How to make an Asthma Diagnosis in Secondary Care

- ✓ *There is no one gold standard test to diagnose asthma*
- ✓ *The aim is to reach a probability of asthma, not a diagnosis*
- ✓ *The degree of probability of a diagnosis of asthma is reached through clinical assessment, investigations and response to treatment*

What are the Clinical Features of Asthma?

The diagnosis of asthma is based on the:

- recognition of a characteristic pattern of respiratory symptoms, signs and test results
- the absence of any alternative explanation for these.

The predictive value of individual symptoms or signs is poor, and a structured clinical assessment should be undertaken. This allows for a patient to be given a degree of probability of a diagnosis of asthma.

The Structured Clinical Assessment

1. History:
    - Interval symptoms:
        - These are the day to day symptoms that a patient may experience.
        - Classically the symptoms are wheeze plus one or more of cough, chest tightness or shortness of breath.
        - There is usually variation in the symptoms, with symptoms worse
            - at night
            - early in the morning
            - with exertion
    - Exacerbations:
        - A documented history of acute attacks of wheeze, dry cough and breathlessness.
        - Attacks may have specific triggers such as viral upper respiratory tract infections, exercise, exposure to smoke and aeroallergens
        - During an attack, there is symptomatic and objective improvement with treatment.

      There are different asthma phenotypes. Some children suffer:
        - predominantly from interval symptoms with few exacerbations
        - predominantly exacerbations and minimal interval symptoms
        - a mixture of interval symptoms and exacerbations
    - Atopic History
        - Personal history of an atopic disorder (eczema or allergic rhinitis) AND / OR
        - a family history of asthma and or atopic disorders

2. Examination:
    - Wheeze must be confirmed by a Healthcare Professional on auscultation
        - It is important to distinguish 'wheeze' from other respiratory noises, such as stridor or 'rattily' breathing.
        - Parents use the word "wheeze" to describe a wide range of respiratory noises. Parental report of wheeze correlates poorly with objectively recorded wheeze.
        - Assessment is best undertaken at a time when a child is acutely unwell to confirm the presence of a true polyphonic (musical) expiratory wheeze.
    - Chest wall shape - patient may be:
        - Hyper-inflated
        - Show evidence of long term poor control with a Harrison sulcus
    - A repeatedly normal respiratory examination when symptomatic reduces the probability of asthma.

3. Investigations: Which Tests are possible in Secondary Care?
    - Investigations of Atopy
      Investigations supportive of atopy include:
        - raised specific IgE levels to aeroallergens
        - eosinophilia on blood testing
        - Specific allergy tests using skin prick tests or specific serum IgE.

    - Investigations of Variable Airflow Obstruction
        - variable airflow obstruction supports a diagnosis of asthma.
        - Spirometry, with bronchodilator reversibility as appropriate, is the preferred initial test and is possible over 5 years over age. (LINK)
        - If spirometry is not available, repeatable Peak Expiratory Flow (PEF) measurements are usually possible in children over the age of 8 years. The best of 3 attempts should be documented each time. A historical record of significantly lower PEF during symptomatic episodes compared to asymptomatic periods provides objective confirmation of obstructive nature of the episodic symptoms.
        - If peak flow is below age appropriate normal ranges (*www.lungfunction.org*), then improvement by 12% or more 20 minutes after administering a short acting β2 agonist (e.g. 400 μg salbutamol given with a metered dose inhaler and spacer) is a useful test to confirm variable airflow obstruction.
        - If peak flow is normal, then a two-week period of home monitoring may be helpful to look for evidence of diurnal variation
        - If the peak flow chart is a flat line, or if variability is within normal limits, despite ongoing symptoms, it is difficult to attribute the findings to asthma. Peak flow variability of 15% or more is strongly suggestive of asthma.


beat
asthma

Probability of Asthma based on the Initial Structured Clinical Assessment (Figure 1)

High Probability

Children with a high probability of asthma have a typical clinical assessment including:

- recurrent episodes of symptoms
- wheeze heard by a healthcare professional
- historical record of variable airflow obstruction
- a positive history of atopy
- no features to suggest an alternative diagnosis (LINK)

In patients with a high probability of asthma:

- record the patient as likely to have asthma and commence a carefully monitored initiation of treatment: typically, 6 weeks of inhaled corticosteroids
- assess status with a validated symptom questionnaire e.g. the ACT score and/or lung function tests (FEV1 at clinic visits or serial peak flow measurements at home)
- In children with a good symptomatic and objective response to treatment, confirm the diagnosis of asthma and record the basis on which the diagnosis was made
- if response is poor or equivocal, check inhaler technique and adherence, arrange further tests and consider alternative diagnoses.

