the ages 10 and 19 years of age. The UK has amongst the highest rate of asthma deaths due to asthma in this age group.[9]

This age group may be vulnerable to uncontrolled asthma due to factors such as:

- Poor adherence, including forgetfulness, poor routines, and organisational difficulties when self-managing.
- Lack of education - poor understanding of the nature of asthma, perceiving it as an intermittent rather than chronic disease, medications taken on an as required basis and not prioritising asthma treatment.
- Poor inhaler technique
- Tobacco smoking or vaping
- Symptoms becoming the 'norm'
- Deconditioning and obesity
- Deprivation
- Feeling of being invincible.

During asthma reviews for young people it is important that they understand:

- Their asthma needs daily attention
- They should aim for NO symptoms and full participation in activities.
- How to use their asthma treatment
- The importance of adherence to medication
- When to seek advice

During a review:

- Questions should be directed to the young person, not the parent / carer. The ACT should be completed by the young person.
- Questioning may be around what the young person enjoys and how it could be improved with better asthma control. Sleep will also be improved. (Consider use of Salbutamol at night may also lead to wakefulness during the night and sleepiness during the day.)
- Medication regimes should be tailored to the adolescent's needs and lifestyle. The young person may no longer wish to carry a spacer with them – an alternative regime may be considered, such as transition to a DPI. If considering offer support on effective technique over several contacts.

Moving on asthma is a helpful resource for young people aimed at helping develop self-management skills as well as fostering independence in accessing healthcare. Home - Moving on Asthma

When to seek advice and / or refer

In an emergency

Asthma action plans should include details of when to seek urgent help.

Worrying symptoms / Red Flags

- Failure to thrive
- Unexpected clinical finding, eg. focal signs, abnormal voice or cry, dysphagia, inspiratory stridor.
- Symptoms present from birth or perinatal lung problem.
- Excessive vomiting or posseting
- Severe upper respiratory tract infection
- Persistent wet or productive cough
- Family history of unusual chest disease
- Nasal polyps

Diagnostic uncertainty

Poor response to treatment or diagnostic uncertainty

Uncontrolled asthma

It is important to distinguish between poorly controlled asthma and severe asthma.

Refer patient with asthma symptoms despite optimal treatment.

Persistent poor control is suggested by:

- ≥3 SABA in the last 12 months despite primary care review including adherence and inhaler technique check.
- ≥2 exacerbations requiring oral steroids in the last 12 months
- Life-threatening asthma attack / admission for asthma attack.

Consider the management of co-morbidities, eg. hayfever

Refer if asthma is not controlled despite maximum dose treatment in primary care (and good adherence.)

