

Management of Childhood Asthma 5- 16 years. A guide for Health Care Providers

What Is Asthma?

1. Patients must have at least 2 of the following symptoms:
 - wheeze (recorded by a health professional)
 - breathlessness
 - chest tightness
 - cough
2. Symptoms vary in time and intensity; worsening with triggers, at night or on wakening
3. Evidence of variable airflow obstruction
 - FEV₁ is low -> FEV₁/ FVC ratio is reduced.
 - Bronchodilator reversibility; FEV₁ increases more than 12% of the base line value.

A personal or family history of atopy also increases the likelihood of asthma but should not be used in the diagnostic criteria.

Diagnostic Criteria

1. History of Variable Respiratory Symptoms

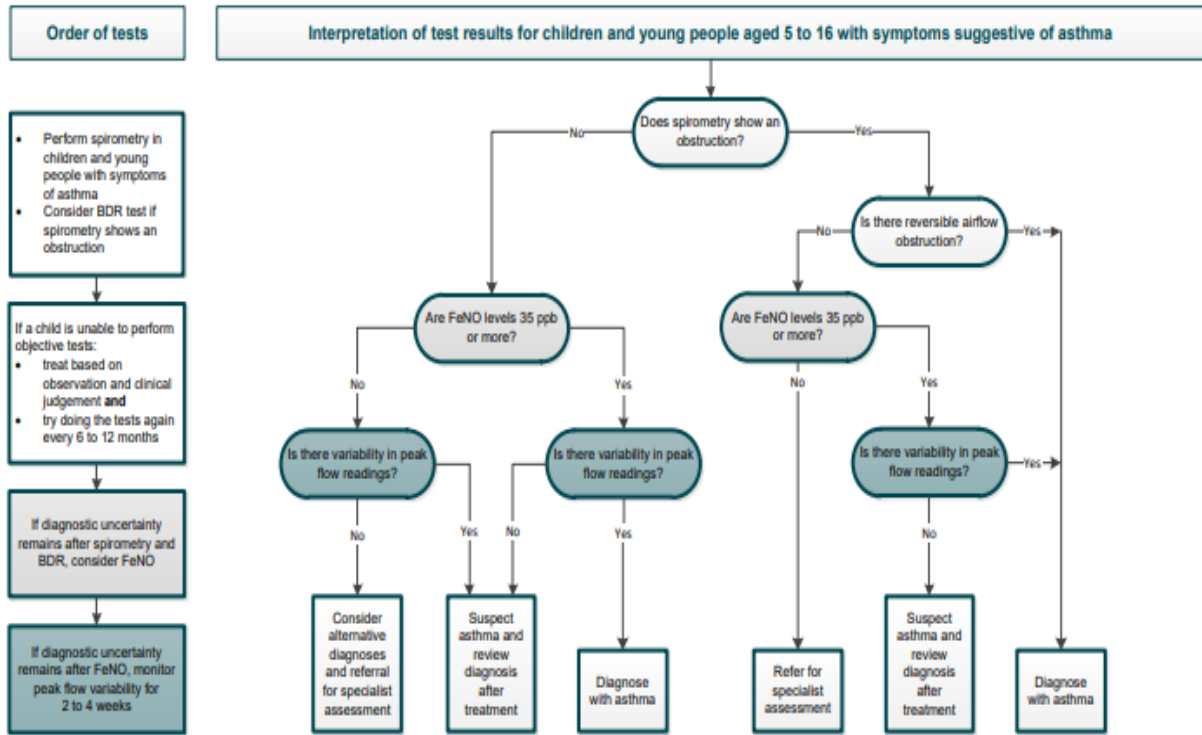
- Wheeze, cough, breathless, chest tightness
- Asthmatics usually have more than 1 symptom.
- Variable over time, worse with triggers, at night or early morning

