Diagnosis and management of asthma in the elderly

Asthma in the elderly is a significant but often under-recognised problem. Once it is considered, simple and safe tests may aid diagnosis. Management should follow National Asthma Campaign guidelines.

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Asthma is characterised by airflow limitation that varies either spontaneously or with bronchodilating treatment, and is associated with relevant symptoms (such as wheeze, chest tightness, cough or breathlessness). These features of reversibility distinguish asthma as a diagnosis from chronic obstructive pulmonary disease.

The problem

Asthma in the elderly is a significant health problem. Between 5.6 and 9.1% of older people have asthma in Australia.[1] Asthma hospitalisation rates are highest in the group aged 65 and above.[2] Equally, this group has a worryingly high mortality: 45% of asthma deaths in Australia in 1986 occurred in those over 65.[3] These figures are similar to worldwide figures, with 58 and 71% of asthma deaths occurring over the age of 70 in England and Wales respectively.[4]

Identification of the asthma and appropriate treatment remain crucial issues. Asthma in the elderly may reflect a recurrence of childhood asthma or overlap with smoking-related lung disease, or it may occur as a new problem. Twenty-two per cent of patients in one Welsh survey developed their first symptoms over the age of 65.[5] It is also recognised that older patients are more likely to have prolonged symptoms of exacerbation before hospital admission. If we can identify the asthma early and treat appropriately, this can lessen the hospitalisation and mortality rates.

Diagnosis

Asthma can be difficult to diagnose in the aged. It is frequently under-recognised in the aged because of a wider differential diagnosis, difficulties with lung function measurement and under-reporting of symptoms incorrectly attributed to ageing.[6]

Asthma often presents atypically in older people. Common symptoms include cough, breathlessness with exertion, chest tightness and wheeze. Cough is a crucial symptom; in 71% of older asthmatics, cough persisting over three weeks was the sole presenting complaint.[7] Equally, wheezing remains a very important symptom. There is the old adage that 'all that wheezes is not asthma', and gastro-oesphageal reflux, cardiac failure and unilateral airway obstruction from a tumour or foreign body

IN SUMMARY

- **Asthma in the elderly tends to be underdiagnosed but, once it is considered, simple and safe tests may aid diagnosis.**
- **Management of elderly patients with asthma should vary little from that of younger patients. The National Asthma Campaign's Six Step Asthma Management Plan provides a proforma for asthma management across all ages.**
- **Inhaled corticosteroids (for stabilising the underlying inflammatory response) and short-acting beta agonists (for control of symptoms) remain the cornerstone of therapy.**
- **It is important to ensure the patient has a current action plan and is using medication correctly.**

may also cause wheeze. However, the presence of wheezing should lead to asthma being strongly considered at all times.

Investigations

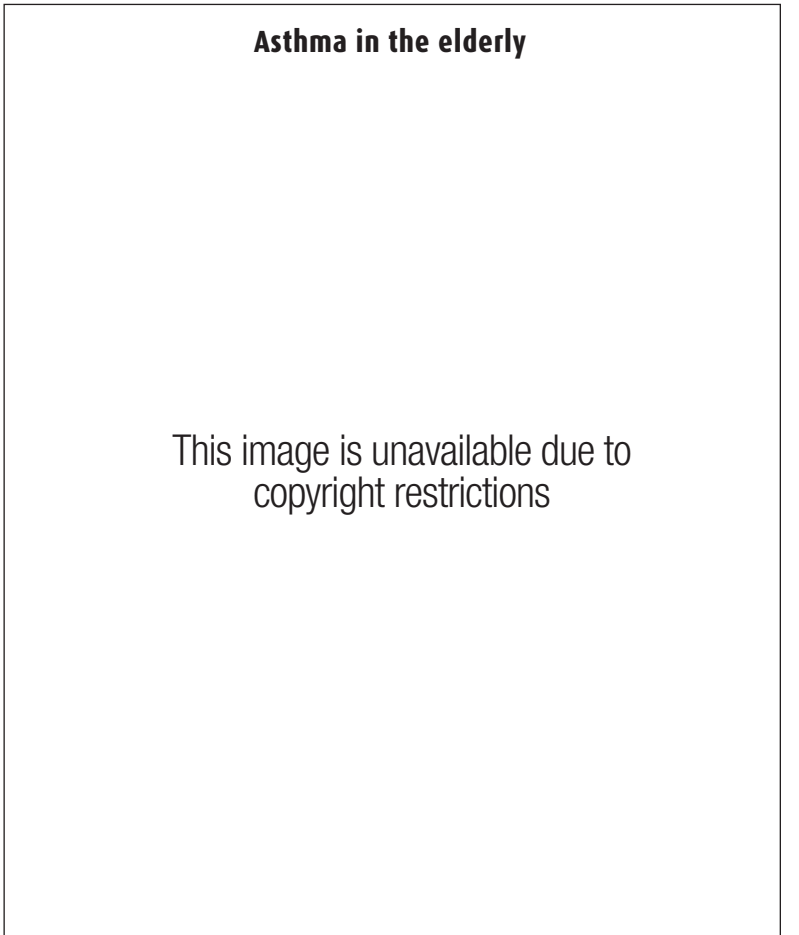
If asthma is considered, some simple and safe tests may aid the diagnosis. Serial peak flow measurements can provide valuable information, especially the appearance of excess day-to-day variability. Patients with asthma need to know their best peak flow measurement and have a peak flow meter readily available so they can quickly identify periods of asthma instability.

