Children's Asthma Guideline

Jan 2020, Tower Hamlets Together Guideline

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Is it Asthma? Making the Diagnosis

What is Asthma?

- Asthma is a condition characterised by airway inflammation and episodic reversible airway narrowing. Symptoms include shortness of breath, cough and wheeze, and are often associated with viral infection, exercise, sleep, or allergen exposure. Acute symptoms are usually responsive to inhaled bronchodilator therapy. There is an association with atopy. Children whose symptoms occur only in the context of viral upper respiratory tract infections are described as having viral-induced wheeze. Treatment strategies are determined by frequency and severity of symptoms rather than the presence or absence of a viral trigger.

Differential Diagnoses

- *Acute* asthma symptoms are mimicked by other conditions such as:

- Croup
- Bronchiolitis
- Pneumonia
- Anaphylaxis
- Cardiac failure
- Anxiety/Dysfunctional breathing/Vocal cord dysfunction

- *Chronic* asthma symptoms are mimicked by other conditions such as:

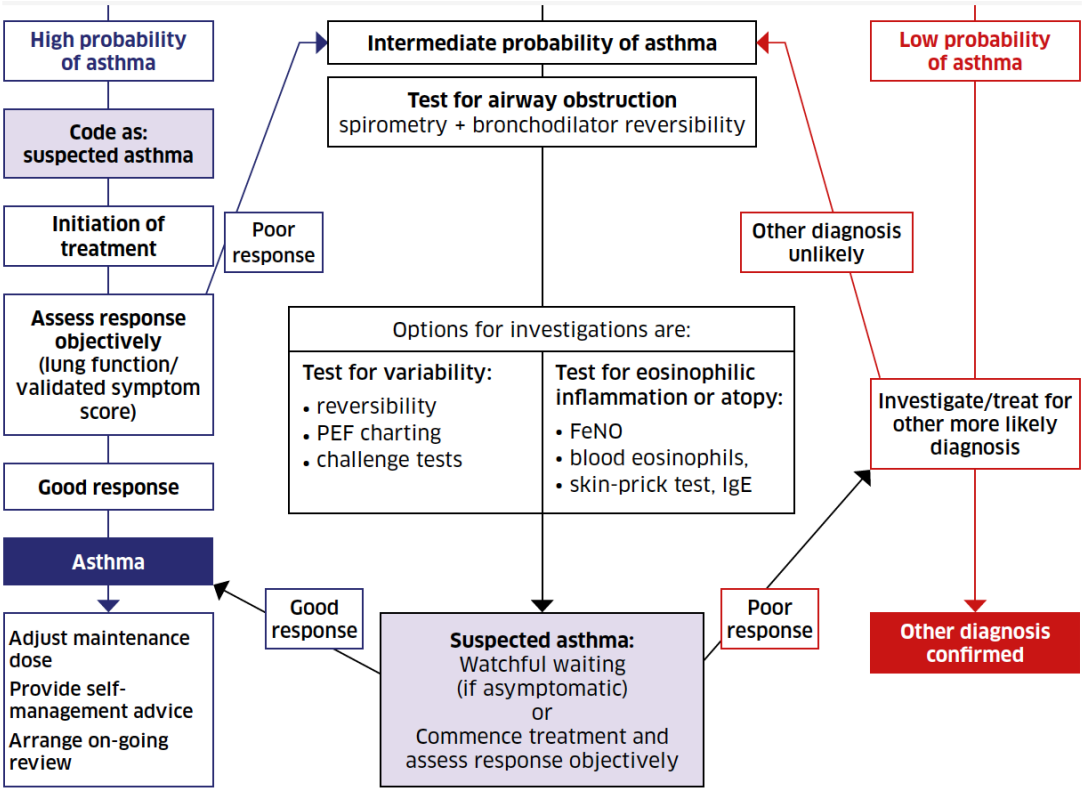
- Aspiration (Gastrooesophageal reflux, dysphagia, laryngeal cleft/tracheooesophageal fistula)
- Extrinsic airway compression (lymphadenopathy, vascular ring)
- Intrinsic airway narrowing (airway malacia, cardiac failure)
- Chronic lung disease (interstitial lung disease, bronchiectasis)

- These differential diagnoses should be considered when evaluating asthma presentations or treatment response (or lack thereof).

Is it Asthma? Making the Diagnosis

Structured clinical assessment
A structured clinical assessment in conjunction with the BTS algorithm cited below can assign children to broad categories of validity of asthma diagnosis and thus guide treatment approach.

- History of recurrent episodes of wheeze, cough, breathlessness and chest tightness that can vary over time
- Peak flow measurement (including diary), diurnal variation, or symptoms with normal peak flow can be helpful.
- Quantification of subjective symptoms via the ACT (available at www.myasthmaproject.co.uk)
- Document evidence of wheeze noted by health professionals (as well as parental-reported)
- Document family/personal history of atopic conditions.
- Check for symptoms/signs to suggest comorbidities / alternative diagnosis (including non-response to salbutamol (acute) or inhaled steroid (longterm) – see page 15.



[1] In children under 5 years and others unable to undertake spirometry in whom there is a high or intermediate probability of asthma, the options are monitored initiation of treatment or watchful waiting according to the assessed probabilityof asthma.

(BTS-SIGN Guideline 2019)

Is it *still* Asthma? Reviewing the Diagnosis

After a trial of treatment, successful or otherwise, it is important to review the diagnosis.

