VERSION 1.2

POPULATIONS

OLDER ADULTS

Special considerations for asthma diagnosis and management in older adults (aged over 55 years), including differential diagnoses, comorbidities and drug interactions, and self-management support

ABOUT

This PDF is a print-friendly reproduction of the content included in the Populations – Older adults section of the Australian Asthma Handbook at asthmahandbook.org.au/populations/older-adults

Please note the content of this PDF reflects the Australian Asthma Handbook at publication of Version 1.2 (October 2016). For the most up-to-date content, please visit asthmahandbook.org.au

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ABBREVIATIONS

CFC  chlorofluorocarbon  LAMA  long-acting muscarinic antagonist
COPD  chronic obstructive pulmonary disease  LTRA  leukotriene receptor antagonist
COX  cyclooxygenase  MBS  Medical Benefits Scheme
ED  emergency department  NIPPV  non-invasive positive pressure ventilation
EIB  exercise-induced bronchoconstriction  NSAIDs  nonsteroidal anti-inflammatory drugs
FEV1  forced expiratory volume over one second  OCS  oral corticosteroids
FVC  forced vital capacity  OSA  obstructive sleep apnoea
FSANZ  Food Standards Australia and New Zealand  PaCO  carbon dioxide partial pressure on blood gas analysis
GORD  gastro-oesophageal reflux disease  PaO2  oxygen partial pressure on blood gas analysis
HFA  formulated with hydrofluoralkane propellant  PBS  Pharmaceutical Benefits Scheme
ICS  inhaled corticosteroid  PEF  peak expiratory flow
ICU  intensive care unit  pMDI  pressurised metered-dose inhaler or ‘puffer’
IgE  Immunoglobulin E  SABA  short-acting beta2-adrenergic receptor agonist
IV  intravenous  LAMA  long-acting muscarinic antagonist
LABA  long-acting beta2-adrenergic receptor agonist  TGA  Therapeutic Goods Administration

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ENDORSEMENT

The Australian Asthma Handbook has been officially endorsed by:

- The Royal Australian College of General Practitioners (RACGP)
- The Australian Primary Health Care Nurses Association (APNA)
- The Thoracic Society of Australia and New Zealand (TSANZ)

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Asthma in older adults

Overview

This section deals with adults over 55 years, but many of these considerations may also apply to younger adults.

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Investigating new asthma-like symptoms in older adults

Recommendations

Consider the possibility of adult-onset asthma in adults of any age with dyspnoea, wheeze or cough, even older people without a history of asthma.

How this recommendation was developed
Consensus
Based on clinical experience and expert opinion (informed by evidence, where available).

When taking a history, ask about:

- lifetime smoking history (including exposure to environmental tobacco smoke)
- comorbid conditions
- new medicines or a change in the regimen
- occupational exposure to allergens or irritants
- new hobbies that may expose the person to new allergens or irritants.

How this recommendation was developed
Consensus
Based on clinical experience and expert opinion (informed by evidence, where available).

When investigating new respiratory symptoms that suggest asthma, perform or arrange spirometry before and 15 minutes after bronchodilator, as for younger adults.

Note: If reliable equipment and appropriately trained staff are available, spirometry can be performed in primary care. If not, refer to an appropriate provider such as an accredited respiratory function laboratory.

How this recommendation was developed
Consensus
Based on clinical experience and expert opinion (informed by evidence, where available), with particular reference to the following source(s):

- Reed, 2010

Before doing spirometry, assess comorbidities and check if the person has any contraindications to spirometry. Advise patients to empty their bladder before spirometry.

How this recommendation was developed
Consensus
Based on clinical experience and expert opinion (informed by evidence, where available).

If FEV₁ improves after administering short-acting beta₂ agonist but the response does not meet criteria for acute response to bronchodilator, repeat spirometry 6–8 weeks after a treatment trial of an inhaled corticosteroid. Compare pre-bronchodilator FEV₁ with the pre-bronchodilator FEV₁ reading from the previous visit.

How this recommendation was developed
If spirometry before and after bronchodilator demonstrates airflow limitation that is not completely reversible, consider the possibility of COPD as an alternative or coexisting diagnosis, even if the person has never smoked. Note: people with longstanding asthma can develop fixed airflow limitation that resembles COPD.