More formal pulmonary function tests are likely to be beneficial. They are simple, safe, reliable and relatively inexpensive. The FEV_1 (forced expiratory volume of air in one second) and FVC (forced vital capacity), with the ratio FEV_1/FVC, are of particular value, as is their response to bronchodilators. The presence of airway obstruction is demonstrated by a reduced FEV_1/FVC ratio (below 70%). These tests will enable quantification of the severity of airflow obstruction (by the FEV_1 level); they also identify reversibility of obstruction by bronchodilator therapy, which is diagnostic of asthma (15% improvement in FEV_1 or FVC or both). The degree of bronchodilator responsiveness is particularly likely to be of diagnostic value in elderly smokers, in whom the margins between chronic bronchitis, emphysema and asthma are often blurred.

Other investigations that may be helpful include a plain chest x-ray, particularly in previous smokers. While this is unlikely to be diagnostic for asthma, other causes of dyspnoea and cough may be identified. Skin tests and/or RAST may be helpful, showing the patient the need for antigen avoidance. Clinical examination and investigations of the cardiovascular system may be very helpful given the overlap in conditions in this age group.

Elderly patients with asthma tend to be underinvestigated. In a Minnesota study of patients over 65 with asthma, only 11% had skin tests, 24% had office peak flow measurement, and 43% had spirometry measurement.[8] Given the difficulties of diagnosis in this age group, the diagnostic tests should be performed at least as often as they are in the younger population, but this rarely happens.

Asthma in the elderly



Identification of asthma and appropriate treatment remain crucial issues for practitioners with elderly patients. Older patients are more likely to have prolonged symptoms of exacerbation before hospital admission. If we can identify the asthma early and treat appropriately, this can lessen the hospitalisation and mortality rates.

Management

Management of elderly patients with asthma should vary little from that of younger patients. The National Asthma Campaign's Six Step Asthma Management Plan provides a proforma for asthma management across all ages (see the box on page 22).[9] The development of an action plan for identification of asthma decline and escalation in treatment is a crucial and often overlooked step. Patients with asthma should have a peak flow meter and know (and have written down) their best peak flow measurement. They should be taught a plan of action to follow

The Six Step Asthma Management Plan[9]

Step 1. Assess asthma severity
- Measure frequency of symptoms, especially nocturnal
- Note previous hospitalisation or near-fatal attacks
- Note frequency of bronchodilator use
- Assess spirometry impairment (when the patient is stable)
- Record peak flow variability

Step 2. Achieve best lung function
- Treat airway inflammation and obstruction (give intensive therapy until best lung function is achieved)

Step 3. Maintain best lung function by avoiding trigger factors
- Identify and avoid allergen exposure
- Give annual influenza vaccination
- Use antibiotics as appropriate
- Avoid adverse drugs (e.g. beta blockers, salicylates, NSAIDs)
- Identify and treat gastro-oesophageal reflux
- Avoid nonallergic triggers (smoke, exposure to irritants through occupation or hobbies)

Step 4. Maintain best lung function by optimising the medication
- Relieve symptoms with initial intensive therapy
- Gradually reduce medications to minimum effective doses
- Minimise adverse effects
- Ensure optimal delivery device and technique used
- Ensure compliance

Step 5. Develop an action plan
- Base the plan on symptoms and peak flow monitoring – the best peak flow must be known
- Advise the patient about appropriate self-management of acute attacks and discuss a crisis plan

Step 6. Educate and review regularly
- Ensure the patients, and their carers, understand the management of their disease, adhere to management and maintain control
- Emphasise need for regular review, even if asthma seems well controlled

Consultant's comment

The elderly are more likely than the young to be prescribed medications that can precipitate or aggravate asthma. These include beta blockers. There are 26 brand names in MIMS listed as beta-adrenergic blocking drugs and two under other MIMS headings (labetalol and sotalol). The beta-blocker antiglaucoma eyedrops are also known to precipitate or aggravate asthma. Examples are betaxolol and timolol.

