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Asthma: diagnosis, monitoring and chronic asthma management. NICE NG80

This guideline covers diagnosing, monitoring and managing asthma in adults, young people and children. It 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. The guideline was updated in February 2020, with new recommendations for children and young people with deteriorating asthma control.

INTRODUCTION AND CONTEXT

This guideline covers diagnosing, monitoring and managing asthma in adults, young people and children. It 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. The investment and training required to implement the guideline will take time. In the meantime, primary care services should implement what they can of the recommendations, using currently available approaches to diagnosis until the infrastructure for objective testing is in place.

There is currently no gold standard test available to diagnose asthma; diagnosis is principally based on a thorough history taken by an experienced clinician. Studies of adults diagnosed with asthma suggest that up to 30% do not have clear evidence of asthma. Some may have had asthma in the past, but it is likely that many have been given an incorrect diagnosis. Conversely, other studies suggest that asthma may be underdiagnosed in some cases.

The diagnosis recommendations will improve patient outcomes and will be cost-effective to the NHS in the long-term; NICE's cost impact assessment projects a saving of approximately £12 million per year in England, before implementation costs.

It is recognised that asthma control is suboptimal in many people with asthma. This has an impact on their quality of life, their use of healthcare services and the associated costs. Asthma control can be monitored by measuring airway obstruction or inflammation and by using validated questionnaires, but the most effective monitoring strategy is unclear.

The severity of asthma varies; some people have severe asthma that limits normal activities, whereas others are able to lead a relatively normal life. The illness fluctuates during the year and over time, so the level of treatment

| TABLE 1. TREATMENT PATHWAY FOR ADULTS AGED 17 AND OVER | | |
|---|--|---|
| Treatment 'steps' | Recommendation | Comments |
| Newly diagnosed asthma | SABA | If infrequent, short-lived wheeze and normal lung function, consider SABA alone |
| First line maintenance therapy | Low dose ICS | If symptoms occur >3 times a week or cause night time waking, or are uncontrolled with SABA alone |
| Uncontrolled on low dose ICS | LTRA + ICS | Review response to treatment after 4–8 weeks |
| Uncontrolled on low dose ICS + LTRA | Add LABA Continue ICS | Review continuation of LTRA, taking account of response and patient views |
| Uncontrolled on low dose ICS + LABA | Change to MART* regimen (low dose ICS + LABA) | |
| Uncontrolled on MART (low dose ICS + LABA) +/- LTRA | Consider increasing ICS to moderate maintenance dose | Either continue with MART regimen or change to fixed-dose of ICS + LABA + SABA for symptom relief |
| Uncontrolled on moderate maintenance dose of ICS + LABA as MART or fixed dose regimen | Increase ICS to high maintenance dose, OR Trial of additional drug e.g. LAMA or theophylline, OR Seek advice from HCP with expertise in asthma | Fixed dose regimen only + SABA for symptom relief |

ICS, inhaled corticosteroid; MART, maintenance and reliever therapy; LABA, long acting beta 2 agonist; LAMA, long acting muscarinic receptor antagonist; LTRA, leukotriene receptor antagonist; SABA, short acting beta 2 agonist

needs to be tailored to the person's current level of asthma severity. Many people with asthma, particularly children, seem to have fewer symptoms over time, and an important part of management is decreasing treatment if asthma is well controlled.

There is no cure for asthma, so management focuses on reducing exposure to known triggers if possible, relief of symptoms if there is airway narrowing, and reduction in airway inflammation by regular preventive treatment. Adherence to regular treatment reduces the risk of significant asthma attacks in most people with asthma. The focus of asthma management in recent years has been on supporting people with asthma and their healthcare professional to devise a personalised treatment plan that is effective and relatively easy to implement.

CLINICAL HISTORY

Take a structured clinical history in people with suspected asthma. Specifically check for:

- Wheeze, cough or breathlessness, and any daily or seasonal variation in these symptoms
- Any triggers that make symptoms worse
- A personal or family history of atopic disorders

Do not use symptoms alone without an objective test to diagnose asthma

Examination

Examine people with suspected asthma to identify expiratory polyphonic wheeze and signs of other causes of respiratory symptoms. Be aware that even if the examination results are normal, the person may still have asthma.

Initial treatment and objective tests

Treat people immediately if they are acutely unwell at presentation, and perform objective tests (FeNO, spirometry and peak flow variability) if the equipment is available and testing will not compromise treatment of the acute episode.

