# Managing asthma in adults and adolescents

## New Australian guidelines

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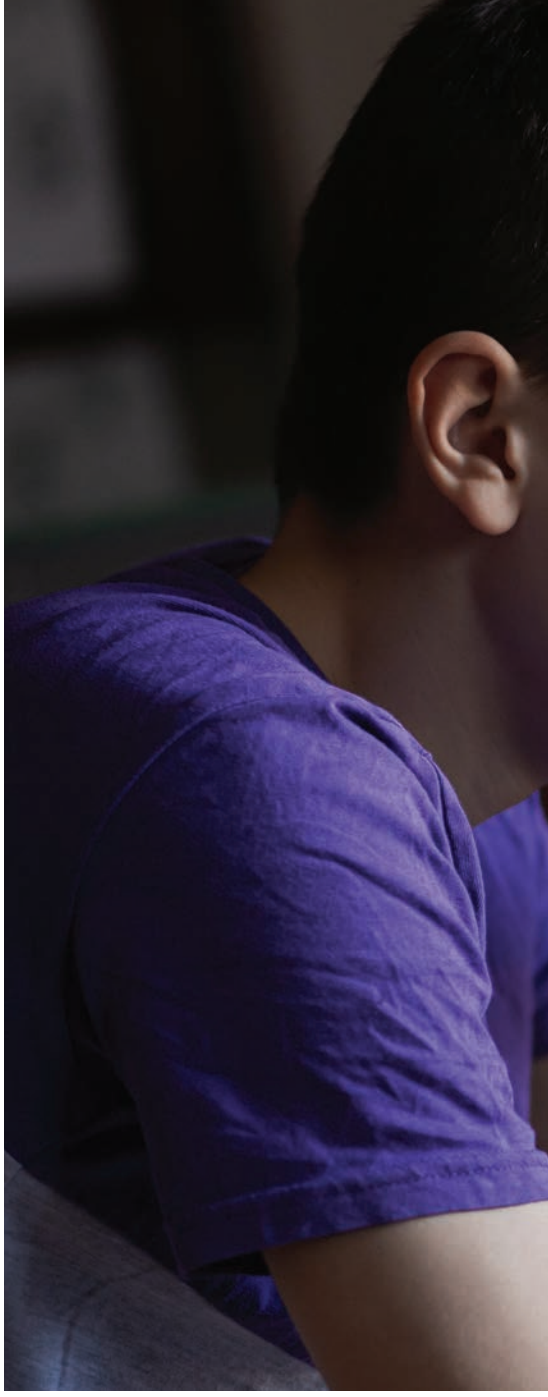
**The National Asthma Council Australia updated the *Australian Asthma Handbook* in September 2025 with new recommendations on airway inflammation testing for the diagnosis of asthma, simplified prescribing recommendations prioritising combination inhaled corticosteroid–formoterol inhalers and a strong recommendation against treatment with short-acting beta-2 agonists alone.**



Around 11% of people in Australia have asthma, causing an estimated 56,600 emergency department visits each year.[1] Asthma is a chronic inflammatory lung condition, clinically defined as the combination of episodic respiratory symptoms (wheeze, dyspnoea, cough, constricted feeling in the chest) and fluctuating airway obstruction. For most people with asthma, airway inflammation is driven by a type 2 immune response, with or without allergy.[2-6] The presence of type 2 inflammation can be identified by blood eosinophil count and by the fractional exhaled nitric oxide (FeNO) test,[7] available in many respiratory function laboratories.

Challenges for clinicians managing asthma include making an accurate diagnosis with limited access to diagnostic tests in primary care,[8] and continued over-reliance on short-acting beta-2 agonists (SABAs) among adults and adolescents.[1] The National Asthma Council Australia has updated the *Australian Asthma Handbook* (available online at: https://www.asthmahandbook.org.au)[9] after