Since more than 10% of people with asthma are sensitive to aspirin (and other NSAIDs), and with the use of low dose aspirin and NSAIDs almost universal in the sick elderly, these agents in their various guises (including nonprescription analgesics such as ibuprofen) should also be considered possible causes or aggravators of asthma. Look out for the patient, elderly or otherwise, on a beta blocker plus a bronchodilator (most commonly salbutamol) or taking antiasthma therapy plus an NSAID! Was the recent increase in asthma deaths (in the elderly) due to overuse of beta agonists or the misuse of beta blockers and/or NSAIDs?

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according to the frequency and severity of symptoms and the degree of reduction of their peak flow rate.

In South Australia in 1995, 42% of patients had an action plan. This represented a significant improvement from 21% in 1992, but substantial room for improvement remains.[10] There is no reason to believe the situation would be any better in other regions, although continuing National Asthma Campaign efforts may be contributing to further improvement.

Drug therapy

Drug therapy depends on the severity of the asthma (see the flowchart on page 24).

Short-acting beta agonists

Inhaled short-acting beta agonists (salbutamol, terbutaline, fenoterol, orciprenaline) remain important as symptom relievers, and should be used as needed. Age is not believed to alter responsiveness to these bronchodilators.[11]

Side effects, such as anxiety, tremor, tachycardia and hypokalaemia, may occur, particularly with excessive doses.

It is important that patients recognise that if they require the beta agonist increasingly frequently it indicates asthma instability and therefore a need to increase preventer medications (inhaled corticosteroids) or step up to intensive therapy.

Inhaled corticosteroids

Inhaled corticosteroids (beclomethasone, budesonide, fluticasone) remain the cornerstone of asthma management at all ages because of their anti-inflammatory effect. They are also the most cost effective asthma therapy. It is recommended that the dose commence in the medium to high range (at least 800 µg/day) for four to eight weeks, to gain rapid control. The dose can then be back-titrated to minimise side effects.

Side effects do occur, particularly with sustained high doses. These may include cataract formation, adrenal suppression, osteoporosis and skin bruising. The latter is particularly evident in the aged. Inhaled corticosteroids are also associated with local side effects such as oral candidiasis and dysphonia.[12]

If the symptoms are not controlled by inhaled corticosteroids, it is important to consider the following:
- Is the patient adhering to the medication plan?
- Is the inhaler technique correct?
- Are there unrecognised trigger factors (allergens, oesphageal reflux etc)?

- Is the diagnosis of asthma correct?

If these issues can be excluded, further medication seems indicated. Recent evidence suggests that long-acting beta agonists have a role here.[13,14]

Long-acting beta agonists

Two studies have revealed that when symptoms are not controlled by inhaled corticosteroids the addition of an inhaled long-acting beta agonist (eformoterol, salmeterol) will lead to a greater reduction in symptoms, a decrease in the use of short-acting beta agonists and an improvement in peak flow measurement, compared with the effect of increasing the inhaled corticosteroid.[13,14] However, it is not recommended that long-acting beta agonists replace inhaled corticosteroids because they do not have anti-inflammatory activity. Equally, the long-acting beta agonists must not be used as immediate symptom relievers. This should be emphasised to the patient because deaths have occurred in this situation.

Other medications

Leukotriene antagonists. The role of leukotriene antagonists in the elderly is not established. They may have additive effects on lung function when used with inhaled corticosteroids in younger patients. They can be given orally, which aids compliance. They appear to have a particular role in aspirin-sensitive, atopic asthmatic patients. Currently they are mainly used as add-on therapy when inhaled corticosteroids are not enough.[12]

Anticholinergics. Anticholinergic therapy is another alternative. The role of ipratropium in asthma treatment is uncertain, but it may be a useful adjunctive bronchodilator, particularly if the patient is intolerant of beta agonists.[15]

Oral corticosteroids. Oral corticosteroids should be used when asthma symptoms are not controlled with the above medications, or in acute asthma episodes. Prednisolone or prednisone (25 to 50 mg a day) should be given for five to 10 days until symptoms are controlled. They should then be stopped.

Cromoglycate and nedocromil. Sodium cromoglycate and nedocromil are rarely found useful in older adults with asthma.

