British guideline on the management of asthma 2014

- Revision of guideline last updated in 2012 (SIGN 101)
- Between 2004 and 2012 sections within the guideline were updated annually
- Subsequently, updating moved to a biennial basis, beginning with the 2014 update

This slide set is an implementation tool and should be used alongside the published guidance. It does not supersede or replace the guidance itself

*See the guideline for full recommendations*

All slides refer to the SIGN guideline 141 unless otherwise stated
What's new? (1)

• This is not just an update, the approach to updating the guideline and the structure has changed:
  – A new section highlighting key recommendations for implementation from across the guideline has been added
  – The section on special situations has been split into 4 separate sections
  – The section on supported self-management has been moved to the beginning
  – There will be biennial (alternate year) updating

What's new? (2)

• Revisions made to the sections on non-pharmacological management, organisation and delivery of care and supported self-management
• Not much has changed in the pharmacological approach
  – Stepwise model remains
  – Addition of tiotropium as an option at step 4
• NICE quality standards have been integrated
• Reference made to the National Review of Asthma Deaths
  • Opportunity to look at the many medicines optimisation issues in the guideline
### Summary of updates to the guideline

<table>
<thead>
<tr>
<th>Section</th>
<th>Section title</th>
<th>Revision date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Key recommendations</td>
<td>2014</td>
</tr>
<tr>
<td>3</td>
<td>Diagnosis and monitoring</td>
<td>2008, 2011</td>
</tr>
<tr>
<td>4</td>
<td>Supported self-management</td>
<td>2004, 2008, <strong>2014</strong></td>
</tr>
<tr>
<td>5</td>
<td>Non-pharmacological management</td>
<td>2008, <strong>2014</strong></td>
</tr>
<tr>
<td>7</td>
<td>Inhaler devices</td>
<td>2005, <strong>2014</strong></td>
</tr>
<tr>
<td>8</td>
<td>Management of acute asthma</td>
<td>2004, 2009, <strong>2014</strong></td>
</tr>
<tr>
<td>9</td>
<td>Difficult asthma</td>
<td>2008, <strong>2014</strong></td>
</tr>
<tr>
<td>10</td>
<td>Asthma in adolescents</td>
<td>2011</td>
</tr>
<tr>
<td>12</td>
<td>Occupational asthma</td>
<td>2005, 2008, <strong>2014</strong></td>
</tr>
<tr>
<td>13</td>
<td>Organisation and delivery of care, and audit</td>
<td>2008, <strong>2014</strong></td>
</tr>
</tbody>
</table>

### Key recommendations

2.1 Diagnosis and monitoring
2.2 Supported self-management
2.3 Non-pharmacological management
2.4 Pharmacological management
2.5 Inhaler devices
2.6 Acute asthma
2.7 Difficult asthma
2.8 Asthma in pregnancy
2.9 Occupational asthma
Key recommendations

2.1 Diagnosis and monitoring
2.2 Supported self-management
2.3 Non-pharmacological management
2.4 Pharmacological management
2.5 Inhaler devices
2.6 Acute asthma
2.7 Difficult asthma
2.8 Asthma in pregnancy
2.9 Occupational asthma

Key recommendations: diagnosis and monitoring (1)

• Focus the initial assessment in children suspected of having asthma on:
  – presence of key features in the history and examination
  – careful consideration of alternative diagnoses
• In children, record the basis on which a diagnosis of asthma is suspected
• In adults, initial diagnosis should be based on a careful assessment of symptoms and a measure of airflow obstruction
• Spirometry is the preferred initial test to assess the presence and severity of airflow obstruction in adults
Key recommendations: diagnosis and monitoring (2)

• In adults, the following factors should be monitored and recorded in primary care:
  – symptomatic asthma control
  – lung function, assessed by spirometry or by PEF
  – asthma attacks, oral corticosteroid use and time off work or school since last assessment
  – inhaler technique
  – adherence
  – bronchodilator reliance
  – possession of and use of a self-management plan/personal action plan

NICE quality statements: diagnosis and management

• NICE quality statement 1: People with newly diagnosed asthma are diagnosed in accordance with BTS/SIGN guidance
• NICE quality statement 6: People with asthma who present with respiratory symptoms receive an assessment of their asthma control
Key recommendations

2.1 Diagnosis and monitoring

2.2 Supported self-management

2.3 Non-pharmacological management

2.4 Pharmacological management

2.5 Inhaler devices

2.6 Acute asthma

2.7 Difficult asthma

2.8 Asthma in pregnancy

2.9 Occupational asthma

---

**Key recommendations: supported self-management**

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

- Prior to discharge, inpatients should receive written personalised asthma action plans, given by healthcare professionals with expertise in providing asthma education