Successful trial of treatment

Children who respond to asthma preventer therapy may or may not need longterm treatment:

- 1 in 3 preschool children will have a wheezy episode but of these only a fifth will subsequently be diagnosed with asthma.
- Those requiring 'asthma' treatment for severe or frequent episodic viral wheeze may outgrow their disease, or simply have had a transient postinfectious airway hyperreactivity

A trial of weaning and stopping preventer therapy should be attempted, with consideration of:

- The severity of previous symptoms (those with greater morbidity may warrant a longer period of stability before weaning is considered.
- The time of year (it may be appropriate to wait until the spring before weaning preventer treatment).
- Parental expectations (parents and carers must be clear that exercise limitation, exacerbation, sleep disturbance or increased salbutamol use indicate a need to restart treatment).

Unsuccessful trial of treatment

Persistence of symptoms may indicate:

- Inadequate prescription (an increased steroid dose or addition of LABA/LTRA may be needed)
- Inadequate treatment compliance
    - Failure to use preventer regularly
    - Failure to use an appropriate delivery device (usually MDI and age-appropriate spacer)
- Remediable factors
    - Untreated rhinitis
    - Tobacco smoke exposure
    - Allergen exposure
    - Obesity
- Inadequate or inappropriate treatment due to misdiagnosis or undiagnosis

Consideration should be given to all of the above (with reference to the schema on page 14), with specialist referral considered if the latter is a possibility.

Episodic Viral Wheeze vs Multiple Trigger Wheeze/Asthma

Much more is made of this distinction than is warranted.

Episodic Viral Wheeze occurs more in preschool children, and describes symptoms only present during viral infections. *Multi-trigger Wheeze* is more frequent in school age children, and includes those with wheeze triggered by other factors such as allergy and exercise.

While there is evidence that oral steroids are unhelpful in acute episodic viral wheeze, the approach to chronic symptoms is similar in both conditions, with inhaled steroids being first line therapy should symptoms be of sufficient frequency and severity to warrant preventive treatment.

Treatment Objectives

- The goal of treatment is control of disease. Complete control of asthma is defined as:
  - no daytime symptoms
  - no night-time awakening due to asthma
  - no need for rescue medication
  - no asthma attacks
  - no limitations on activity including exercise
  - normal lung function (in practical terms FEV1/PEF>80% predicted or best)
  - minimal side effects from medication.

- In clinical practice patients may have different goals and may wish to balance the aims of asthma management against the potential side effects or inconvenience of taking medication necessary to achieve perfect control.

- Other indicators of poor control include:
  - Routinely requiring reliever inhaler >3x/week
  - Requiring >10 salbutamol inhalers in a year
  - Asthma Control Test™ <19
  - Admission to intensive care
  - 2 or more courses of systemic corticosteroid in a year (e.g oral prednisolone, dexamethasone, IV hydrocortisone)
  - 2 or more emergency room attendances in a year
  - Recent hospital admission
- Any of these should prompt treatment escalation, referral to High Risk/Community Asthma Nurse Clinic, via the Specialist Children's SPA or paediatric referral.

Therapeutic Options

- Non- Pharmacological management

- Parents and children should be advised not to smoke. Referral to local smoking cessation services should be made in primary care.
- Weight loss can improve asthma control. Children with BMI > 3.5 z-scores above the mean should be referred to the obesity service at the Royal London.
- Families should be made aware of and assisted in mitigating triggers associated with their asthma (e.g. allergens, smoking, air pollution, exercise).

- Pharmacological management

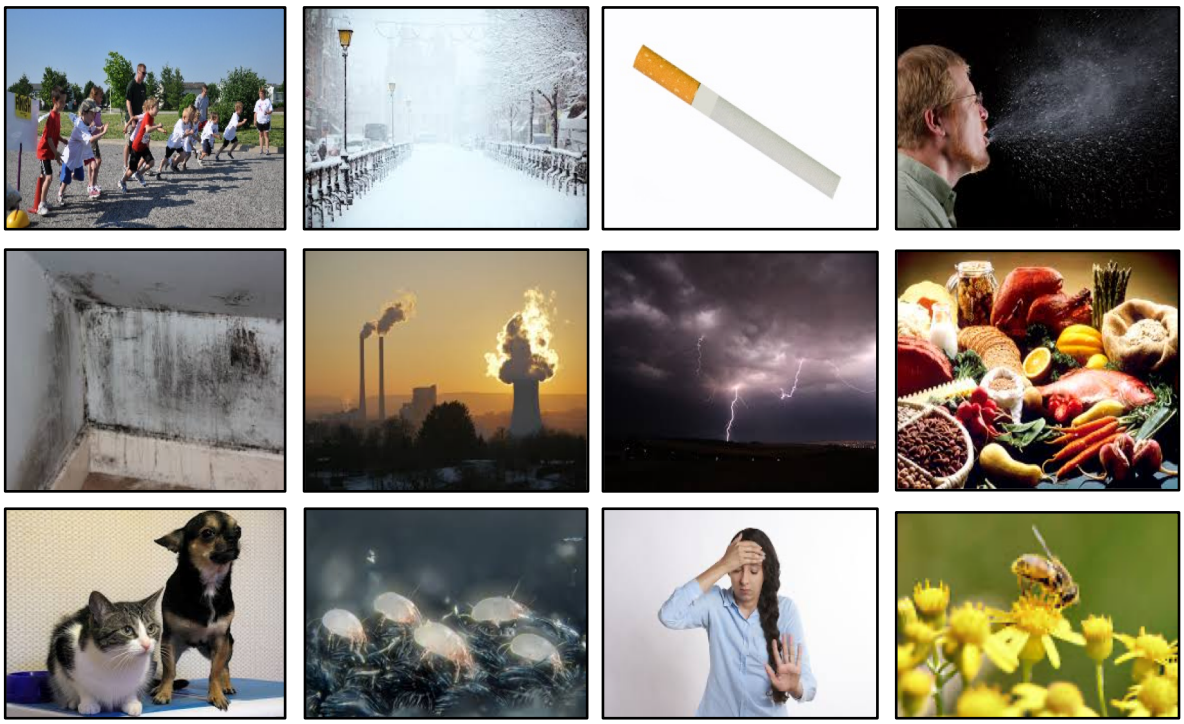
- Inhaled corticosteroids are the first line recommended preventer drug
- The first choice as add-on therapy to inhaled corticosteroids is an inhaled long-acting β_2 agonist (LABA) – (>5y), or a LTRA such as montelukast (<5y).
- Always use a combination device if adding LABA (NICE TA131 2007)
- If asthma control remains suboptimal after the addition of an inhaled long-acting β_2 agonist then the dose of inhaled corticosteroids should be increased from a very low dose to a low dose in children (5-12 years).
- BTS Guidelines (2019 - key sections are on page 9-10) give guidance around treatment escalation and step down.

