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Guideline

Asthma: diagnosis, monitoring and chronic asthma management

Draft for consultation, June 2024

This guideline covers diagnosing, monitoring and managing asthma in adults, young people and children. It aims to improve the accuracy of diagnosis, help people to control their asthma and reduce the risk of asthma attacks. It does not cover managing severe asthma or acute asthma attacks.

This is a new collaborative guideline produced by BTS, NICE and SIGN. It updates NICE guideline 80 (published November 2017) and parts of BTS/SIGN guideline (SIGN 158, published July 2019).

Who is it for?

- GPs and practice nurses
- Healthcare professionals in secondary care and tertiary asthma services
- Commissioners and providers
- People with suspected or diagnosed asthma, their families and carers

What does it include?

- the recommendations
- recommendations for research

- rationale and impact sections that explain why the committee made the 2024 recommendations and how they might affect practice
- the guideline context.

Information about how the guideline was developed is on the [guideline's webpage](#). This includes the evidence reviews, the scope, details of the committee and any declarations of interest.

New and updated recommendations

We have reviewed the evidence on the diagnosis, treatment and monitoring of asthma. You are invited to comment on the new and updated recommendations. These are marked as **[2024]**.

You are also invited to comment on:

- recommendations that we propose to delete from the 2017 and 2019 guidelines, and
- any recommendations marked with BTS/SIGN (with or without NICE; we have not reviewed the evidence for these).

We cannot accept comments on recommendations shaded in grey, and we have not reviewed the evidence for these. In some cases, we have made minor wording changes for clarification.

See [update information](#) for a full explanation of what is being updated.

Full details of the evidence and the committee's discussion on the 2024 recommendations are in the [evidence reviews](#). Evidence for the 2017 NICE recommendations is in the [full version](#) of the 2017 guideline, and evidence for the 2022 recommendation is in the [2020 evidence review](#). Evidence for the 2019 BTS/SIGN recommendations is in the [BTS/SIGN guideline](#).

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1 Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in [NICE's information on making decisions about your care](#). Information about decision making is also available from [Realistic medicine](#).

How we use words to show the strength (or certainty) of our recommendations, information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding is explained in [Making decisions using NICE guidelines](#) and [Using SIGN guidelines](#).

In this guideline, the NHS refers to NHS England and NHS Scotland unless stated otherwise.

2 1.1 Initial clinical assessment

3 Clinical history

4 1.1.1 Obtain a structured clinical history in people with suspected asthma.
5 Specifically, check for:

- 6 • reported wheeze, noisy breathing, cough, breathlessness or chest
- 7 tightness, and any variation (for example, daily or seasonal) in these
- 8 symptoms
- 9 • any triggers that make symptoms worse
- 10 • a personal or family history of [atopic disorders](#)
- 11 • symptoms to suggest alternative diagnoses. **[NICE 2017, BTS/SIGN**
- 12 **2019]**

13 1.1.2 **Do not confirm a diagnosis of asthma without a suggestive clinical history**
14 **and a supporting objective test. [NICE 2017, amended 2024]**

15 1.1.3 Record the basis for a diagnosis of asthma in the person's medical
16 records, alongside the coded diagnostic entry. **[BTS/SIGN 2019]**

1 Physical examination

2 1.1.4 Examine people with suspected asthma to identify expiratory polyphonic
3 wheeze and signs of other causes of respiratory symptoms, but be aware
4 that even if examination results are normal, the person may still have
5 asthma. **[NICE 2017]**

6 Initial treatment and objective tests for acute symptoms at presentation

7 1.1.5 Treat people immediately if they are acutely unwell at presentation, and
8 perform objective tests for asthma (for example, eosinophil count,
9 fractional exhaled nitric oxide [FeNO], spirometry or **peak flow with**
10 **bronchodilator reversibility) if the equipment is available. [NICE 2017,**
11 **amended 2024]**

12 1.1.6 If objective tests for asthma cannot be done immediately for people who
13 are acutely unwell at presentation, carry them out when acute symptoms
14 have been controlled, and advise people to contact their healthcare
15 professional immediately if they become unwell while waiting to have
16 objective tests. **[NICE 2017]**

17 1.1.7 Be aware that the results of spirometry and [FeNO tests](#) may be affected in
18 people who have been treated with inhaled corticosteroids. **[NICE 2017]**

19 1.2 Objective tests for diagnosing asthma in adults, young 20 people and children aged 5 to 16

21 Adults

22 1.2.1 Measure the blood eosinophil count or FeNO level in adults with a history
23 suggestive of asthma. Diagnose asthma if the eosinophil count is above
24 the laboratory reference range or the FeNO level is 50 ppb or more.
25 **[2024]**

26 1.2.2 If asthma is not confirmed by eosinophil count or FeNO level, measure
27 [bronchodilator reversibility](#) (BDR) with spirometry. Diagnose asthma if
28 reversibility is greater than 12% from baseline and greater than 200 ml (or
29 greater than 10% of predicted normal). **[2024]**

1 1.2.3 If asthma is not confirmed by eosinophil count, FeNO or BDR but still
2 suspected on clinical grounds, measure bronchial responsiveness.
3 Diagnose asthma if [bronchial hyper-responsiveness](#) is present. **[2024]**

4 **Children aged 5 to 16**

5 1.2.4 Measure the FeNO level in children with a history suggestive of asthma.
6 Diagnose asthma if the FeNO level is more than 35 ppb. **[2024]**

7 1.2.5 If the FeNO level is not raised, or if FeNO is not available, measure BDR.
8 Diagnose asthma if BDR is greater than 12% from baseline (or greater
9 than 10% of predicted normal). **[2024]**

10 1.2.6 If asthma is not confirmed by FeNO or BDR but still suspected on clinical
11 grounds, either perform [skin prick testing](#) to house dust mite or measure
12 IgE level and eosinophil count.

- 13 • Exclude asthma if there is no evidence of sensitisation to house dust
14 mite on skin prick testing or if the total serum IgE is not raised.
- 15 • Diagnose asthma if there is evidence of sensitisation or a raised IgE
16 level and the eosinophil count is more than 0.5×10^9 per litre. **[2024]**

17 1.2.7 If there is still doubt about the diagnosis, refer to a paediatric respiratory
18 specialist for a second opinion, including consideration of a [bronchial](#)
19 [challenge test](#). **[2024]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on objective tests for diagnosing asthma in adults, young people and children aged 5 to 16](#).

Full details of the evidence and the committee's discussion are in [evidence review A: accuracy and clinical and cost-effectiveness of spirometry for diagnosis of asthma](#), [evidence review B: accuracy and clinical and cost-effectiveness of bronchodilator response in the diagnosis of asthma](#), [evidence review C: accuracy and clinical and cost-effectiveness of peak expiratory flow in the diagnosis of asthma](#), [evidence review D: accuracy and clinical and cost-effectiveness of skin prick test in children for diagnosis of asthma](#), [evidence review E: accuracy and](#)

[clinical and cost-effectiveness of serum IgE measures in diagnosing asthma in children](#), [evidence review F: accuracy and clinical and cost-effectiveness of FeNO in the diagnosis of asthma](#), [evidence review G: accuracy and clinical and cost-effectiveness of eosinophil blood count measures in the diagnosis of asthma](#), [evidence review H: accuracy and clinical and cost-effectiveness of histamine and methacholine in the diagnosis of asthma](#), [evidence review I: accuracy and clinical and cost-effectiveness of bronchial challenge testing \(indirect\) with mannitol in diagnosing asthma](#), [evidence review J: accuracy and clinical and cost-effectiveness of bronchial challenge testing in response to exercise in diagnosis of asthma](#) and [evidence review K: accuracy and clinical and cost-effectiveness of combination tests for diagnosis in people with suspected asthma](#).

1.3 Diagnosing asthma in children under 5

Diagnosis is hard in this age group because it is difficult to do the tests and there are no good reference standards.

1.3.1 For children under 5 with suspected asthma, treat based on clinical judgement (follow the [recommendations on medicines for initial management in children under 5](#)) and review the child on a regular basis. If they still have symptoms when they reach 5 years, attempt objective tests (see the section on objective tests for diagnosing asthma in adults, young people and children aged 5 to 16). **[NICE 2017]**

1.3.2 If a child is unable to perform objective tests when they are aged 5:

- continue to treat based on observation and clinical judgement
- try doing the tests again every 6 to 12 months until satisfactory results are obtained
- refer for specialist assessment if the child's asthma is not responding to treatment. **[NICE 2017, BTS/SIGN 2019, amended 2024]**

1.4 Diagnosing occupational asthma

See the [BTS clinical statement on occupational asthma](#).