2. Evidence of Variable Expiratory Airflow Limitation supported by evidence of airway inflammation

- Ideally spirometry and Fractional exhaled Nitric Oxide (FeNO) should be used in the diagnosis of asthma.
- There should be at least 12% rise in FEV₁ following bronchodilator inhalation to diagnose Asthma.
- PEFr measurement can be used where spirometry is not available. NICE suggests that variability of 20% in PEFr is suggestive of asthma. However, studies have shown that PEFr measurements in children are not reliably reproducible and therefore its results cannot exclude or confirm a diagnosis of asthma. Recordings at different times of the day, when symptomatic and asymptomatic, before and after salbutamol use may be of more value.
- Suggest that patients make a diary of recordings at least twice daily for 2-4 weeks
 - The more times variation in airflow is recorded, the more convincing the diagnosis of asthma.
 - Lack of reversibility on initial testing does not exclude asthma. Repeat when symptomatic, early morning and withholding bronchodilator medications. Well controlled asthmatics may not show any variability.
 - Reversibility may not be seen during inter-current infections or severe exacerbations.

- FeNO can be normal where there is no eosinophilic inflammation. Likely to be poor corticosteroids response when there is no eosinophilic inflammation (i.e. normal FeNO).

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



Abbreviations:
 FeNO, fractional exhaled nitric oxide
 BDR, bronchodilator reversibility

This algorithm is based on recommendations from NICE's guideline on [asthma diagnosis, monitoring and chronic asthma management](#) (2017)

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%

NICE National Institute for Health and Care Excellence

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Link for the table (<https://www.nice.org.uk/guidance/ng80/resources/algorithm-b-objective-tests-for-asthma-in-children-and-young-people-aged-5-to-16-pdf-4656176750>)

Triggers

- Viral infections
- Allergens e.g. house dust mite, pollens
- Tobacco smoke
- Exercise
- Stress, laughter
- Cold air
- Medications e.g. beta-blockers, NSAIDs, aspirin

PROBABILITY OF ASTHMA

High Probability

Patients should be considered to have a high probability of having asthma if they have:

- A history of recurrent episodes of wheeze recorded by a health professional
- History of variable airflow obstruction
- A positive history of atopy
- No features to suggest an alternative diagnosis

Low Probability

In patients who do not have typical symptoms, or an alternative diagnosis is likely, then either investigate/ treat as the more likely alternative diagnosis or arrange further investigations to test for asthma.

Intermediate Probability

Patients have an intermediate probability of asthma if:

- Some, but not all, typical features are present, or
- Patients who do not respond well to a 6-8 weeks trial of ICS (*ensure compliance and inhaler technique first*).

In children who are old enough to perform PEFr, ask them to record a symptom and PEFr diary over 2-4 weeks and review with results.

Management options for children with an intermediate probability who are unable to perform PEFr:

- ➔ start initiation of ICS and review in 6-8 weeks
- ➔ if asymptomatic then adopt a “watchful waiting” approach.

