Asthma: diagnosis, monitoring and chronic asthma management (NG80)

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Diagnosis, monitoring and chronic asthma management

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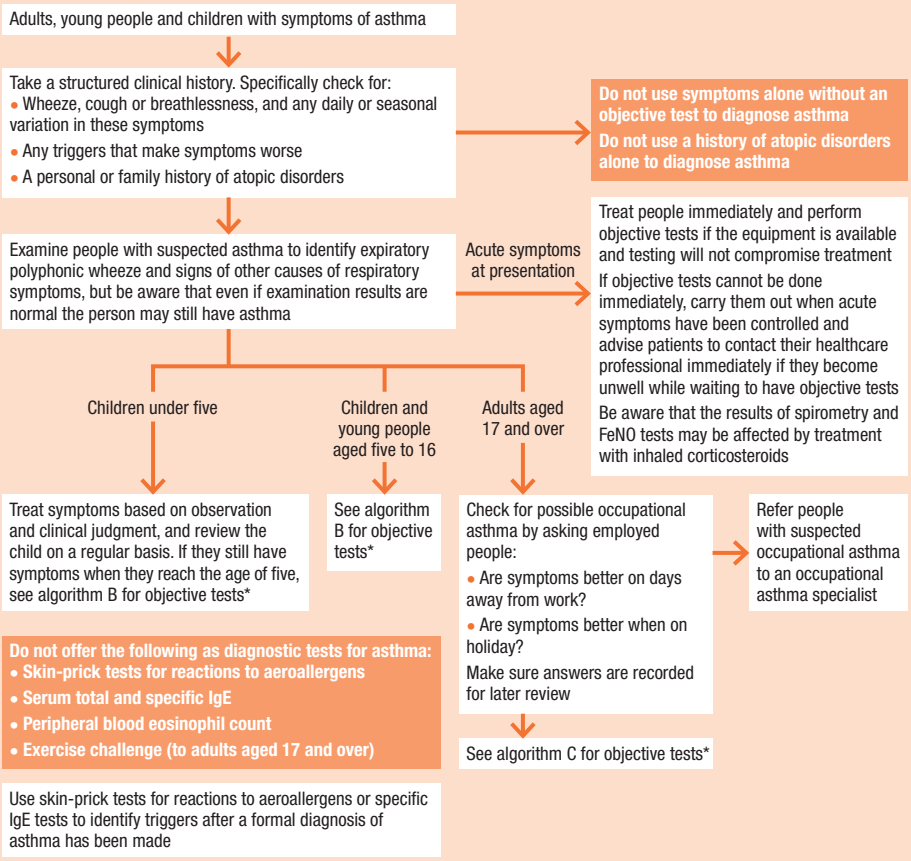
Introduction

This guideline aims to improve the accuracy of diagnosis, help people to control their asthma and reduce the risk of asthma attacks. It does not cover managing severe asthma or acute asthma attacks.

Algorithm A

Initial clinical assessment of adults, young people and children with suspected asthma



* See reference for link to full NICE algorithms

Diagnosis and objective testing for adults and children

Fractional exhaled nitric oxide (FeNO)

- Offer a FeNO test to adults if considering a diagnosis of asthma. Regard a FeNO level ≥40 parts per billion (ppb) as positive.
- Consider a FeNO test in children and young people (aged five to 16) if there is diagnostic uncertainty after initial assessment and they have either normal spirometry or obstructive spirometry with a negative bronchodilator reversibility (BDR) test. Regard a FeNO level ≥35 ppb as positive.

Lung function tests

Spirometry

- Offer spirometry to adults, young people and children aged five and over if a diagnosis of asthma is being considered. Regard an FEV1/FVC of less than 70% (or below the lower limit of normal if this value is available) as positive for obstructive airway disease (obstructive spirometry).

Bronchodilator reversibility (BDR)

- Offer a BDR test to adults with obstructive spirometry. Regard an improvement in FEV1 ≥12%, together with an increase in volume of 200ml or more, as positive.
- Consider a BDR test in children and young people (aged five to 16) with obstructive spirometry. Regard an improvement in FEV1 ≥12% as positive.