- Medication delivery

- Inhaler prescription should be accompanied by device training
- Specific brands should be prescribed (e.g. Qvar/Clenil Modulite NOT 'beclometasone')
- A pMDI and spacer are the preferred method of delivery of inhaled medication.
- A facemask should be used only in children unable to breathe reproducibly using the mask (usually children below 3-5 years or with developmental delay).
- Alternative delivery devices should be considered ONLY if a pMDI and spacer are likely to reduce compliance (e.g in older children)

Trigger Recognition and Avoidance

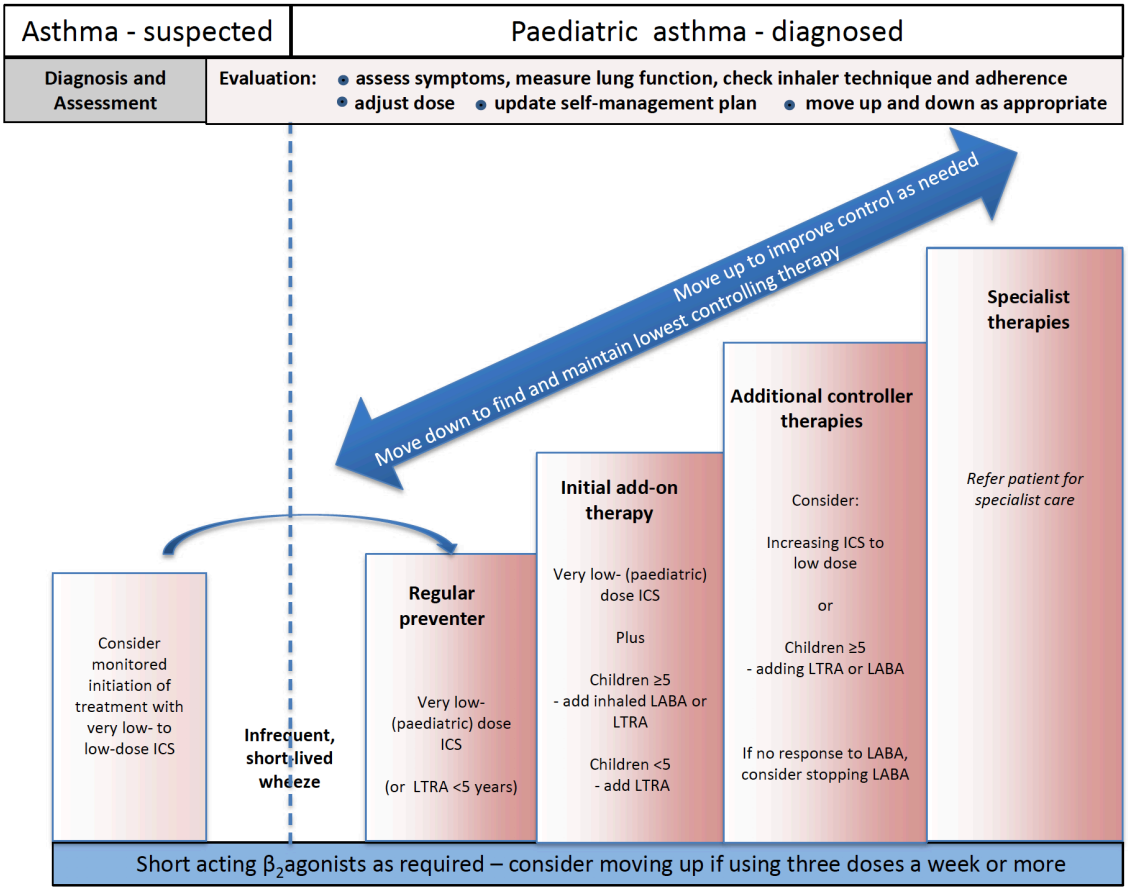
- Patients should be encouraged to consider their asthma triggers
- Some will be generic and some will be specific to the child
- Common triggers with potential for mitigation are as below



Treatment Escalation and Reduction

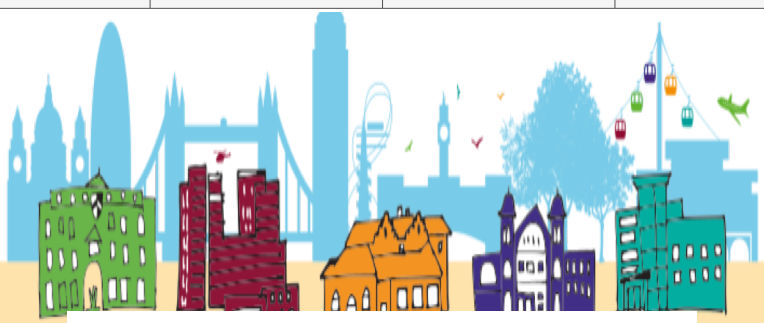
- Initiating Treatment

- Commence ICS preventer treatment at low dose (>5y) or very low dose (<5y). See flow chart on page 15 for a detailed summary.
- Provide inhaler technique and asthma education.
- Step down treatment at asthma review if adequate control (pg. 6) is reached.
- Increase inhaled steroids dose or commence add-on therapy if control is not achieved despite good compliance and technique and avoidance of triggers.
- The BTS Treatment Ladder (below) guides treatment escalation or reduction
- The following page indicates preventer inhaler dose equivalences.