**How this recommendation was developed**

**Consensus**

Based on clinical experience and expert opinion (informed by evidence, where available), with particular reference to the following source(s):

- Gibson et al. 2010
- Gibson and Simpson, 2009
- McDonald et al. 2012
- Abramson et al. 2012
- Reed, 2010

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**Asthma prevalence in older adults**

An estimated 7–15% of Australians aged 65 years or over have asthma, similar to asthma prevalence in the general adult population. According to the latest available Australian population survey data (2011–2012), self-reported current asthma rates among those aged 65–74 years are 9% for men and 13% for women, and among those aged 75 years and over are 8% for men and 13% for women.

New cases of adult-onset asthma can occur at any age. Asthma is under-diagnosed and commonly misdiagnosed in older people. The diagnosis is unrecognised in an estimated 50% of people with asthma aged over 75 years.

**Effects of ageing on the lungs**

Lung function peaks at age 20–25 years, then progressively falls throughout life. Age-related decrease in lung function is greater in men than in women.

Ageing is associated with increased work of breathing, weakening of respiratory muscles, and inflammation of the airways.

**Asthma presentation in older adults**

Asthma presents with the same clinical features in older adults as in younger adults. However, older patients may under-report symptoms and attribute breathlessness to age or other comorbidities.

Wheeze and whistling in the chest are common (particularly in those aged over 75 years) and can be due to asthma, COPD, cardiac failure, acute bronchitis, bronchiectasis, cancer, or pulmonary embolism. Wheezing can also occur in obese people who do not have asthma. Approximately one-third of people over 75 years old experience breathlessness.

As with any patient, a careful history is necessary to identify symptoms and triggers. Physical examination should include examination of upper airway and chest auscultation, and alternative causes of respiratory symptoms should be considered and investigated as indicated.

Ask about new hobbies that may expose the person to new airborne allergens or irritants (e.g. woodworking, bird-keeping or home renovation projects). Asthma that begins in late adult life is rarely immunoglobulin E (IgE)-mediated. However, allergic sensitisation is still common among older patients with respiratory symptoms to warrant allergy tests in the investigation of asthma-like symptoms when allergic triggers are suspected (e.g. if history suggests that symptoms worsen seasonally or in certain places, or if control not achieved despite adherence to appropriate treatment and correct inhaler technique).
**Lung function testing in older adults**

More than 90% of patients with obstructive airway disease aged 65 years and over can perform an acceptable spirometry test (when staff are appropriately trained and rigorous quality control protocols are followed).\(^2, 12, 13\) Contraindications to spirometry include conditions in which increased blood pressure, intraocular pressure, intra-abdominal or intrathoracic pressure may be dangerous, such as unstable cardiovascular disease, recent myocardial infarction, recent pulmonary embolus, aneurysm, and recent cataract surgery.\(^14\) Advise patients to empty their bladder before spirometry, because the effort required may cause leaking for those with urinary incontinence.

FEV\(_1\)/FVC ratio decreases with normal ageing. Reference values for forced expiratory volume in one second (FEV\(_1\)) and ratio of FEV\(_1\) to forced vital capacity (FEV\(_1\)/FVC) applicable to people aged up to 95 years have been developed.\(^15\) Reference values for older people are incorporated into newer spirometers. Airflow limitation should not be diagnosed based solely on the shape of the flow–volume loop.

Some degree of concavity in the expiration flow–volume curve (typical of airflow limitation) occurs as people age, even without asthma.

> Go to: National Asthma Council Australia’s Spirometry Resources

**Definition of variable expiratory airflow limitation**

Most of the tests for variable expiratory airflow limitation are based on showing variability in FEV\(_1\). While reduced FEV\(_1\) may be seen with many other lung diseases (or due to poor spirometric technique), a reduced ratio of FEV\(_1\) to FVC indicates airflow limitation.\(^16\) Normal FEV\(_1\)/FVC values derived from population studies vary,\(^17, 15\) but are usually greater than:

- 0.85 in people aged up to 19 years
- 0.80 in people aged 20–39 years
- 0.75 in people aged 40–59 years
- 0.70 in people aged 60–80 years.

In children, it is less useful to define expiratory airflow limitation according to a specific cut-off for FEV\(_1\)/FVC ratio, because normal values in children change considerably with age.\(^15\)

Some spirometers provide predicted normal values specific to age group. If these are available, a FEV\(_1\)/FVC ratio less than the lower limit of normal (i.e. less than the 5th percentile of normal population) indicates airflow limitation.