MANAGEMENT OF WHEEZE/ACUTE ASTHMA

1. MANAGEMENT OF WHEEZE IN UNDER 2 YEARS

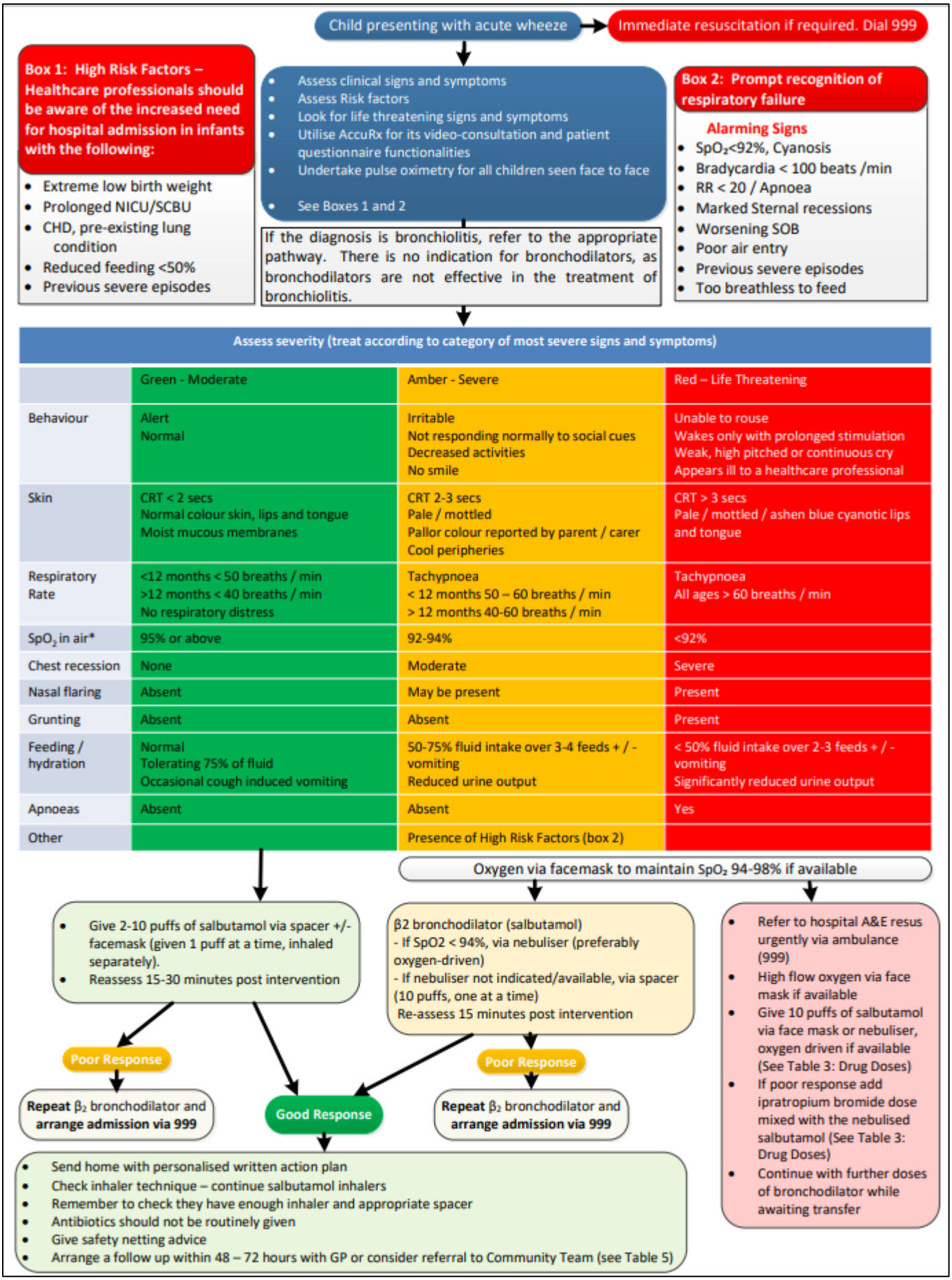

Table 3: Drug Doses:

Dose of Salbutamol nebulisers	<5yrs 2.5 mg
Dose of Ipratropium Bromide nebulisers	250 mcg all ages (or up to 500mcg via nebuliser for over 12 years)

Table 4: Inhalers vs Nebulisers

Indications for nebulisers:

- Low saturations <94%
- 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

Table 5 - Community Children's Nursing Teams

Bedford and North Bedfordshire
Children's Community Nursing Team 01234 310103
Children's Rapid Response Team - 07966025787

Luton and South Bedfordshire

- Children's Community Nursing Team 0333 405 0079
- Children's Rapid Response Team – 07966025787

Milton Keynes
Children's Primary Care Team - 01908 303030 (choose option 4)

Table 6 - Secondary Care Referrals

Bedford General Hospital
Switchboard 01234 355122: Paediatric Registrar

Luton & Dunstable Hospital
Switchboard 01582 491166: Paediatric Registrar bleep 733
GP Urgent Connect (Monday-Friday 9-5pm) 01582 297297 for referrals and advice

Milton Keynes Hospital
01908 660033 bleep paediatrician on call.