Avoidance of theophylline. Theophylline is best avoided in the elderly. Comorbidities, such as heart failure and reduced hepatic clearance, make plasma levels difficult to predict. Also, there are many serious drug interactions – more likely to be an issue in the elderly patient. The side effects include seizures (often refractory to therapy), arrhythmias and gastric irritation, and are potentially life threatening.[16]

Delivery devices

Correct use of inhaler devices is crucial. One study found that only 25% of patients

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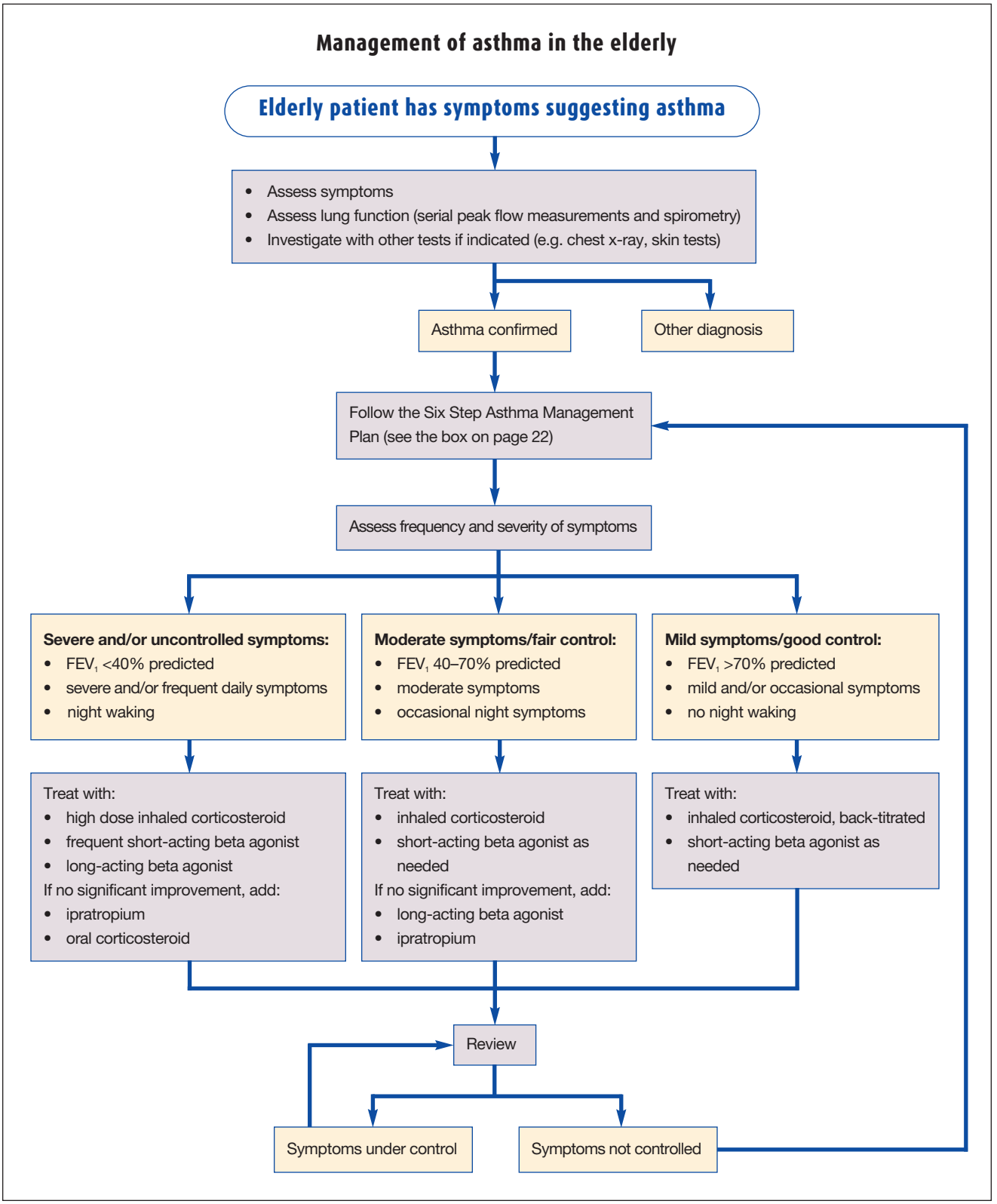
Management of asthma in the elderly



used these devices appropriately.[17] Inappropriate use leads to suboptimal therapeutic effect and increased side effects. Problems include:

- oral and upper airway deposition, where only a small proportion (around 10%) of the particles reach the lungs and around 80% are deposited in the oropharynx[18] – a spacer can diminish oropharyngeal deposition from 80 to 8%, and this is particularly important in minimising candidiasis and dysphonia resulting from corticosteroid treatment
- inco-ordination between use of inhaler and inhalation – here a breath-activated device may help to decrease problems with timing.[19]