Variable expiratory airflow limitation (beyond the range seen in healthy populations) can be documented if any of the following are recorded:

- a clinically important increase in FEV\(_1\) (change in FEV\(_1\) of at least 200 mL and 12% from baseline for adults, or at least 12% from baseline for children) 10–15 minutes after administration of bronchodilator
- clinically important variation in lung function (at least 20% change in FEV\(_1\)) when measured repeatedly over time (e.g. spirometry on separate visits)
- a clinically important reduction in lung function (decrease in FEV\(_1\) of at least 200 mL and 12% from baseline on spirometry, or decrease in peak expiratory flow rate by at least 20%) after exercise (formal laboratory-based exercise challenge testing uses different criteria for exercise-induced bronchoconstriction)
- a clinically important increase in lung function (at least 200 mL and 12% from baseline) after a trial of 4 or more weeks of treatment with an inhaled corticosteroid
- clinically important variation in peak expiratory flow (diurnal variability of more than 10%)
- a clinically important reduction in lung function (15–20%, depending on the test) during a test for airway hyperresponsiveness (exercise challenge test or bronchial provocation test) measured by a respiratory function laboratory.

**Notes**

Patients referred to a respiratory function laboratory may be asked not to take certain medicines within a few hours to days before a spirometry visit.

A clinically important increase or decrease in lung function is defined as a change in FEV\(_1\) of at least 200 mL and 12% from baseline for adults, or at least 12% from baseline for children, or a change in peak expiratory flow rate of at least 20% on the same meter.\(^18, 16\) A clinically important increase in FVC after administering bronchodilator may also indicate reversible airflow limitation, but FVC is a less reliable measure in primary care because FVC may vary due to factors such as variation in inspiratory volume or expiratory time.
The finding of 'normal' lung function during symptoms reduces the probability that a patient has asthma, but a clinically important improvement in response to bronchodilator or inhaled corticosteroid can occur in patients whose baseline value is within the predicted normal range.

The greater the variation in lung function, the more certain is the diagnosis of asthma. However, people with longstanding asthma may develop fixed airflow limitation.

Reversibility in airflow limitation may not be detected if the person is already taking a long-acting beta₂ agonist or inhaled corticosteroid.

Airflow limitation can be transient and does not necessarily mean that the person has asthma (e.g. when recorded during a severe acute infection of the respiratory tract). Ideally, airflow limitation should be confirmed when the patient does not have a respiratory tract infection. Reduction in lung function during a respiratory tract infection with improvement in lung function after its resolution, commonly occurs in people with asthma, but can also be seen in patients with COPD or in healthy people without either asthma or COPD.¹,²,¹⁹,²⁰

Coexisting asthma and COPD in older adults

Definition and prevalence
There is a subgroup of patients with longstanding asthma who do not demonstrate reversible airflow limitation.³,⁴ Asthma that begins later in life often shows a component of irreversible or incompletely reversible airflow limitation (also called 'fixed airway obstruction'), due to airway remodelling and stiffening of the chest wall.¹

Correspondingly, there is a subgroup of patients with COPD who demonstrate significant bronchodilator response and meet the diagnostic criteria for asthma.³,⁴

The coexistence of incompletely reversible airflow limitation (characteristic of COPD) and increased airflow variability (characteristic of asthma) is relatively common among people with respiratory symptoms aged 65 years and over, and even among those over 50 years.²,³

Risk factors for coexisting asthma and COPD

Smoking (or exposure to smoke) is a major risk factor for COPD.⁵ However, the coexistence of asthma and COPD in older patients is not always due to cigarette smoking.¹ In some people, COPD may develop as a complication of long-term asthma.² Incompletely reversible airway limitation can also be unrelated either to the duration of disease or to the individual's smoking history.¹

Investigating suspected COPD in older patients

If initial spirometry shows a partial response to bronchodilator that does not meet criteria for reversible airflow limitation (increase of at least 200 mL and at least 12%), a treatment trial of an inhaled corticosteroid for 6–8 weeks can help distinguish between those with significant eosinophilic airway inflammation (who may thus show improvement in FEV₁ with corticosteroid treatment) and those with 'fixed' airflow obstruction (who may not show any improvement in spirometry).

Note: If the patient has features of asthma, long-term inhaled corticosteroid treatment is recommended to reduce the risk of asthma flare-ups, even if the patient does not show a short-term response in FEV₁.

For patients with incompletely reversible airflow limitation, a careful history will often clarify which investigation is most appropriate. Lung volume tests and diffusing capacity tests may be helpful to identify emphysema or pulmonary fibrosis. High-resolution computed tomography is useful if bronchiectasis is suspected.