Preventer Therapy Dose Equivalence

ICS	Dose		
	Very low dose	Low dose	Medium dose#
Pressurised metered dose inhalers (pMDI) with spacer			
Beclometasone dipropionate			
Non-proprietary	50 micrograms two puffs twice a day	100 micrograms two puffs twice a day	200 micrograms two puffs twice a day
Clenil Modulite	50 micrograms two puffs twice a day	100 micrograms two puffs twice a day	200 micrograms two puffs twice a day
Qvar (extrafine) Qvar autohaler Qvar Easi-breathe	n/a	50 micrograms two puffs twice a day	100 micrograms two puffs twice a day
Soprobec	50 micrograms two puffs twice a day	100 micrograms two puffs twice a day	200 micrograms two puffs twice a day
Ciclesonide			
Alvesco Aerosol inhaler	n/a	80 micrograms two puffs once a day	160 micrograms two puffs once a day
Fluticasone propionate			
Flixotide Evohaler	50 micrograms one puff twice a day	50 micrograms two puffs twice a day	125 micrograms two puffs twice a day
Dry powder inhalers (DPI)			
Budesonide			
Non-proprietary Easyhaler	n/a	100 micrograms two puffs twice a day	200 micrograms two puffs twice a day
Pulmicort Turbohaler	100 micrograms one puff twice a day	100 micrograms two puffs twice a day 200 micrograms one puff twice a day	200 micrograms two puffs twice a day 400 micrograms one puff twice a day
Fluticasone propionate			
Flixotide Accuhaler	50 micrograms one puff twice a day	100 micrograms one puff twice a day	250 micrograms one puff twice a day
Mometasone			
Asmanex Twisthaler	n/a	200 micrograms one puff twice a day	n/a
Combination inhalers			
Budesonide with formoterol			
Symbicort Turbohaler	100/6 one puff twice a day	100/6 two puffs twice a day 200/6 one puff twice a day	n/a
Fluticasone propionate with salmeterol			
Combisal MDI	n/a	50/25 two puffs twice a day	n/a
Seretide Accuhaler	n/a	100/50 one puff twice a day	n/a
Seretide Evohaler	n/a	50/25 two puffs twice a day	n/a



Primary Care Management - Acute

- Key Pointers

- Children presenting to primary care with suspected acute asthma should have important differentials excluded.
- Children with acute asthma should have an assessment of asthma severity.
- Children with severe asthma should be treated and referred to hospital.
- Treatment approach varies slightly with age

Important Differentials:
- Pneumonia
- Croup
- Bronchiolitis
- Anaphylaxis
- Inhaled foreign body
- Diabetic ketoacidosis

Age<5y
Give 3 x 10 puffs inhaled salbutamol via pMDI and spacer over the first 1hr, consider 10-20mg oral prednisolone.
Age>5
Give 3 x 10 puffs inhaled salbutamol via pMDI and spacer and 40mg oral prednisolone.

Children requiring oxygen should receive nebulised bronchodilator with oxygen
If not improving send to hospital, via Ambulance if appropriate.
If improving can be discharged home if symptom-free (or likely to be) 3-4hr post salbutamol.

Discharge Requirements - On discharge ensure:
- Patient stable on 3-4 hourly bronchodilators
- Personalised Asthma Action Plan provided
- Written wheeze information provided and understood
- Wheeze triggers are identified
- Escalation of treatment is considered
- Inhaler technique and understanding is reviewed
- Overuse of salbutamol (>10/yr)/underuse of preventer inhaler is considered
- Primary care review within 48 hrs of an acute attack
- Referral to secondary care is considered (see later for criteria)

Clinical Assessment Tool for the Child with Acute Exacerbation of asthma 2-16 Years

Management within a Community Setting

Suspected Acute exacerbation of Asthma:

Consider other diagnosis if any of the following are present:
- Fever
- Dysphagia
- Productive Cough
- Breathlessness with light headedness and peripheral tingling (hyperventilation)
- Asymmetry on auscultation
- Excessive vomiting
- Inspiratory Stridor

No → Suspected Acute Exacerbation of Asthma. Assess severity (ref Box 1):

Yes → It may not be asthma: Seek expert Help (Consider use of another pathway)

If all green features and no amber or red

Moderate Exacerbation
- Give 2-10 puffs of $ß_2$ agonist via a spacer (with a facemask in younger children using tidal breathing)
- Use patient own spacer where available
- Increase $ß_2$ agonist dose by 2 puffs every 2 minutes upto 10 puffs according to response
- Consider an appropriate dose of soluble oral prednisolone (ref table 5)

Assess response

- Good Response (Green features)
- Deterioration? Consider if now amber/red

Good Response:
- Advise patient to continue using $ß_2$ agonist via spacer as needed—but not exceeding 4 hourly.
- Give asthma discharge management advice leaflet.
- Continue Prednisolone for up to 3 days.
- Arrange asthma clinic follow up within 48hrs.
- Review inhaler technique

If any amber features and no red

Severe Exacerbation
- Give Oxygen via a facemask/nasal prongs to achieve $Sp0_2$ 94-98%
- Give $ß_2$ agonist 10 puffs via spacer ± facemask or nebulised salbutamol at an appropriate dose driven by oxygen (Ref Table 4)
- Give an appropriate dose of oral prednisolone (Ref Table 5)