- Adherence to long-term asthma treatment should be routinely and regularly addressed by all healthcare professionals within the context of a comprehensive programme of accessible proactive asthma care
NICE quality statements: supported self-management

- **NICE quality statement 3**: People with asthma receive a written personalised action plan
- **NICE quality statement 5**: People with asthma receive a structured review at least annually
- **NICE quality statement 9**: People admitted to hospital with an acute exacerbation of asthma have a structured review by a member of a specialist respiratory team before discharge

Supported self-management

- Self-management education incorporating written personalised asthma action plans (PAAPs) delivered to adults or children with asthma (and/or their parents/carers):
  - reduces emergency use of healthcare resources, including emergency department visits, hospital admissions and unscheduled consultations
  - improves markers of asthma control, including reduced symptoms and days off work, and improves quality of life

- Example of PAAP in Annex 10 of the guideline
  - In adults, PAAPs may be based on symptoms and/or peak flows: symptom-based plans are generally preferable for children
Supported self-management: good practice points

• Every asthma consultation is an opportunity to review, reinforce and extend both the patient’s knowledge and skills
  – This is true whether the patient is seen in primary care, the emergency department or the outpatient clinic
  – It is important to recognise that education is a process and not a single event
  – No patient should leave hospital without a written PAAP
  – Brief simple education linked to patient goals is most likely to be acceptable to patients

Supported self-management: specific patient groups

• Primary care; Self-management education, supported by a written PAAP, should be offered to all patients on general practice ‘active asthma’ registers
  – Primary care practices should ensure that they have trained professionals and an environment conducive to providing supported self-management

• Secondary care; Prior to discharge, inpatients should receive written PAAPs, given by healthcare professionals with expertise in providing asthma education
Supported self-management: implementation in practice

- Implementation in routine practice remains poor with only a third of people with asthma having a PAAP
- **Commissioners and providers of services for people with asthma** should consider how they can develop an organisation which prioritises and actively supports self-management
  - This should include strategies to proactively engage and empower patients and train and motivate professionals as well as providing an environment that promotes self-management and monitors implementation

Key recommendations

2.1 Diagnosis and monitoring
2.2 Supported self-management
2.3 **Non-pharmacological management**
2.4 Pharmacological management
2.5 Inhaler devices
2.6 Acute asthma
2.7 Difficult asthma
2.8 Asthma in pregnancy
2.9 Occupational asthma
Key recommendations: non-pharmacological management

- Parents with asthma should be advised about the danger of smoking to themselves and to their children with asthma, and be offered appropriate support to stop smoking.
- Weight loss in overweight patients has many health benefits, and should be supported in people with asthma; if successful, it may lead to improvements in asthma symptoms.
- Breathing exercise programmes can be offered to people with asthma as an adjuvant to pharmacological treatment to improve quality of life and reduce symptoms.

Supplements and probiotics in asthma

- Results from observational studies are inconsistent and a Cochrane review of nine RCTs concluded that there was insufficient evidence to recommend fish oil supplementation for the treatment of asthma.
- Intervention studies suggest that neither supplementation with vitamin C, vitamin E nor selenium is associated with clinical benefits in people with asthma.
- Only one study of probiotics in the treatment of established allergic disease focused on asthma, finding a decrease in eosinophilia but no effect on clinical parameters.
Key recommendations

2.1 Diagnosis and monitoring
2.2 Supported self-management
2.3 Non-pharmacological management

2.4 Pharmacological management

2.5 Inhaler devices
2.6 Acute asthma
2.7 Difficult asthma
2.8 Asthma in pregnancy
2.9 Occupational asthma

Key recommendations: pharmacological management (1)

- Before initiating a new drug therapy practitioners should check adherence with existing therapies, inhaler technique and eliminate trigger factors
- Inhaled corticosteroids are the recommended preventer drug for adults and children for achieving overall treatment goals
Key recommendations: pharmacological management (2)

- The first choice as add-on therapy to inhaled corticosteroids in adults and children (5–12 years) is an inhaled long-acting β2 agonist, which should be considered before going above a dose of 400 micrograms beclometasone dipropionate (BDP) or equivalent per day and certainly before going above 800 micrograms BDP.

- The first choice as add-on therapy to inhaled corticosteroids in children under five years old is a leukotriene receptor antagonist.

Key recommendations: pharmacological management (3)

- If asthma control remains suboptimal after the addition of an inhaled long-acting β2 agonist then the dose of inhaled corticosteroids should be increased to 800 micrograms/day in adults or 400 micrograms/day in children (5–12 years), if not already on these doses.