Peak expiratory flow variability

- Monitor peak flow variability in adults if there is diagnostic uncertainty after initial assessment and a FeNO test and they have either normal spirometry, or obstructive spirometry, positive BDR, but a FeNO level ≤39 ppb.
- Consider monitoring peak flow variability in adults if there is diagnostic uncertainty after initial assessment and they have obstructive spirometry and negative BDR and a FeNO level of 25-39 ppb.
- Monitor peak flow variability in children and young people (aged five to 16) if there is diagnostic uncertainty after initial assessment and a FeNO test and they have either normal spirometry or obstructive spirometry, negative BDR and a FeNO level ≥35 ppb.
- In each case, monitor for two to four weeks and regard a value of >20% variability as positive.

*Direct bronchial challenge test with histamine or methacholine***

- Offer a direct bronchial challenge test with histamine or methacholine to adults if there is diagnostic uncertainty after a normal spirometry and either a FeNO level ≥40 ppb and no variability in peak flow readings or a FeNO level ≤39 ppb with variability in peak flow readings.
- Consider a direct bronchial challenge test with histamine or methacholine in adults with obstructive spirometry without bronchodilator reversibility and a FeNO level of 25-39 ppb and no variability in peak flow readings.
- Regard a PC20 value ≤8mg/ml as positive.
- If a direct bronchial challenge test with histamine or methacholine is unavailable, suspect asthma and review the diagnosis after treatment, or refer for a histamine or methacholine challenge test.

Please see NICE algorithms for more details on objective testing and diagnosis in adults and children aged five to 16 years.*

Pharmacological treatment pathway for adults

- In newly diagnosed asthma offer a short-acting β_2 agonist (SABA) as reliever therapy.
- For infrequent, short-lived wheeze and normal lung function, consider treatment with SABA reliever therapy alone.
- Offer a low-dose inhaled corticosteroid (ICS)

**Histamine and methacholine do not currently have UK marketing authorisation for this use. Healthcare professionals should follow relevant professional guidance, taking full responsibility for the decision to use this test. Informed consent should be obtained and documented. See the GMC's *Prescribing guidance: prescribing unlicensed medicines*

as first-line maintenance therapy to adults with symptoms at presentation that clearly indicate the need for maintenance therapy or asthma that is uncontrolled with a SABA alone.

- If asthma is uncontrolled on low-dose maintenance ICS, offer a leukotriene receptor antagonist (LTRA) in addition to the ICS and review in four to eight weeks.
- If asthma is uncontrolled on a low dose of ICS and an LTRA as maintenance therapy, offer a long-acting β_2 agonist (LABA) in combination with the ICS, and review LTRA treatment.
- If asthma is uncontrolled on a low dose of ICS and a LABA, with or without an LTRA, offer to change the person's ICS and LABA maintenance therapy to a MART (maintenance and reliever therapy) regimen with a low maintenance ICS dose.
- If asthma is uncontrolled on a MART regimen with a low maintenance ICS dose, with or without an LTRA, consider increasing the ICS to a moderate maintenance dose (either continuing on a MART regimen or changing to a fixed dose of an ICS and a LABA, with a SABA as a reliever).
- If asthma is uncontrolled on a moderate maintenance ICS dose with a LABA (either as MART or a fixed-dose regimen), with or without an LTRA, consider increasing the ICS to a high maintenance dose or a trial of an additional drug (for example, a long-acting muscarinic receptor antagonist or theophylline) or seeking advice from an asthma expert.

