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Management of chronic mild to moderate asthma in adults

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Abstract

Although classically asthma is characterised by variable airflow obstruction and inflammation, leading to symptoms of breathlessness, wheeze, chest tightness and cough, it can present with a broad spectrum of symptoms that have a wide differential diagnosis. Clinical examination is frequently entirely normal and clinical history alone is not sufficient to diagnose asthma. There is over-reliance on short-acting beta-agonists and a widespread underuse of inhaled corticosteroids.

In mild to moderate disease, fluctuating symptoms can lead to an over-reliance on short-acting reliever treatment at the expense of preventative inhaled steroids. This risks the concealment of deteriorating symptoms and the potential build-up of critical airways inflammation. Routine clinical review is recommended at least on an annual basis. Asking the three questions in the Royal College of Physicians questionnaire remains the best way to assess symptom control. All patients should have a personalised asthma action plan which should include details of maintenance therapy and advice on what to do in case of an exacerbation. Referral to secondary care should be considered in the following situations: diagnostic uncertainty; high-risk patients; frequent corticosteroid use; and where addition of other specialist treatments may be needed.

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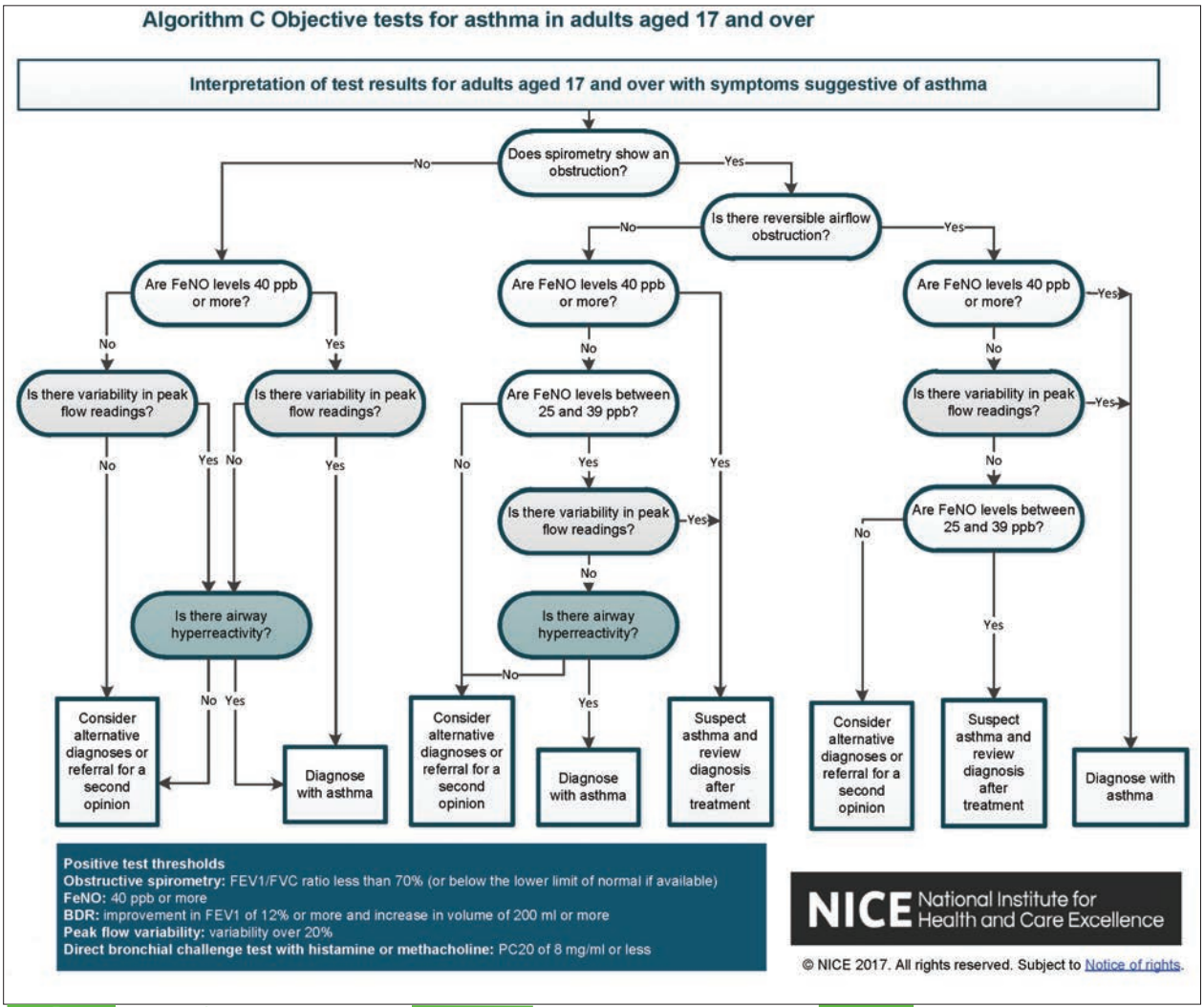

FIGURE 1
NICE algorithm for objective tests for asthma in adults based on NICE guideline NG80[2] (Order of tests panel not included)

What are the management options?