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## Key points

- **The diagnosis of asthma in adults and adolescents requires both a history of typical respiratory symptoms and objective evidence of either excessive variability in airflow or airway inflammation. Variable expiratory airflow limitation can be demonstrated by a positive bronchodilator responsiveness test recorded during spirometry. Evidence of airway inflammation can be obtained by measuring exhaled nitric oxide. Bronchial challenge testing may be required if the diagnosis cannot be confirmed.**
- **All adults and adolescents with asthma need inhaled corticosteroids as part of their treatment to reduce inflammation and prevent exacerbations.**
- **The use of short-acting beta-2 agonists (e.g. salbutamol) alone is inadequate and encourages risky over-reliance.**
- **Treatment with an inhaled corticosteroid (ICS)–formoterol combination as the reliever (with or without maintenance ICS–formoterol treatment) is now recommended in place of fixed-dose maintenance treatment with an ICS or ICS–long-acting beta-2 agonist combination with salbutamol or terbutaline as the reliever.**
- **Long-term use of high doses of ICS-containing treatment is not recommended in primary care.**
- **A key goal of asthma treatment is to avoid the need for multiple oral corticosteroid courses.**
- **Monoclonal antibody therapy (via specialist-only prescription) is indicated for severe allergic or eosinophilic asthma. Patients should be offered referral for assessment if asthma cannot be controlled with ICS-containing combinations at a medium dose, after investigating and addressing common causes of poor control (e.g. poor adherence, incorrect inhaler technique, exposure to avoidable triggers).**

reviewing the evidence and recommendations in international guidelines selected on the basis of quality and recency.[10-13] The 2025 guidance on diagnosis and treatment in patients aged 12 years and older includes some major changes that reflect an increasing understanding of inflammation in asthma (Table).[9] These new recommendations reinforce the *Handbook's* longstanding key principles: use objective tests to confirm the diagnosis and base treatment on inhaled corticosteroid (ICS)-containing treatment to target airway inflammation and prevent exacerbations.[9]

## How to diagnose asthma

The diagnosis of asthma in adults and adolescents requires a history of variable respiratory symptoms that are unlikely to be explained by another condition, together with objective evidence of variable expiratory airflow limitation, or of airway inflammation. Spirometry and bronchial provocation testing are established tests for excess variability in expiratory airflow. The *Australian Asthma Handbook* now also advises that direct measurement of airway inflammation with FeNO testing can be used to confirm the diagnosis in patients with symptoms consistent with asthma (Figure 1).[9]

### Typical symptoms must be present but do not prove diagnosis

Asthma symptoms include wheeze, breathlessness, chest tightness and cough. Symptoms may be worse overnight and early in the morning, and may be triggered by airborne allergens and irritants, viral respiratory infections, exercise, air pollution, cold dry air or medications. Although wheezing with dyspnoea is a strong predictor of asthma in adults,[14] over-reliance on symptoms alone to diagnose asthma carries the risk of substantial overdiagnosis and underdiagnosis.[5] Suspected occupational asthma should be investigated by a respiratory or occupational physician.[15]

**Table. Key changes in the 2025 edition of the *Australian Asthma Handbook*[9]**

| Topic | Previous guidance | New recommendation |
|---|---|---|
| Diagnosis | FeNO testing not included in diagnostic algorithm or recommendations | FeNO testing recommended in diagnostic investigations in addition to spirometry |
| Level 1 (least intense) treatment | [Revoked] SABA monotherapy permitted for a small proportion of adults and adolescents | Recommendation against SABA monotherapy; ICS-containing treatment now indicated for all adults and adolescents with asthma |
| Initial treatment | [Revised] Two options for starting treatment for most adults and adults with a new diagnosis of asthma:<br>• AIR (budesonide–formoterol) as needed<br>• regular daily maintenance treatment with a low dose of ICS, plus SABA as needed | AIR (single-inhaler budesonide–formoterol, taken as needed for asthma symptoms) is the recommended starting treatment for most adults and adolescents with a new diagnosis of asthma |
| Recommended and alternative regimens | [Revised] Regimens with anti-inflammatory reliever and regimens with SABA reliever recommended as equal options at each level of treatment intensity | Explicit recommendation to prescribe regimens using AIR (single-inhaler budesonide–formoterol or beclomethasone–formoterol) in preference to regimens using SABA (salbutamol or terbutaline) as reliever |
| Difficult-to-treat asthma | Blood eosinophil count is not explicitly recommended in primary care | Blood eosinophil count and spirometry are recommended in the assessment of asthma that is uncontrolled despite maintenance treatment with regimens containing medium-dose ICS, pending specialist referral |
| Difficult-to-treat asthma | [Revised] Less explicit recommendation to refer immediately | Referral to a specialist is routinely recommended for asthma that is uncontrolled despite optimised maintenance treatment with regimens containing medium-dose ICS (after assessing and managing treatable contributing factors, including poor adherence and incorrect inhaler technique) |

Abbreviations: AIR = anti-inflammatory reliever; FeNO = fractional exhaled nitric oxide; ICS = inhaled corticosteroids; SABA = short-acting beta-2 agonist.