References

3. Gibson PG, Simpson JS. The overlap syndrome of asthma and COPD: what are its features and how important is it?. Thorax. 2009; 64: 728-735. Available from: http://thorax.bmj.com/content/64/8/728.full


Managing asthma in older adults

Recommendations

When considering management options, take into account the individual’s risk factors, comorbidity and self-management skills as well as assessing asthma control and lung function.

*How this recommendation was developed*
Consensus
Based on clinical experience and expert opinion (informed by evidence, where available).

Before prescribing any asthma treatment, consider potential drug-to-drug interactions with the person’s other medicines or potential effects on other conditions.

*How this recommendation was developed*
Consensus
Based on clinical experience and expert opinion (informed by evidence, where available).

When starting a medicine or changing the regimen, conduct a treatment trial (e.g. 6–8 weeks) before prescribing long term.

When trialling any change, follow the steps for conducting a treatment trial.

**Table. Steps for conducting a treatment trial**

1. Document baseline lung function.
2. Document baseline asthma control using a validated standardised tool such as the Asthma Score.
3. Discuss treatment goals and potential adverse effects with the person.
4. Run treatment trial for agreed period (e.g. 4–8 weeks, depending on the treatment and clinical circumstances, including urgency).
5. At an agreed interval, measure asthma control and lung function again and document any adverse effects.
6. If asthma control has not improved despite correct inhaler technique and good adherence, resume previous treatment and consider referral for specialist consultation.

*See:* Asthma Score (Asthma Control Test)

Asset ID: 36

*How this recommendation was developed*
Consensus
Based on clinical experience and expert opinion (informed by evidence, where available).

Advise and support older patients to quit smoking; explain that quitting has health benefits at any age and discuss all quitting options, considering any potential drug-to-drug interactions.
Where possible, prescribe inhalers in preference to nebulisers and ensure the type of inhaler is appropriate for the individual.

Avoid prescribing different types of inhaler devices, if possible. Minimise the number of inhaler devices and simplify the treatment regimen as much as possible.

Carefully train patients to use their inhaler correctly. Check inhaler technique at each visit by asking patients to show you how they use their inhaler. Repeat instructions regularly. Make sure your own knowledge of correct inhaler technique is up to date so you can give a physical demonstration and coach patients.

Provide self-management education, including a written asthma action plan. Consider whether the person needs:

- a large-print written asthma action plan
- a pictorial action plan with minimal writing
- an integrated written self-management plan that includes instructions for managing comorbid conditions.

More information

Prescribing for older adults

Treatment-related adverse effects
Particular care may be needed when prescribing some medicines for older people.
Adverse effects of corticosteroids and beta2-agonists are more common in patients aged 65 years and over than in younger adults, based on epidemiological evidence. Older people experience more adverse drug effects because of pharmacodynamic and pharmacokinetic changes and particularly drug–drug and drug–disease interactions.

Theophylline is metabolised mainly by the liver and commonly interacts with other medicines. Its concentration in plasma should be monitored closely in older people.

How this recommendation was developed
Adapted from existing guidance
Based on reliable clinical practice guideline(s) or position statement(s):
- Zwar et al. 2011

How this recommendation was developed
Consensus
Based on clinical experience and expert opinion (informed by evidence, where available).

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Consensus
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Oral corticosteroids are effective in regaining asthma control after a flare-up. However, long-term or frequent use increases the risk of cataracts and osteoporosis in older patients and may affect control of blood pressure, body weight and diabetes. Impaired glucose tolerance is common among older people, so consider monitoring blood glucose (e.g. morning and evening samples).

To minimise the risk of cataracts and osteoporosis, the use of oral corticosteroids should be minimised, and inhaled corticosteroids should be prescribed at the lowest dose needed to maintain good asthma control.

### Table. Treatment-related adverse effects reported in older people with asthma

<table>
<thead>
<tr>
<th>Class of medicine</th>
<th>Potential adverse effects</th>
<th>Clinical action</th>
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<tr>
<td><strong>Beta2 agonists</strong></td>
<td>Inotropic and chronotropic effects may worsen heart disease (e.g. arrhythmias, cardiomyopathy, myocardial ischaemia) or cause electrolyte disturbances.</td>
<td>Minimise need for short-acting beta2 agonists by maintaining good asthma control with preventer treatment as indicated.</td>
</tr>
<tr>
<td><strong>Inhaled corticosteroids</strong></td>
<td>Long-term high doses may slightly increase risk of bone fractures. Overall, treatment does not appear to increase bone fracture risk in patients with COPD or asthma aged 40 years or over (meta-analysis of randomised controlled clinical trials).</td>
<td>Prescribe minimal dose needed to maintain good asthma control. Back-titrage dose in patients who have maintained good control for several months.</td>
</tr>
<tr>
<td><strong>Combination inhaled corticosteroid/long-acting beta2 agonist</strong></td>
<td>Overall, treatment does not appear to increase risk (composite measure including asthma-related hospitalisations, deaths, and intubations) among patients aged ≥ 65 years (meta-analysis of controlled clinical trials comparing long-acting beta2 agonists with no long-acting beta2 agonist treatment).</td>
<td>Prescribe if indicated, as for younger adults.</td>
</tr>
<tr>
<td><strong>Theophylline</strong></td>
<td>Metabolised mainly by the liver. May interact with other medicines.</td>
<td>Monitor plasma concentration if theophylline needed to manage acute asthma. Avoid regular theophylline treatment.</td>
</tr>
</tbody>
</table>