ALTHOUGH CLASSICALLY, ASTHMA IS CHARACTERISED BY VARIABLE AIRFLOW OBSTRUCTION AND inflammation, leading to symptoms of breathlessness, wheeze, chest tightness and cough,[1] it can present with a broad spectrum of symptoms that have a wide differential diagnosis.

Moreover, clinical examination is frequently entirely normal. Clinical history alone is not sufficient to diagnose asthma.[2] However, there is no single agreed gold standard diagnostic test and the more objective tests that aid diagnosis such as FeNO, although now integrated into national guidance, are not always available in primary care (see figure 1, above).[2]

When should patients be referred?

The UK has one of the highest rates of asthma in the world, with more than 18 million people treated for asthma at some point in their lifetime, requiring an estimated 6.4 million GP and nurse consultations each year.[3] Mortality from asthma remains high despite the development of new asthma therapies and an increased focus on research, as detailed in the 2014 National Review of Asthma Deaths (NRAD) *Why asthma still kills* report.[4] Almost half (46%) of asthma related deaths were considered avoidable had the appropriate guidelines been followed.[4]

How can outcomes be improved?

MANAGEMENT

Pharmacological treatment

The NRAD report found a prevalent over-reliance on short-acting beta-

agonists (SABA) and a widespread underuse of inhaled corticosteroids (ICS) which continues to be an issue.[4] In cases of fatal asthma, 80% of patients had not received any monthly treatment.

Asthma is primarily an inflammatory airways disease and therefore requires treatment with inhaled corticosteroids. The use of SABA, while necessary, should be considered an adjunct therapy to the inhaled steroid. Most patients are considered to have mild to moderate disease, which does not require high-dose treatment, and are predominantly managed in primary care. In mild to moderate disease, fluctuating symptoms can lead to an over-reliance on short-acting reliever treatment at the expense of preventative inhaled steroids. However, this risks the concealment of deteriorating symptoms and the potential build-up of critical airways inflammation, that could lead to a sudden onset life-threatening exacerbation.

Both the joint BTS/SIGN guideline[5] and the NICE guideline advocate starting ICS for newly diagnosed chronic asthma in adults.[2] Significantly, NICE deviates from the BTS/SIGN guidance by suggesting that there is a small group of patients (with short-lived wheeze and normal spirometry) that may be treated with SABA alone, although this has proved controversial in light of the findings of the NRAD report.[4] NICE guidance also departs from the recommended initial add-on therapy to regular low-dose ICS in those reporting ongoing symptoms.

The BTS/SIGN guidance recommends the addition of a long-acting beta-agonist (LABA) as a combination therapy.[5] Current evidence suggests that this approach reduces non-adherence to inhaled steroids and has demonstrated a modest reduction in the frequency of exacerbations requiring oral corticosteroids when compared with the NICE recommendation of adding a leukotriene receptor antagonist (LTRA).[6] BTS/SIGN advises adding this after escalating to a LABA/ICS combination.[5] However, the early use of an LTRA may prove more cost effective in the long term for individuals who respond.

The differing perspective of the two guidelines has been acknowledged, and a new NICE, BTS and SIGN taskforce is currently developing a unified approach for the diagnosis, monitoring and management of chronic asthma.

For those who do not respond at this stage, both guidelines advocate the use of a maintenance and reliever therapy (MART) regimen either before (NICE) or after (BTS/SIGN) a progressive increase in their ICS dose.[2,5] This approach has the advantage of ensuring ICS is delivered at the point it is most required, when the patient's symptoms are escalating. This technique has been shown to reduce overall steroid burden and unplanned admissions.[7] However, MART is only licensed for certain LABA/ICS combinations and the maximum inhaled dose that can be utilised differs between products.