NICE
Pharmacological management
SIGN 141 Quick Reference Guide

**Pharmacological Management**

The aim of asthma management is control of the disease. Complete control is defined as:
- no daytime symptoms
- no night time awakening due to asthma
- no need for rescue medication
- no asthma attacks
- no exacerbations
- no limitations on activity including exercise
- normal lung function (in practical terms FEV₁ and/or PEF >80% predicted or best)
- minimal side effects from medication.

**The Stepwise Approach**

1. Start treatment at the step most appropriate to initial severity.
2. Achieve early control
3. Maintain control by:
   - stepping up treatment as necessary
   - stepping down when control is good.

Before initiating a new drug therapy, practitioners should check adherence with existing therapies, inhaler technique and eliminate trigger factors.

Until May 2009 all doses of inhaled corticosteroids were referenced against beclomethasone dipropionate (BDP) given via CFC-MDs. As BDP-CFC is now unavailable, the reference inhaled corticosteroid will be the BDP-HFA product, which is available at the same dosage as BDP-CFC. Adjustments to doses will have to be made for other inhaler devices and other corticosteroid molecules.

---

**Summary of stepwise management in adults**
SIGN 141 Quick Reference Guide

**NICE**

**Step 1**
Mild intermittent asthma

**Step 2**
Regular prevention therapy

**Step 3**
Initial add-on therapy

**Step 4**
Persistent poor control

**Step 5**
Continuation of current use of oral steroids

**Symptoms vs Treatment**

*BDP or equivalent*
Summary of stepwise management in children aged 5-12 years
SIGN 141 Quick Reference Guide

STEP 1
Mild intermittent asthma

STEP 2
Regular preventer therapy

STEP 3
Initial add-on therapy

STEP 4
Persist until control

STEP 5
Consult Paediatrics or Respiratory Medicine

Summary of stepwise management in children less than 5 years
SIGN 141 Quick Reference Guide

STEP 1
Mild intermittent asthma

STEP 2
Regular preventer therapy

STEP 3
Initial add-on therapy

STEP 4
Persist until control

STEP 5
Refer to Respiratory Paediatrics
Pharmacological management: step 1 mild intermittent asthma

- Prescribe an inhaled short-acting β2 agonist as short term reliever therapy for all patients with symptomatic asthma

Anyone prescribed more than 1 short acting bronchodilator inhaler device a month should be identified and have their asthma assessed urgently and measures taken to improve asthma control if this is poor

Pharmacological management: step 2 regular preventer therapy

Inhaled corticosteroids (ICS) should be considered for patients with any of the following asthma-related features:

- **asthma attack** in the last 2 years*
- using inhaled β2 agonists 3 times a week or more
- symptomatic 3 times a week or more
- waking 1 night a week

*new for 2014 is the replacement of the term ‘asthma exacerbation’ with the new term ‘asthma attack’. The guideline development group believes that is more understandable and gives clearer indication of the need for action
Pharmacological management:
step 2 regular preventer therapy

Start patients at a dose of ICS appropriate to the severity of disease

- In adults, a reasonable starting dose of ICS will usually be 400 micrograms BDP per day and in children 200 micrograms BDP per day
- In children under 5 years, higher doses may be required if there are problems in obtaining consistent drug delivery
- Titrate the dose of ICS to the lowest dose at which effective control of asthma is maintained

Pharmacological management:
step 3 initial add-on therapy (1)

- The first choice as add-on therapy to ICS in adults and children (5-12 years) is an inhaled long-acting β2 agonist (LABA), which should be considered before going above a dose of 400 micrograms BDP or equivalent per day and certainly before going above 800 micrograms BDP
- The first choice as add-on therapy to ICS in children under 5 years old is a leukotriene receptor antagonist
Pharmacological management: step 3 initial add-on therapy (2)

- If there is no response to inhaled LABA stop the LABA and increase the dose of ICS to 800 micrograms BDP/day (adults) or 400 micrograms BDP/day (children) if not already on this dose.
- If there is a response to LABA, but control remains suboptimal, continue with the LABA and increase the dose of ICS to 800 micrograms/day (adults) or 400 micrograms/day (children 5–12 years).

Safety of LABAs

- LABAs should only be started in patients who are already on ICS, and the ICS should be continued.
- Combination inhalers are recommended to:
  - guarantee that the LABA is not taken without ICS
  - improve inhaler adherence
- See later slides on inhalers.
LABAs: reminder for use in children and adults
Drug Safety Update September 2010; 4(2) H2

- Always prescribe LABA with concomitant ICS and only when ICS alone are not sufficient to control asthma symptoms
- LABA should not be initiated in patients with rapidly deteriorating asthma
- Review LABA therapy regularly, prescribe the lowest effective dose, and stop if there is no benefit
- Stepping-down therapy should be considered when good long-term asthma control has been achieved

NICE

LABAs: reminder for use in children and adults
Drug Safety Update September 2010; 4(2) H2

- LABA should not be prescribed for the relief of exercise-induced asthma symptoms in the absence of regular ICS (a short-acting β2-agonist should be used in this situation)
- Combination inhalers should be prescribed when appropriate to aid compliance in line with NICE Guidance

NICE
LABAs: reminder for use in children and adults
Drug Safety Update September 2010; 4(2) H2

Further advice for use in children:

• Prescribers are advised that a daily dose of 24 micrograms formoterol should be sufficient for most children, particularly for younger age-groups. Higher doses should be used rarely, and only when control is not maintained on the lower dose.