### Sources


Asset ID: 48
Efficacy of asthma treatments
Older patients may have reduced response to bronchodilators and inhaled corticosteroids due to age-related changes such as stiffening of the chest wall, reduced respiratory muscle function, and an increase in residual volume from loss of elastic recoil in the lung.\(^2\)

Effects of other medicines on asthma
Medicines that are commonly prescribed for older adults may worsen asthma control or interact with asthma medicines. Interactions and adverse effects differ between individuals. Predictable bronchoconstriction can occur with:

- beta-adrenergic blocking agents (beta blockers) used in the management of hypertension, cardiac disorders, migraine and glaucoma
- cholinergic agents (e.g. carbachol, pilocarpine)
- cholinesterase inhibitors (e.g. pyridostygmine).

Comorbidity in older adults
Many older people with asthma also have multiple comorbidities and complex healthcare needs.\(^5, 6\) Common conditions in older people that may affect asthma control include:\(^5\)

- obesity
- gastro-oesophageal reflux disease
- obstructive sleep apnoea syndrome and other sleep disorders
- osteoporosis (vertebral fractures can impair respiratory capacity)
- cardiovascular disease (some medicines may worsen asthma).

The presence of diabetes can affect decisions about the use of systemic corticosteroids, while heart disease or anaemia can mimic symptoms.

There is limited clinical trial evidence to guide asthma management in older people with common comorbid conditions, because most asthma treatment trials have excluded people with these conditions.\(^3, 5\) Guidelines for one disease condition may have to be modified for older people with multiple chronic diseases to avoid potential adverse effects including drug–drug interactions.\(^5\)

Common age-related problems such as cognitive impairment, poor eyesight, hearing loss, poor coordination or osteoarthritis can affect a person’s ability to use inhaler devices correctly.

Medicare items for chronic disease management (e.g. GP Management Plans, Team Care Arrangements, Multidisciplinary Care Plans) apply to patients with asthma.

Smoking and older adults
Older people who smoke may believe that the damage has already been done and therefore there is no benefit in attempting to quit, or believe that smoking is less risky in older people.\(^5\)

However, older people can successfully quit smoking, and may even be less likely to relapse than younger adults.\(^5\)

Choosing inhaler devices for older adults
Problems for older patients using inhalers
Inhaler devices should be used in favour of nebulisers wherever possible, just as for younger adults.\(^5\) The use of nebulisers increases the risk of transmitting infections to other patients or to health workers. The use of ipratropium bromide via nebulisers with loose-fitting masks has been associated with pupil dilatation, blurred vision and acute glaucoma.\(^4\) In practice, many patients do not maintain their nebuliser adequately (e.g. change bowl as often as recommended).

Incorrect inhaler technique is common among older people with asthma or COPD, whether using a pressurised metered-dose inhaler or a dry-powder inhaler, particularly with those with more severe airflow limitation.\(^7, 5, 8, 9, 10, 11, 12\)

Common problems for older people include:\(^8, 11, 13, 14, 15, 16\)

- inadequate inspiratory flow (particularly among those with COPD), which limits ability to use dry-powder inhalers or pressurised metered-dose inhalers properly
• difficulty connecting a pressurised metered-dose inhaler to a spacer
• inability to coordinate breathing in with actuating a pressurised metered-dose inhaler
• inability to actuate a pressurised metered-dose inhaler due to osteoarthritis or weakness of the hands
• inability to achieve a firm seal around the mouthpiece when using inhalers alone or with a spacer (particularly for patients with cognitive impairment, facial weakness, or who are missing teeth).