Most individuals with mild to moderate asthma respond to treatment prior to initiating high dose ICS or the recommended addition of further adjunct therapies (such as long-acting muscarinic receptor antagonists or theophylline). Non-response is suggestive of severe asthma and at this point referral to specialist services should be considered.[2,5] It is important that prior to escalating treatment, and as part of assessing response to treatment, that the patient's adherence to the current treatment regimen and inhaler technique are reviewed.[2,5]

The majority of women with asthma have normal pregnancies and the risk of complications is small in those with well controlled asthma. However, asthma symptoms can worsen during pregnancy for a multitude of reasons, and it is imperative that this group continue their maintenance treatment throughout the pregnancy.[2] Large-scale studies have not shown any increase in congenital malformations associated with asthma therapy and uncontrolled asthma poses a much greater risk to the developing fetus.[5]

In patients with controlled symptoms for more than three months, stepping down their treatment, initially oral therapies and then by ICS dose, should be considered, as the current evidence suggests that in this group there is no impact on asthma control, or hospital admissions.[8] De-escalation of any steroid-containing product should only be performed by a 25-50% reduction at any time, until the lowest ICS maintenance regimen achievable is found for that individual.[5]

Climate change and global warming are an increasingly important concern[9] and the NICE guidance has been updated to take this into account.[2] The propellants in pressurised metered dose inhalers are responsible for an estimated 3.5% of all NHS emissions alone.[10] The lower impact dry powder inhaler devices are now recommended wherever possible.[2] However, any changes to ICS delivery devices should be balanced against the risk of compromising asthma control and would require patient education first.

Non-pharmacological interventions

As with many chronic conditions, non-pharmacological management plays a major role in controlling the disease process and managing symptoms. Especially important is weight loss, which is proven to improve asthma symptoms,[11] although by mechanisms not related to airway inflammation.[12] As with other respiratory conditions, patients frequently become fearful of inducing breathlessness and therefore restrict their physical activity, leading to a cycle of deconditioning and promoting weight gain.

Smoking is associated with poorer asthma control and an increased frequency of oral corticosteroid use.[13] Despite this, one in five individuals with asthma smoke,[14] and smoking cessation should be recommended at every opportunity.

When identified specific triggers should be avoided. However, there is a lack of evidence for forms of aeroallergen avoidance, especially those aimed at reducing exposure to house dust mite.[2] NICE recommends the avoidance of indoor and outdoor pollution where possible.[2]

Monitoring response to treatment

The BTS/SIGN guideline defines well controlled asthma by four criteria:

- No bothersome symptoms during the day or night
- Little/no reliever medication required
- No exacerbations
- Preserved lung function

In addition, symptom control should be achieved without any significant side effects.[5] Routine clinical review is recommended at least on an annual basis.[5] Asking the three questions in the Royal College of Physicians questionnaire[15] (see box 1, p24) remains the best way to assess symptom control. This quick and easy to use tool is useful not only to assess current symptoms, but also the likelihood of future exacerbations, and may prompt consideration to increase treatment or seek specialist advice.

Self-management

The BTS/SIGN guideline also advocates the importance of offering patients a personalised asthma action plan (PAAP).[5] This ensures that patients are informed and involved in their treatment from the beginning. This plan should be revisited regularly to assess the patient's understanding and compliance, and no patient should leave an acute respiratory consultation without having an asthma plan in place.

As previously discussed, it is imperative »

Box 1

The three questions in the Royal College of Physicians questionnaire to assess symptom control[15]

In the last month:

1 Have you had difficulty sleeping because of asthma symptoms (including cough)? **Yes/No**

2 Have you had your usual asthma symptoms during the day (cough, wheeze, chest tightness or breathlessness)? **Yes/No**

3 Has your asthma interfered with your usual activities (e.g. housework, work, school, etc)? **Yes/No**

The 'Yes/No' responses are scored with 1 for each positive answer giving a total score between 0 and 3

Table 1

Criteria for referral to secondary care

Diagnostic uncertainty or atypical features
Clinical findings: Crepitations, inspiratory or monomorphic wheeze, clubbing, persistent breathlessness, copious sputum production. Rapidly progressive course; significant extrapulmonary/systemic symptoms

Investigations: Chest X-ray changes, restrictive spirometry, marked or persistent eosinophilia

Coexisting conditions complicating asthma control:
Overlapping COPD; vocal cord dysfunction; bronchiectasis; nasal polyposis. Pregnancy if associated with deteriorating control or significant problems during previous pregnancies

Possibility of hypersensitivity to inhaled material including cases of suspected:
Hypersensitivity pneumonitis; occupational asthma; work-aggravated asthma; reactive airways dysfunction syndrome (that follows a single high-volume exposure to an irritant)