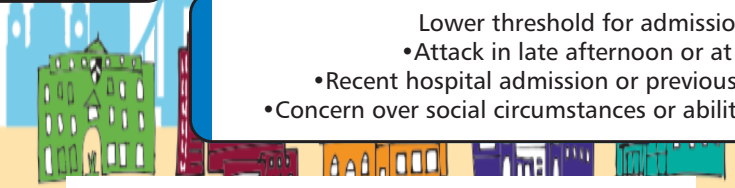
- If symptoms are not controlled repeat $ß_2$ agonist via oxygen driven nebuliser.
- Refer to hospital—consider ambulance +/- 999.
- Discuss with Paediatric Registrar via 02073777000 Bleep 1052.
- Stay with child until ambulance arrives

If any red features

Life Threatening
- Give Oxygen via a facemask to achieve $Sp0_2$ 94-98%
- Call 999 for an Emergency Ambulance
- Give Nebulised $ß_2$ agonist and ipratropium at an appropriate dose driven by oxygen (Ref table 4)
- Give an appropriate dose of oral prednisolone (Ref Table 5)
- Repeat $ß_2$ agonist up to every 20-30 minutes while waiting for ambulance to arrive
- Continually assess the child after each intervention.
- Ensure continuous oxygen delivery
- Stay with the child whilst waiting for ambulance to arrive

- Can tilt volumatic to 45° to open valve
- Give nebulised B-agonist if hypoxic
- Steroids may not be needed in age <5y

Lower threshold for admission if:
- Attack in late afternoon or at night
- Recent hospital admission or previous severe attack
- Concern over social circumstances or ability to cope at home



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Clinical Assessment Tool for the Child with Acute Exacerbation of asthma 2-16 Years

Management within a Community Setting

Table 1: Traffic Light system for identifying signs and symptoms of clinical dehdration and shock

	Green – Moderate	Amber – Severe	Red – Life Threatening
Behaviour*	Normal	Anxious/Agitated	Exhaustion/Confusion
Talking	In sentences	Not able to complete a sentence in one breath	Not able
Respiratory	≤40 breaths/min 2-5 years ≤30 breaths/min 5-12 years <25 breaths/min 12-16 years	Rate>40 Breaths/min 2-5 years Rate>30 Breaths/min >5 years Silent Chest	
Heart Rate	Within normal range (Ref to table 2)	>140 beats p/min (2-5 years) >125 beats p/min (>5 years) *Consider influence of fever &/or Salbutamol	
$Sa0_2$	≥92% in air	<92% in air	
PEFR	>50% of predicted (Ref to table 3)	33-50% of predicted (Ref to table 3)	<33% of predicted (Ref to table 3)

CRT: capillary refill time **RR:** respiration rate

Table 2: Normal Paediatric Values:

Respiratory Rate at Rest:

2-5yrs	25-30 breaths/min
5-12yrs	20-25 breaths/min
>12yrs	15-20 breaths/min

Systolic Blood Pressure

2-5yrs	80-100 mmhg
5-12yrs	90-110 mmhg
>12yrs	100-120 mmhg

Heart Rate

2-5yrs	95-140 bpm
5-12yrs	80-120 bpm
>12yrs	60-100 bpm

Table 3: Predicted Peak Flow: For use with EU / EN13826 scale PEF metres only

Height (m)	Height (ft)	Predicted EU PEFR	Height (m) (L/min)	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

Table 4: Guidelines for nebuliser

- Significantly low sats despite inhaler and spacer use
- Oxygen Saturations persistently below 96%
- Requiring oxygen
- Unable to use volumatic/spacer device
- Severe respiratory distress

Salbutomol
2-5 years– 2.5mg, 5-12 years– 2.5-5mg, 12-16 years– 5mg

Ipratropium
under 12 years – 250micrograms,
12-18 years – 500micrograms

Table 5: Prednisolone Guideline BNFC 2019

Give **prednisolone** by mouth:
child under 12 years 1–2 mg/kg (max. 40 mg) daily for up to 3 days or longer if necessary, if the child has been taking an oral corticosteroid for more than a few days give prednisolone 2mg/kg (max. 60mg). Child12-18 years 40-50mg daily for at least 5 days

BTS guidelines 2019: *(if weight not available)*
Use a dose of 10 mg prednisolone for children under two years of age, 20 mg for children aged 2–5 years and 30–40 mg for children > 5y

This guidance is written in the following context

This assessment tool was arrived at after careful consideration of the evidence available including but not exclusively use BTS Guidelines and NHS evidence. 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 guardian or carer.

Steroid duration and Salbutamol weaning

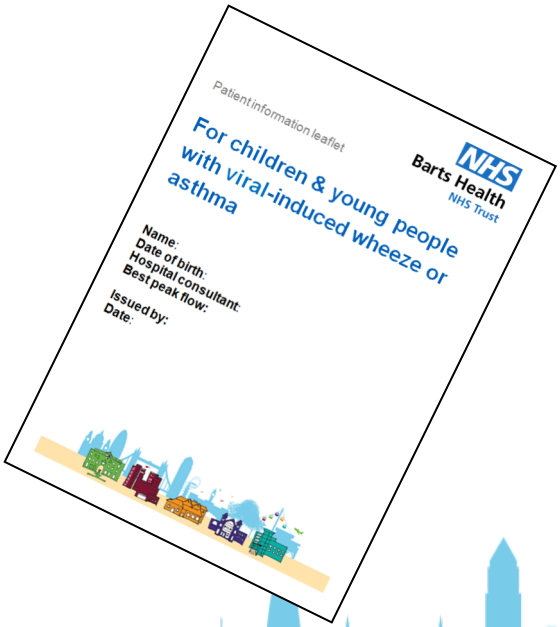
After treatment of an acute episode we recommend the following regimen for weaning salbutamol:

Day after discharge	Number of puffs	How often to give
1	10 puffs	Every 4 hours
2	10 puffs	Every 6 hours
3	10 puffs	Every 8 hours
4	10 puffs	Twice a day
5	Stop if no wheeze	

If a child receives oral steroids they will usually receive a one off dose of dexamethasone or 3 days of oral prednisolone, these are equivalent.