Tips for correct use of inhalers
Patients with osteoarthritis may find it easier to use an aid (e.g. Haleraid hand-grip device) to help them actuate their inhaler, or use a breath-actuated inhaler. Mechanical difficulties can usually be overcome by checking each individual’s technique and helping the person identify which inhaler they can use best among those available for the required medicine.

For some patients, a breath-actuated pressurised metered-dose inhaler (e.g. Autohaler) or breath-actuated dry-powder inhaler (e.g. Turbuhaler or Accuhaler) may be easier to use than pressurised metered-dose inhalers. However, some patients (e.g. those with severe COPD) may be unable to achieve a high enough inspiratory rate to actuate dry-powder inhalers (e.g. Accuhaler or Turbuhaler). With a breath-actuated inhaler, adequate lung doses of inhaled corticosteroids may be achieved despite poor technique.

Older people with asthma can acquire and retain appropriate technique after specific instruction, but this instruction needs to be repeated regularly to reinforce correct inhaler technique, just as for young people. People with cognitive impairment are likely to have problems retaining skills after instruction in the use of an inhaler.

About half of all older people with asthma or COPD are prescribed more than one inhaler device. As the number of prescribed devices increase, the frequency of error also increases.

Table. Considerations when choosing inhaler devices for older patients

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced maximal inspiratory flow</td>
<td>Consider pMDI alone or with spacer</td>
</tr>
<tr>
<td></td>
<td>Avoid dry-powder inhalers</td>
</tr>
<tr>
<td>Reduced manual dexterity (e.g. due to osteoarthritis)</td>
<td>Consider a Haleraid with a pMDI, where relevant (salbutamol, fluticasone, fluticasone/salmeterol)</td>
</tr>
<tr>
<td></td>
<td>Consider pMDI with small-volume spacer or breath-actuated dry-powder inhaler</td>
</tr>
<tr>
<td>Inability to coordinate actuation and inhalation</td>
<td>Consider pMDI with spacer, breath-actuated pMDI or breath-actuated dry-powder inhaler</td>
</tr>
<tr>
<td></td>
<td>Avoid pMDI without spacer</td>
</tr>
<tr>
<td>Inability to form effective seal with lips around mouthpiece</td>
<td>Use spacer plus face mask</td>
</tr>
</tbody>
</table>

Correct use of inhaler devices
The majority of patients do not use inhaler devices correctly. Australian research studies have reported that only approximately 10% of patients use correct technique. Go to: National Asthma Council Australia’s Using your inhaler webpage for information, patient resources and videos on inhaler technique. Go to: National Asthma Council Australia information paper for health professionals on Inhaler technique for people with asthma and COPD.
High rates of incorrect inhaler use among children with asthma and adults with asthma or COPD have been reported, even among regular users. Regardless of the type of inhaler device prescribed, patients are unlikely to use inhalers correctly unless they receive clear instruction, including a physical demonstration, and have their inhaler technique checked regularly.

Poor inhaler technique has been associated with worse outcomes in asthma and COPD. It can lead to poor asthma symptom control and overuse of relievers and preventers. In patients with asthma or COPD, incorrect technique is associated with a 50% increased risk of hospitalisation, increased emergency department visits and increased use of oral corticosteroids due to flare-ups.

Correcting patients’ inhaler technique has been shown to improve asthma control, asthma-related quality of life and lung function.

**Common errors and problems with inhaler technique**

Common errors with manually actuated pressurised metered dose inhalers include:

- failing to shake the inhaler before actuating
- holding the inhaler in wrong position
- failing to exhale fully before actuating the inhaler
- actuating the inhaler too early or during exhalation (the medicine may be seen escaping from the top of the inhaler)
- actuating the inhaler too late while inhaling
- actuating more than once while inhaling
- inhaling too rapidly (this can be especially difficult for children to overcome)
- multiple actuations without shaking between doses.

Common errors for dry powder inhalers include:

- not keeping the device in the correct position while loading the dose (horizontal for Accuhaler and vertical for Turbuhaler)
- failing to exhale fully before inhaling
- failing to inhale completely
- inhaling too slowly and weakly
- exhaling into the device mouthpiece before or after inhaling
- failing to close the inhaler after use
- using past the expiry date or when empty.

Other common problems include:

- difficulty manipulating device due to problems with dexterity (e.g. osteoarthritis, stroke, muscle weakness)
- inability to seal the lips firmly around the mouthpiece of an inhaler or spacer
- inability to generate adequate inspiratory flow for the inhaler type
- failure to use a spacer when appropriate
- use of incorrect size mask
- inappropriate use of a mask with a spacer in older children.

