

Is it asthma? Diagnosing with confidence

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Aims & Objectives

- BTS vs NICE guidelines
- Recommended investigations
- How to manage diagnostic uncertainty
- Viral wheeze vs Asthma



Practice approach to asthma diagnosis **NHS**

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- A clinical diagnosis based on a characteristic **pattern of respiratory symptoms and signs.**
- **Tests** can influence the probability of asthma but do not prove a diagnosis.
- An **absence of any alternative explanations** for clinical symptoms/signs.



DIAGNOSTIC ALGORITHM

Presentation with respiratory symptoms: wheeze, cough, breathlessness, chest tightness¹

Structured clinical assessment (from history and examination of previous medical records)

Look for:

- recurrent episodes of symptoms
- symptom variability
- absence of symptoms of alternative diagnosis
- recorded observation of wheeze
- personal history of atopy
- historical record of variable PEF or FEV₁

High probability of asthma

Code as:
suspected asthma

Initiation of
treatment

Assess response
objectively
(lung function/
validated symptom
score)

Good response

Asthma

Adjust maintenance
dose. Provide self-
management advice
Arrange on-going
review

Poor response

Intermediate probability of asthma

Test for airway obstruction
spirometry + bronchodilator reversibility

Options for investigations are:

Test for variability:

- reversibility
- PEF charting
- challenge tests

**Test for eosinophilic
inflammation or
atopy:**

- FeNO
- blood eosinophils,
- skin-prick test, IgE

Good response

Suspected asthma:
Watchful waiting (if
asymptomatic)
or
Commence treatment and
assess response objectively

Other diagnosis
unlikely

Low probability of
asthma

Investigate/treat for
other more likely
diagnosis

**Other diagnosis
confirmed**

Poor response

BTS
diagnostic
algorithm
(2016)

Initial clinical review

Recurrent episodes or more than 1 of;

- a. Chest tightness
- b. Wheezing**
- c. Breathlessness
- d. Cough



[Cough alone is not a sufficient symptom to diagnose asthma in children]

Triggered by viral infections, allergen exposure, exercise, cold weather, laughter or emotion.

Record of **significantly lower FEV1 or PEF** during symptomatic episodes

Evidence of **diurnal variation and atopic history**

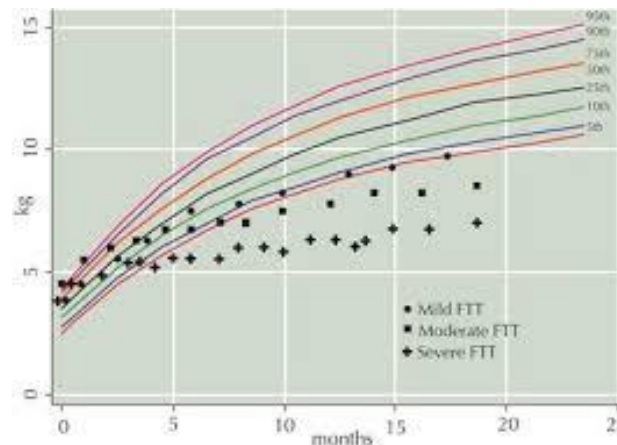
Periods of no/minimal symptoms between episodes



Diagnostic uncertainty

Features suggestive of alternative diagnosis:

- Symptoms since birth
 - Wet/productive cough
 - Reflux/indigestion symptoms
 - Stridor
 - Dysphagia
 - Severe upper respiratory tract symptoms
-
- Abnormal voice/cry
 - Failure to thrive
 - Pallor
 - Nasal polyps
 - Clubbing
 - Focal signs
-
- Family history of unusual respiratory disease
 - Anxiety/panic attack symptoms



High probability of asthma diagnosis



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1. Initiate treatment (typically 6/52s of inhaled corticosteroids)
2. Assess response objectively (PEFR & asthma control test score)

Good response to treatment: code as asthmatic

Organise ongoing follow-up

Support self-management with education and PAAP



Poor response to treatment:

Check inhaler technique (1/3 aren't using correctly) and adherence

Revisit diagnosis and consider further investigations

Under 5s or those who can't complete spirometry – watchful waiting (if asymptomatic) or initiate treatment



Intermediate probability of asthma diagnosis

-Test for airway reversibility (spirometry and bronchodilator reversibility)

Options for further investigations:

1. PEF charting
2. FeNO, blood eosinophils (tests for eosinophilic inflammation)
3. Skin prick testing, IgE (tests for atopy)

Suspected asthma:

1. Watchful waiting (if asymptomatic) OR
2. Initiate treatment and assess response

Poor response to treatment:

Check inhaler technique and adherence

Revisit diagnosis and consider further investigations



Low probability of asthma diagnosis



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- Investigate/treat for other more likely diagnosis (e.g. GORD, allergic rhinitis)
- Consider referral to specialist service



Investigations

Tests of atopic status

Positive skin-prick testing,
blood eosinophilia $\geq 4\%$ or
raised allergen-specific IgE
increase the probability of asthma



The positive predictive values for individual tests are poor

These help corroborate a history of atopic status, but these tests should not be offered routinely as a diagnostic test for asthma



Investigations

Peak flow monitoring



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“In children, serial measures of peak flow variability and FEV1 show poor concordance with disease activity and do not reliably rule the diagnosis of asthma in or out.”

A peak flow recorded when symptomatic may be compared to a peak flow when asymptomatic (eg after recovery from an asthma attack) in order to confirm variability.



Investigations

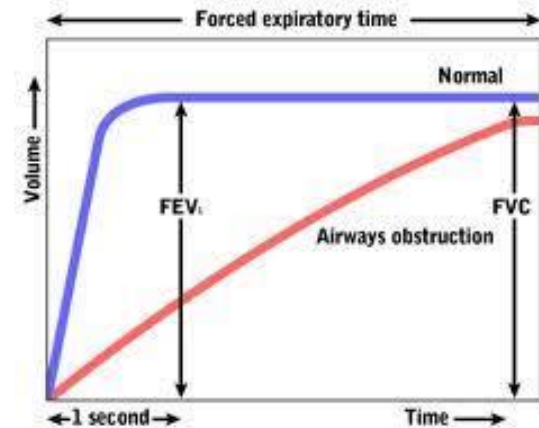
Spirometry

Usually feasible in children over 5 years old

Obstructive spirometry with positive bronchodilator reversibility (FEV₁ improvement of 12% or more) increases the probability of asthma.

Normal spirometry in an asymptomatic patient does not rule out the diagnosis of asthma

Has a false negative rate of at least 50%



Investigations

Fractional exhaled nitric oxide



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A positive FeNO test suggests eosinophilic inflammation and provides supportive (but not conclusive) evidence for an asthma diagnosis.

In schoolchildren a FeNO level of 35 ppb or more is regarded as a positive test.

FeNO levels are also;
increased in allergic rhinitis and patients with bronchiectasis,
and
reduced with use of inhaled/oral steroids and in smokers



Investigations

Fractional exhaled nitric oxide

It feasible to attempt FeNO from 4 years upwards

May have a benefit in monitoring non-adherence

**A positive test increases the probability of asthma BUT
a negative test does not exclude asthma.**



NICE guideline update

Diagnosis

Spirometry (with bronchodilator reversibility) and FeNO feature predominantly in the diagnostic algorithm.

NICE stress the need for an objective test to diagnose asthma.

Due to possibility of false negative results in both spirometry and FeNO we support continuing to use BTS guidelines.

Continue to regularly revisit diagnosis and review treatment response.

Low threshold for completing further investigations if no/equivocal response to treatment.



Diagnostic uncertainty

Pre-school wheezers (viral wheeze)



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Almost 50% of children will wheeze by the age of 6 years old

Bronchiolitis vs Pre-school wheezers vs Asthma

Viral wheeze is the commonest paediatric presentation

The younger the age of presentation, the more likely to grow out of the condition.



Diagnostic uncertainty

Pre-school wheezers (viral wheeze)



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Increased likelihood of asthma;

1. Coexistent atopy
2. Multiple frequent presentations of wheeze (and severe)
3. Family history of atopy (particularly maternal atopy)



Diagnostic uncertainty

Viral wheeze vs Asthma

Viral-induced wheeze

- younger
- small airways
- no interval symptoms
- tend to grow out of the condition

Asthma

- generally atopic
- older
- reactive airways
- multi-trigger
- persistent



Summary

Majority of asthmatic patients can be accurately diagnosed without the need for further investigations

Review diagnosis and check compliance if no response to treatment

Consider specialist referral if diagnostic uncertainty



Thanks

Any questions?

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