Treatment and exacerbations
Need for high-dose ICS to control symptoms:
Refer patients at any stage of treatment in the following circumstances:
- More than two courses of systemic corticosteroids/year required
- Presentation to emergency services more than once in the past 12 months
- Following any asthma-related hospital admission

Patients who have suffered even a single life-threatening asthma attack at any point in the past should be under specialist supervision

Table 2

Improving outcomes in asthma

- Use asthma registry data to identify patients on SABA monotherapy and review their asthma diagnosis and treatment
- Consider MART therapy where possible to improve ICS adherence
- Ensure all asthma patients have an up-to-date personalised asthma action plan
- Consider how often SABA prescriptions are being reissued, as over-reliance on SABA is associated with higher rates of asthma fatality
- Ensure patients have good inhaler technique and avoid blanket switching of devices without further education

to educate patients about the importance of using the ICS-containing maintenance therapy, even if symptoms have subsided to ensure good asthma control. Concordance with treatment remains a significant problem. A recent study has shown that adherence to ICS ranged from 22 to 63%.[16]

Primary care plays a vital role in educating patients regarding self-management. Previous research has shown that this in combination with a PAAP can lead to a reduction in hospital admissions and asthma exacerbations.[5] PAAPs should include details of maintenance therapy and advice on how to act in case of an exacerbation, such as quadrupling the dose of ICS (for up to 14 days) and recognising when to commence oral steroids.[3] PAAPs are guided by worsening symptoms or decreasing peak flow, compared with patients' predicted or actual best. Asthma + Lung UK (formerly Asthma UK) provides a PAAP template using a traffic light system which is freely available to download from their website (see figure 2, p25).[17]

Any encounter with health services, primary or secondary, should be seen as an opportunity to reassess a patient's inhaler technique. Unsurprisingly, patients with respiratory conditions, who exhibit poor inhaler technique, experience poor disease control and more severe exacerbations.[18]

REFERRAL

The four main criteria for referral to secondary care for further investigations and treatment are listed below.[19]
- Diagnostic uncertainty
- High-risk patients
- Frequent corticosteroid use
- Addition of other specialist treatments

Table 1, left, provides a summary that can be used as a guide for referral. The importance of early referral to secondary care was highlighted by the NRAD report, which concluded that failure to refer to secondary care is an avoidable factor in asthma deaths.[4] A recent large-scale national study[20] highlighted that 72% of patients with potentially severe asthma were not referred to specialist care. There is evidence of a large unmet need in patients meeting eligibility criteria being referred for specialist review.[21]

IMPROVING ASTHMA OUTCOMES

Ensuring the regular use of ICS-containing inhalers and assessing proper inhaler technique are key, see table 2, left. It is also vital to ensure that each patient has a PAAP to help early recognition of a

FIGURE 2
Asthma + Lung UK Adult asthma action plan (page 2 of 2)

1 Every day asthma care:

My asthma is being managed well:

- With this daily routine I should expect/aim to have no symptoms.
- If I have not had any symptoms or needed my reliever inhaler for at least 12 weeks, I can ask my GP or asthma nurse to review my medicines in case they can reduce the dose.
- My personal best peak flow is:

My daily asthma routine:

My preventer inhaler (insert name/colour):

.....

I need to take my preventer inhaler every day even when I feel well.

I take ..... puff(s) in the morning

and ..... puff(s) at night.

My reliever inhaler (insert name/colour):

.....

I take my reliever inhaler only if I need to

I take ..... puff(s) of my reliever inhaler if any of these things happen:

- I'm wheezing
- My chest feels tight
- I'm finding it hard to breathe
- I'm coughing

Other medicines and devices (e.g spacer, peak flow meter) I use for my asthma every day:

2 When I feel worse:

My asthma is getting worse if I'm experiencing any of these:

- My symptoms are coming back (wheeze, tightness in my chest, feeling breathless, cough).
- I am waking up at night.
- My symptoms are interfering with my usual day-to-day activities (eg at work, exercising).
- I am using my reliever inhaler three times a week or more.
- My peak flow drops to below: .....

URGENT! If you need your reliever inhaler more than every four hours, you need to take emergency action now. See section 3.

What I can do to get on top of my asthma now:

If I haven't been using my preventer inhaler, I'll start using it regularly again or if I have been using it:

- Increase my preventer inhaler dose to ..... puffs ..... times a day until my symptoms have gone and my peak flow is back to my personal best.
- Take my reliever inhaler as needed (up to ..... puffs every four hours).
- Carry my reliever inhaler with me when I'm out.

URGENT! See a doctor or nurse within 24 hours if you get worse at any time or you haven't improved after seven days.