Intermediate Probability

Children with an intermediate probability of asthma will have

- some but not all, of the typical features of asthma on an initial assessment or
- will not respond well to a monitored initiation of treatment

These patients should have a test of airways obstruction:

- In children with evidence of airways obstruction, undertake reversibility tests and/or a monitored initiation of treatment assessing the response to treatment by repeating lung function tests and objective measures of asthma control.
- In children with no evidence of airway obstruction, a measurement of exhaled nitric oxide (FeNO) can be helpful as an elevated reading suggests eosinophilic inflammation
- In children with normal spirometry results and FeNO, consider alternative diagnoses

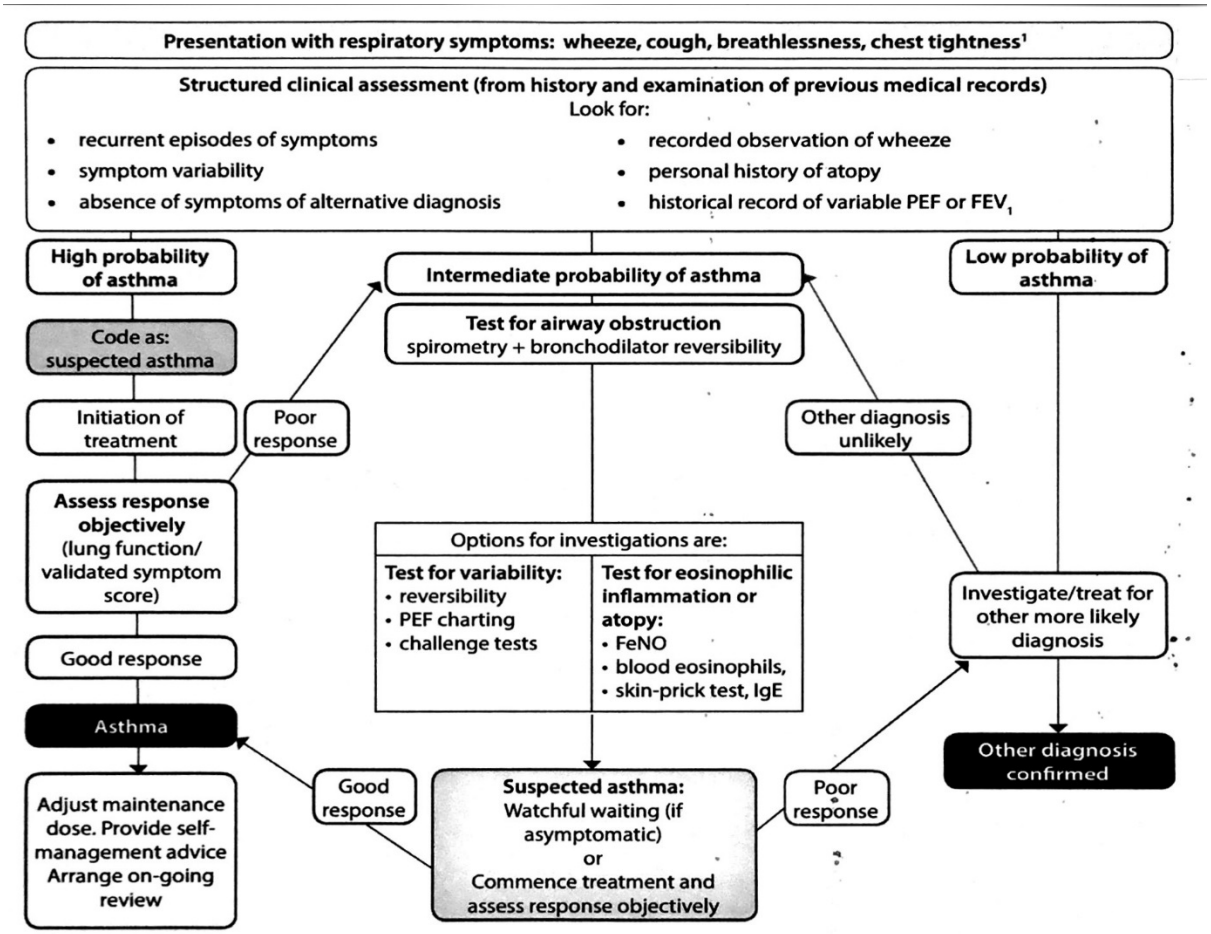
In children with an intermediate probability of asthma who cannot perform spirometry:

- consider watchful waiting if the child is asymptomatic
- offer a carefully monitored trial of treatment if the child is symptomatic
    - Initiate treatment with an inhaled corticosteroid using a metered dose inhaler and spacer and reassess at six weeks
    - if no benefit, stop treatment and consider referral to secondary care
    - if symptoms disappear, stop treatment and reassess after six weeks to ensure that any apparent benefit is related to the treatment

Low Probability

Children who do not have any of the typical features on initial structured clinical assessment or who have symptoms suggestive of an alternative diagnosis have a low probability of asthma and require further investigation.

Figure 1: Diagnostic Algorithm



[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.