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Management of Adult Asthma

Current British Guidelines on the Management of Asthma provide the following recommendations for the management of asthma: [1]

General principles of management

- Step up/down treatment according to disease severity to maintain good control and minimise drug-related side-effects.
- Start at the step most fitting to the initial severity of the asthma.
- Treatment plans and goals should be negotiated with the patient but usual aims would be to minimise impact of symptoms on life, reduce reliance on reliever medication and prevent severe exacerbations.
- Self-management education including individualised written asthma action plans should be offered.
- Always check concordance with medication/existing action plan, effective inhaler technique and the presence/absence of trigger factors before initiating new drug therapy.
- It is very important to consider the upper respiratory tract when treating asthma. It is much more difficult to successfully treat asthma if co-existing allergic rhinitis is not adequately controlled. [2]

See also the separate articles on Occupational Asthma, Bronchial Asthma and Acute Severe Asthma and Status Asthmaticus.

Asthma reviews

Routine asthma care is largely carried out in primary care. Practices must keep a register of patients with asthma to ensure adequate follow-up and audit. All patients with asthma should be reviewed at least annually, more often if disease is less well controlled or recently diagnosed. Reviews should be carried out by a nurse or doctor with appropriate and up-to-date training and should include:

- Current symptoms using objective measures.
  The Royal College of Physicians (RCP) 'three questions' are widely used:
    - In the last month/week have you had difficulty sleeping due to your asthma (including cough symptoms)?
    - Have you had your usual asthma symptoms (eg, cough, wheeze, chest tightness, shortness of breath) during the day?
    - Has your asthma interfered with your usual daily activities (eg, school, work, housework)?

  Note: one 'yes' indicates medium morbidity and two or three 'yes' answers indicate high morbidity. Alternatives include the Asthma Control Questionnaire, Asthma Control Test and Mini Asthma Quality of Life Questionnaire.
- Record an up-to-date smoking status; offer smoking cessation advice and support where appropriate.
- Record any acute exacerbations since last seen.
- Check medication use - a prescription count can indicate overuse/underuse of medication, inhaler and spacer, problems and side-effects. The use of more than two canisters of short-acting $beta_2$ agonist per month - or 10-12 puffs per day - is associated with poorly controlled and higher-risk asthma.
- Check immunisation (pneumococcal/influenza) status. (Note that influenza vaccine for asthmatics is no longer a quality indicator for asthma in QOF 2008).
- Review peak flow diaries and record current peak expiratory flow rate (PEFR)/spirometry values.
- Address any educational needs.
- Provide/update a written action plan.
- Consider home monitoring of PEFR - useful particularly in those with severe or brittle asthma and those who have difficulty recognising symptom deterioration.
- Agree duration of subsequent follow-up and ensure the patient is aware of how to seek help if their asthma deteriorates.

Studies have shown that telephone reviews are effective in improving care delivery and reducing cost. [3] Assessing patients over the phone using the RCP 'three questions' approach, with the addition of two additional risk questions (Have you been admitted for asthma in the last year? Have you ever needed ITU care for asthma?), has been trialled. Where a positive answer occurs, a clinic review is arranged. Otherwise, action and duration prior to next follow-up are agreed. Telephone review appears to achieve similar rates of control, better review rates and cheaper care compared with usual clinic asthma reviews. Telephone reviews are endorsed by the current guidelines to reach individuals unable/unwilling to come in for regular review; however, they are not thought suitable for those with poorly controlled asthma or where there are problems of inhaler technique. [1]

Non-drug treatment [1]

All people with asthma (and/or their carers) should be offered self-management education which should include a written personalised asthma action plan and be supported by regular professional review.

- **Smoking cessation**. Smoking exacerbates asthma symptoms. It increases the risk of persistent asthma in teenagers who smoke. Clear personalised advice should be given to stop smoking and help provided with nicotine replacement therapy, etc, where appropriate.
- **Weight reduction** in obese patients improves asthma symptoms and should be encouraged.
- Breathing exercise programmes can be offered to people with asthma as an adjuvant to pharmacological treatment, to improve quality of life and reduce symptoms.
- **Allergen avoidance**. There is little evidence that reducing allergen exposure reduces morbidity from asthma and it does not appear to be a cost-effective treatment for asthma. Avoiding house dust mite allergen (bed covers, carpet removal, high-temperature washing of bedding, dehumidification and use of acaricides on soft furnishings) requires commitment beyond what is possible in most households. Similarly, cat and dog allergens are potent triggers for many people's asthma. Again, however, observational evidence that removal of the pet from the household improves asthma control, is lacking. Nonetheless, expert consensus usually advocates their removal.
- **Immunotherapy**. This may be considered where there is a clinically significant and identified allergen that cannot be avoided. Patients need to be aware of the risk of anaphylaxis and treatment should only take place within specialist settings.