1 1.4.1 In people with adult-onset asthma, poorly controlled established asthma,
2 or reappearance of childhood asthma, check for a possible occupational
3 component by asking:

- 4 • Are symptoms the same, better or worse on days away from work?
- 5 • Are symptoms the same, better or worse when on holiday (time away
6 from work, longer than usual breaks, at weekends or between shifts)?

7
8 Make sure all answers are recorded for later review. **[NICE 2017,**
9 **BTS/SIGN 2019]**

10 1.4.2 Refer people with suspected occupational asthma to an occupational
11 asthma specialist. **[NICE 2017]**

12 **1.5 Monitoring asthma control**

13 1.5.1 Monitor [asthma control](#) at every review. In addition to asking about
14 symptoms, check:

- 15 • time off work or school due to asthma
- 16 • amount of reliever inhaler used
- 17 • number of courses of oral corticosteroids
- 18 • active or passive exposure to smoking. **[2024]**

19 1.5.2 Consider using a validated symptom questionnaire (for example, the
20 Asthma Control Questionnaire or the Asthma Control Test) to assess
21 asthma control in adults at annual review. **[2024]**

22 1.5.3 Do not use regular peak expiratory flow (PEF) monitoring to assess
23 asthma control unless there are person-specific reasons for doing so.
24 **[2024]**

25 1.5.4 Consider FeNO monitoring for people with asthma:

- 26 • at their regular review, **and**
- 27 • before and after changing their asthma therapy. **[2024]**

28 1.5.5 If control is suboptimal:

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- confirm the person's adherence to prescribed treatment in line with the [recommendations on assessing adherence in the NICE guideline on medicines adherence](#)
 - review the person's inhaler technique
 - review if treatment needs to be changed
 - ask about triggers including work-related symptoms (see the [recommendation on checking for possible occupational asthma](#)) [NICE 2017]

9

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on monitoring asthma control](#).

Full details of the evidence and the committee's discussion are in [evidence review L: symptoms scores/diaries or validated questionnaires measuring symptom control to monitor asthma](#), [evidence review M: pulmonary function: spirometry or peak expiratory flow to monitor asthma](#) and [evidence review N: FeNO measures to monitor asthma](#).

10 **1.6 Principles of pharmacological treatment**

11 Licensed indications for asthma inhalers vary between different medicines, different
12 doses and different devices. Not all asthma inhalers are licensed for use in line with
13 the recommendations in this guideline. [See NICE's information on prescribing](#)
14 [medicines](#) and refer to the summary of product characteristics for individual
15 products.

16 1.6.1 Take into account and try to address the possible reasons for [uncontrolled](#)
17 [asthma](#) before starting or adjusting medicines for asthma in adults, young
18 people and children. These may include:

- 19
- 20
- 21
- alternative or additional diagnoses (for example, obesity)
 - lack of adherence (see the [recommendation on adherence](#))
 - suboptimal inhaler technique

- 1 • smoking (active or passive), including vaping using e-cigarettes
- 2 • occupational exposures
- 3 • psychosocial factors (for example, anxiety and depression,
- 4 relationships and social networks)
- 5 • seasonal factors
- 6 • environmental factors (for example, air pollution, indoor mould
- 7 exposure). **[NICE 2017, BTS/SIGN 2019, amended 2024]**

8 1.6.2 Do not prescribe short-acting beta₂ agonists to people of any age with
9 asthma without a concomitant prescription of an inhaled corticosteroid
10 (ICS). **[2024]**

11 1.6.3 After starting or adjusting medicines for asthma, review the response to
12 treatment in **8 to 12 weeks** (see the recommendations on monitoring
13 [asthma control](#)). **[NICE 2017, amended 2024]**

For a short explanation of why the committee made this 2024 recommendation and how it might affect practice, see the [rationale and impact section on principles of pharmacological treatment](#).

Full details of the evidence and the committee's discussion are in [evidence review P: pharmacological management of asthma in people who are treatment-naïve or receiving SABA-only](#).

14 Inhalers

15 1.6.4 Base the choice of inhaler(s) for asthma on:

- 16 • an assessment of correct technique
- 17 • the lowest environmental impact among suitable devices
- 18 • the preference of the person receiving the treatment.

19
20 See the [patient decision aid on asthma inhalers and climate change](#).
21 **[BTS/SIGN 2019, amended 2024]**

1 1.6.5 Give people with asthma information on their inhaler treatments. This
2 should include the medicines they contain, how they work, when they
3 should be taken and the correct technique to use for each device.

4 **[BTS/SIGN 2019, amended 2024]**

5 1.6.6 Observe the person using their inhaler device (and spacer if used) to
6 check they can use it properly:

- 7
- 8 • at every asthma review, either routine or unscheduled
 - 9 • at every consultation
 - 10 • when there is deterioration in asthma control
 - 11 • when the inhaler device is changed (for example, when a person
12 switches to a generic device)
 - 13 • when the person asks for it to be checked or changed.

13 If the person is assessed as being unable to use a device properly, find an
14 alternative. **[NICE 2017, BTS/SIGN 2019, amended 2024]**

15 1.6.7 Prescribe the same type of device to deliver preventer and reliever
16 treatments where more than one inhaler is needed. **[BTS/SIGN 2019,
17 amended 2024]**

18 1.6.8 Encourage people to take their used inhalers to their pharmacy for
19 disposal. **[BTS/SIGN 2019, amended 2024]**

20 **Digital inhalers**

21 1.6.9 Digital inhalers are not recommended for routine use in people with
22 asthma. However, they may be used in individual cases based on clinical
23 judgement, for example where poor adherence to maintenance therapy is
24 suspected or when the need for biologic therapy is being considered.
25 **[2024]**

For a short explanation of why the committee made this 2024 recommendation and how it might affect practice, see the [rationale and impact section on digital inhalers](#).

Full details of the evidence and the committee's discussion are in [evidence review R: smart preventer/maintenance inhalers for the management of asthma](#).

1 **1.7 Pharmacological management in people aged 12 and over**

2 **Initial management of newly diagnosed asthma in people aged 12 and** 3 **over**

4 1.7.1 Offer a low-dose ICS/formoterol combination inhaler to be taken as
5 needed for symptom relief to people aged 12 and over with newly
6 diagnosed asthma. **[2024]**

7 In June 2024, only certain ICS/formoterol inhalers were licensed for
8 reliever therapy in mild asthma. The use of any other ICS/formoterol
9 inhalers would therefore be off-label. See [NICE's information on](#)
10 [prescribing medicines](#) or [SIGN's information on prescribing licensed](#)
11 [medicines outwith their marketing authorisation](#).

12 1.7.2 If the person needing asthma treatment presents highly symptomatic (for
13 example, regular nocturnal waking) or with a severe exacerbation, start
14 treatment with low-dose MART ([maintenance and reliever therapy](#)).
15 Consider stepping down to a low-dose ICS/formoterol combination inhaler
16 used only as needed for symptom relief at a later date if their asthma is
17 controlled. **[2024]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on medicines for initial management of newly diagnosed asthma in people aged 12 and over](#).

Full details of the evidence and the committee's discussion are in [evidence review P: pharmacological management of asthma in people who are treatment-naïve or receiving SABA-only](#).

