



## Managing acute asthma in adults in primary care

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**BOX 1**  
 Adult asthma action plan (page 2 of two), Asthma UK. The full template can be downloaded free from the Asthma UK website: [www.asthma.org.uk](http://www.asthma.org.uk)

**1 Every day asthma care:**

**My asthma is being managed well:**

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

**My daily asthma routine:**

**My preventer inhaler** (insert name/colour):

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

I take  puff(s) in the morning and  puff(s) at night.

**My reliever inhaler** (insert name/colour):

I take my **reliever inhaler** only if I need to

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

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

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

**2 When I feel worse:**

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

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

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

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

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

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

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

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

**3 In an asthma attack:**

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

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

**What to do in an asthma attack**

- Sit up straight** – try to keep calm.
- Take one puff of your reliever inhaler (usually blue)** every 30 - 60 seconds, up to a maximum of 10 puffs.
- If you feel worse** at any point OR you don't feel better after 10 puffs call 999 for an ambulance.
- Repeat step 2 after 15 minutes** while you're waiting for an ambulance.

**After an asthma attack:**

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

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

**How** should patients be assessed?

**Which** patients should be admitted to hospital?

**How** should patients be followed up?



**ACUTE ASTHMA IS CHARACTERISED BY PROGRESSIVE WORSENING OF ASTHMA SYMPTOMS,**

such as wheeze, chest tightness, breathlessness and cough with the need for bronchodilator therapy.

Asthma is a common, chronic respiratory condition affecting around 8% of adults in the UK.<sup>1</sup>

The National Review of Asthma Deaths (NRAD) report *Why asthma still kills* found that most fatal asthma attacks occurred in patients who were not under specialist supervision at the time of their death.<sup>2</sup>

All patients presenting with a flare of their asthma should be assessed

clinically with particular attention to objective observations and pulmonary function should be measured, typically by peak expiratory flow rate (PEFR), in the community setting. Ideally, PEFR readings taken during an exacerbation should be compared with the patient's established baseline reading. However, when this is not known, an estimated PEFR can be calculated taking into account factors such as age, height, gender and ethnicity, for which online tools are available (see Useful information, p23).

These simple objective assessments can help triage acute asthma exacerbations, guide treatment and identify those patients who need to be

admitted to hospital (see table 1, p20).

Use of other measures acutely, such as exhaled nitric oxide, to guide risk stratification and treatment has not yet been established and there are significant pitfalls in relying on clinical examination, when auscultation findings of a clear chest can be found in both very mild and life-threatening attacks.

Once the severity of an acute asthma attack has been established appropriate treatment needs to be initiated immediately, see figure 1, p21. Treatment with bronchodilators and oral corticosteroids should be given as soon as possible in an acute asthma exacerbation.

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# SYMPOSIUM RESPIRATORY MEDICINE

## ACUTE ASTHMA IN ADULTS

The NRAD report highlighted that there was a delay in administration of treatment in a significant proportion of fatal asthma attacks; in 32% of cases patients had not received emergency reliever therapy within 30 minutes of being seen by a doctor.<sup>2</sup>

Most patients with moderate acute asthma can be managed in the community, with oral steroids the mainstay of therapy. Response to treatment should be assessed in a timely fashion bearing in mind that oral steroid therapy may take several days to be fully effective during which time patients may deteriorate. In certain patients, liquid or soluble steroid preparations may be considered in lieu of tablets, and if the oral route is not feasible,

IV hydrocortisone can be used.

Tapering steroid regimens should be considered in those on maintenance steroid treatment, patients who have needed recurrent courses of steroids or when steroids are required for three or more weeks. Inhaled corticosteroid (ICS) therapy should be continued during oral steroid treatment.

Most guidelines do not recommend routine prescription of antibiotics, unless infection is suspected (e.g. fever and purulent sputum).<sup>3,4</sup> Nonetheless, the diagnosis of bacterial infection is often overestimated in acute asthma exacerbations, as most infective exacerbations of asthma are viral.<sup>3</sup>

Likewise, a chest X-ray for community managed exacerbations is not routinely

recommended, unless there is an unsatisfactory response to treatment or a superadded diagnosis is suspected e.g. pneumothorax.<sup>4</sup>

In moderate exacerbations the decision about hospital admission is based on multiple factors, including response to initial treatment, known reduction in baseline lung function, history of exacerbations, particularly previous need for critical care involvement, and the patient's ability to cope at home.<sup>4</sup>

Patients with features of acute severe or life-threatening asthma should be referred to hospital immediately following initial assessment.<sup>3,5</sup> In an emergency situation, oxygen saturations should be maintained at 94-98% with supplemental oxygen although care should be taken in patients with coexisting COPD or with known oxygen sensitivity.

Short-acting beta-agonists (SABA) should preferably be administered by oxygen-driven nebuliser or supplemental oxygen therapy administered if only air-driven devices are available. Continuous nebulisation can be considered if the initial response is poor and the addition of nebulised antimuscarinic therapy (e.g. ipratropium bromide), if available, produces synergistic bronchodilatation.