Pharmacological treatment pathway for children aged five to 16

- Offer children aged five to 16 with newly diagnosed asthma a SABA as reliever therapy.
- For infrequent, short-lived wheeze and normal lung function, consider treatment with SABA reliever therapy alone.
- Offer a paediatric low-dose ICS as first-line maintenance therapy to children with symptoms at presentation that clearly indicate the need for maintenance therapy or asthma that is uncontrolled with a SABA alone.
- If asthma is uncontrolled on a paediatric low-dose maintenance ICS, consider an LTRA in addition to the ICS and review in four to eight weeks.
- If asthma is uncontrolled on a paediatric low dose of ICS and an LTRA as maintenance therapy, consider stopping the LTRA and starting a LABA in combination with the ICS.
- If asthma is uncontrolled on a paediatric low dose of ICS and a LABA as maintenance therapy, consider changing the ICS and LABA maintenance therapy to a MART regimen with a paediatric low maintenance ICS dose.†
- If asthma is uncontrolled on a MART regimen with a paediatric low maintenance ICS dose, consider increasing the ICS to a paediatric moderate maintenance dose (either continuing on a MART regimen or changing to a fixed dose of an ICS and a LABA, with a SABA as a reliever therapy).†
- If asthma is uncontrolled on a paediatric moderate maintenance ICS dose with LABA (either as MART or a fixed-dose regimen), consider seeking advice from an asthma expert and either increasing the ICS dose to

†MART regimens do not currently have a UK marketing authorisation for use in children and young people (aged under 12) for this indication. Informed consent should be obtained and documented. See the GMC's *Prescribing guidance: prescribing unlicensed medicines*

paediatric high maintenance dose or a trial of an additional drug (for example, theophylline).†

Pharmacological treatment pathway for children under five

- Offer a SABA as reliever therapy in suspected asthma. This should be for symptom relief alongside all maintenance therapy.
- Consider an eight-week trial of a paediatric moderate dose of an ICS for symptoms at presentation that clearly indicate the need for maintenance therapy or suspected asthma that is uncontrolled with a SABA alone.
- After eight weeks, stop ICS treatment and monitor the child's symptoms. If symptoms did not resolve during the trial period, review whether an alternative diagnosis is likely. If symptoms resolved then recurred within four weeks of stopping ICS treatment, restart the ICS at a paediatric low dose as first-line maintenance therapy. If symptoms resolved but recurred beyond four weeks after stopping ICS, repeat the eight-week trial of a paediatric moderate dose of ICS.
- If suspected asthma is uncontrolled on a paediatric low dose of ICS as maintenance therapy, consider adding an LTRA to the ICS.
- If suspected asthma is uncontrolled on a paediatric low dose of ICS and an LTRA as maintenance therapy, stop the LTRA and refer the child.

Self-management

- Offer an asthma self-management programme (a written personal action plan and education) to adults, young people and children aged five and over diagnosed with asthma (and their families or carers if appropriate). Consider this for families and carers of children under five.
- Within a self-management programme, offer to adults – and consider for children and young people (aged five to 16) – who are using an ICS in a single inhaler an increased dose of ICS for seven days when asthma control deteriorates. Clearly outline in the action plan how and when to do this, and what to do if symptoms do not improve. When increasing ICS treatment, consider quadrupling the regular ICS dose but do not exceed the maximum licensed daily dose.

Decreasing maintenance therapy

- Consider decreasing maintenance therapy when a person's asthma has been controlled with their current maintenance therapy for at least three months.
- When reducing maintenance therapy, stop or reduce dose of medicines in an order that takes into account the clinical effectiveness when introduced, side-effects and the person's preference. Only consider stopping ICS treatment completely for people who are using low-dose ICS alone as maintenance therapy and are symptom free.

Reference

NICE (2017). Asthma: diagnosis, monitoring and chronic asthma management.

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IMPORTANT INFORMATION REGARDING NIOX VERO®
NIOX VERO is a portable system for the non-invasive, quantitative, simple and safe measurement of Nitric Oxide (NO) in human breath. Nitric Oxide is frequently increased in some inflammatory processes such as asthma. FeNO measurements provide the physician with means of evaluating an asthma patient's response to anti-inflammatory therapy, as an adjunct to the established clinical and laboratory assessments in asthma. The NIOX VERO is intended for prescription use and should only be used as directed in the NIOX VERO User Manual by trained healthcare professionals. NIOX VERO is suitable for children, approximately 7–17 years, and adults 18 years and older. NIOX VERO cannot be used with infants or by children approximately under the age of 7, as measurement requires patient cooperation. NIOX VERO should not be used in critical care, emergency care or in anesthesiology.

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