1 **Medicine combination and sequencing for newly diagnosed asthma in**
2 **people aged 12 and over**

3 1.7.3 Offer low-dose MART to people aged 12 and over with asthma that is not
4 controlled on a low-dose ICS/formoterol combination inhaler used only as
5 needed. **[2024]**

6 1.7.4 Offer moderate-dose MART to people aged 12 and over with asthma that
7 is not controlled on low-dose MART. **[2024]**

8 1.7.5 Consider adding a [leukotriene receptor antagonist](#) (LTRA) to moderate-
9 dose MART for people aged 12 and over with asthma that is not
10 controlled on moderate-dose MART alone. Give the LTRA for a minimum
11 trial period of 3 months (unless there are side-effects) and then stop it if it
12 is ineffective. **[2024]**

13 1.7.6 Consider adding a [long-acting muscarinic receptor antagonist](#) (LAMA) to
14 moderate-dose MART plus an LTRA, or to moderate-dose MART alone if
15 an LTRA has proved ineffective, for adults with asthma that is not
16 controlled on current treatment. Give the LAMA for a minimum trial period
17 of 3 months (unless there are side-effects) and then stop it if it is
18 ineffective. **[2024]**

19 1.7.7 Refer people to a specialist in asthma care when asthma is not controlled
20 despite treating with moderate dose ICS, LABA ([long-acting beta₂](#)
21 [agonist](#)), LTRA and a LAMA. **[2024]**.

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on medicine combination and sequencing for newly diagnosed asthma in people aged 12 and over](#).

Full details of the evidence and the committee's discussion are in [evidence review Q: drug combinations and sequencing for asthma management](#).

1 **Transferring people from other treatment pathways**

2 These recommendations are for people with uncontrolled asthma who are on the
3 treatment pathway recommended by previous NICE and BTS/SIGN guidelines.

4 1.7.8 Consider changing treatment for people with confirmed asthma who are
5 currently using a short-acting beta₂ agonist (SABA) only to a low-dose
6 ICS/formoterol combination inhaler used as needed. **[2024]**

7 1.7.9 Consider changing treatment to low-dose MART for people with asthma
8 that is not controlled on:

- 9 • regular low-dose ICS plus SABA as needed
- 10 • regular low-dose ICS/LABA combination inhaler plus SABA as needed
- 11 • regular low-dose ICS and supplementary therapy (LTRA and/or LAMA)
12 plus SABA as needed.
- 13 • regular low-dose ICS/LABA combination inhaler and supplementary
14 therapy (LTRA and/or LAMA) plus SABA as needed. **[2024]**

15 1.7.10 Consider changing treatment to moderate-dose MART for people with
16 asthma that is not controlled on:

- 17 • regular moderate dose ICS plus SABA as needed
- 18 • regular moderate dose ICS/LABA combination inhaler plus SABA as
19 needed
- 20 • regular moderate dose ICS and supplementary therapy (LTRA and/or
21 LAMA) plus SABA as needed
- 22 • regular moderate dose ICS/LABA combination inhaler and
23 supplementary therapy (LTRA and/or LAMA) plus SABA as needed.
24 **[2024]**

25 1.7.11 When changing from low- or moderate-dose ICS (or ICS/LABA
26 combination inhaler) plus supplementary therapy to MART, consider
27 whether to stop or continue the supplementary therapy based on the
28 degree of benefit achieved when first introduced. **[2024]**

- 1 1.7.12 Refer people with asthma that is not controlled on high dose ICS to a
2 specialist in asthma care. **[2024]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on transferring people aged 12 and over from other treatment pathways](#).

Full details of the evidence and the committee's discussion are in [evidence review P: pharmacological management of asthma in people who are treatment-naïve or receiving SABA-only](#) and [evidence review Q: drug combinations and sequencing for asthma management](#).

3 **1.8 Pharmacological management in children aged 5 to 11**

4 **Initial management in children aged 5 to 11**

- 5 1.8.1 Offer a twice-daily paediatric low-dose inhaled corticosteroid (ICS), with a
6 short-acting beta₂ agonist (SABA) as needed, as initial treatment for
7 children aged 5 to 11 years with newly diagnosed asthma. **[2024]**

For a short explanation of why the committee made this recommendation and how it might affect practice, see the [rationale and impact section on medicines for initial management in children aged 5 to 11](#).

Full details of the evidence and the committee's discussion are in [evidence review P: pharmacological management of asthma in people who are treatment-naïve or receiving SABA-only](#).

8 **Medicine combination and sequencing in children aged 5 to 11**

9 ***MART pathway***

- 10 1.8.2 Consider paediatric low-dose MART (maintenance and reliever therapy)
11 for children with asthma that is not controlled on paediatric low-dose ICS
12 plus SABA as needed, as long as they are assessed to have the ability to
13 manage a MART regimen. **[2024]**

1 In June 2024, no asthma inhalers were licensed for MART use in children
2 under 12, so this use would be off-label. See [NICE's information on](#)
3 [prescribing medicines](#) or [SIGN's information on prescribing licensed](#)
4 [medicines outwith their marketing authorisation](#).

5 1.8.3 Consider increasing to paediatric moderate-dose MART if asthma is not
6 controlled on paediatric low-dose MART. **[2024]**

7 ***Non-MART pathway***

8 1.8.4 Consider adding a leukotriene receptor antagonist (LTRA) to twice daily
9 paediatric low-dose ICS plus SABA as needed when a child has
10 uncontrolled asthma and is assessed as unable to manage the MART
11 regimen. Give the LTRA for a trial period of 3 months (unless there are
12 side-effects), then stop it if it is ineffective. **[2024]**

13 1.8.5 Offer a twice daily paediatric low-dose ICS/LABA combination inhaler plus
14 SABA as needed to children assessed as unable to manage the MART
15 regimen if their asthma is not controlled on paediatric low-dose ICS plus
16 SABA as needed (with or without an LTRA depending on previous
17 response). **[2024]**

18 1.8.6 Offer a twice daily paediatric moderate dose ICS/LABA inhaler plus SABA
19 as needed to children with asthma that is not controlled on paediatric low-
20 dose ICS/LABA plus SABA as needed (with or without an LTRA
21 depending on previous response). **[2024]**

22 ***All children aged 5 to 11***

23 1.8.7 Refer children to a specialist in asthma care if their asthma is not
24 controlled on paediatric moderate dose MART or paediatric moderate
25 dose ICS/LABA maintenance treatment. **[2024]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on medicine combination and sequencing in children aged 5 to 11](#).

Full details of the evidence and the committee's discussion are in [evidence review Q: drug combinations and sequencing for asthma management](#).

1 **1.9 Medicines for management in children under 5**

2 These recommendations are for children under 5 with newly suspected or confirmed
3 asthma, or with asthma symptoms that are uncontrolled on their current treatment.

4 1.9.1 Consider an 8-12 week trial of twice-daily paediatric low dose inhaled
5 corticosteroid (ICS) as maintenance therapy (with a short-acting beta₂
6 agonist [SABA] for reliever therapy) in children under 5 with suspected
7 asthma and:

- 8 • symptoms at presentation that indicate the need for maintenance
9 therapy (for example, interval symptoms in children with another atopic
10 disorder), **or**
- 11 • severe acute episodes of difficulty breathing and wheeze (for example,
12 requiring hospital admission). **[2024]**

13 1.9.2 If symptoms do not resolve during the trial period, take the following
14 sequential steps:

- 15 • check inhaler technique and adherence
- 16 • check whether there is an environmental source of their symptoms (for
17 example mould in the home, cold housing, smokers or pets)
- 18 • review whether an alternative diagnosis is likely.

19
20 If none of these explain the failure to respond to treatment, refer the
21 child to a specialist in asthma care. **[2024]**

22 1.9.3 Consider stopping ICS and SABA treatment after 8-12 weeks if symptoms
23 are resolved. Review the symptoms after a further 3 months. **[2024]**

24 1.9.4 If symptoms resolve during the trial period, but then:

- 25 • symptoms recur by the 3-month review, **or**

- 1 • the child has an acute episode requiring systemic steroids or
2 hospitalisation.

3
4 Restart regular ICS (begin at a paediatric low dose and titrate up to a
5 paediatric moderate dose if needed) with SABA as needed and
6 consider a further trial without treatment after reviewing the child within
7 12 months. **[2024]**

8 1.9.5 If suspected asthma is uncontrolled in children under 5 on a paediatric
9 moderate dose of ICS as maintenance therapy (with SABA as needed),
10 consider a leukotriene receptor antagonist (LTRA) in addition to the
11 ICS. Give the LTRA for a trial period of 3 months (unless there are side-
12 effects), then stop it if it is ineffective **[2024]**

13 1.9.6 If suspected asthma is uncontrolled in children under 5 on a paediatric
14 moderate dose of ICS and an LTRA as maintenance therapy, stop the
15 LTRA and refer the child to a specialist in asthma care for further
16 investigation and management. **[2024]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the [rationale and impact section on medicines for management in children under 5](#).