If objective tests cannot be done immediately, carry them out when acute symptoms have been controlled, and advise people to contact their healthcare professional immediately if they become unwell while waiting for objective tests.

Empiric treatment with ICS may affect the results of spirometry and FeNO.

Skin prick tests, serum total and specific IgE, peripheral blood eosinophil count and exercise challenge are not recommended.

Occupational asthma

Check for possible occupational asthma by asking employed people with suspected new-onset asthma or asthma that is poorly controlled if their symptoms are better on days away from work or on holiday.

Record answers for later review, and refer people with suspected occupational asthma to an occupational asthma specialist.

Diagnosing asthma in young children

For children under 5 with suspected asthma, treat symptoms based on observation and clinical judgement. If they still have symptoms when they reach 5 years, carry out objective tests.

If the child is unable to perform the tests, try again every 6 to 12 months until satisfactory results are obtained.

OBJECTIVE TESTS

CCGs should consider establishing asthma diagnostic hubs to achieve economies of scale and improve the practicality of implementing the recommendations.

FeNO

Offer a FeNO test to adults, aged 17 and over, if a diagnosis of asthma is being considered. A level of 40 parts per billion (ppb) or more is positive.

Consider a FeNO test for children and young people (aged 5 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 of 35ppb or more as a positive test.

Spirometry

Offer spirometry to adults, young people and children aged 5 and over if a diagnosis of asthma is being considered. Regard a forced expiratory volume in 1 second/forced vital capacity (FEV1/FVC) ratio of less than 70% as positive for obstructive spirometry.

Bronchodilator reversibility

Offer a BDR test to adults (aged 17 and over) with an FEV1/FVC ratio <70%. An improvement in FEV1 of 12% or more, together with an increase in volume of 200ml or more, as positive.

Consider offering a BDR test to children and young people (aged 5 to 16) with an FEV1/FVC ratio <70%. Regard an improvement in FEV1 of >12% as positive.

Peak flow expiratory flow variability

Monitor peak flow variability for 2–4 weeks if there is diagnostic uncertainty after initial assessment and a FeNO test – regard a value of more than 20% variability as positive:

- In adults (aged 17 and over) who have:
 - Normal spirometry, or
 - Obstructive spirometry, positive BDR but FeNO level of 39ppb or less.
- In children and young people (aged 5 to 16) who have:
 - [indent][dash]Normal spirometry or[indent][dash]Obstructive spirometry, negative BDR and a FeNO level of 35ppb or more

PRINCIPLES OF PHARMACOLOGICAL TREATMENT

Consider possible reasons for uncontrolled asthma before starting or adjusting treatment, including:

- Alternative diagnoses
- Lack of adherence
- Suboptimal inhaler technique
- Smoking (active or passive)
- Occupational exposures
- Psychosocial factors
- Seasonal or environmental factors

Review response to treatment in 4–8 weeks after starting or adjusting medication for asthma.

If needed, offer daily ICS maintenance therapy.

Adjust the dose of ICS maintenance therapy over time, aiming for the lowest dose required for effective asthma control.

ICS DOSES

ICS doses and pharmacological strengths vary across different formulations.

For adults aged 17 and over:

- Low dose – less than or equal to 400mcg budesonide or equivalent
- Moderate dose – more than 400mcg to 800mcg budesonide or equivalent
- High dose – more than 800mcg budesonide or equivalent

- Paediatric low dose – less than or equal to 200mcg budesonide or equivalent
- Paediatric moderate dose – more than 200mcg to 400mcg budesonide or equivalent
- Paediatric high dose – more than 400mcg budesonide or equivalent

MART

Maintenance and reliever therapy (MART) is a form of combined ICS and LABA in which a single inhaler, containing both ICS and a fast-acting LABA is used for both daily maintenance therapy and the relief of symptoms as required. MART is only available for ICS and LABA combinations in which the LABA has a fast-acting component (e.g. formoterol).

The treatment pathway for adults aged 17 and over is shown in Table 1.

TREATMENT FOR CHILDREN/YOUNG PEOPLE 5 – 16

Children and young people (aged 5 – 16) should be offered a SABA as reliever therapy. If symptoms are infrequent and short-lived, and lung function is normal, consider SABA alone.