**How to improve patients’ inhaler technique**

Patients’ inhaler technique can be improved by brief education, including a physical demonstration, from a health professional or other person trained in correct technique. The best way to train patients to use their inhalers correctly is one-to-one training by a healthcare professional (e.g. nurse, pharmacist, GP, specialist), that involves both verbal instruction and physical demonstration. Patients do not learn to use their inhalers properly just by reading the manufacturer’s leaflet. An effective method is to assess the individual’s technique by comparing with a checklist specific to the type of inhaler, and then, after training in correct technique, to provide written instructions about errors (e.g. a sticker attached to the device).

The National Asthma Council information paper on inhaler technique includes checklists for correct technique with all common inhaler types used in asthma or COPD.

Inhaler technique must be rechecked and training must be repeated regularly to help children and adults maintain correct technique.

Go to: National Asthma Council Australia’s [Using your inhaler](https://www.nationalasthma.org.au/using-your-inhaler) webpage for information, patient resources and videos on inhaler technique.

Go to: National Asthma Council Australia’s information paper for health professionals on [Inhaler technique for people with asthma or COPD](https://www.nationalasthma.org.au/inhaler-technique-for-people-with-asthma-or-copd).

Go to: NPS MedicineWise information on [Inhaler devices for respiratory medicines](https://www.nps.org.au/).
Self-management education for older adults

Inability to perceive airflow limitation or the severity of asthma symptoms, poor medication adherence, physical disability, cognitive dysfunction, and a passive self-management approach contribute to poorer asthma outcomes among elderly people with asthma. Older people commonly attribute asthma symptoms to normal ageing and do not recognise the risk of asthma.

Written asthma action plans for older people should be clear and easy to read. Some asthma educators use pictorial plans that feature images of the person’s inhalers. Monitoring of peak expiratory flow at home (using a peak-flow meter) probably has no advantage over symptom monitoring in adults aged 50 years and over with moderate-to-severe asthma.

Older people with multiple comorbid conditions are likely to be receiving advice from various health professionals. It may be necessary to integrate a person’s written asthma action plan with their written advice for self-management of other conditions.

The best type of self-management education for older people with asthma has not been clearly identified, because the majority of studies have included younger adults. However, individualised education can improve older patients’ ability to manage their asthma:

- Provision of information in writing (large, easy-to-read lettering with few words) and pictures can improve older people’s lung function, asthma knowledge and skills, and ability and confidence to manage their asthma, compared with individualised education alone.
- A combination of regular monitoring of asthma control, small-group education, personalised written asthma action plans, and coaching in correct use of inhalers can improve asthma-related quality of life, lung function and inhaler technique in adults aged 50 years and over with moderate-to-severe asthma.

Telephone follow-up may help ensure older people have an asthma action plan. Few studies have assessed strategies for improving adherence to asthma medicines in older patients.

When caring for older Aboriginal and Torres Strait Islander people or people from culturally and linguistically diverse communities, health professionals should provide culturally appropriate health care and should work with interpreters as necessary to ensure effective communication.

Psychosocial factors affecting asthma self-management

Psychosocial factors can affect asthma symptoms and outcomes in children and adults. These can include biological, individual, family and community-level factors, which can have synergistic effects in an individual with asthma. Mechanisms may include effects of stress on the immune system and effects of life circumstances on patients’ and families’ ability to manage asthma.

Relationships between psychosocial and cultural factors

Important influences on asthma outcomes include the person’s asthma knowledge and beliefs, confidence in ability to self-manage, perceived barriers to healthcare, socioeconomic status, and healthcare system navigation skills, and by the quality of interaction and communication between patient and healthcare provider. There is a complex interrelationship between:

- patient factors (e.g. health literacy, health beliefs, ethnicity, educational level, social support, cultural beliefs, comorbidities, mental health)
- healthcare provider factors (e.g. communication skills, teaching abilities, available time, educational resources and skills in working with people from different backgrounds)
- healthcare system factors (e.g. the complexity of the system, the healthcare delivery model, the degree to which the system is oriented towards chronic disease management or acute care, and the degree to which the system is sensitive to sociocultural needs).

Health literacy

‘Health literacy’ refers to the individual’s capacity to obtain, process, and understand basic health information and services they need to make appropriate health decisions. A person’s level of health literacy is influenced by various factors including skills in reading, writing, numeracy, speaking, listening, cultural and conceptual knowledge.
Inadequate health literacy is recognised as a risk factor for poorer health outcomes and less effective use of health care services. Poor health literacy has been associated with poor asthma control, poor knowledge of medications, and incorrect inhaler technique. Aspects of health literacy that have been associated with poorer asthma outcomes in adults include reading skills, listening skills, numeracy skills, and combinations of these. Studies assessing the association between parents’ health literacy and children’s asthma have reported inconsistent findings. Overall, there is not enough evidence to prove that low health literacy causes poor asthma control or inadequate self-management.