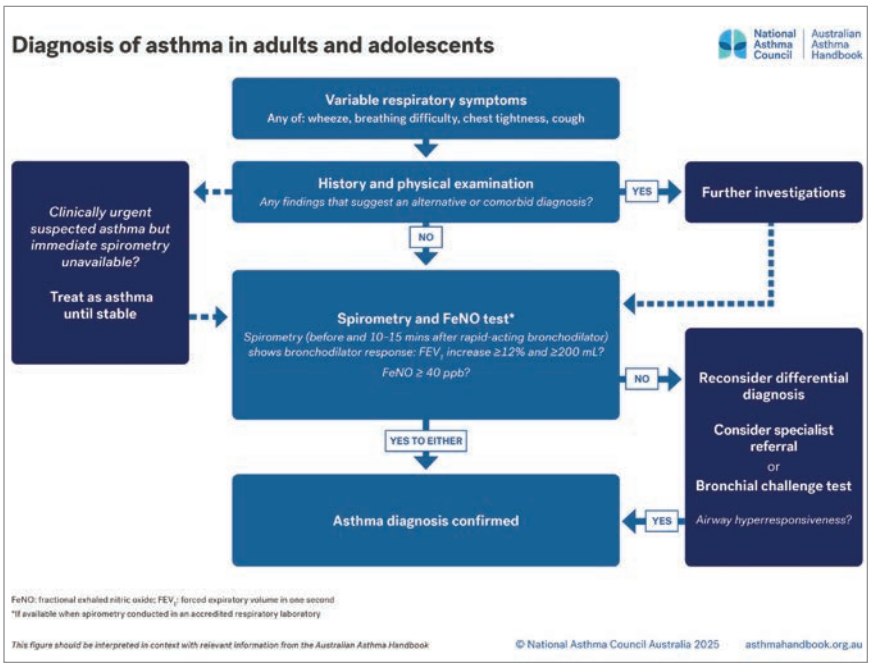


**Figure 1. Diagnosis of asthma in adults and adolescents.[9]**
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### Arrange spirometry to test for variable airflow obstruction

When symptoms and signs suggest asthma, the diagnosis must be confirmed by objective testing. A positive bronchodilator responsiveness test, conducted using spirometry, can help confirm the diagnosis (Box 1). The larger the increase in forced expiratory volume in 1 second after bronchodilator use, the more certain the diagnosis. However, a negative bronchodilator responsiveness test cannot rule out the diagnosis of asthma, especially when no abnormality is detected on pre-bronchodilator spirometry.[16]

Some primary care practices do not perform their own spirometry because of a lack of training, lack of confidence interpreting the results, cost and concerns about infection control during the COVID-19 pandemic.[8,17] If a significant delay to objective testing is unavoidable, treatment should be started if clinically urgent.

### 1. Bronchodilator responsiveness test in adults and adolescents with asthma

**Key diagnostic information from spirometry**

- $FEV_1$ below normal for the patient's sex, age and height indicates abnormal lung function
- A reduced ratio of $FEV_1$ to forced vital capacity indicates the patient has expiratory airflow obstruction but does not prove asthma
- A positive bronchodilator responsiveness test confirms asthma if typical symptoms are present

**How to perform the bronchodilator responsiveness test**

- Perform spirometry with at least three acceptable manoeuvres and record the highest value for $FEV_1$
- Repeat 10–15 minutes after administering rapid-acting bronchodilator (e.g. 400 mcg salbutamol)
- Bronchodilator responsiveness is assessed by measuring the change in $FEV_1$

**How to interpret the test results**

- The spirometer software calculates the percentage increase in $FEV_1$ before and after use of the bronchodilator
- The test is positive if there is a clinically significant increase, defined as a relative increase ≥12% and absolute increase ≥200 mL, compared with the prebronchodilator $FEV_1$

Abbreviation: $FEV_1$ = forced expiratory volume in 1 second.

### 2. Practice points: diagnosing asthma

- Ask about allergies (including family history of atopy and asthma), what provokes the symptoms, smoking or vaping habits and home and work environments.
- If an adolescent patient's parent or carer is present, see the patient alone for part of the consultation to enable confidential discussion of sensitive issues such as smoking and vaping.
- Offer specialist referral for patients with suspected occupational asthma.
- If spirometry testing is arranged in a respiratory function laboratory, request a FeNO test in the same session by simply adding 'FeNO' to the request form.
- The bronchodilator responsiveness test is affected by recent use of a bronchodilator. Respiratory laboratories and primary care practices performing spirometry or bronchial provocation should provide pretest instructions on withholding medicines before testing.