This guidance has been produced by Primary Care and consultant clinicians across Bedfordshire, Luton and Milton Keynes, and is written in the following context:

This assessment tool was arrived at after careful consideration of the evidence available including but not exclusively NICE. SIGN, Bristol guideline, EBM data and NHS evidence. Healthcare professionals are expected to take it fully into account when exercising 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 guardian or carer.
Issue date: November 2023

2 MANAGEMENT OF ACUTE ASTHMA / WHEEZE IN 2-16 YEARS

Management of Acute Asthma / Wheeze in Primary Care
Clinical Assessment / Management Tool for 2 – 16 years

Management – Out of Hospital Setting acute Asthma/Wheeze

Child presenting with acute wheeze → Immediate resuscitation if required. Dial 999

Table 1: High Risk Factors – Healthcare professionals should be aware of the increased need for hospital admission in children with the following:

- Attack in late afternoon, at night or early in the morning
- Recent hospital admission
- Previous severe attack
- Young age
- Previous cardio-respiratory illness
- Significant co-morbidity
- Already taking oral steroids or high doses of inhaled steroids
- Concern over social circumstances or ability to cope at home
- Food allergy

Table 2: Consider other diagnoses if any of the following are present:

- Fever (pneumonia) >38.5 C
- Dysphagia (epiglottitis)
- Productive cough (pneumonia)
- Inspiratory stridor (croup)
- Breathlessness with light headedness and peripheral tingling (hyperventilation)
- Asymmetry on auscultation (pneumonia or a foreign body etc.)
- Excessive vomiting (GORD)
- Possibility of anaphylaxis

Consider video consultation as part of the assessment to determine the need for a face-to-face consultation in Primary Care

Table 3: Traffic Light system for identifying severity of acute wheeze/asthma

	Green Moderate Asthma	Amber Acute Severe Asthma	Red Life Threatening Asthma
Talking	In sentences	Not able to complete a sentence in one breath Too breathless to talk or feed	Not able to talk / Not responding Confusion / Agitation
Auscultation	Good air entry, mild – moderate wheeze	Decreased air entry with marked wheeze	Silent chest
Respiratory Rate	Within normal range ≤ 40 breaths / min (2-5 years) ≤ 30 breaths / min (>5 years)	>40 breaths / min (2-5 years) >30 breaths / min (>5 years) Use of accessory muscles	Cyanosis Poor respiratory effort Exhaustion
Heart rate	≤ 140 beats / min (2-5 years) ≤ 125 beats / min (>5 years)	> 140 beats / min (2-5 years) > 125 beats / min (>5 years)	Hypotension
Oxygen saturation in air	≥ 94% in air	< 94% in air	< 94% in air
PEFR (if possible)	> 50% best or predicted	33-50% best or predicted	<33% best or predicted

If all green features and no amber or red:
- Give 1 puff via spacer every minute, up until a maximum or 10 puffs, adjusted to clinical response.
- Reassess 15-30 minutes post intervention
- Consider giving 3 – 5 day course of prednisolone 1mg/kg (max 40mg) – 1st dose now (See Table 4: Drug Doses)
- Nebulise if SpO_2 <94% or unable to tolerate a spacer

Poor Response →
- Consider hospital admission/999
- Oxygen if Sp02 <94%
- Continue with further doses of salbutamol while awaiting transfer
- Add ipratropium dose mixed with salbutamol nebuliser

Good Response →

Oxygen via facemask to maintain SpO_2 94-98% if available

Severe Exacerbation
- If SpO2 < 94% give O2 to achieve SpO2 in air 94-98%
- Give salbutamol –
  - SpO2 ≥ 94% : 10 puffs via MDI and spacer
  - If SpO2 < 94% Nebuliser driven by O2 (Ref Table 4)
  - if nebuliser not indicated/available, give via spacer (10 puffs)
- Reassess after 15 mins, if further treatment needed then repeat salbutamol (as above) and if SpO2 < 94% then add in ipratropium bromide via a nebuliser (refer to Table 4)
- Give oral prednisolone (refer to Table 4)