Australian research suggests that there are probably many Australians with limited health literacy. It may be possible to identify some groups of patients more likely to have inadequate health literacy, such as people living in regions with low socioeconomic status, and those with low English literacy (e.g. people with limited education, members of some ethnic minorities, immigrants, and the elderly). However, even well-educated patients might have trouble with basic health literacy skills.

Attempting to assess every patient’s health literacy is impractical and may be embarrassing for the person and time-consuming for the health professional. Instead, it may be more effective for health professionals simply to assume that all patients have limited health literacy. Accordingly, all self-management skills need to be explained carefully, simply and repeatedly, and all written material should be clear and easy to read. Special consideration is needed for patients from culturally and linguistically diverse communities, including Aboriginal and Torres Strait Islander people.

Psychosocial support and improving health literacy

Psychosocial interventions that include asthma education may improve health-related quality of life for children and adolescents with asthma and their families. However, simply providing education might not improve a person’s health literacy, since it also depends on other factors like socioeconomic status, social support, and is influence by the provider and the healthcare system.

Asthma Australia provides personal support and information for people with asthma and parents of children with asthma through the Asthma Australia Information line by telephone on 1800 Asthma (1800 278 462) or online.

Go to: Asthma Australia

References


Assessing and monitoring asthma control in older adults

Recommendations

As well as assessing asthma control and lung function, assess comorbidity, risk factors and psychosocial factors that may affect asthma control and self-management (e.g. poor eyesight, hearing loss, poor coordination, osteoarthritis, cognitive impairment and other mental health conditions).

How this recommendation was developed
Consensus
Based on clinical experience and expert opinion (informed by evidence, where available).

Review asthma regularly, as for younger adults. Consider:

- recent asthma symptom control
- risk factors for flare-ups, deterioration in lung function or treatment-related adverse effects
- lung function
- inhaler technique
- adherence to medicines.

How this recommendation was developed
Consensus
Based on clinical experience and expert opinion (informed by evidence, where available).

More information

Special considerations for review of asthma in older adults

Patient-reported symptoms can underestimate the severity of asthma in older adults.\(^1\) Therefore, spirometry is necessary to measure lung function objectively.

Factors that can affect asthma control and self-management in older adults include comorbidity, chest infections, cognitive decline, social isolation, anxiety and depression, long-term smoking, obesity, dysfunctional breathing and exercise limitation.\(^2\) The cost of medicines may also prevent people taking preventers as directed. All these factors should be checked when reviewing asthma.

The risk of dying from asthma increases with age in Australian men and women.\(^3\) Approximately 60% of Australians who die from asthma are over 65 years old.\(^4\) Most people 65 years and older who experience acute asthma are not taking regular inhaled corticosteroid treatment.\(^2\)

Comorbidity in older adults

Many older people with asthma also have multiple comorbidities and complex healthcare needs.\(^2,5\) Common conditions in older people that may affect asthma control include:

- obesity
- gastro-oesophageal reflux disease
- obstructive sleep apnoea syndrome and other sleep disorders
- osteoporosis (vertebral fractures can impair respiratory capacity)
- cardiovascular disease (some medicines may worsen asthma).
The presence of diabetes can affect decisions about the use of systemic corticosteroids, while heart disease or anaemia can mimic symptoms.

There is limited clinical trial evidence to guide asthma management in older people with common comorbid conditions, because most asthma treatment trials have excluded people with these conditions. Guidelines for one disease condition may have to be modified for older people with multiple chronic diseases to avoid potential adverse effects including drug–drug interactions.

Common age-related problems such as cognitive impairment, poor eyesight, hearing loss, poor coordination or osteoarthritis can affect a person’s ability to use inhaler devices correctly.

Medicare items for chronic disease management (e.g. GP Management Plans, Team Care Arrangements, Multidisciplinary Care Plans) apply to patients with asthma.

Go to: Australian Government Department of Health

References

4. Andrews KL, Jones SC. "We would have got it by now if we were going to get it..." An analysis of asthma awareness and beliefs in older adults. Health Promot J Aust. 2009; 20: 146-150. Available from: http://www.ncbi.nlm.nih.gov/pubmed/19642964