If a patient is not improving satisfactorily at 48 hr GP review, the GP should consider extending the course or steroid by two further days with 2 days of oral prednisolone on days 4 and 5.

The Barts Health NHS Trust Asthma and Wheeze Leaflet is a useful patient education resource



All patient encounters, but particularly exacerbations, are patient education opportunities. Key points include:

- Basic pathology of asthma
- Appropriate spacer choice, technique, and maintenance
- Recognition and mitigation of triggers
- When to seek help

The Barts Health NHS Trust Asthma and Wheeze Leaflet is a useful patient education resource

Chronic Management – Primary Care

Suspected Asthma

Episodic cough & wheeze, viral/nocturnal/exercise symptoms, Salbutamol response
Diurnal/Symptomatic variation in lung function (PEFR/FEV-1), Other Atopy

Troublesome Symptoms?

Salbutamol used > 3 days/week
Disturbed sleep, School absence, Exercise limitation
Hospitalisation, Requires oral steroids
ACT Score <19, PEFR < 80% predicted

Initiate Preventer Treatment

Age < 5 – Clenil Modulite 100mcg BD via MDI and spacer (mask or mouthpiece)
Age >5 – Clenil Modulite 200mcg BD via MDI and spacer (mouthpiece)
Salbutamol as required for exercise/URTI
Assess ACT Score, PEFR after 3 months

Symptoms Resolved?

Reduce/Stop Treatment
Reassess ACT Score, PEFR
If symptoms recur, restart/escalate
If not, reduce/discontinue

Monitor

ACT, PEFR
Salbutamol Prescription
Prednisolone Prescription
School Absence, ++USMA*
Cause for Concern?

Symptoms Persist

Age < 5 – Add montelukast 4mg OD
Age > 5 – Start Seretide 50**, TT BD via MDI and spacer
Reassess ACT Score, PEFR
Symptoms Persist?

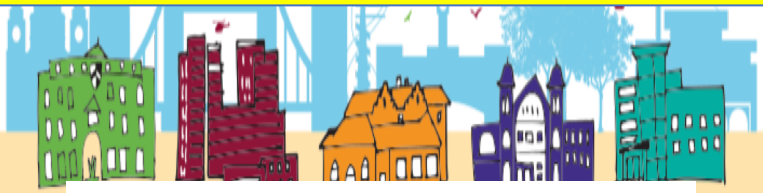
YES

NO

Increase Steroid dose***/
Add montelukast****
Reassess ACT Score, PEFR
Symptoms Persist?

Refer to Secondary Care

*USMA = unscheduled medical attendance.
**or other licensed preparation (e.g. COMBISAL)
***if montelukast already added, higher dose combinations may represent off license usage
****5-14y 5mg daily, 15+ 10mg daily

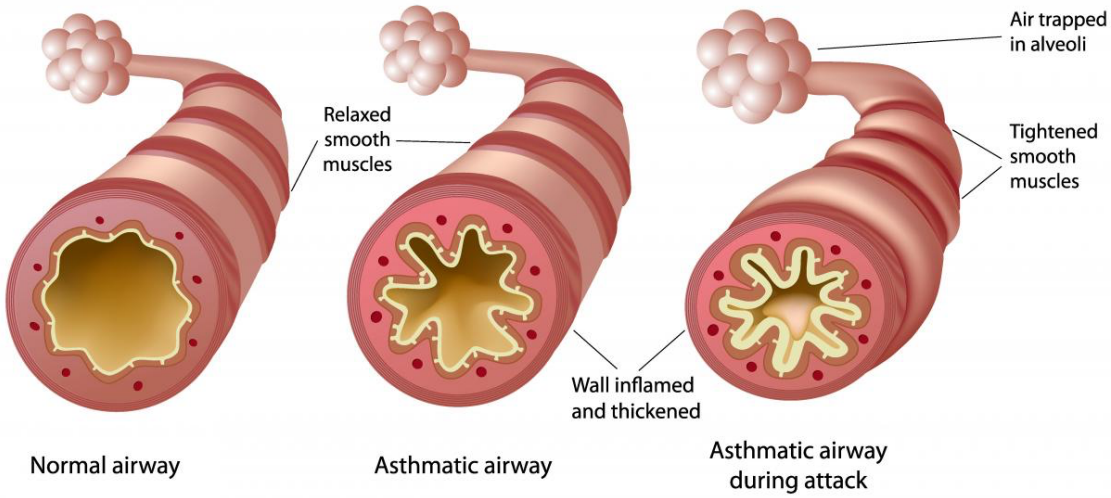


Back to Basics: Explaining to children and families

- What is Asthma?
- What is the role of the reliever and preventer inhalers?
- How are inhalers used and maintained?
- How often are they forgetting their steroid inhaler and why?

What is asthma?

- The airway has a lining and a muscle wall
- Children with asthma have inflamed, swollen airway lining and thickened airway muscle
- The swollen lining makes the muscle wall twitchy
- Twitchy muscles can easily go into spasm and cause an asthma attack



How do my inhalers help?

- The preventer inhaler (usually brown, purple or red) makes the airway lining less swollen and inflamed
- Less inflamed airway lining reduces muscle twitchiness
- This stops the airway going into spasm and reduces wheeze
- The preventer works longterm but does not treat an asthma attack

- The reliever inhaler (usually blue) treats airway spasm for a short time
- If it is being used more than three times per week then your preventer inhaler may need to be increased

Back to Basics: Spacers

What is a spacer and how is it used?