Abbreviation: FeNO = fractional exhaled nitric oxide.

#### Consider investigating airway inflammation with FeNO testing

Recent evidence has shown that, in patients with symptoms consistent with asthma, an elevated FeNO level demonstrates diagnostic reliability similar to that of spirometry with a positive bronchodilator responsiveness test.[10,12] Either test finding can therefore be used to confirm a diagnosis of asthma. Spirometry and FeNO testing provide complementary information; thus, combining them increases the chance of confirming the diagnosis without the need for bronchial provocation testing.[18]

The *Australian Asthma Handbook* recommends that FeNO testing should be included when spirometry is performed in a respiratory function laboratory, including when initial spirometry in primary care does not confirm asthma.[9] In an adult with symptoms and signs strongly suggestive of asthma and unexplained by another condition, and who is not using an ICS, a FeNO level of 40 ppb or greater supports the diagnosis of asthma.[10,19] However, FeNO levels are not always raised in asthma and are also influenced by a range of factors including smoking, anti-inflammatory medications (including ICS), allergic rhinitis, acute respiratory infection, adiposity and diet.[18,20]

Some international guidelines also recommend a blood eosinophil count as a diagnostic test,[12] but the National Asthma Council's Guidelines Committee does not consider it to be reliable enough as a standalone test for asthma.[21]

#### Test for airway hyper-reactivity if necessary

If the diagnosis is still uncertain, refer the patient to a specialist (respiratory physician, clinical immunologist or allergist) or arrange a bronchial provocation test for airway hyper-reactivity at a lung function laboratory. Bronchial provocation is the most sensitive test for detecting variable airflow obstruction in asthma and is also useful for ruling out asthma.[22,23]

Practice points on asthma diagnosis in primary care are provided in Box 2.

## How to prescribe asthma treatment for adults and adolescents

The evidence base for asthma treatment has evolved steadily over recent decades. This has been driven partly by the arrival of new medicines, but also by new ways of using familiar medicines. These advances have led to a profusion of valid treatments, but also to complexity for prescribers. Some practice points for GPs relevant to treatment are provided in Box 3.

Building on recent evidence, the latest edition of the *Australian Asthma Handbook* moves towards simplicity (Figure 2).[9] Many broad principles remain unchanged, including the importance of ICS as the cornerstone of treatment. However, there is now an increased emphasis on combination therapies, and a different approach to relievers in cases of mild asthma. The goal of avoiding exacerbations that require oral corticosteroids is emphasised more strongly, in view of increasing evidence for their long-term harms.[24,25]

#### The evolving idea of a 'reliever'

For many years, the concept of an asthma reliever was synonymous with a SABA. However, in recent decades, research has established that ICS–formoterol inhalers may also be used on an as-needed basis. As these provide a combination of anti-inflammatory action and fast-acting bronchodilation, the term 'anti-inflammatory reliever' (AIR) has recently come into favour.[26]

The first evidence for ICS–formoterol inhalers as relievers was from the use of a single ICS–formoterol inhaler as both regular maintenance and reliever therapy. Such use has been called maintenance-and-reliever

### 3. Practice points: treating asthma

- All patients aged 12 years and older need treatment that includes ICS.
- Managing asthma solely with short-acting beta-2 agonists is an outdated and risky approach.
- The usual recommended starting treatment after diagnosis is budesonide–formoterol as needed.
- If maintenance treatment is needed, the recommended regimen is ICS–formoterol (beclometasone–formoterol or budesonide–formoterol) as both maintenance treatment and as-needed reliever.
- Patients with frequent or severe symptoms at diagnosis may need to start at a higher treatment level (Figure 2) but be aware that maintenance combination treatments as initial treatment are not funded by the PBS, except during or soon after a course of oral corticosteroids. A patient starting treatment with as-needed budesonide–formoterol can step up to maintenance-and-reliever therapy if they need reliever doses on most days.
- If asthma cannot be controlled with ICS-containing treatment, referral of patients to a specialist is recommended. Before the specialist consultation, GPs can facilitate access to monoclonal antibody therapy for potentially eligible patients by promptly stepping through the recommended investigations (spirometry, blood eosinophil count, FeNO testing) and treatment trials. Addition of a long-acting muscarinic antagonist may benefit patients with persistent airflow limitation, but this should not delay referral.