Dietary modifications (use of probiotics, antioxidants, fish oils/lipid supplements, magnesium) and complementary therapies are not currently supported by the guidelines.

Drug treatment

Step up/down management of chronic asthma. [1] [4]

Step 1: mild, intermittent asthma

Prescribe an **inhaled short-acting beta$_2$ agonist** as a short-term reliever for all patients with symptomatic asthma.

Step 2: introduction of regular preventer therapy

Inhaled steroids are the most effective preventer drugs for achieving overall treatment goals. They should be considered for any patient with:

- A recent exacerbation (in the previous two years).
- Nocturnal asthma (waking with symptoms more than once a week).
- Daytime symptoms or use of an inhaled short-acting beta$_2$ agonist more than three times per week.

Regular use of bronchodilators alone may be linked with worsening asthma and asthma deaths and some patients may be non-compliant with their 'preventative' medication for varied reasons. Review medication use. Start treatment at a dose appropriate to symptoms between 200-800 micrograms/day beclometasone propionate or equivalent (400 micrograms/day is appropriate for many).

In the past, advice has been to double inhaled steroids early in an exacerbation. Evidence for being effective at lower dose (eg, 200 to 400 micrograms/day) is lacking but there is some evidence of efficacy switching from low-dose to high-dose inhaled steroids (eg, 200 to 1000 micrograms/day) early in an exacerbation. Current guidance advises commencing oral steroids early in an exacerbation.

Step 3: add-on therapy

First choice as add-on therapy to inhaled steroids are **inhaled long-acting beta$_2$ agonists (LABAs)** such as salmeterol or formoterol.

- Review after a trial of therapy - continue if successful in controlling symptoms well.
- Discontinue after a trial of therapy if no benefit is seen. Then, increase the inhaled steroid dose to 800 micrograms/day beclometasone propionate or equivalent. If control remains suboptimal, consider a trial of another add-on therapy such as leukotriene receptor antagonists or modified-release theophylline.
- If there is benefit but partial control only, continue the LABA but increase the inhaled corticosteroid to 800 micrograms/day beclometasone propionate or equivalent.

Step 4: poor control on moderate dose of inhaled steroid plus add-on therapy

Recommendations at this step are based on extrapolated results, as specific clinical trials are lacking and are consequently less evidence-based. Trial an additional fourth drug over six weeks (eg, leukotriene receptor antagonist, sustained-release theophylline or beta$_2$ agonist tablet) and increase the inhaled steroid to high-dose ranges (up to 2000 micrograms/day are suggested strategies at this level).

Step 5: continuous or frequent use of oral steroids

Where previous steps have failed to control a patient's asthma, the use of daily steroid tablet in the lowest dose providing adequate control is suggested. Maintain high-dose inhaled corticosteroids at 2000 micrograms/day and consider other treatments to minimise the use of steroid tablets.

These patients should be under the care of a respiratory physician. They run higher risk of steroid-related side-effects and should be monitored for the development of side-effects of treatment, eg, hypertension, diabetes or hyperlipidaemia, osteoporosis, cataracts and adrenal suppression.

Stepping down

Review treatment every three months. Step it down if possible (but consider seasonal variation in symptoms, severity of asthma, risk of adverse effects, patient preference) and use the lowest possible dose of inhaled corticosteroid to control the asthma symptoms. When reducing inhaled steroids, cut the dose slowly by 25-50% each time.

Combination products

Increasingly, combination inhalers of LABAs and low-dose inhaled steroids (eg, Symbicort® = formoterol and budesonide, Seretide® = salmeterol and fluticasone) are being marketed and used. These products are convenient since many patients are on a maintenance dose of both types of drugs and should be expected to improve adherence. However, they should only be used if the patient requires both drugs and has previously been stabilised on a dosage regimen that is deliverable by the combination inhaler. Using combined inhalers makes it harder to assess whether a patient still requires both drugs and in what doses and so the LABA or inhaled corticosteroid may not be stepped down appropriately.

They appear in the new British guidelines for the first time for adult patients at Step 3 when the use of formoterol and budesonide combined inhalers may be stepped up from regular use as preventative treatment to rescue treatment (instead of a short-acting beta$_2$ agonist) when symptomatic. [1] This has been shown to be effective provided patients receive adequate education about their use.

Omalizumab [5]

NICE recommends omalizumab as an option for treating severe persistent confirmed allergic IgE-mediated asthma as an add-on to optimised standard therapy in people aged 6 years and older who need continuous or frequent treatment with oral corticosteroids (defined as four or more courses in the previous year). Omalizumab should only be initiated by a specialist.