Full details of the evidence and the committee's discussion are in [evidence review P: pharmacological management of asthma in people who are treatment-naïve or receiving SABA-only](#).

17 **1.10 Decreasing maintenance therapy**

18 1.10.1 At annual review discuss with the person with asthma (or their family or
19 carer, if appropriate) the potential risks and benefits of decreasing their
20 maintenance therapy when their asthma has been well controlled on their
21 current maintenance therapy. **[NICE 2017, BTS/SIGN 2019, amended**
22 **2024]**

23 1.10.2 When reducing maintenance therapy:

- 1 • Stop or reduce dose of medicines in an order that takes into account
- 2 the clinical effectiveness when introduced, side effects and the person's
- 3 preference.
- 4 • If considering step down treatment for people who are using low dose
- 5 inhaled corticosteroid alone or low dose MART (maintenance and
- 6 reliever therapy), step down to low dose ICS/formoterol combination
- 7 inhaler as needed. **[NICE 2017, BTS/SIGN 2019, amended 2024]**

8 1.10.3 Agree with the person (or their family or carer if appropriate) how the
9 effects of decreasing maintenance therapy will be monitored and
10 reviewed, including self-monitoring and follow-up with a healthcare
11 professional. **[NICE 2017]**

12 1.10.4 Review and update the person's asthma action plan when decreasing
13 maintenance therapy. **[NICE 2017]**

14 **1.11 Adherence**

15 1.11.1 Check adherence, using prescription records, and inhaler technique at
16 every asthma-related healthcare review. Use the principles outlined in the
17 [NICE guidelines on shared decision making](#) (endorsed by SIGN for use in
18 Scotland) and [medicines adherence](#). **[NICE 2017, BTS/SIGN 2019]**

19 **1.12 Asthma in pregnancy**

20 For recommendations on intrapartum care, see the [NICE guideline on intrapartum](#)
21 [care for women with existing medical conditions or obstetric complications and their](#)
22 [babies](#).

23 **Pregnancy**

24 1.12.1 People with asthma should have an asthma review during early
25 pregnancy and in the postpartum period. Emphasise the importance and
26 safety of maintaining good control of asthma during pregnancy and of
27 continuing asthma medicines to avoid problems for themselves and their
28 baby. **[BTS/SIGN 2019]**

1 1.12.2 Advise anyone who is pregnant and who smokes about the dangers for
2 themselves and their babies and give appropriate support to stop
3 smoking. See the [NICE guideline on tobacco](#) for more information.

4 **[BTS/SIGN 2019]**

5 1.12.3 Advise using the following medicines as normal during pregnancy:

- 6 • short-acting and long-acting beta-agonists
- 7 • inhaled corticosteroids
- 8 • oral theophyllines. **[BTS/SIGN 2019]**

9 1.12.4 Offer oral corticosteroids during pregnancy if needed to treat
10 exacerbations of asthma. Advise that the benefits of treatment with oral
11 corticosteroids outweigh the risks. **[BTS/SIGN 2019, amended 2024]**

12 1.12.5 If leukotriene receptor antagonists or long-acting muscarinic receptor
13 antagonists are needed to achieve asthma control, they should not be
14 stopped during pregnancy. **[BTS/SIGN 2019, amended 2024]**

15 **1.13 Asthma in adolescents**

16 For guidance on transitioning to adult services, see the [NICE guideline on transition](#)
17 [from children's to adults' services for young people using health or social care](#)
18 [services](#) and the [Scottish Parliament Information Centre briefing on transitions of](#)
19 [young people with service and care needs between child and adult services in](#)
20 [Scotland](#).

21 1.13.1 Discuss future career choices with adolescents with asthma and highlight
22 occupations that might increase susceptibility to work-related asthma
23 symptoms. **[BTS/SIGN 2019]**

24 1.13.2 Ask adolescents with asthma if they vape or smoke. Encourage them to
25 stop, give them advice and signpost them to local NHS stop smoking
26 services. **[BTS/SIGN 2019, amended 2024]**

27 1.13.3 Ask about factors that may affect a person's use of their inhaler device in
28 real life settings, such as school and social situations. **[BTS/SIGN 2019]**

1 **1.14 Self-management**

2 1.14.1 For adults, young people and children aged 5 and over with a diagnosis of
3 asthma (and their families or carers, if appropriate):

- 4 • Offer an asthma self-management programme, comprising a
5 documented personalised action plan and education. In adults, they
6 may be based on symptoms and/or peak flows: symptom-based plans
7 are usually preferred for children.
- 8 • Explain that pollution can trigger asthma symptoms and exacerbations,
9 and include in the personalised action plan approaches for minimising
10 exposure to indoor and outdoor air pollution. For more guidance on
11 how to minimise exposure and the effect of air pollution on health, see
12 the recommendations on:
 - 13 – vulnerable groups in the [NICE guideline on air pollution: outdoor air](#)
14 [quality and health](#)
 - 15 – people with asthma, other respiratory conditions or cardiovascular
16 conditions in the [NICE guideline on indoor air quality at home](#) and
17 – smoking in the [NICE guideline on tobacco](#). **[NICE 2017, amended**
18 **2021; BTS/SIGN 2019]**

19 1.14.2 Review self-management plans during:

- 20 • hospital admission, including virtual wards – ensure the person has a
21 written personalised asthma action plan and check inhaler technique
- 22 • acute consultations in primary care or emergency department
- 23 • annual reviews. **[BTS/SIGN 2019, amended 2024]**

24 1.14.3 Consider an asthma self-management programme, comprising a written
25 personalised action plan (including approaches to minimising exposure to
26 indoor and outdoor air pollution) and education, for the families or carers
27 of children under 5 with suspected or confirmed asthma. **[NICE 2017,**
28 **amended 2021]**

29 1.14.4 For adults (aged 17 and over) who are using an ICS in a single inhaler,
30 offer an increased dose of ICS for 7 days, within a self-management

1 programme, when asthma control deteriorates. Clearly outline in the
2 person's asthma action plan how and when to do this, and what to do if
3 symptoms do not improve.

4
5 When increasing ICS treatment:

- 6 • consider quadrupling the regular ICS dose
- 7 • do not exceed the maximum licensed daily dose. **[NICE 2017]**

8 1.14.5 **Include** advice in self-management programmes on contacting a
9 healthcare professional for a review if asthma control deteriorates (see the
10 recommendations on monitoring asthma control). **[NICE 2020, amended**
11 **2024]**

12 1.14.6 When implementing self-management interventions in primary care, take
13 into account strategies to aid this, which could include:

- 14 • the use of proactive alerts to ensure routine reviews
- 15 • structured protocols for asthma reviews
- 16 • support from pharmacists
- 17 • mailing/emailing of educational resources
- 18 • telephone calls to provide ongoing support and advice
- 19 • IT-based education and monitoring
- 20 • involvement of community workers to support clinical teams in deprived
21 and/or ethnic minority communities. **[BTS/SIGN 2019]**

22 1.14.7 Schools and health services should work together to provide in-school
23 asthma self-management education programmes provided by
24 appropriately trained personnel. **[BTS/SIGN 2019]**

25 1.14.8 Provide self-management education in line with the recommendations on
26 education programmes in the [section on enabling patients to actively](#)
27 [participate in their care in the NICE guideline on patient experience in](#)
28 [adult NHS services](#). **[BTS/SIGN 2019, amended 2024]**

For a short explanation of why the committee made the 2020 recommendation on self-management and how it might affect practice, see the [rationale and impact section on self-management](#).

Full details of the evidence and the committee's discussion are in [evidence review A from NG80: increasing ICS treatment within supported self-management for children and young people](#).

1 **1.15 Risk-stratified care**

2 1.15.1 Consider actively identifying people with asthma who are at risk of poor
3 outcomes and tailor care to their needs. Risk factors should include:

- 4
- non-adherence to medication
 - over-use of SABA inhalers
 - repeated episodes of unscheduled care for asthma. **[2024]**
- 6

For a short explanation of why the committee made this recommendation and how it might affect practice, see the [rationale and impact section on risk-stratified care](#).

Full details of the evidence and the committee's discussion are in [evidence review O: risk stratified care for people with asthma](#).