Reassess as clinically required

Assess response to treatment 15mins after β_2 bronchodilator

Good Response →

Poor Response → **Repeat** salbutamol and **arrange admission via 999**

Arrange immediate hospital admission via 999
Salbutamol with ipratropium (via nebuliser if require oxygen) (see Table 4)
- oral prednisolone (see Table 4)

Repeat salbutamol with ipratropium (preferably via **oxygen-driven nebuliser) whilst awaiting hospital transfer as required**

- Before discharge review overall asthma control, inhaler technique, medication and ask If parent smokes or if child smokes (if >11 years old). If yes, offer quit smoking support.
- Check understanding of condition and signpost to further resources (Asthma + Lung UK)
- Ensure that Personalised Asthma Action Plan is up-to-date
- Antibiotics should not be routinely given
- Give safety net advice
- Consider referral to appropriate community team (see next page)
- Advise parents to book a follow-up review with their GP surgery within 2 working days
- Check they have enough inhaler and appropriate spacer
- If second (or more) asthma attack within 12 months, consider referral to secondary care

Table 4: Drug Doses:

Dose of Prednisolone (orally) **Plain 5mg tablets** (can be crushed if required) **Where child already receiving maintenance oral steroid**	**2-5yrs 20mg; 5-7yrs 30-40mg; >7yrs 40mg** **1 – 2 mg per kg per dose (max.40mg)** **2mg/kg (max. 60mg)**

- If given, should be given within the first hour
- In mild to moderate viral induced wheeze, steroids may not be necessary
- 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.
- Dexamethasone 0.6mg/kg may be given as alternative to prednisolone.

Dose of Salbutamol nebulisers	<5yrs 2.5 mg; >5yrs 5mg
Dose of Ipratropium Bromide nebulisers	250 mcg all ages (or up to 500mcg via nebuliser for over 12 years)

Adapted from APLS+	Respiratory rate at rest:	Heart rate:	Systolic BP: (mmHg)
Pre-school 2 – 5 years	25 - 30	95 - 140	85 - 100
School 5 - 11 years	20 – 25	80 – 120	90 - 110
Adolescent 12-16 years	15 – 20	60 – 100	100 - 120

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 <94%
- Unable to use inhaler and spacer (not compliant)
- Severe and life-threatening respiratory distress
- Nebulisers are generally not recommended for home use

Milton Keynes

Children's Primary Care Team

- Tel: 01908 303030 (choose option 4)

Milton Keynes Hospital

- Paediatric asthma nurse – Tel: 01908 996574 (Monday -Friday, 08:30 to 16:30)
- Paediatrician on call - Tel: 01908 660033 (bleep paediatrician on call)

North Bedfordshire

Children's Rapid Response Team

- Tel: 07966025787

Bedford General Hospital

Switchboard Tel: 01234 355122 - Paediatric Registrar

Table 6 - Predicted Peak Flow: for use with EU / EN13826 scale PEF meters only

Height (m)	Height (ft)	Predicted EU PEFR (L/min)	Height (m)	Height (ft)	Predicted EU PEFR (L/min)
0.85	2'9"	87	1.30	4'3"	212
0.90	2'11"	95	1.35	4'5"	233
0.95	3'1"	104	1.40	4'7"	254
1.00	3'3"	115	1.45	4'9"	276
1.05	3'5"	127	1.50	4'11"	299
1.10	3'7"	141	1.55	5'1"	323
1.15	3'9"	157	1.60	5'3"	346
1.20	3'11"	174	1.65	5'5"	370
1.25	4'1"	192	1.70	5'7"	393

Luton and South Bedfordshire

Children's Rapid Response Team

- Tel: 07966025787

Luton & Dunstable Hospital

- GP Urgent Connect (Monday - Friday 9am - 5pm) 01582 297297 for referrals and advice
- Out-of-hours: Switchboard 01582 491166: Paediatric Registrar bleep 733

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3 Specialist Team contacts and referrals

Children's Community Nursing Teams

Bedford and North Bedfordshire
Children's Community Nursing Team 01234 310103
Children's Rapid response team 07966025787

Luton and South Bedfordshire
Children's Community Nursing Team 0333 405 0079
Children's Rapid Response Team - 07966025787