Budesonide/ formoterol in a single inhaler

• In selected adult patients at step 3 who are poorly controlled or in selected adult patients at step 2 (above BDP 400 micrograms/day and poorly controlled), the use of budesonide/ formoterol in a single inhaler as rescue medication instead of a short-acting β2 agonist, in addition to its regular use as controller therapy has been shown to be an effective treatment regime
  – the total regular dose of daily ICS should not be decreased

• Patients taking rescue budesonide/formoterol once a day or more on a regular basis should have their treatment reviewed
  – Careful education of patients is required
Pharmacological management:
step 4 addition of fourth drug (1)

• If control remains inadequate on 800 micrograms BDP daily (adults) and 400 micrograms daily (children) of an ICS plus LABA, consider the following interventions:
  – increasing ICS to 2000 micrograms BDP/day (adults) or 800 micrograms BDP/day (children 5-12 years) *
  – leukotriene receptor antagonists
  – theophyllines
  – slow release β2 agonist tablets, although caution needs to be used in patients already on long-acting β2 agonists.

*at high doses of ICS via pMDI, a spacer should be used

Pharmacological management:
step 4 addition of fourth drug (2)

• Long-acting muscarinic antagonists appear to be as effective as salmeterol in the short term and may be superior to doubling the dose of ICS in fixed airways obstruction
• Longer term studies are required to confirm this evidence
• There would also appear to be benefit in adding tiotropium to ICS and salmeterol in patients who remain symptomatic despite these medications
4.1 Therapeutic indications

Asthma

Spiriva Respimat is indicated as an add-on maintenance bronchodilator treatment in adult patients with asthma who are currently treated with the maintenance combination of inhaled corticosteroids (≥800 micrograms budesonide/day or equivalent) and long-acting β2 agonists and who experienced one or more severe exacerbations in the previous year.

Tiotropium evidence (1)


- Two replicate RCTs, analysed together (n=912)
- People with poorly controlled asthma and persistent airflow limitation taking ICS (median budesonide equivalent 800 micrograms) plus LABA
- Received tiotropium 5 micrograms/day or placebo for 48 weeks
- At 24 weeks, mean (±SE) change in FEV₁ from baseline was statistically significantly greater in tiotropium group; between-group differences:
  - Peak 86±34 ml (trial 1) and 154±32 ml (trial 2)
  - Trough 88±31 ml (trial 1) and 111±30 ml (trial 2) greater
- Time to first severe exacerbation was increased in tiotropium group (HR 0.79, 95% CI 0.62 to 1.00, p=0.03)
Tiotropium evidence (2)
Medicines Evidence Commentary on Kerstjens et al studies, 2012

- Fewer participants receiving tiotropium had a severe exacerbation than those receiving placebo over 48 weeks
  - 26.9% versus 32.8%, HR 0.79, 95% CI not stated, p<0.05, NNT 17
- Asthma control and quality of life was assessed however, between-group differences were small and statistically significant only in Trial 2
- Differences were less than the recognised minimum clinically important differences for these scales
- ESNM scheduled for March 2015

Tiotropium evidence (3)
Medicines Evidence Commentary on Kerstjens et al studies Nov 2012

- “Longstanding severe, uncontrolled asthma (even in non-smokers) may result in airways remodelling and fixed airflow obstruction”
- “It would seem logical that if LAMAs are going to help anyone with asthma, it is most likely to be those with more severe disease and a pattern of illness and physiology more similar to that seen in COPD”
- “We should be careful not to extrapolate these benefits to patients without airflow obstruction”
- “Despite the lack of major adverse events in this study, we should be mindful of the cardiovascular safety concerns associated with tiotropium administered through the Respimat device, particularly in those with cardiac rhythm disorders. The role of LAMAs in those with milder asthma awaits investigation”

Prof Mike Thomas, Professor of Primary Care Research, University of Southampton and Chief Medical Advisor, Asthma UK
Pharmacological management: step 5 continuous or frequent use of oral steroids