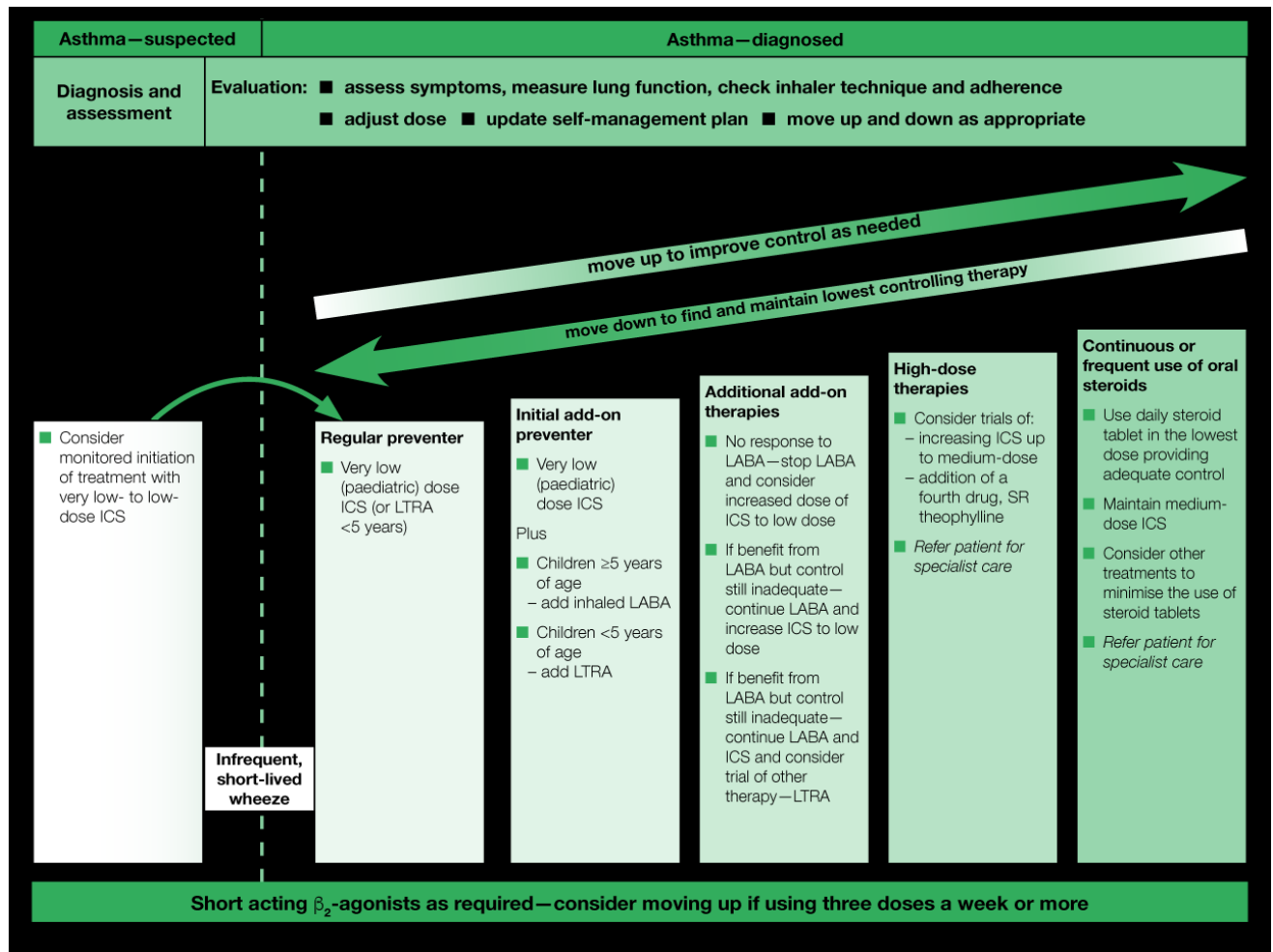
MANAGEMENT

Modifiable Risk Factors - Non-Pharmacological Therapy

- ✓ Obesity
 - Offer weight-loss programmes where available. Encourage physical activity
- ✓ Smoking, including parental smoking
 - Refer to smoking cessation services
- ✓ Anxiety
 - Breathing exercise programmes may improve quality of life and reduce symptoms in some with asthma
- ✓ Confirmed food allergy
- ✓ Avoid NSAIDs if there is a clear history of exacerbation associated with its use.

Note that the use of physical and chemical methods of reducing house dust mite burden in the house are not effective and should not be endorsed

Pharmacological Management - Stepwise approach



STEP-WISE APPROACH

SABA as required

Use in patients who fit the following profile:

- Normal PEF_R or FEV₁
- Rarely symptomatic
- No nocturnal symptoms
- No exacerbations for over 1y

STEP 1 Very Low dose ICS

or LTRA but this is less effective (consider in those <5 years)

STEP 2 Very Low dose ICS/ LABA plus:

Inhaled LABA if over 5 years
LTRA if under 5 years

STEP 3 If no response to LABA

Stop LABA, increase ICS to low dose

If benefit from LABA but inadequate control

Continue LABA and with increase ICS to low dose OR give a trial of LRTA

STEP4 Refer to respiratory pediatrician

Trial of:

Medium dose ICS

Or

Add in 4th Drug; SR Theophylline

STEP 5 Under respiratory pediatrician only

Low dose daily oral steroid, maintaining medium dose ICS

Anti-IgE (*SC omalizumab*) in severe allergic asthma >6y

Anti-IL5 (*SC mepolizumab, SC benralizumab*) >12y with severe eosinophilic asthma

Stepping up

If poor control despite 2-3 months of current treatment. CHECK:

- Is it the correct diagnosis?
- Check inhaler technique
- Check compliance
- Modifiable risk factors are adjusted where possible
- Co-morbid conditions are screened for and treated

Stepping down

If well controlled for 3 months + low risk for exacerbations

Complete control is defined by SIGN as:

- No exacerbations
- No need for rescue medication
- No nocturnal wakening due to asthma
- No day time symptoms
- No limitation of activity (including exercise)
- PEFr >80% best or predicted

Reduce ICS dose by 25-50% at 2-3 monthly intervals

Provide written asthma plan

Book a follow-up visit

Categorization of inhaled corticosteroids

ICS	Dose		
	Very low dose	Low dose	Medium dose [#]
Pressurised metered dose inhalers (pMDI) with spacer			
First line			
Clenil Modulite (Beclom- etasone dipropionate)	50 micrograms two puffs twice a day	100 micrograms two puffs twice a day	200 micrograms two puffs twice a day
Second line			
Fluticasone propionate	50 micrograms one puff twice a day	50 micrograms two puffs twice a day	125 micrograms two puffs twice a day
Budesonide	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
Third line (Blue, licensed from 12 years old – see joint formulary on HERPC website https://www.hey.nhs.uk/herpc/joint-formulary/)			
Alvesco Aerosol inhaler (Ciclesonide)		80 micrograms two puffs once a day	160 micrograms two puffs once a day
Combination inhalers			
First line			
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	
Second line			
Fluticasone propionate with Salmeterol		100/50 one puff twice a day	
Fluticasone propionate with Salmeterol		50/25 two puffs twice a day	

Asthma Review Appointments

- 1-3 months after starting treatment
- Then every 3-12 months depending on level of control, response to treatment and skills at self-management
- Within 1 week following an exacerbation
- Check inhaler technique at every opportunity
- Smoking cessation advice (if applicable)
- Check compliance
 - At least 50% of patients do not take their controller medications as prescribed
 - Check with patient how many days a week they miss a dose
 - Check dispensing records
 - Explore attitudes and beliefs about asthma and the treatment

Written Asthma Action Plans

Personalized action plans have been shown to improve outcomes for asthmatics. They should be given to all patient's carers so they know how to recognize worsening asthma and respond appropriately. At each review appointment, or following an acute exacerbation, the plan should be reviewed.

Action plan resources can be downloaded: www.asthma.org.uk/control

Alternative Diagnoses

Many alternative diagnoses have features which may overlap with asthma. Consideration should be given to other possibilities such as; recurrent viral infections, gastro-oesophageal reflux, post-nasal drip, vocal cord dysfunction, amongst others.

Referral to specialist care should be done in children with the following features

- Step four of Asthma management
- Failure to thrive
- Abnormal clinical findings (such as stridor, focal chest signs, dysphagia)
- Symptoms present from birth
- Excessive vomiting
- Nasal polyps
- Severe respiratory infection(s)
- Persistent productive cough
- Family history of unusual respiratory disease
- Significant care-giver anxiety
- Severe or life-threatening exacerbation

References

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APPROVAL PROCESS

Written by:	Dr Emma McQueen, Dr Haji Sheeraz Khan, Dr Mary Barraclough
Consultation process:	<i>Specialist teams, PRG</i>
Approved by:	<i>MMIG</i>
Ratified by:	<i>HERPC July 2019</i>
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