If there is no immediate access to a nebuliser, metered dose SABA can be administered via a large volume spacer (see figure 1, p21).

When emergency treatment has been administered in the community while awaiting transfer to hospital, it is important to remember to hand over documentation concerning the severity of the exacerbation to paramedic teams as nebulised short-acting bronchodilators in particular can lead to rapid clinical improvements which may be falsely reassuring to ambulance and A&E staff leading to inappropriate triaging on arrival at the hospital.

All patients with an acute asthma exacerbation, regardless of severity, should have a review of asthma control (ideally within 2 working days), focusing on risk factors for further attacks and opportunities to improve outcomes, see below.

### RISK FACTORS FOR SEVERE EXACERBATIONS

Recognised risk factors for the development of near-fatal or fatal asthma are shown in table 2, left.<sup>2,3</sup> These factors can be subdivided into patient factors and disease factors.

Overuse of SABA therapy can mask

**Table 1**

**Levels of severity of acute asthma attacks in adults<sup>3</sup>**

<b>Moderate acute asthma</b>	Increasing symptoms PEF >50-75% best or predicted No features of acute severe asthma	
<b>Acute severe asthma</b>	Any one of: - PEF 33-50% best or predicted - respiratory rate ≥25/min - heart rate ≥110/min - inability to complete sentences in one breath	
<b>Life-threatening asthma</b>	Any one of the following in a patient with severe asthma:	
	<b>Clinical signs</b>	<b>Measurements</b>
	Altered conscious level	PEF <33% best or predicted
	Exhaustion	SpO <sub>2</sub> <92%
	Arrhythmia	PaO <sub>2</sub> <8 kPa
	Hypotension	'normal' PaCO <sub>2</sub> (4.6-6.0 kPa)
	Cyanosis	
	Silent chest	
	Poor respiratory effort	
<b>Near-fatal asthma</b>	Raised PaCO <sub>2</sub> and/or requiring mechanical ventilation with raised inflation pressures	

**Table 2**

**Risk factors for developing near-fatal or fatal asthma<sup>2,3</sup>**

**A combination of severe asthma recognised by one or more of:**

- Heavy use of β<sub>2</sub> agonist
- Previous near-fatal asthma, e.g. previous ventilation or respiratory acidosis
- Previous admission for asthma especially if in the past year
- Requiring three or more classes of asthma medication
- Emergency department attendance for asthma care especially if in the past year

**AND adverse behavioural or psychosocial features recognised by one or more of:**

- Behavioural features: non-adherence with treatment or monitoring, failure to attend appointments, fewer GP contacts, frequent home visits, self-discharge from hospital, smoking or exposure to smoke
- Psychological features: psychosis, depression, other psychiatric illness or deliberate self-harm, current or recent major tranquilliser use, denial
- Coexisting conditions/circumstances: alcohol or drug abuse, obesity, learning difficulties
- Social circumstances: employment problems, income problems, social isolation, childhood abuse, severe domestic, marital or legal stress

**FIGURE 1**  
Management of acute asthma in adults in general practice (SIGN 158)<sup>3</sup>



## key points

### SELECTED BY

**Dr Peter Saul**

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#### All patients presenting with a flare of their asthma should

be assessed clinically with particular attention to objective observations and pulmonary function should be measured, typically by peak expiratory flow rate (PEFR), in the community setting. Ideally, PEFR readings taken during an exacerbation should be compared with the patient's established baseline reading. Use of other measures acutely has not yet been established and there are significant pitfalls in relying on clinical examination.

#### Treatment with bronchodilators and oral corticosteroids

should be given as soon as possible in an acute asthma exacerbation. Most patients with moderate acute asthma can be managed in the community, with oral steroids the mainstay of therapy. In moderate exacerbations, hospital admission is based on multiple factors, including response to initial treatment, known reduction in baseline lung function, history of exacerbations, particularly previous need for critical care involvement, and ability to cope at home.

#### Patients with features of acute severe or life-threatening

asthma should be referred to hospital immediately following initial assessment while maintaining oxygen saturations at 94-98% with supplemental oxygen. Short-acting beta-agonists (SABA) should preferably be administered by oxygen-driven nebuliser or supplemental oxygen therapy administered if only air-driven devices are available. Large volume spacers may be used when a nebuliser is unavailable. The addition of synergistic antimuscarinic therapy may be considered.

#### All patients with an acute asthma exacerbation, regardless

of severity, should have a review of asthma control (ideally within 2 working days) focusing on risk factors for further attacks and opportunities to improve outcomes. Overuse of SABA therapy can mask deteriorating symptoms without attenuating the underlying inflammatory process within the lungs for which inhaled corticosteroid (ICS) treatment is crucial, and is a risk factor for asthma attacks. Underuse of ICS has also been identified as a risk factor.

#### Self-management is an essential component in asthma

management. Individuals should be able to recognise and act on symptoms and signs of deterioration. All patients with asthma should be provided with supported self-management programmes including patient education and a personalised asthma action plan. Individuals who persistently require multiple courses of oral steroids should be considered for referral to secondary care for further investigation, as should patients with suspected superadded conditions and any potential occupational component to their asthma.