Other advice from my GP about what to do if my asthma is worse (eg MART or rescue steroid tablets):

3 In an asthma attack:

I'm having an asthma attack if I'm experiencing any of these:

- My reliever inhaler is not helping or I need it more than every four hours.
- I find it difficult to walk or talk.
- I find it difficult to breathe.
- I'm wheezing a lot, or I have a very tight chest, or I'm coughing a lot.
- My peak flow is below: .....

What to do in an asthma attack

1. Sit up straight - try to keep calm.
2. Take one puff of your reliever inhaler (usually blue) every 30-60 seconds up to 10 puffs.
3. If you feel worse at any point OR you don't feel better after 10 puffs **call 999 for an ambulance**.
4. If the ambulance has not arrived after 10 minutes and your symptoms are not improving, repeat step 2.
5. If your symptoms are no better after repeating step 2, and the ambulance has still not arrived, **contact 999 again immediately**.

Important: this asthma attack advice does not apply to you if you use a MART inhaler.

After an asthma attack

- If you dealt with your asthma attack at home, see your GP today.
- If you were treated in hospital, see your GP within 48 hours of being discharged.
- Finish any medicines they prescribe you, even if you start to feel better.
- If you don't improve after treatment, see your GP urgently.

What to do in an asthma attack if I'm on MART:

key points

SELECTED BY

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Although classically asthma is characterised by variable airflow obstruction and inflammation, leading to symptoms of breathlessness, wheeze, chest tightness and cough, it can present with a broad spectrum of symptoms that have a wide differential diagnosis. Clinical examination is frequently entirely normal and clinical history alone is not sufficient to diagnose asthma. The UK has one of the highest rates of asthma in the world, with more than 18 million people treated for asthma at some point in their lifetime. There is over-reliance on short-acting beta-agonists and a widespread underuse of inhaled corticosteroids (ICS). In mild to moderate disease, fluctuating symptoms can lead to an over-reliance on short-acting reliever treatment at the expense of preventative inhaled steroids. This risks the concealment of deteriorating symptoms and the potential build-up of critical airways inflammation.

The joint BTS/SIGN guideline and the NICE guideline advocate starting ICS for newly diagnosed chronic asthma in adults. The BTS/SIGN guidance recommends the addition of a long-acting beta-agonist as a combination therapy in contrast to the NICE recommendation of adding a leukotriene receptor antagonist at this stage. For non-responders, both guidelines then advocate the use of a maintenance and reliever therapy regimen either before (NICE) or after (BTS/SIGN) a progressive increase in their ICS dose. Failure to respond after initiating high dose ICS or the addition of further adjunct therapies such as long-acting muscarinic receptor antagonists or theophylline is suggestive of severe asthma and at this point referral to specialist services should be considered.

Stepping down treatment, initially oral therapies and then by ICS dose, should be considered when symptoms have been controlled for more than three months. De-escalation of any steroid-containing product should only be performed by a 25-50% reduction at any time, until the lowest ICS maintenance regimen achievable is found for that individual.

Smoking cessation and weight loss, where appropriate, and avoidance of indoor and outdoor pollution, where possible, should be advised. Routine clinical review is recommended at least on an annual basis. Asking the three questions in the Royal College of Physicians questionnaire remains the best way to assess symptom control. All patients should have a personalised asthma action plan which should include details of maintenance therapy and advice on what to do in case of an exacerbation.

Referral to secondary care should be considered in the following situations: diagnostic uncertainty; high-risk patients; frequent corticosteroid use; and where addition of other specialist treatments may be needed.

deterioration in symptoms; patients are frequently too accepting of suboptimal symptom control and can underestimate their potential for future deterioration.

The NRAD report also emphasised the importance of the annual asthma review, in addition to having a named asthma lead in primary care.[4]

The identification, through prescription monitoring, of patients prescribed more than 12 blue inhalers a year can be used to target interventions for those at highest risk of deterioration at an earlier stage.[4]

Likewise, patients on a MART regimen who require frequent repeat prescriptions should be called in for review. A well structured PAAP should ensure minimal blue inhaler use, meaning that a blue inhaler should last for almost a year if used twice weekly or less.

Competing interests
Dr Gareth H Jones has previously received honoraria from GSK, AstraZeneca and Chiesi, and non-financial support from NAPP. The other authors have no competing interests

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Useful information

Asthma + Lung UK
Advice and support for patients
www.asthma.org.uk

Adult asthma action plan
Copies of the asthma action plan template can be downloaded from the website
www.asthma.org.uk/c2e067c2/globalassets/health-advice/resources/adults/your-asthma-plan-a4-trifold-digital-july22.pdf

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