7 **1.16 Organisation and delivery of care**

8 1.16.1 In primary care, people with asthma should be reviewed at least annually
9 by a healthcare professional with appropriate training in asthma
10 management. The review should incorporate a written personalised action
11 plan. **[BTS/SIGN 2019, amended 2024]**

12 1.16.2 Think about telehealthcare as an option for supporting self-management.
13 **[BTS/SIGN 2019]**

14 1.16.3 Think about computerised decision support systems for patient use to
15 support self-management. **[BTS/SIGN, 2019]**

1 **Terms used in this guideline**

2 This section defines terms that have been used in a particular way for this guideline.

3 **Asthma control**

4 Complete control of asthma is defined as no daytime symptoms, no night-time
5 awakening due to asthma, no asthma attacks, no need for rescue medication, no
6 limitations on activity including exercise, normal lung function (in practical terms
7 forced expiratory volume in 1 second [[FEV₁](#)] and/or peak expiratory flow [PEF] more
8 than 80% predicted or best), and minimal side-effects from treatment.

9 **Atopic disorders**

10 Allergic conditions including allergic rhinitis (hay fever), atopic dermatitis (eczema),
11 allergic asthma and other specific and non-specific allergic conditions such as food
12 allergies.

13 **Bronchial challenge test**

14 A test to measure airway responsiveness.

15 **Bronchial hyper-responsiveness**

16 A measure of how easily bronchospasm can be induced in the airways.

17 **Bronchodilator reversibility**

18 A measure of the ability to reverse obstruction in the airways using medicines that
19 widen the airways (bronchodilators).

20 **FeNO test**

21 A test that measures the amount of nitric oxide (NO) present on exhalation, usually
22 expressed in parts per billion.

23 **FEV₁**

24 The amount of air that can be forcibly exhaled from the lungs in one second (forced
25 expiratory volume in one second).

1 **Leukotriene receptor antagonist**

2 A type of oral medicine that blocks cysteinyl leukotrienes, used in the treatment of
3 asthma and seasonal allergies. Also known as leukotriene modifiers.

4 **Long-acting beta₂ agonist**

5 A long-acting medicine that acts on beta-receptors in the airway to relax airway
6 smooth muscle and relieve symptoms of asthma.

7 **Long-acting muscarinic receptor antagonist**

8 A long-acting medicine that acts on muscarinic receptors in the airway to relax
9 airway smooth muscle and relieve symptoms of asthma.

10 **Maintenance and reliever therapy (MART)**

11 A form of combined ICS + LABA treatment in which a single inhaler, containing both
12 ICS and a fast-acting LABA, is used for both daily maintenance therapy and the relief
13 of symptoms as needed. The terms low dose and moderate dose MART refer to the
14 dosage of the maintenance component of MART.

15 **Peak expiratory flow (PEF) variability**

16 A measure of the maximum speed of expiration, generally expressed in litres per
17 minute. PEF variability is a measure of the extent to which this varies over time.

18 **Skin prick testing**

19 A test that measures the allergic response of an individual to certain specific
20 allergens when a very small amount of the specific allergen is introduced into the
21 skin (usually the inner forearm).

22 **Uncontrolled asthma**

23 A term used when asthma is having an impact on a person's lifestyle, or is restricting
24 their normal activities, because of symptoms such as coughing, wheezing, shortness
25 of breath and chest tightness. Uncontrolled asthma can include one or both of:

- 26
- Any asthma exacerbation requiring treatment with oral corticosteroids
 - Frequent regular symptoms such as needing a reliever inhaler 3 or more days per
27 week, or having 1 or more nights per week when asthma causes night-time
28

1 waking. These can be quantified by questionnaires such as the Asthma Control
2 Questionnaire or Asthma Control test.

3 **Recommendations for research**

4 The guideline committee has made the following recommendations for research.

5 **Key recommendations for research**

6 **1 Medicines for initial management**

7 What is the clinical and cost-effectiveness of regular ‘fixed-dose’ inhaled
8 corticosteroid (ICS) regimens (using SABA as a reliever) compared with ‘as-needed’
9 strategies (for example ICS/formoterol) as the initial standard treatment for asthma in
10 children age 5-11 years? **[2024]**

For a short explanation of why the committee made this recommendation for research, see the [rationale and impact section on medicines for initial management in children aged 5 to 11](#).

Full details of the evidence and the committee’s discussion are in [evidence review P: pharmacological management of asthma in people who are treatment-naïve or receiving SABA-only](#).

11 **2 Medicine combination and sequencing**

12 What is the best step-up treatment for people whose asthma is not controlled on a
13 combination inhaler of inhaled corticosteroid plus formoterol used as needed? **[2024]**

For a short explanation of why the committee made this recommendation for research, see the [rationale and impact section on medicine combination and sequencing in people aged 12 and over](#).

Full details of the evidence and the committee’s discussion are in [evidence review Q: drug combinations and sequencing for asthma management.title](#).

14

1 **3 Diagnostic pathways**

- 2 What is the cost-effectiveness and feasibility of the proposed BTS/NICE/SIGN
3 diagnostic pathways for asthma in children and young people aged 5 and over and in
4 adults aged 17 and over? **[2024]**

For a short explanation of why the committee made this recommendation for research, see the [rationale and impact section on objective tests for diagnosing asthma in adults, young people and children aged 5 to 16](#).

Full details of the evidence and the committee's discussion are in in [evidence review A: accuracy and clinical and cost-effectiveness of spirometry for diagnosis of asthma](#), [evidence review B: accuracy and clinical and cost-effectiveness of bronchodilator response in the diagnosis of asthma](#), [evidence review C: accuracy and clinical and cost-effectiveness of peak expiratory flow in the diagnosis of asthma](#), [evidence review D: accuracy and clinical and cost-effectiveness of skin prick test in children for diagnosis of asthma](#), [evidence review E: accuracy and clinical and cost-effectiveness of serum IgE measures in diagnosing asthma in children](#), [evidence review F: accuracy and clinical and cost-effectiveness of FeNO in the diagnosis of asthma](#), [evidence review G: accuracy and clinical and cost-effectiveness of eosinophil blood count measures in the diagnosis of asthma](#), [evidence review H: accuracy and clinical and cost-effectiveness of histamine and methacholine in the diagnosis of asthma](#), [evidence review I: accuracy and clinical and cost-effectiveness of bronchial challenge testing \(indirect\) with mannitol in diagnosing asthma](#), [evidence review J: accuracy and clinical and cost-effectiveness of bronchial challenge testing in response to exercise in diagnosis of asthma](#) and [evidence review K: accuracy and clinical and cost-effectiveness of combination tests for diagnosis in people with suspected asthma](#).

5 **4 Inhalers**

- 6 Can digital inhaler monitors cost-effectively improve adherence to preventer inhalers
7 for people with asthma? Does this improve asthma control and who would benefit
8 most from this intervention? **[2024]**

For a short explanation of why the committee made this recommendation for research, see the [rationale and impact section on digital inhalers](#).

Full details of the evidence and the committee's discussion are in [evidence review R: smart preventer/maintenance inhalers for the management of asthma](#).

1 **5 Monitoring inhaler technique**

2 What is the current frequency and the current method being used to check the
3 inhaler technique of people with asthma? What is the optimal frequency and the best
4 method of checking inhaler technique to improve clinical outcomes for people with
5 asthma? **[NICE 2017]**

6 **6 Monitoring asthma control using tele-healthcare**

7 What is the long-term (more than 12 months) clinical and cost effectiveness of using
8 tele-healthcare as a means to monitor asthma control in adults, young people and
9 children? Methods of tele-healthcare can include telephone interview (with
10 healthcare professional involvement) and internet or smartphone-based monitoring
11 support (no healthcare professional involvement). **[NICE 2017]**

12 **7 Decreasing pharmacological treatment**

13 In adults, young people and children with well-controlled asthma, what are the
14 objective measurements and prognostic factors that indicate that a decrease in
15 regular maintenance treatment is appropriate? **[NICE 2017]**

16 **8 Improving adherence to asthma medication**

17 What are the most clinically and cost-effective strategies to improve medicines
18 adherence in adults, young people and children with asthma who are non-adherent
19 to prescribed medicines? **[NICE 2017]**

1 **Other recommendations for research**

2 **Increasing the dose of ICS within a personalised self-management** 3 **programme for children and young people**

4 For children and young people with asthma that is managed in primary care, is there
5 an advantage to increasing the ICS dose when asthma control has deteriorated
6 compared with using the usual dose in a self-management programme? **[NICE**
7 **2020]**

For a short explanation of why the committee made this recommendation for research, see the [rationale and impact section on self management](#).