Abbreviations: ICS = inhaled corticosteroids; FeNO = fractional exhaled nitric oxide.

therapy (MART). Systematic reviews on this treatment approach have found that, compared with traditional maintenance therapy with a separate SABA reliever, the single-inhaler approach was associated with a reduced need for oral corticosteroid courses, a longer average time between exacerbations and, possibly, reduced hospitalisation.[27-29] MART reduces exacerbation rates, compared with the same or higher dose of ICS–long-acting beta-2 agonist (LABA) in a fixed-dose regimen.[29] MART using a single inhaler (beclomethasone–formoterol or budesonide–formoterol) also has the virtue of simplicity. It has been available on the PBS for many years for patients with asthma that is not well controlled on a low dose of ICS.

More recent research has evaluated the use of budesonide–formoterol inhalers only as needed, without maintenance treatment, for people with mild asthma. For many doctors who were taught that ICS are medications that should be used regularly, such an as-needed approach may sound like a radical and dubious change. However, there are now several major trials of this AIR approach, and the evidence is solid. The *Cochrane* review of these trials revealed that as-needed budesonide–formoterol use is as effective for mild asthma as maintenance low-dose ICS with a SABA reliever. It is both safer and more effective than SABA use alone, more than halving the risk of severe exacerbations requiring oral corticosteroids.[30] Budesonide–formoterol has been available on the PBS for this AIR-only as-needed use since late 2020.[31,32]

#### Farewell to the lone SABA for mild asthma

Historically, guidelines have endorsed the use of SABAs alone, without any ICS, in people with asthma with few symptoms. In the previous edition of the *Australian Asthma Handbook*, for example, this was limited to patients experiencing symptoms fewer than twice a month and without any risk factors for flare-ups.[31] However, major international guidelines have changed: they no longer recommend patients with asthma be prescribed SABAs without an accompanying prescription for an ICS, and they recommend as-needed budesonide–formoterol in place of as-needed SABAs for milder asthma.[12,33]

In 2025, the *Australian Asthma Handbook* follows suit. This is because the use of SABAs without an ICS is less safe than relievers used alongside an ICS. We know this from studies comparing AIRs (budesonide–formoterol) with traditional SABA relievers. In these studies, the need for systemic corticosteroid courses was roughly halved, and presentations to hospital or urgent care were also fewer.[30] It is also likely that starting patients on SABA therapy alone trains people to think of this as their principal, familiar inhaler.[13] Given the inferior safety of SABA therapy alone, such training is best avoided.

Unfortunately, the use of SABA therapy alone is very common. About one-quarter of people in Australia with asthma have the combination of poor asthma control and little or no ICS use.[34] Both SABA over-reliance (lack of anti-inflammatory treatment to target the causes of asthma symptoms) and SABA overuse (dose escalation leading to receptor downregulation) should be avoided.[35,36] Both of these problems are common among people buying over-the-counter SABAs at Australian pharmacies.[37]

There is clearly a significant opportunity here for improved asthma control. We hope that as our guidelines shift away from endorsing SABA use without ICS, this treatment gap may narrow. However, this may be challenging, given the availability of nonprescription SABAs in Australia, while ICSs remain available via prescription only.

#### Combination therapy is preferred at all treatment levels

Another significant change in the 2025 edition of the *Australian Asthma Handbook* is an explicit preference for combination ICS–formoterol inhalers (Figure 2). There are several reasons for this. In clinical trials, ICS–formoterol inhalers reduced the frequency of exacerbations and the need for oral corticosteroid courses.[27,28,38] Additionally, in the real world, poor adherence to maintenance (preventer) therapy is common, as people often value inhalers that bring immediate symptom relief and prefer simpler (rather than complex) treatment regimens.[39] Such preferences lead to poor ICS adherence, which exposes people to the dangers of SABA overuse and ICS underuse. Normalising the use of anti-inflammatory inhalers at all treatment levels should reduce adverse asthma outcomes while simplifying treatment. Note that only certain ICS–formoterol inhaler strengths are approved for use as relievers, and combinations of ICS with any LABA other than formoterol cannot be used this way.

Despite the new recommendation for combination ICS–formoterol therapies, the traditional approach of separate maintenance and SABA therapies is still included as an alternative option. This traditional strategy might be particularly suitable for people who already have good asthma control on such a regimen, are reliably adherent to their maintenance doses and are disinclined to change their inhalers.

Where appropriate, we should consider prescribing dry powder inhalers (rather than pressurised metered-dose inhalers) due to their significantly less adverse environmental impact.[40,41] Key clinical trials of combination therapies have used dry powder inhalers.[42-45] Regardless of which inhaler device is prescribed, all patients need training to use their inhaler correctly. The technique should be checked at every opportunity.