If symptoms at presentation (more than 3 times a week or causing waking at night, or uncontrolled on SABA alone, offer a paediatric low dose of ICS.

If asthma remains uncontrolled, consider adding LTRA in addition to ICS, and review response in 4–8 weeks. If it remains uncontrolled, consider stopping LTRA and starting LABA in combination with ICS.

If asthma is still uncontrolled, consider a MART regimen, ensuring the child or young person understands and is able to comply with this approach.

The next step if control is not achieved is to increase ICS dose to moderate paediatric maintenance dose – either continuing MART or switching to fixed dose regimen, with SABA as reliever therapy.

If still uncontrolled, seek advice from a healthcare professional with expertise in asthma and consider a trial of an additional drug e.g. theophylline.

NEW

NICE has reversed its previous recommendations to increase the dose of inhaled corticosteroids (ICS) for children experiencing deteriorating asthma control.

Previously NICE recommended that an increased dose of ICS, such as quadrupling, for 7 days should be considered for children and young people who were previously using ICS when asthma control deteriorated. But new evidence indicates that this strategy may not reduce the rate of severe asthma exacerbations in children with mild-to-moderate asthma, and may have an adverse effect on growth.

NICE now recommends:

For children and young people aged 5 to 16 with a diagnosis of asthma, include advice in their self-management programme on contacting a healthcare professional for a review if their asthma control deteriorates.

For those in this age group who have not been taking their ICS consistently, explain that restarting regular use may help them to regain control of their asthma. The evidence for increasing ICS doses to self-manage deteriorating asthma control is limited.

TREATMENT OF CHILDREN UNDER 5

It can be difficult to confirm asthma diagnosis in young children until they are able to undergo objective tests. For those with confirmed or suspected asthma:

- Offer SABA as reliever therapy
- Consider 8-week trial of paediatric moderate dose ICS for children with

- symptoms more than 3 times a week, or night time wakening, or suspected asthma uncontrolled with SABA alone
- After 8 weeks, stop ICS treatment and monitor child's symptoms.
- If symptoms did not resolve during trial period, consider alternative diagnosis
- If symptoms resolved then recurred within 4 weeks of stopping ICS, restart ICS at paediatric low dose
- If symptoms resolved then recurred after 4 weeks of stopping ICS, repeat 8-week trial of ICS at paediatric moderate low dose
- If suspected asthma is uncontrolled in children under 5 on a paediatric low dose of ICS as maintenance therapy, consider adding LTRA.
- If suspected asthma is uncontrolled on paediatric low dose ICS + LTRA, stop LTRA and refer child to an HCP with expertise in asthma for further investigation and management

SELF-MANAGEMENT

Offer an asthma self-management programme – written personalised action plan and education – to adults, young people and children with a diagnosis of asthma, and their families or carers if appropriate.

Increasing ICS within self-management plan

For adults aged 17 and over, offer an increased dose of ICS for 7 days when asthma control deteriorates. Clearly outline how and when to do so, and what to do if symptoms do not improve.

When increasing ICS dose:

- Consider quadrupling the regular ICS dose
- Do not exceed maximum licensed daily dose

DECREASING MAINTENANCE THERAPY

For patients whose asthma has been controlled for at least 3 months, consider decreasing current maintenance therapy. Stop or reduce dose of medicines in an order that takes account of 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.

MONITORING ASTHMA CONTROL

Monitor asthma control at every review. If control is suboptimal:

- Confirm the person's adherence to prescribed treatment in line with the recommendations on assessing adherence in the [NICE guideline on medicines adherence](#).²
- Review the person's inhaler technique
- Review if treatment needs to be changed
- Ask about occupational asthma (see above).

Use a validated questionnaire e.g. Asthma Control Questionnaire or Asthma Control test to monitor asthma control in adults (aged 17 and over).

Monitor asthma control at each review in adults, young people and children aged 5 and over using spirometry or peak flow variability testing.

Do not routinely use FeNO to monitor asthma control.

Consider FeNO measurement for people who are symptomatic despite using inhaled corticosteroids.³ See [NICE guideline on FeNO](#).

Do not use challenge testing to monitor asthma control.

Observe and give advice on the person's inhaler technique:

- At every consultation relating to an asthma attack, in all care settings
- When there is deterioration in asthma control
- When the inhaler device is changed
- At every annual review
- If the person asks for it to be checked.

REFERENCES

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