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deteriorating symptoms without attenuating the underlying inflammatory process within the lungs for which ICS treatment is crucial. Patients with well controlled asthma should need no more than 2 reliever inhalers a year. However, patients with monthly SABA inhalers on their repeat prescription may use up to 7 puffs a day, every day, without seeking review for what would clearly be very poorly controlled asthma. Ideally, reliever inhalers should not be available at this frequency.

While overuse of SABA was a common theme in the NRAD report conversely underuse of ICS, which when prescribed as monotherapy gives no immediate symptomatic response, was also identified as a risk factor for death.

Identifying patients, from their electronic records, who are underusing ICS and over relying on SABA, and hence at higher risk of asthma attacks can facilitate timely patient review.

This provides an opportunity to reinforce the importance of adherence to ICS and explain that this is the mainstay of asthma treatment, and that the need for SABA therapy should be best considered as a marker of disease control.

Such a structured approach may address the mismatch between ICS and SABA use but there is little convincing evidence that any specific intervention can attenuate an individual's adherence long term.

A pragmatic acknowledgment of this crucial issue has led some international expert consensus guideline consortia to recommend the as required use of fast-acting LABA/ICS combination therapy as first-line treatment.<sup>4</sup> While this approach has not yet been advocated by national bodies in the UK there is emerging evidence that it can reduce exacerbations.<sup>6</sup>

Both BTS and NICE guidance do recommend the use of similar products to be used as maintenance and reliever therapy (MART).<sup>3,5</sup> A MART regimen enables a single inhaler, containing both ICS and a fast-acting LABA, to be used for both daily maintenance therapy and the relief of symptoms as required. MART is only available for ICS and LABA combinations in which the LABA has a fast-acting component (e.g. formoterol). This regimen allows for automatic escalation of inhaled steroid dose when symptoms increase which has been shown to reduce unplanned admission and paradoxically reduce steroid burden overall.<sup>7</sup>

Non-intentional non-adherence

is another important risk factor for severe exacerbations.<sup>8</sup> Ensuring inhaler technique has been taught by a suitably trained individual and reassessed regularly will help address this, as will matching inhaler device types across classes where possible. Avoiding the need to learn multiple inhaler techniques is another advantage of the MART approach. Checking and correcting inhaler technique using a standard checklist takes minutes and can lead to improved asthma control.<sup>4</sup>

For patients prescribed a pressurised metered dose inhaler, use of a spacer significantly improves delivery and for ICS reduces the potential of local side effects.<sup>4</sup>

Smoking and exposure to second-hand smoke in the home are also important modifiable factors. Studies have shown as many as 1 in 5 patients with asthma smoke.<sup>9</sup> When smoking cessation is discussed the increased risk of mortality in patients with asthma should be highlighted.<sup>10</sup>

### SELF-MANAGEMENT

Self-management is an essential component in asthma management, as in all chronic conditions. Individuals should be able to recognise and act on symptoms and signs of deterioration. All patients with asthma should be provided with supported self-management programmes, including patient education and a personalised asthma action plan (PAAP).<sup>3,4,5</sup>

PAAPs should include specific advice about recognising asthma deterioration by means of worsening symptoms or peak flow measurements, and a summary of the actions to take (e.g. increasing ICS, starting oral steroids or seeking emergency help) when this occurs (see box 1, p19).

The BTS/SIGN guideline recommends that all patients on the 'active asthma' register should receive self-management education, supported by a written PAAP in primary care.<sup>3</sup>

Measures that may be helpful in implementing effective self-management interventions include: proactive triggers to ensure routine reviews; structured protocols for asthma reviews; support from community pharmacists; routine mailing of educational resources; ongoing phone support and advice; and IT-based education and monitoring.<sup>3</sup>

### REFERRAL

Individuals who persistently require multiple courses of oral steroids should be considered for referral to secondary care for further investigation, as should

patients with suspected superadded conditions and any potential occupational component to their asthma.

A large scale observational study using NHS registry data has identified that only a small proportion of eligible asthma patients are actually referred to secondary care services and those who are often experience long delays to be seen in hospital.<sup>11</sup>

#### Competing interests

Dr Gareth Jones has previously received honoraria from AstraZeneca, Pfizer, GSK and Chiesi and non-financial support from Napp. Dr Victoria Randles and Dr Wing Yin Leung have no competing interests

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#### Useful information

##### Asthma UK

Information for patients and a downloadable asthma action plan template [www.asthma.org.uk](http://www.asthma.org.uk)

##### BTS/SIGN guideline

SIGN 158 British guideline on the management of asthma [www.sign.ac.uk/our-guidelines/british-guideline-on-the-management-of-asthma](http://www.sign.ac.uk/our-guidelines/british-guideline-on-the-management-of-asthma)

##### Online PEFR calculator

[www.mdcalc.com/estimated-expected-peak-expiratory-flow-peak-flow](http://www.mdcalc.com/estimated-expected-peak-expiratory-flow-peak-flow)

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