Milton Keynes
Children's Primary Care Team - 01908 303030 (Option 4)

Secondary Care Referrals

Bedfordshire Hospital NHS Trusts

Luton & Dunstable Hospital Site
Switchboard 01582 491166: Paediatric Registrar bleep 733
GP Urgent Connect (Monday-Friday 9-5pm) 01582 297297 for referrals and advice

Bedford General Hospital Site
Switchboard 01234 355122: Paediatric Registrar bleep

Milton Keynes University Hospital NHS Trust
Paediatric asthma nurse – Tel: 01908 996574 (Monday-Friday, 08:30-16:30.)
Paediatrician on-call – Tel: 01908 660033 (bleep paediatrician on call)

Resources for HealthCare Professionals and Patients/Carers

Resources for children and young people with asthma and their carers

Asthma and Lung UK

- Asthma education
- How to use your inhalers (videos)
- Peak flow diary
- Asthma attack recovery plan

Beat Asthma

- Asthma education
- Asthmanauts leaflet: helping explain asthma to my child
- PAAP
- PAAP (MART)
- How to use your inhalers (videos)
- Resources for adolescents

Adolescents

- Moving on Asthma

Itchy, Sneezy, Wheezy – Everything you need to know about allergies.
Rightbreathe – how to look after inhalers and spacers, including videos

Resources for healthcare professionals

Asthma and Lung UK – health professionals information
Beat Asthma – resources for primary healthcare professionals, resources for secondary healthcare professionals
Education

- Asthma (Children and young people) - elearning for healthcare (e-lfh.org.uk) A range of e-learning modules on different aspects of asthma care.

Resources for schools
Home :: Bedfordshire, Luton & Milton Keynes Healthier Together (frank-digital.co.uk)
BLMKICB Medicines Management – BLMKICB Medicines Management
Using FeNO (wessexahsn.org.uk)

REFERENCES

1. Asthma and Lung UK. Statistics about lung conditions, updated 19/11/22. Available at https://public.tableau.com/app/profile/asthmaandlunguk/viz/Asthmaprevalence/Asthmaprevalence Accessed 16/2/24 Accessed 08/2023
2. Kavanagh J, et al. 2019. Over and under diagnosis in asthma. Breathe (Sheff) 15(1): e20-e27. Available via https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6481983/
3. Office for Health Improvement & Disparities. Nov 2023. Fingertips public health data. Available via https://fingertips.phe.org.uk/profile/respiratory-disease/ Accessed 08/2023.
4. RCP, 2014. Why asthma still kills. The National Review of Asthma Deaths (NRAD) Confidential Enquiry Report. www.rcplondon.ac.uk/sites/default/files/why-asthma-still-kills-full-report.pdf
5. Global Initiative for Asthma. Global strategy for Asthma management and prevention, 2023. Available at www.ginasthma.org Accessed 08/2023.
6. British Thoracic Society/Scottish Intercollegiate Guidelines Network, 2019. British guideline on management of asthma. Available at https://www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/ Accessed 08/23.
7. NICE Guideline [NG80] 29/11/17, last updated 22/3/21. Asthma: Diagnosis, monitoring and chronic asthma management. Available at https://www.nice.org.uk/guidance/ng80 Accessed 08/23.
8. NHS England. National Bundle of Care for Children and Young People with Asthma: Phase one. Sept 2021. Report template - NHSI website (england.nhs.uk) Resource Pack to accompany the National Bundle of Care for Children and Young People with Asthma. National-bundle-of-care-for-children-and-young-people-with-asthma-resource-pack-September-2021.pdf (england.nhs.uk) Accessed 05/2024
9. Shah, R., Hagell A. & Cheung, R. (2019.) International comparisons of health and wellbeing in adolescence and early adulthood. Nuffield Trust & Association for Young People's Health: January 2019. Available via https://www.nuffieldtrust.org.uk/research/international-comparisons-of-health-and-wellbeing-in-adolescence-and-early-adulthood Accessed 25/3/24.