- For the small number of patients not controlled at step 4, use daily steroid tablets in the lowest dose providing adequate control
- Prevention and treatment of steroid-induced side effects
  - blood pressure should be monitored
  - urine or blood sugar and cholesterol should be checked
  - bone mineral density should be monitored in adults and children older than 5
  - growth (height and weight centile) should be monitored in children
  - cataracts may be screened for in children through community optometric services

Other medications and potential steroid sparing treatments

- **Omalizumab** treatment should only be initiated in specialist centres with experience of evaluation and management of patients with severe and difficult asthma
- **Immunosuppressants** (methotrexate, ciclosporin and oral gold) may be given as a 3 month trial, once other drug treatments have proved unsuccessful
- **Bronchial thermoplasty** may be considered for the treatment of adult patients who have poorly controlled asthma despite optimal therapy
Omalizumab for treating severe persistent allergic asthma (review of TA133 and TA201)
NICE technology appraisal 278  April 2013

• Omalizumab is recommended as an option for treating severe persistent confirmed allergic IgE-mediated asthma as an add-on to optimised standard therapy [defined in TA] in people aged 6 years and older:
  – who need continuous or frequent treatment with oral corticosteroids (defined as 4 or more courses in the previous year), and
  – only if the manufacturer makes omalizumab available with the discount agreed in the patient access scheme

Pharmacological management: stepping down

• Stepping down therapy once asthma is controlled is recommended, but often not implemented leaving some patients overtreated
  – Regular review of patients as treatment is stepped down is important. When deciding which drug to step down first and at what rate, the severity of asthma, the side effects of the treatment, time on current dose, the beneficial effect achieved, and the patient’s preference should all be taken into account
  – Patients should be maintained at the lowest possible dose of inhaled corticosteroid. Reduction in ICS dose should be slow as patients deteriorate at different rates
  – Reductions should be considered every three months, decreasing the dose by approximately 25–50% each time
Pharmacological management: asthma attacks

• Doubling the dose of ICS at the time of an exacerbation is of unproven value
  – An RCT (Foresi A et al, 2000) investigated whether or not asthma exacerbations could be treated by a short-term increase in the daily dose of budesonide
  – The study showed that in adult patients on a low dose (200 micrograms BDP) of ICS, a fivefold increase in dose at the time of an asthma attack leads to a decrease in the severity of asthma attacks
  – This study cannot be extrapolated to patients already taking higher doses of ICS and further evidence in this area is required

• There is some limited evidence that leukotriene antagonists may be used intermittently in children with episodic asthma

Key recommendations

2.1 Diagnosis and monitoring
2.2 Supported self-management
2.3 Non-pharmacological management
2.4 Pharmacological management
2.5 Inhaler devices
2.6 Acute asthma
2.7 Difficult asthma
2.8 Asthma in pregnancy
2.9 Occupational asthma
Key recommendations: inhaler devices

- Prescribe inhalers only after patients have received training in the use of the device and have demonstrated satisfactory technique
- In children, pMDI and spacer are the preferred method of delivery of β2 agonists or ICS. A face mask is required until the child can breathe reproducibly using the spacer mouthpiece. Where this is ineffective a nebuliser may be required

NICE quality statement: inhaler devices

- NICE quality statement 4: People with asthma are given specific training and assessment in inhaler technique before starting any new inhaler treatment
Inhaler devices

• There is no evidence to dictate an order in which devices should be tested for those patients who cannot use pMDI
• In the absence of evidence, the most important points to consider are patient preference and local cost
• The choice of device may be determined by the choice of drug
• Prescribing mixed inhaler types may cause confusion and lead to increased errors in use. Using the same type of device to deliver preventer and reliever treatments may improve outcomes
  – But see NICE guidance on inhalers

NICE

Inhaler devices for routine treatment of chronic asthma in older children (aged 5–15 years)
NICE technology appraisal 38 (March 2002)

• A pMDI plus spacer is recommended as the first choice of inhaler for use with ICS in asthma
  – if a clinician believes that it is so unlikely that an individual child will use the MDI plus spacer properly that his or her asthma control may be affected, other inhalers should be considered
• For other inhaled medicines for asthma, such as bronchodilators, a wider range of inhalers should be considered
  – This recommendation takes into account that the child is more likely to have to carry this inhaler around with him or her so that it is available for use when needed

NICE
Key recommendations

2.1 Diagnosis and monitoring
2.2 Supported self-management
2.3 Non-pharmacological management
2.4 Pharmacological management
2.5 Inhaler devices