Full details of the evidence and the committee's discussion are in [evidence review A: increasing ICS treatment within supported self-management for children and young people](#).

8

9 **Rationale and impact**

10 These sections briefly explain why the committee made the recommendations and
11 how they might affect practice.

12 As this guideline applies to England and Scotland, the perspective was for both
13 England and Scotland.

14 **Objective tests for diagnosing asthma in adults, young people and** 15 **children aged 5 to 16**

16 **Why the committee made the recommendations**

17 [Recommendations 1.2.1 to 1.2.7](#)

18 Although evidence on symptoms and signs of asthma was not reviewed for this
19 guideline update, the committee emphasised the importance of taking a good clinical
20 history in all their discussions of diagnosis. Evidence on objective tests was only
21 included if it was carried out in people in whom asthma was suspected on clinical
22 grounds. Therefore, the recommendations for diagnostic testing should only be

1 applied when the history and examination findings support a diagnosis of asthma.
2 The committee also noted that, depending on the mode of presentation, other
3 diagnoses might be considered, but they confined their recommendations to
4 confirmation or exclusion of asthma.

5 The committee reviewed evidence on tests of variation in airflow obstruction and
6 markers of allergy separately for adults and children. They took into account the
7 sensitivity and specificity of the various tests but did not base their recommendations
8 on these measures alone. They noted that no test showed high enough values of
9 both sensitivity and specificity to be diagnostic when used alone, and therefore a
10 combination of tests would be needed. When considering combinations of tests, the
11 extent to which the available tests correlate with one another is important because
12 there is less benefit in performing a test that gives similar information to a preceding
13 one. Practical aspects were taken into account using the committee's knowledge and
14 experience. These included the availability of the tests, which varies considerably (in
15 particular, bronchial challenge testing is not available in primary care and not readily
16 available in secondary care), the ability of people to perform the tests, and the
17 acceptability of the tests to the person, which is particularly relevant in younger
18 children.

19 The committee also considered the cost of the available tests. However, no health
20 economic study on the most cost-effective sequence or combination of tests was
21 identified. Therefore, a health economic model was developed to help address this.

22 The committee discussed what cut-off values should be recommended for the tests.
23 For some of the tests it was agreed that it was inappropriate to state a numerical
24 value for an abnormal result. For example, normal ranges for blood tests may vary
25 slightly between laboratories. Therefore, for eosinophil counts and IgE levels, a
26 raised measurement (suggesting asthma) should be regarded as one above the
27 upper end of the local reference range. There are also several standardised methods
28 of performing bronchial challenge tests and the definition of bronchial
29 hyperresponsiveness will be dependent on the method used.

30 Spirometry should always be performed using an international standard protocol but
31 the method of expressing reversibility after bronchodilator varies. Ideally this would

1 be based on change in z-scores, but these are not measured by all spirometry
2 equipment. Change in absolute values of FEV₁ is arguably best given as the
3 percentage change compared with the person's predicted FEV₁, and using this
4 parameter a change >10% is abnormal. This is the committee's preferred definition
5 of reversibility but it is a relatively new concept. Using the more traditional means of
6 expressing the change as a percentage of the baseline FEV₁ increased reversibility
7 would be over 12% in adults and children; in adults the change should also be over
8 200 ml. The committee agreed to include both in its recommendation.

9 An optimal cut-off value is also difficult to give for FeNO. There is good evidence that
10 FeNO levels increase with age and with height, and ideally normal ranges would be
11 available which correct for these factors. However, there are currently no standard
12 charts and FeNO equipment does not give an age/height corrected output. Although
13 not ideal, the committee agreed that they need to suggest a simple cut-off value and
14 because FeNO is the first, and possibly the only, test in the recommended
15 sequences in both adults and children they agreed that the value should be
16 reasonably high so that it would be specific, acknowledging that this sacrifices a
17 degree of sensitivity. Cut-offs of 50 ppb in adults and 35 ppb in children were agreed.

18 No evidence was available for diagnostic tests in children under 5. The age at which
19 a child can co-operate with tests will vary, but the committee agreed that it is usually
20 necessary to manage these children pragmatically based on symptoms and signs
21 only.

22 **Adults**

23 Several tests showed good specificity for asthma, with values over 80% for blood
24 eosinophils, FeNO (cut-off values 40-50 ppb), [peak expiratory flow \(PEF\) variability](#),
25 bronchial challenge tests, and spirometry with bronchodilator reversibility. However,
26 sensitivity was poor for most of these, and only FeNO and bronchial challenge tests
27 showed values over 70%. Although bronchial challenge is the most accurate test,
28 overall, it is more costly than others and is less readily available.

29 Using the health economic model, the most cost-effective diagnostic strategy was
30 found to be a gradual rule-in approach. It facilitates a positive diagnosis of asthma in

1 a broad population using relatively inexpensive tests and confines the more
2 expensive bronchial challenge tests to the end of the sequence.

3 The committee agreed that a cheap and highly specific test to rule in asthma should
4 start the sequence. This should be either an eosinophil count or a FeNO
5 measurement, but both need care in interpretation. For example, a raised eosinophil
6 count can occur for other reasons including other allergic diseases, and FeNO is
7 also affected by allergic diseases although only those that affect the airways. Both
8 measurements are altered in smokers. However, if used correctly in the presence of
9 a history suggesting asthma, they are good rule-in tests.

10 The second test in the sequence should be to measure spirometry with reversibility.
11 This is a more specific test than it is sensitive, but it represents a test of airway
12 function to complement a first test which reflects atopy and so both components of
13 asthma will have been assessed.

14 If asthma is not diagnosed at this stage, the only additional investigation that offers
15 sensitivity without losing significant specificity is a bronchial challenge test. The
16 committee are aware that these tests are not easily available in many areas but
17 reasoned that making a positive recommendation should encourage services to
18 improve access. They also noted that methacholine challenge is more sensitive than
19 mannitol but did not want to further limit the recommendation.

20 **Children aged 5 to 16**

21 The committee noted that diagnostic testing is harder in children as they may find
22 some tests difficult to perform and be unwilling to have blood tests.

23 A separate health economic model was developed for children using children-
24 specific diagnostic accuracy data and inputs. In children, testing for sensitisation to
25 house dust mite via skin prick test or finding an elevated IgE both showed high
26 sensitivity. Therefore, the diagnostic strategy was a rule-in–rule-out approach. This
27 proved to be the most cost-effective in children as it considerably reduced the
28 proportion of children reaching the last stage and needing an expensive bronchial
29 challenge test.

1 The committee agreed that a cheap and highly specific test was needed first to rule
2 in asthma. FeNO is a more acceptable first test in children than an eosinophil count
3 because it avoids the need to take blood, and because a level of more than 35 ppb is
4 reasonably specific for asthma in the presence of a suggestive history.

5 The model suggested that a sensitive test should come next to rule out asthma.
6 However, the committee noted that some children would not be able to have a FeNO
7 test because the equipment is not available in all primary care settings, or because a
8 minority may not be able to perform the necessary expiratory manoeuvre. They were
9 also concerned that an increasing proportion of children with asthma are non-atopic
10 and therefore unlikely to have a raised FeNO level. However, these children may
11 show bronchodilator reversibility (BDR). It was therefore agreed that it would be
12 appropriate to use spirometry with BDR as a second test for those without an
13 elevated FeNO, or as the first test in those in whom FeNO could not be measured.
14 Although this does not follow our optimal model exactly, including BDR at this stage
15 is still cost effective.

16 In children with a suggestive history of asthma, both skin prick testing for
17 sensitisation to house dust mite and measurement of total IgE are sensitive tests,
18 and the committee agreed that one or the other should be done next. If the test is
19 negative, asthma is highly unlikely and can be ruled out without resorting to bronchial
20 challenge testing. Although taking blood for IgE is invasive, it does have the
21 advantage that an eosinophil count could also be obtained, and if this is above $0.5 \times$
22 10^9 per litre, it would support a diagnosis of asthma. The best single test is a
23 bronchial challenge but these are not readily available and cannot be done in
24 primary care. If there is still diagnostic doubt after performing other tests, the
25 committee agreed that a referral to an asthma specialist should be made for a
26 second opinion including consideration of a challenge test.