It is important to demonstrate the appropriate technique and then observe the patient using the device. This will lead to an idea of where problems lie. Some rather extraordinary methods have been reported, from underarm or nasal use to actuation on expiration, upside-down use and not removing the cap. Some patients mistakenly use asthma inhalers for angina. Patients who are provided with accurate instruction and demonstration are known to make significantly fewer mistakes with metered dose inhaler use.[20]

There is a wide array of delivery devices available (see Figure). Something suitable can be found for nearly all patients. Devices to help the arthritic patient and those with poor eyesight are particularly valuable in the elderly.

In general, a metered dose aerosol with spacer is recommended for effectiveness and ease of use. There is little to choose between large and small volume spacers.

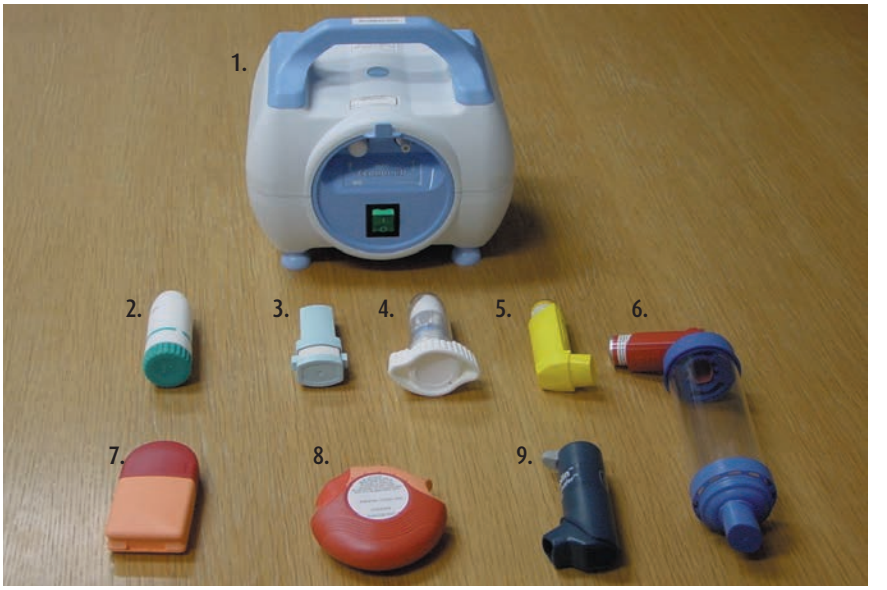


Figure. Available delivery devices: 1. Nebuliser, 2. Turbuhaler, 3. Aerolizer, 4. Turbuhaler with handigrip, 5. Metered dose inhaler, 6. Inhaler with spacer, 7. Diskhaler, 8. Accuhaler, 9. Autohaler.

Other issues

Vaccinations

The elderly patient should have influenza vaccination every year and pneumococcal vaccination (Pneumovax 23) every five years. Occasionally, very hyper-responsive patients may experience a short-term increase in asthma symptoms following vaccination, and mild systemic reactions are sometimes seen as in the general population. However, adverse effects are rare.

Osteoporosis

Osteoporosis is important to consider, investigate and treat, particularly for a patient on long term inhaled or oral corticosteroids. Medications that prevent (and even reverse) osteoporosis in people requiring ongoing corticosteroids are now available for both men and women.

Smoking

Cessation of smoking remains crucial to prevent accelerated decline in lung function and airway hyperactivity. A wide range of techniques is available to assist older patients, with combinations of counselling, support and nicotine replacement or bupropion (Zyban) being the most effective. Care with bupropion is especially important in the elderly.

Avoidance of other medications

Drugs that can precipitate or worsen asthma are often prescribed in older people. These include beta blockers (for hypertension, angina, glaucoma, tremor) and NSAIDs. Careful thought needs to be put to whether there are alternatives. Where possible, all beta blockers and all NSAIDs should be avoided.

Antigen avoidance

For specific allergies, antigen avoidance is important (although often difficult). Desensitisation is rarely indicated.

Conclusion

Asthma in the elderly can be difficult to identify. It tends to be underdiagnosed, yet most of the deaths due to asthma occur in this age group. Investigation and referral, either for specialist evaluation or asthma education, may help. Management should follow National Asthma Campaign guidelines and varies little from that of younger patients. Asthma action plans and inhaler technique are frequently overlooked issues. MT

The list of references is available on request to the editorial office.

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