2.6 Acute asthma

2.7 Difficult asthma
2.8 Asthma in pregnancy
2.9 Occupational asthma

---

NICE

Key recommendations: acute asthma – adults

- Refer to hospital any patients with features of acute severe or life-threatening asthma
- Give supplementary oxygen to all hypoxaemic patients with acute severe asthma to maintain an SpO2 level of 94–98%
  - Lack of pulse oximetry should not prevent the use of oxygen
- Use high-dose inhaled β2 agonists as first line agents in patients with acute asthma and administer as early as possible
  - Reserve intravenous β2 agonists for those patients in whom inhaled therapy cannot be used reliably
- Give steroids in adequate doses in all cases of acute asthma attack

---

NICE
Key recommendations:
**acute asthma – children**

- **Children aged 2 years and over**
  - Children with life-threatening asthma or SpO2<94% should receive high flow oxygen via a tight fitting face mask or nasal cannula at sufficient flow rates to achieve normal saturations of 94–98%.
  - Inhaled β2 agonists are the first line treatment for acute asthma.
  - Give oral steroids early in the treatment of acute asthma attacks.

- **Children aged less than 2 years**
  - In infants, consider steroid tablets early in the management of severe asthma attacks in the hospital setting.

---

**Key recommendations:**
**acute asthma – all patients**

- It is essential that the patient’s primary care practice is informed within 24 hours of discharge from the emergency department or hospital following an asthma attack.
  - Ideally this communication should be directly with a named individual responsible for asthma care within the practice, by means of fax or email.
NICE quality statements: acute asthma

- **NICE quality statement 7**: People with asthma who present with an exacerbation of their symptoms receive an objective measurement of severity at the time of presentation
- **NICE quality statement 8**: People aged 5 years or older presenting to a healthcare professional with a severe or life-threatening acute exacerbation of asthma receive oral or intravenous steroids within 1 hour of presentation
- **NICE quality statement 10**: People who received treatment in hospital or through out-of-hours services for an acute exacerbation of asthma are followed up by their own GP practice within 2 working days of treatment

Lessons from asthma deaths and near-fatal asthma

- Most patients who died of asthma had chronically severe asthma
- Many of the deaths occurred in patients who had received inadequate treatment with ICS or steroid tablets and/or inadequate objective monitoring of their asthma
  - Follow up was inadequate in some and others should have been referred earlier for specialist advice
  - There was widespread underuse of written management plans
  - Heavy or increasing use of β2 agonist therapy was associated with asthma death
Asthma deaths: 
adverse psychosocial and behavioural factors

- Behavioural and adverse psychosocial factors were recorded in the majority of patients who died of asthma
  - learning difficulties, psychosis or prescribed antipsychotic drugs, financial/employment problems, repeated DNA or self-discharge, drug/alcohol abuse, obesity, previous near-fatal attack
- Healthcare professionals must be aware that patients with severe asthma and one or more adverse psychosocial factors are at risk of death
  - With near-fatal asthma it is advisable to involve a close relative when discussing future management
  - Keep patients who have had a near-fatal asthma attack under specialist supervision indefinitely

Key recommendations

2.1 Diagnosis and monitoring
2.2 Supported self-management
2.3 Non-pharmacological management
2.4 Pharmacological management
2.5 Inhaler devices
2.6 Acute asthma
2.7 Difficult asthma
2.8 Asthma in pregnancy
2.9 Occupational asthma
Key recommendations: 
difficult asthma

- Difficult asthma is defined as persistent symptoms and/or frequent asthma attacks despite treatment at step 4 or step 5
- Patients with difficult asthma should be systematically evaluated, including:
  - confirmation of the diagnosis of asthma, and
  - identification of the mechanism of persisting symptoms and assessment of adherence to therapy

NICE quality statement: 
difficult asthma

- NICE quality statement 11: People with difficult asthma are offered an assessment by a multidisciplinary difficult asthma service
Key recommendations

2.1 Diagnosis and monitoring
2.2 Supported self-management
2.3 Non-pharmacological management
2.4 Pharmacological management
2.5 Inhaler devices
2.6 Acute asthma
2.7 Difficult asthma

2.8 Asthma in pregnancy
2.9 Occupational asthma

Key recommendations: asthma in pregnancy

- Women should be advised of the importance of maintaining good control of their asthma during pregnancy to avoid problems for both mother and baby
- Counsel women with asthma regarding the importance and safety of continuing their asthma medications during pregnancy to ensure good asthma control
Key recommendations

2.1 Diagnosis and monitoring
2.2 Supported self-management
2.3 Non-pharmacological management
2.4 Pharmacological management
2.5 Inhaler devices
2.6 Acute asthma
2.7 Difficult asthma
2.8 Asthma in pregnancy
2.9 Occupational asthma

Key recommendations: occupational asthma

• In patients with adult onset, or reappearance of childhood asthma, healthcare professionals should consider that there may be an occupational cause

• Adults with airflow obstruction should be asked:
  – Are you better on days away from work?
  – Are you better on holiday?