27 **Further research**

28 Although there is evidence underpinning each of the tests included in the
29 recommended diagnostic sequences for adults and for children aged 5-16 years, the
30 committee acknowledged that the sequences themselves have not been tested. [The](#)

1 [clinical and cost-effectiveness of the recommended diagnostic process should be](#)
2 [formally evaluated.](#)

3 **Children under 5**

4 The main issue in this age group is differentiating asthma from symptoms caused by
5 recurrent viral infections. The committee were aware of evidence outside the review
6 of diagnostic tests showing that asthma is more likely than recurrent viral wheeze
7 when the episodes are frequent or severe, when they occur in the absence of other
8 signs of viral illness and when the child shows other evidence of atopy. On this basis
9 they agreed that young children with recurrent wheeze and features suggesting
10 asthma should be treated empirically with a low dose of inhaled corticosteroid (ICS)
11 for a period of 8 weeks. If this is ineffective in reducing wheezing episodes,
12 assuming that the ICS has been given satisfactorily, a referral to a specialist to
13 consider other diagnoses is appropriate. If the ICS is associated with improvement,
14 this is not proof of asthma as viral wheezing can remit and relapse spontaneously,
15 so the committee agreed that the ICS should be stopped. If symptoms then reappear
16 within a few weeks, asthma is the more likely diagnosis and the ICS should be re-
17 started.

18 **How the recommendations might affect practice**

19 The diagnostic tests recommended for both children and adults are not routinely
20 carried out in current practice, with the exception of spirometry and reversibility
21 testing, which is performed in some adults with suspected asthma. FeNO equipment
22 is not available in some areas, but an eosinophil count and IgE level is easily
23 obtainable everywhere. Bronchial challenge tests are not done in primary care and
24 infrequently used in secondary care. The recommendations will increase the demand
25 for challenge tests and initially there will be a capacity problem. Incorporating the
26 recommended diagnostic sequences into clinical practice would therefore require
27 significant investment. However, using the tests increases the accuracy of asthma
28 diagnosis and will be cost-effective over time.

29 The recommendations for children under 5 are based on a pragmatic trial of
30 treatment, as is current practice.

31 [Return to recommendations](#)

1 **Monitoring asthma control**

2 **Why the committee made the recommendations**

3 [Recommendations 1.5.1 to 1.5.4](#)

4 The committee agreed that there is some information that should always be obtained
5 at a routine monitoring review, for example whether any courses of oral
6 corticosteroid have been needed since the last review.

7 **Symptom questionnaires and diaries**

8 The committee looked at evidence on the effects of monitoring asthma control using
9 symptom questionnaires given at intervals ranging from weekly to twice in 3 months.
10 Although there were a small number of beneficial outcomes in individual studies,
11 overall, there was no clinically useful effect of the monitoring in either adults or
12 children. The committee noted that the interventions were complex, as they
13 assessed the effects not just of the symptom monitoring but also the therapeutic
14 adjustments made in response to the questionnaire result. Nonetheless, they
15 concluded that they should not recommend questionnaires used at these relatively
16 frequent intervals.

17 The committee were aware of evidence (that was not part of this review) showing
18 that the results of asthma control questionnaires predict the risk of future asthma
19 attacks. They therefore used their experience to recommend that questionnaires
20 should be used as part of the annual review of people with asthma.

21 **Pulmonary function**

22 The committee looked for evidence on the use of spirometry and PEF monitoring as
23 measures of asthma control but did not find any data on spirometry used in this
24 context.

25 There was evidence on PEF monitoring in both adults and children. The monitoring
26 was typically linked to treatment changes triggered by designated thresholds of PEF
27 and compared with the effects of treatment changes triggered by symptoms. In
28 adults, regular PEF measurement was associated with worse quality of life
29 parameters. The committee believed that this might be explained by regular

1 monitoring inducing anxiety in some people if PEF is not consistently high, and by
2 the inconvenience of making regular measurements.

3 In both adults and children, PEF monitoring was associated with an increase in
4 asthma attacks which appears to be a further disadvantage of regular monitoring.
5 The committee found this hard to explain as monitoring itself seems unlikely to make
6 asthma worse. It is possible that PEF measurements may have led to quicker
7 identification and appropriate early treatment of some attacks. However, if this is the
8 case, one might expect to see a reduction in the need for hospitalisation, or time off
9 work or school, and these potential benefits were not seen.

10 The committee agreed that a minority of people with asthma benefit from regular
11 measurement of PEF, for example those who are poor at perceiving changes in their
12 airways and are therefore at risk of delaying treatment of asthma attacks. So, they
13 recommended against the use of routine PEF monitoring, with the caveat that it
14 might have value in specific circumstances.

15 **FeNO**

16 The evidence showed that, in both adults and children, regular FeNO monitoring led
17 to a reduction in the number of asthma exacerbations. In children there was also a
18 significant improvement in lung function. In adults, the reduction in exacerbations
19 was achieved alongside an overall reduction in the dosage of maintenance ICS
20 therapy. This was not the case in children, but the studies in this age group were
21 more likely to be conducted in secondary or tertiary care, so it is likely that they had
22 a higher maintenance therapy requirement.

23 The committee concluded that FeNO monitoring was potentially cost effective in
24 adults and children. It was not possible on the current evidence to say what the
25 optimum frequency of monitoring should be, but the committee agreed that the
26 appropriate opportunity would be to make a routine measurement at the person's
27 annual review.

28 The FeNO level is a proxy measure of airway inflammation. It can therefore be very
29 useful in determining how to adjust treatment, or as an indicator of treatment
30 adherence, when a person with asthma has poor symptom control. Conversely,
31 when symptom control is excellent and the possibility of reducing maintenance

1 therapy arises, a normal FeNO level provides helpful reassurance. The committee
2 therefore agreed that a FeNO measurement should be considered whenever a
3 change in maintenance therapy might be appropriate.

4 **How the recommendations might affect practice**

5 Asthma control questionnaires are already recommended as part of an annual
6 review. Therefore, no change to practice is anticipated. The recommendations on
7 pulmonary function are expected to reduce the use of PEF monitoring.

8 Measurement of FeNO is increasingly used in secondary care asthma clinics, but in
9 primary care only a minority of GP practices have on-site access to the test. Regular
10 FeNO monitoring represents a significant change in practice because most people
11 with asthma are managed in primary care. This change will also carry a cost. The
12 committee noted that FeNO measurement is also useful in diagnosing asthma (see
13 section 1.2), and increased access to the test will therefore be of dual benefit.

14 [Return to recommendations](#)

15 **Principles of pharmacological treatment**

16 [Recommendation 1.6.2](#)

17 **Why the committee made the recommendation**

18 The evidence review showed that clinical outcomes were poorest in all age groups
19 with asthma when using SABA alone, although it was the cheapest option. The
20 committee also took into account other evidence from several sources, including
21 national reviews of asthma deaths in both adults and children, which highlighted the
22 dangers of using SABA without ICS in people with asthma. They therefore
23 recommended that SABA alone should not be used in people with a diagnosis of
24 asthma.

25 **How the recommendation might affect practice**

26 The prescription of SABA alone has been commonplace, although this is becoming
27 less so because of the publicity around asthma deaths. The recommendation will
28 reduce its use further. The replacement therapies in adults and children are more

1 expensive, but they should produce clinical benefits and cost-savings through a
2 reduction in exacerbations.

3 [Return to recommendations](#)

4 **Digital inhalers**

5 [Recommendation 1.6.9](#)

6 **Why the committee made the recommendation**

7 The committee looked at evidence comparing the use of digital smart inhalers with
8 usual care and with digital inhalers with the feedback utility switched off. The trials
9 included both children and adults with asthma, and a variety of types of inhaler. The
10 evidence showed improvement in adherence to treatment with digital inhalers but
11 this did not result in significant improvement in measures of asthma control. In
12 addition, there was an unexplained increase in hospital admissions among people
13 using digital inhalers when compared with usual care. The participants in the
14 contributing trials varied considerably in terms of baseline adherence and asthma
15 control, and benefit was generally more likely in the studies of people with poorer
16 baseline values.