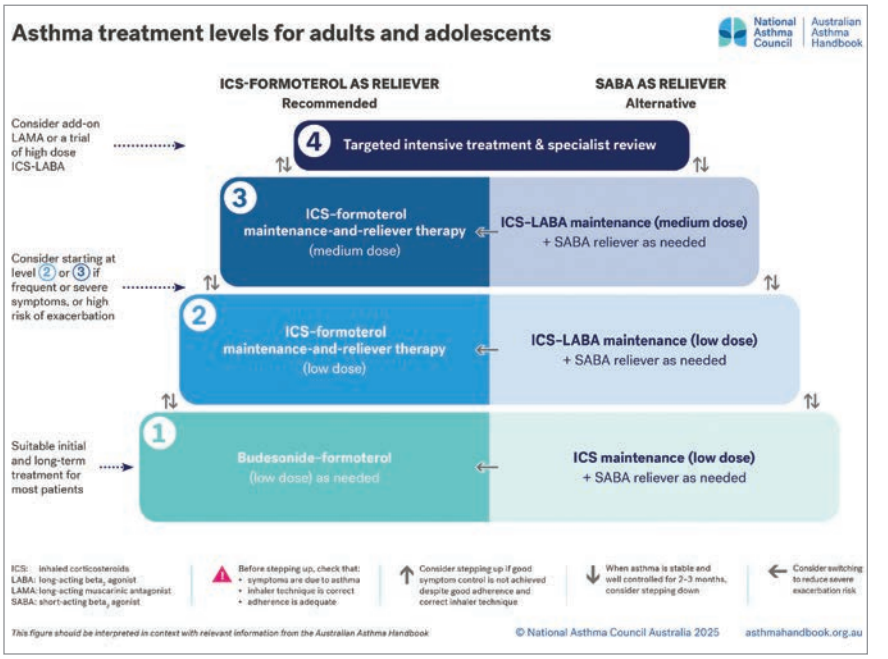


**Figure 2. Asthma treatment levels for adults and adolescents.[9]**
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### Do not delay referral for targeted treatment for patients with severe asthma

For patients with severe allergic or eosinophilic asthma that cannot be adequately controlled with ICS-containing treatment, the most effective treatments are often monoclonal antibody therapies targeting components of the inflammatory response.[6]

Severe asthma refers to asthma that remains uncontrolled despite treatable factors having been addressed and maximal inhaled therapy being taken regularly. Asthma is uncontrolled if the patient experiences frequent symptoms, activity limitations, night waking or exacerbations that require systemic corticosteroid treatment. Among adults with asthma, estimates of the proportion with severe asthma range from 4 to 9.5%.[46,47]

The 2025 edition of the *Australian Asthma Handbook* includes updated advice on the sequence of tests and treatment trials that will provide the most efficient pathway for patients with severe asthma to access monoclonal antibody therapy. This involves ruling out common reasons for frequent symptoms or exacerbations despite seemingly adequate treatment (e.g. poor adherence, incorrect inhaler technique, continued exposure to avoidable triggers, comorbid conditions), arranging spirometry and a blood eosinophil count to identify type 2 airway inflammation, clearer indications for referral and what to do while waiting for specialist consultation.[9]

The *Australian Asthma Handbook* also provides updated guidance on when to consider prescribing a combination of an ICS, a LABA and a long-acting muscarinic antagonist: for a patient who has developed persistent expiratory airflow limitation over time, or as a treatment trial for a patient with severe asthma awaiting referral.[48] This approach should not delay referral for consideration of monoclonal antibody therapies, which have greater benefits in cases of severe asthma.[49]

## Conclusion

The updated *Australian Asthma Handbook* recommendations on the diagnosis and management of asthma in adults reflect our increasing understanding of the central role of chronic airway inflammation in asthma. Spirometry is still recommended in the diagnostic workup of asthma, but FeNO testing is similarly reliable in patients with typical asthma symptoms. Performing both tests will improve diagnostic accuracy. The revised guidance on medications will help GPs reduce asthma symptoms and emergency room visits. Key updates include the new message that ICS-containing treatment is indicated for all adults and adolescents with asthma, strengthened recommendations for AIR therapy as the best option for managing symptoms and updated guidance on streamlining access to targeted monoclonal antibody therapy for patients with severe asthma. **RMT**

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A list of references is included in the online version of this article (www.respiratorymedicinetoday.com.au).

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