

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*
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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.
- Response to asthma therapies

The predictive value of individual symptoms or signs is poor, and a structured clinical assessment should be undertaken supported by objective measurements. 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
- Asthma attacks:
 - 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 asthma attacks
- predominantly asthma attacks and minimal interval symptoms
- a mixture of interval symptoms and asthma attacks
- 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 normal or 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.

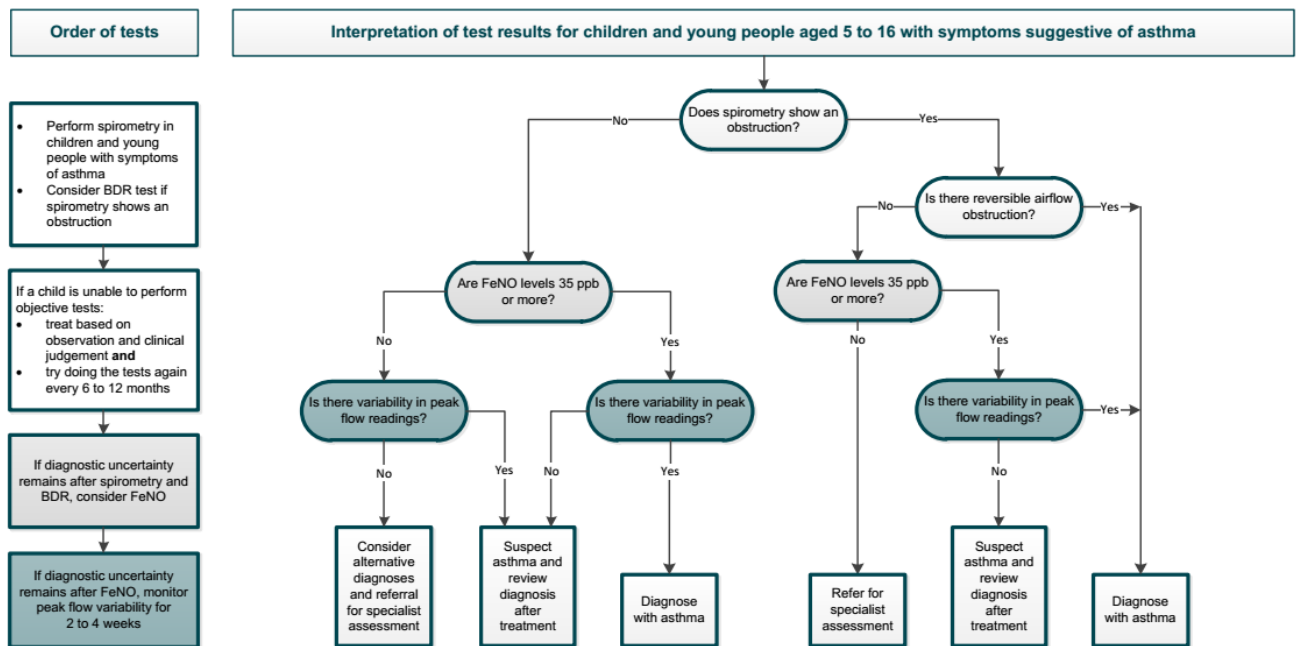
3. Investigations:

- For young children (5 years or less), or those unable to perform objective tests, treat symptoms based on clinical judgement with regular reviews, until the child is able to perform objective measures
- Investigations of Variable Airflow Obstruction
 - Variable airflow obstruction supports a diagnosis of asthma.
 - Spirometry, with bronchodilator reversibility as appropriate, is the preferred initial test. It should be performed by a professional trained in paediatric spirometry and is possible over 5 years over age.
 - An obstructive picture (FEV1/FVC ratio < 70%) and/or reversibility of 12% or more is supportive of a diagnosis of asthma
 - 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 normal, then a two-week period of home monitoring may be helpful to look for evidence of diurnal variation
 - Peak flow variability of 20% or more is strongly suggestive of asthma
 - 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.
- Fractional exhaled Nitric Oxide (FeNO)
 - Consider a FeNO test if there is diagnostic uncertainty, such as normal spirometry or negative bronchodilator reversibility.
 - A FeNO \geq 25ppb is supportive of a diagnosis of asthma, with higher levels (>35ppb) more suggestive of a diagnosis of asthma.
- Skin prick tests, measurements of Eosinophil counts, total IgE and specific IgE should not be offered as a diagnostic test for asthma.
 - Skin prick tests or specific IgE to aeroallergens can be used to help identify triggers once a diagnosis has been made.

Diagnosis of Asthma Based on the Structured Clinical Assessment

1. Diagnose asthma if the child/young person has a typical clinical assessment and evidence of air flow obstruction, either
 - a. Obstructive spirometry and bronchodilator reversibility, or
 - b. FeNO ≥ 25 ppb and variability in PEF
2. Suspect the diagnosis of asthma if the child or young person has symptoms of asthma and:
 - a. A raised FeNO, but normal spirometry and no variability in PEF, or
 - b. A raised FeNO, obstructive spirometry, but no reversibility and no variability in PEF, or
 - c. Variability in PEF, but normal spirometry and a normal FeNO.
3. Consider referral to specialist services, for assessment, when the child or young person has symptoms suggestive of asthma, but all investigations are negative.
4. Refer for specialist opinion, if a child or young person has obstructive spirometry, but no bronchodilator reversibility and normal FeNO.
5. Refer for specialist opinion, if a child or young person has obstructive spirometry, but no bronchodilator reversibility and normal FeNO.

Objective Tests for Children and Young People with Possible Asthma



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%

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