• Those with positive answers should be investigated for occupational asthma
NICE quality statement: occupational asthma

• NICE quality statement 2: Adults with new onset asthma are assessed for occupational causes

Organisation and delivery of care: education

• There is strong evidence that educating clinicians can improve health outcomes for patients
• Training for primary care clinicians should include educational outreach visits using multifaceted programmes that include consultation training including goal setting
Organisation and delivery of care: 

asthma clinics

• In primary care, people with asthma should be reviewed regularly by a nurse or doctor with appropriate training in asthma management. Review should incorporate a written action plan
  – It is good practice to audit the percentage of patients reviewed annually
  – Consider focusing on particular groups such as those overusing bronchodilators, patients on higher treatment steps, those with asthma attacks or from groups with more complex needs

• Consider including psycho-educational interventions in clinics for adults and children with difficult asthma

Summary of SIGN 141

• Updated comprehensive review of asthma management
• Recommendations on organisational review may be challenging
• Multidisciplinary management tailored to the care of the individual
• Education of patient and healthcare professionals is key
Possible implementation issues for medicines optimisation

- Use of personalised asthma action plans, supported by regular professional review
  - Address adherence routinely and regularly.
  - Investigate high use of short-acting β2 agonist
- Safe and appropriate use of LABAs, ICS and tiotropium
- Good communication between primary and secondary care after asthma attacks
- Identification of people at high risk of death from asthma and targeted support tailored to their needs
Why asthma still kills
The National Review of Asthma Deaths (NRAD) May 2014

• Advancements in drug treatments, applied research and the development of evidence-based clinical guidelines have contributed to the reduction of deaths from asthma over the past 50 years

• Previous confidential enquiries have suggested that avoidable factors play a part in as many as three-quarters of cases of asthma deaths

• The primary aim of the NRAD was to understand the circumstances surrounding asthma deaths in the UK in order to identify avoidable factors and make recommendations to improve care and reduce the number of deaths

“As you read this report, do not forget that it concerns people who have died, many needlessly and many prematurely, leaving anguish and heartbreak for their loved ones. The best result from this report would be that its recommendations are implemented and a further review of asthma deaths will not be required, because fewer people die from the disease.”

Martyn R Partridge
Professor of Respiratory Medicine, Imperial College London
Why asthma still kills: key findings (1)
The National Review of Asthma Deaths (NRAD) May 2014

• During the final attack of asthma, 87 (45%) of the 195 people were known to have died without seeking medical assistance or before emergency medical care could be provided

• The majority of people who died from asthma (112, 57%) were not recorded as being under specialist supervision during the 12 months prior to death
  – Only 83 (43%) were managed in secondary or tertiary care during this period

Why asthma still kills: key findings (2)
The National Review of Asthma Deaths (NRAD) May 2014

• There was a history of previous hospital admission for asthma in 47% (90 of 190)

• Nineteen (10%) of the 195 died within 28 days of discharge from hospital after treatment for asthma

• At least 40 (21%) of the 195 people who died had attended a hospital emergency department with asthma at least once in the previous year and, of these, 23 had attended twice or more
Medical and professional care (1)
The National Review of Asthma Deaths (NRAD) May 2014

• Personal asthma action plans (PAAPs), acknowledged to improve asthma care, were known to be provided to only 44 (23%) of the 195 people who died from asthma

• There was no evidence that an asthma review had taken place in general practice in the last year before death for 84 (43%) of the 195 people who died

• Exacerbating factors, or triggers, were documented in the records of almost half (95) of patients; they included drugs, viral infections and allergy. A trigger was not documented in the other half

Medical and professional care (2)
The National Review of Asthma Deaths (NRAD) May 2014

• Of 155 patients for whom severity could be estimated, 61 (39%) appeared to have severe asthma
  – It is likely that many patients who were treated as having mild or moderate asthma had poorly controlled undertreated asthma, rather than truly mild or moderate disease

• The expert panels identified factors that could have avoided death in relation to the health professional’s implementation of asthma guidelines in 89 (46%) of the 195 deaths, including lack of specific asthma expertise in 34 (17%) and lack of knowledge of the UK asthma guidelines in 48 (25%)
Prescribing and medicines use
The National Review of Asthma Deaths (NRAD) May 2014

• Prescription information was available for most but not all people
• There was evidence of excessive prescribing of reliever medication
  – 65 people had been prescribed >12 short-acting reliever inhalers in the year before they died, while 6 had been prescribed >50
• There was evidence of under-prescribing or inappropriate prescribing of preventer medication
  – 49 people had <4 prescriptions in the year before they died
  – At least 5 people were on LABA monotherapy