Spacers are large, empty devices (or tubes) that are usually made out of plastic. They help you get the best from your asthma medicine if you use a metered dose inhaler (MDI).

- Using a spacer makes it easier to get the right amount of medicine straight to your lungs.
- We recommend the tidal breathing technique as per the Asthma UK videos: https://www.asthma.org.uk/advice/inhaler-videos
- Using a spacer can also reduce the risk of side effects from your medicine.
- You may receive one of several types of inhaler; the main ones are aerochambers or volumatics.
- The spacer should be soaked in warm soapy water for 15 minutes before first use and once per month and allowed to drip dry. DO NOT RUB OR TOWEL DRY AS THIS REDUCES EFFECTIVENESS.
- Spacers should be replaced when damaged or after 12 months' use.

Volumatic Spacers

If you receive an Volumatic spacer you may receive one with or without a mask.

- Children of school age should generally remove the rubber mask and use the mouthpiece only.
- Tilting the spacer to 45 degrees holds the spacer valve open which can help in small children during an asthma attack.

Spacer	Appropriate User
With Mask	0-5y
Without Mask	5+

Back to Basics: Spacers

Aerochamber Spacers
If you receive an aerochamber (below), please make sure you have the right one for your child's age.

Spacer	Appropriate User
With Mask	0-18 months
With Mask	1-5 years
No Mask	5-16 years
No Mask	12+ years
With Mask	5+ years with learning difficulties/inability to use mouthpiece
With Mask	16+ years with learning difficulties/inability to use mouthpiece

Prescribers should specify the type of *AeroChamber Plus Flow-Vu anti-static VHC* spacer from the list below. A mouthpiece should be used where possible in preference to a mask, with the exception of small children.

Colour	Name of Spacer
Orange	AeroChamber Plus Flow-Vu Anti-static VHC with Small Mask for Infants (0-18 months)
Yellow	AeroChamber Plus Flow-Vu Anti-static VHC with Medium Mask for Children (1-5 years)
Green	AeroChamber Plus Flow-Vu Anti-static VHC Youth Mouthpiece (5+ years)
Blue	AeroChamber Plus Flow-Vu Anti-static VHC with Mouthpiece
Purple	AeroChamber Plus Flow-Vu Anti-static VHC with Small Adult Mask
Blue	AeroChamber Plus Flow-Vu Anti-static VHC with Large Adult Mask

Back to Basics: Inhalers for Children

The devices below are those that we recommend for use in paediatrics:

SABA	LAMA/SAMA	ICS	ICS/LABA	ICS/LABA (DPI)
Salamol Evohaler Salbutamol 100µg/puff Age 0+ (usu >1y)  £0.22/30 days (if 1 puff/day)	**Spiriva Respimat** Tiotropium 2.5µg/puff Age 6+  £23/30 days (if 2 puffs/day)	**Clenil Modulite 50 Evohaler** Beclomethasone 50µg/puff Age 2+ (occ use <2 years) VLD  £2.22/30 days (if 4 puffs/day)	**Seretide 50 Evohaler** Salmeterol/ Fluticasone 25/50µg/puff Age 4+ LD  £18/30 days (if 4 puffs/day)	**Symbicort 100 Turbohaler** Budesonide/ Formoterol 100/6µg/puff Age 6+ (SMART at 12+) LD (VLD at 2 puffs/day)  £28/30 days (if 4 puffs/day)
Ventolin Evohaler Salbutamol 100µg/puff Age 4+ (often <4y)  £0.23/30 days (if 1 puff/day)	**Atrovent inhaler** Ipratropium 20µg/puff Age 1m+  £0.83/30 days (if 1 puff/day)	**Clenil Modulite 100 Evohaler** Beclomethasone 100µg/puff Age 2+ (occ use <2 years) LD  £4.45/30 days (if 4 puffs/day)	**Combisal 50 Evohaler** Salmeterol/ Fluticasone 25/50µg/puff Age 4+ LD  £13.50/30 days (4 puffs/day)	**Symbicort 200 Turbohaler** Budesonide/ Formoterol 200/6µg/puff Age 12+ MD (LD at 2 puffs/day)  £28/30 days (if 4 puffs/day)
Salamol Easi-breathe Salbutamol 100µg/puff Age 4+ (rarely <12y)  £0.95/30 days (if 1 puff/day)		**Clenil Modulite 200 Evohaler** Beclomethasone 200µg/puff Age 12+ (occ use < 12 years) MD  £9.70/30 days (if 4 puffs/day)	**Seretide 125 Evohaler** Salmeterol/ Fluticasone 25/125µg/puff Age 12+ MD  £23.45/30 days (4 puffs/day)	**Symbicort 400 Turbohaler** Budesonide/ Formoterol 400/12µg/puff Age 12+ HD (MD at 2 puffs/day)  £56/30 days (if 4 puffs/day)
Airomir Autohaler Salbutamol 100µg/puff Age 4+ (rarely <12y)  £0.90/30 days (if 1 puff/day)		**Clenil Modulite 250 Evohaler** Beclomethasone 250µg/puff Age 12+ (occ use < 12 years MD  £9.77/30 days (if 4 puffs/day)	**Combisal 125 Evohaler** Salmeterol/ Fluticasone 25/50µg/puff Age 12+ MD  £17.59/30 days (4 puffs/day)	**Relvar Ellipta 92** Fluticasone/ Vilanterol 92/22mcg/puff Age 12+ MD  £22/30 days (if 1 puff/day)
This list is not exhaustive (e.g. Soprobec) Generic prescribing is avoided due to: - differing activity of formulations such (e.g. Qvar) - Unlicensed formulations (e.g. Sirdupla)			**Seretide 250 Evohaler** Salmeterol/ Fluticasone 25/250µg/puff Age 12+ HD  £29.32/30 days (4 puffs/day)	**Relvar Ellipta 184** Fluticasone/ Vilanterol 184/22mcg/puff Age 12+ HD  £29.50/30 days (1 puff/day)
VLD = **Very Low Dose** inhaled steroid at suggested dose/age LD = **Low Dose** inhaled steroid at suggested dose/age MD = **Medium Dose** inhaled steroid at suggested dose/age HD = **High Dose** inhaled steroid at suggested dose/age	Pricing is representative and assumes dosing as on bottom line of each cell and is correct at time of going to print.		**Combisal 250 Evohaler** Salmeterol/ Fluticasone 25/50µg/puff Age 12+ HD  £27.99/30 days (4 puffs/day)	**References:** 1) www.rightbreathe.com 2) www.bnfc.nice.org.uk