Optimised standard therapy is defined as a full trial of and, if tolerated, documented compliance with inhaled high-dose corticosteroids, long-acting $beta_2$ agonists, leukotriene receptor antagonists, theophyllines, oral corticosteroids, and smoking cessation if clinically appropriate.

Management of acute asthma

See the separate article on Acute Severe Asthma and Status Asthmaticus - treat as an emergency.

Asthma in pregnancy[1] [6]

Asthma's course in pregnancy is very variable. The risk of deterioration is highest in those with severe asthma but, equally approximately, a third of asthmatic women improve symptomatically during pregnancy. Up to a fifth of pregnant women with asthma require emergency treatment, of which two thirds require hospitalisation.

Well controlled asthma minimises the risk of fetal and maternal complications. Pre-pregnancy, optimise control and emphasise the importance of continuing medication in pregnancy. Monitor pregnant asthmatics closely so that appropriate changes to their treatment can be quickly implemented in response to changed symptoms.

Treat exacerbations vigorously, in particular ensuring oxygen saturation is maintained above 95%. In general, asthma medications are believed to be safe in pregnancy - women should be reassured regarding treatments. Inhaled short- and long-acting $beta_2$ antagonists, inhaled corticosteroids, and oral and intravenous theophyllines can be used as normal during pregnancy.

Acute severe asthma in pregnancy is an emergency and should be treated vigorously in hospital.

Smoking cessation and breast-feeding should be particularly encouraged in asthmatic women. Asthma drugs can be used as normal in breast-feeding women.

Inhaler and spacer devices[1]

See also the separate article on Which Device in Asthma.

Asthma management can be confusing given the array of devices, masks and spacers used to deliver inhaled drugs. When considering which inhaler device, consider manual dexterity and other necessary abilities to activate a particular device, factors such as portability and convenience and the patient's willingness to use a particular device.

Whenever an inhaler is prescribed, training should be given and technique checked regularly to ensure that it is being used correctly.

Instructions for the correct use of a pressurised metered-dose inhaler (pMDI):

- Remove the cap from the mouthpiece and shake hard.
- If you have not used it for >1 week or it is the first time it has been used, spray into the air to check it works.
- Stand/sit up straight and lift the chin to open the airway.
- Take a few deep breaths and then breathe out gently. Put the mouthpiece in your mouth with teeth around it (not biting) and seal with your lips.
- Start to breathe in and out through the mouthpiece. As you start to breathe in, simultaneously press on the inhaler canister to release one puff of medicine. Continue to breathe in deeply to make sure it gets to the lungs.
- Hold your breath for 10 seconds or as long as you can comfortably manage before breathing out slowly.

- If you need another puff, wait for 30 seconds and shake the inhaler and repeat the process.
- Replace the cap on the mouthpiece.

The first-line choice for delivery of inhaled corticosteroids and bronchodilators in the treatment of stable asthma is the pMDI +/- a spacer device. Other alternative inhaler devices have not been shown to be more effective than pMDI and are more expensive. They are also considered first-line for the delivery of treatment for mild-to-moderate asthma exacerbations and are at least as effective as a nebuliser in these situations.

Large-volume spacer devices are useful for increasing drug delivery to the lungs and may be used for all patients but are strongly indicated for those who have difficulty co-ordinating pMDI activation with inhalation and those on high doses of inhaled corticosteroids (>800 micrograms/day). Portability of spacers can be an issue. In the very young, a face mask should be used with the pMDI and spacer combination, until the spacer mouthpiece can be reliably used. If this is ineffective, a nebuliser should be considered.

Referral [1]

Consider specialist referral if:

- Diagnosis unclear.
- Unexpected clinical findings (ie crackles, clubbing, cyanosis, cardiac disease).
- Unexplained restrictive spirometry.
- Suspected occupational asthma.
- Persistent non-variable breathlessness.
- Monophonic wheeze or stridor.
- Prominent systemic features (myalgia, fever, weight loss).
- Chronic sputum production.
- CXR shadowing.
- Marked blood eosinophilia (>1 x 10^9/L).
- Poor response to asthma treatment.
- Severe asthma attack.

Further reading & references

- Primary Care Respiratory Society UK
- Asthma; NICE CKS, Dec 2013 (UK access only)
- Global Initiative for Asthma (GINA)

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3. Pinnock H, McKenzie L, Price D, et al; Cost-effectiveness of telephone or surgery asthma reviews: economic analysis of a randomised controlled trial. Br J Gen Pract. 2005 Feb;55(511):119-24.
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6. Dombrowski MP; Asthma and pregnancy. Obstet Gynecol. 2006 Sep;108(3 Pt 1):667-81.

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