Patient factors and perception of risk of poor control
The National Review of Asthma Deaths (NRAD) May 2014

• Factors that could have avoided the death related to patients, their families and the environment were identified in 126 (65%) of those who died
• These included
  – current tobacco smoking
  – exposure to second-hand smoke in the home
  – non-adherence to medical advice
  – non-attendance at review appointments.
• Poor recognition of risk of adverse outcome was an important avoidable factor in children and young people
Key recommendations
The National Review of Asthma Deaths (NRAD) May 2014

• Organisation of NHS services
• Medical and professional care
• Prescribing and medicines use
• Patient factors and perception of risk

Key recommendations:
Organisation of NHS services (1)
The National Review of Asthma Deaths (NRAD) May 2014

• Every NHS hospital and general practice should have a designated, named clinical lead for asthma services, responsible for formal training in the management of acute asthma
• Patients with asthma must be referred to a specialist asthma service if
  – They have required more than 2 courses of systemic corticosteroids, oral or injected, in the previous 12 months or
  – They require management using BTS stepwise treatment 4 or 5 to achieve control
Key recommendations:
Organisation of NHS services (2)
The National Review of Asthma Deaths (NRAD) May 2014

- Follow-up arrangements must be made after every attendance at an emergency department or out-of-hours service for an asthma attack
- Secondary care follow-up should be arranged after every hospital admission for asthma, and for patients who have attended the emergency department 2 or more times with an asthma attack in the previous 12 months

Key recommendations:
Organisation of NHS services (3)
The National Review of Asthma Deaths (NRAD) May 2014

- A standard national asthma template should be developed to facilitate a structured, thorough asthma review
- Electronic surveillance of prescribing in primary care should be introduced as a matter of urgency
  - To alert clinicians to patients being prescribed excessive quantities of short-acting reliever inhalers, or too few preventer inhalers
- A national ongoing audit of asthma should be established
Key recommendations:

**Medical and professional care (1)**
The National Review of Asthma Deaths (NRAD) May 2014

- All people with asthma should be provided with written guidance in the form of a personal asthma action plan (PAAP) that details their own triggers and current treatment, and specifies how to prevent relapse and when and how to seek help in an emergency
- People with asthma should have a structured review by a healthcare professional with specialist training in asthma, at least annually
  - People at high risk of severe asthma attacks should be monitored more closely, ensuring that their PAAPs are reviewed and updated at each review

---

**NICE**

Key recommendations:

**Medical and professional care (2)**
The National Review of Asthma Deaths (NRAD) May 2014

- Factors that trigger or exacerbate asthma must be elicited routinely and documented in the medical records and PAAPs of all people with asthma
- An assessment of recent asthma control should be undertaken at every asthma review
  - Where loss of control is identified, immediate action is required, including escalation of responsibility, treatment change and arrangements for follow-up
- Health professionals must be aware of the factors that increase the risk of asthma attacks and death
Key recommendations:
Prescribing and medicines use (1)
The National Review of Asthma Deaths (NRAD) May 2014

• All asthma patients who have been prescribed more than 12 short-acting reliever inhalers in the previous 12 months should be invited for urgent review of their asthma control, with the aim of improving their asthma through education and change of treatment if required
• An assessment of inhaler technique to ensure effectiveness should be routinely undertaken and formally documented at annual review, and also checked by the pharmacist when a new device is dispensed

Key recommendations:
Prescribing and medicines use (2)
The National Review of Asthma Deaths (NRAD) May 2014

• Non-adherence to preventer inhaled corticosteroids is associated with increased risk of poor asthma control and should be continually monitored
• The use of combination inhalers should be encouraged. LABA bronchodilators are prescribed for people with asthma, they should be prescribed with an inhaled corticosteroid in a single combination inhaler
Key recommendations:
Patient factors and perception of risk (1)
The National Review of Asthma Deaths (NRAD) May 2014

- Patient self-management should be encouraged to reflect their known triggers
  - Such as increasing medication before the start of the hay-fever season, avoiding NSAIDs or by the early use of oral corticosteroids with viral- or allergic-induced exacerbations
- A history of smoking and/or exposure to second-hand smoke should be documented in the medical records of all people with asthma
  - Current smokers should be offered referral to a smoking-cessation service.

Key recommendations:
Patient factors and perception of risk (2)
The National Review of Asthma Deaths (NRAD) May 2014

- Parents and children, and those who care for or teach them, should be educated about managing asthma
  - This should include emphasis on ‘how’, ‘why’ and ‘when’ they should use their asthma medications, recognising when asthma is not controlled and knowing when and how to seek emergency advice
- Efforts to minimise exposure to allergens and second-hand smoke should be emphasised, especially in young people with asthma