Barts Health NHS Trust and Tower Hamlets Together are committed to sustainability in healthcare.
As part of this commitment we encourage recycling of inhaler devices.

Information can be found at:
www.completethecycle.eu

Chronic Management – Secondary Care

Asthma/Wheezing Primary/Secondary Care Referral

e.g. BTS Step 3-4, Hospital Admission, x2 prednisolone/ED in 12m
xs salbutamol use, Persistent poor control, School absence, Uncertain diagnosis
All clinics (Clinic Nurse): Weight, Height, ACT, PEFR – document on CRS

↓

Secondary Care Clinic

Physiologist: Spirometry +/- BDR, SPT Aeroallergen panel 1 (New patients only)
CNS: Inhaler technique, PAAP, Education (Risk factors/triggers/treatment)
Paediatrician: Hx and Examination, consider differentials, review medication, Consider baseline Ix (CXR, Immune screen, barium study, allergy referral)
Discharge if stable on BTS step 2-3, 6 monthly review minimum usually
Manage comorbidities: reflux, rhinitis, allergies, anxiety, damp

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ED/Ward Discharge Rapid Referral

No ICU, No IV therapy required, No comorbidity

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Nurse-led Clinic (nurse with asthma diploma)

For children discharged from ED, screen for Cons clinic <2m after d/c)
Hx and Exam, meds review, School liaison, PAAP, Inhaler technique, Patient Education
Identify and manage triggers – damp, smoking etc.

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Monitoring/Follow-up

All clinics (Clinic Nurse): Weight, Height, ACT, PEFR – on CRS
CNS: Inhaler technique, PAAP, Check understanding
Paediatrician: Medication review (XS salbutamol use, compliance, adequacy)
Persistent poor control, School absence, Uncertain diagnosis
Consider DEXA, Vitamin D levels, Cortisol/Synacthen if on High Dose steroids

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Discharge Criteria

Clinical: No USMA/prednisolone in last 6 months, ACT > 19 (consider social factors)
Physiology: No BDR on Spirometry
CNS: Satisfactory Inhaler technique, PAAP, Education
Paediatrician: Diagnosis clear, management satisfactory at BTS Step 2-3, Clear strategy for comorbidities

Asthma transition

The transition process prepares young people to take responsibility for their own medical care. Depending on the young person's medical and social needs this care may continue in conjunction with hospital or primary care. We begin the process of transition relatively early and use the 'Ready Steady Go' transition pathway.

Transition Arrangements - Ready Steady Go

Age 11+

Identify chronic patients and commence transition plan document

Provide red questionnaire (child) and Parent Questionnaire

Age 13+

Provide amber questionnaire (child) and Parent Questionnaire

Consider discharge to primary care

Age 15+

Provide green questionnaire (child) and Parent Questionnaire

Adult Referral Letter (Complete Referral template)

1st Transition clinic in 15th year (pre-GCSE) – Royal London Hospital

2nd transition clinic (post-GCSE)- Royal London Hospital

- Life threatening asthma requiring ventilation in the last 10 years
- Continuous or frequent treatment with oral corticosteroids 2 in a year
- Fixed airway obstruction with post bronchodilator forced FEV1 <70%
- Other specific vulnerability or reason to keep in hospital services

Yes

Book into Transition clinic

No

Refer Back to General Practitioner for asthma management

Glossary of Terms

ACT	Asthma Control Test
BDR	Bronchodilator Reversibility
BTS	British Thoracic Society
CNS	Clinical Nurse Specialist
CRS	Care Record System (specifically Cerner at Barts Health)
CXR	Chest X-Ray
DEXA	Dual X-Ray Absorptiometry (Bone Density) scan
ED	Emergency Department
FEV-1	Forced Expiratory Volume in 1 Second
HD	High Dose (ICS)
ICS	Inhaled Corticosteroids
LABA	Long-Acting Beta2 Agonist
LAMA	Long-Acting Muscarinic Antagonist
LD	Low Dose (ICS)
LTRA	Leukotriene Receptor Antagonist
MD	Medium Dose (ICS)
(p)MDI	(Pressurised) Metered Dose Inhaler
PAAP	Personalised Asthma/Wheeze Action Plan
PEFR	Peak Expiratory Flow Rate
SPA	Single Point of Access Referral Form (community services)
SPT	Allergy Skin Prick Testing
USMA	Unscheduled Medical Attendances
VHC	Valved Holding Chamber (spacers)
VLD	Very Low Dose (ICS)

References and Resources

This Document borrows material from the following sources:

- British Thoracic Society Asthma Guideline 153 – September 2019
- Asthma UK
- Healthy London Partnership Asthma Toolkit
- NICE TA131 2007

Please see the following sources for additional information:

- http://www.myasthmaproject.co.uk/
- Asthma UK website
- Healthy London Partnership Asthma Toolkit
- British Thoracic Society Guideline 2019
- NICE TA131 2007
- www.rightbreathe.com
- https://bnfc.nice.org.uk/
- www.completethecycle.eu
- Community Asthma Nurse Referral form
- Spacer Leaflet for patients