17 Digital inhalers are more expensive than conventional devices, partly because of the
18 device itself and partly because of the set-up and monitoring requirements. The
19 committee concluded that digital inhalers are not a cost-effective option for routine
20 use in asthma. However, they are potentially valuable in selected people with
21 asthma, for example those in whom the need for biologic therapy is being considered
22 and there is a need to confirm good adherence. [Further research is needed to
23 identify more precisely the people and the circumstances in which they might be
24 used.](#)

25 **How the recommendation might affect practice**

26 Digital inhalers are not recommended for routine use in the NHS, and this is in line
27 with current practice.

28 [Return to recommendations](#)

1 **Medicines for initial management of newly diagnosed asthma in** 2 **people aged 12 and over**

3 [Recommendations 1.7.1 and 1.7.2](#)

4 **Why the committee made the recommendations**

5 The committee looked at evidence comparing 3 treatment options in people aged 12
6 and over with a new diagnosis of asthma. These were short-acting beta₂ agonists
7 (SABA) as needed with no inhaled corticosteroid (ICS); regular low-dose ICS plus
8 SABA as needed; and a combination inhaler of ICS plus formoterol, a fast onset
9 long-acting beta₂ agonist (LABA), used as needed.

10 The most important difference between the groups was a reduction in severe
11 exacerbations of asthma in the group using ICS/formoterol as needed, and this
12 applied to the comparisons with both of the other treatment options. There were also
13 fewer exacerbations with ICS plus SABA than with SABA alone. Apart from the
14 difference in exacerbations, there were only small differences between outcomes
15 when comparing ICS plus SABA as needed with ICS/formoterol as needed, and the
16 committee did not assess these as clinically important. However, the evidence
17 showed that use of ICS (either as an ICS/formoterol combination inhaler used as
18 needed or as regular low-dose ICS plus SABA as needed) produced consistently
19 better outcomes than SABA alone.

20 Health economic data showed that treatment with an ICS/LABA combination inhaler
21 as needed was cheaper than regular ICS plus SABA as needed. The committee
22 therefore concluded that combination inhalers used as needed should be the
23 preferred treatment in newly diagnosed asthma in adults. However, there were
24 concerns about the minority of people with asthma in whom the diagnosis is first
25 made because of an acute attack. In these particularly symptomatic people, the
26 committee agreed on safety grounds that initial treatment should be given regularly
27 and recommended starting the low-dose MART regimen.

28 **How the recommendations might affect practice**

29 Most people aged 12 and over with newly diagnosed asthma are currently treated
30 with either a SABA alone or with regular ICS plus SABA as needed. The new

1 recommendations represent a significant change in practice. The use of combination
2 inhalers is more expensive than SABA alone, but cheaper than regular ICS plus
3 SABA as needed. Therefore, the cost impact will vary depending on the predominant
4 form of treatment in each general practice. However, there should be future savings
5 from a reduction in severe asthma exacerbations compared with either of the current
6 treatment options.

7 [Return to recommendations](#)

8 **Medicine combination and sequencing for newly diagnosed asthma** 9 **in people aged 12 and over**

10 [Recommendations 1.7.3 to 1.7.7](#)

11 **Why the committee made the recommendations**

12 No studies were found in which treatment was added to an ICS/formoterol
13 combination inhaler used as needed, the recommended first treatment step in people
14 aged 12 and over. This was unsurprising as the advantages of this initial therapy
15 have only recently been recognised. The committee therefore had to consider
16 studies of people with asthma uncontrolled on other starting treatments, either a
17 SABA when used as needed as sole therapy or when used in addition to regular low-
18 dose ICS. They reasoned that these people would be sufficiently similar to people
19 who are not controlled with ICS/formoterol used when needed to allow
20 recommendations to be made, but agreed that further [research comparing different](#)
21 [add-on therapies to ICS/formoterol as needed](#) would be useful.

22 The evidence showed that regular low-dose ICS/LABA plus SABA as needed was
23 superior to regular low-dose ICS plus SABA as needed. It produced greater
24 improvements in lung function, and reduced exacerbations and the amount of
25 reliever therapy needed. Low-dose MART was also better than regular low-dose ICS
26 plus SABA as needed in reducing asthma exacerbations, and people on this
27 treatment needed less reliever therapy.

28 When low-dose ICS/LABA plus SABA as needed was compared with low-dose
29 MART, the people using MART were found to have fewer exacerbations and hospital
30 admissions. The committee noted that it would be simpler for people who are already

1 using an ICS/formoterol inhaler to start the MART regimen than to convert to new
2 inhalers. The committee also considered the economic analysis done for this update,
3 and agreed that the MART regimen would be a cost-effective use of resources
4 compared with low-dose ICS/LABA plus SABA as needed.

5 If treatment with MART using a low-dose maintenance regimen does not provide
6 adequate asthma control, the committee agreed that increasing the maintenance
7 element of MART to moderate dose is the appropriate next step. Evidence
8 supporting this was available from studies comparing moderate dose MART with
9 both regular moderate dose ICS/LABA with SABA as reliever and with regular
10 moderate dose ICS with SABA as reliever. MART was superior in both comparisons,
11 most notably in reducing severe asthma exacerbations.

12 If treatment with MART using a moderate-dose maintenance regimen does not
13 provide adequate asthma control, the evidence on how best to increase treatment is
14 less clear cut. The committee considered the possible options to be the addition of
15 either an LTRA or a LAMA, or an increase in the amount of maintenance ICS given
16 each day. Without a FeNO measurement the committee did not wish to recommend
17 an increase to high dose daily ICS, because of potential side effects and because
18 this would necessitate using an additional inhaler which is more awkward for the
19 patient and has an adverse environmental impact. Evidence was available looking at
20 the addition of either an LTRA or a LAMA to baseline treatment with moderate-dose
21 ICS or moderate dose ICS/LABA, but the 2 options were only compared directly in 1
22 small study. Although this showed a reduction in exacerbations with a LAMA
23 compared with an LTRA, the committee did not have much confidence in the result
24 because of the small study population. So, because 1 option was no better than the
25 other, the committee used their knowledge and experience to recommend a trial of
26 an LTRA. An LTRA is less costly than a LAMA and it has environmental advantages,
27 as an additional inhaler is not needed for it to be used together with MART. If an
28 LTRA is ineffective after a trial period it can be stopped, and a LAMA tried instead.

29 If these medicines have been tried and the person's asthma continues to be
30 inadequately controlled, further treatment is available using a variety of biologic
31 agents. Use of these falls outside the scope of this guideline and requires specialist

1 assessment. The committee therefore recommended that a referral should be made
2 at this stage.

3 **How the recommendations might affect practice**

4 The recommendations for increasing treatment are different from current standard
5 practice, but they apply to people with a new diagnosis of asthma. People with an
6 existing diagnosis of asthma who are stable on their current therapy do not have to
7 switch treatment. People on current pathways who need an increase in treatment will
8 be switched to MART, but this is one of the current options. There should therefore
9 not be significant disruption to asthma care. The new treatment steps are cost-
10 effective for the NHS and in particular will reduce the number of exacerbations
11 requiring treatment and the number of hospital admissions for asthma.

12 [Return to recommendations](#)

13 **Transferring people aged 12 and over from other treatment** 14 **pathways**

15 [Recommendations 1.7.8 to 1.7.12](#)

16 **Why the committee made the recommendations**

17 The treatment pathway recommended in this guideline update for people aged 12
18 and over relies on using MART with increasing dose of regular ICS/formoterol
19 depending on response to treatment. This is a different strategy from that
20 recommended by previous guidelines (NICE and BTS/SIGN) and many people will
21 be on treatment that is not part of this new pathway. The committee recognised that
22 this will cause a problem for these people when their asthma is not controlled. They
23 therefore discussed and agreed how treatment should be changed in these
24 circumstances. They noted that the general advice about checking inhaler technique,
25 adherence, etc. (see [recommendation 1.6.1](#)) before escalating treatment still applies
26 here. The recommendations are not based on a specific evidence search, but the
27 committee noted that people in the MART studies reviewed for recommendations
28 1.7.3-1.7.7 were taking some form of non-MART therapy before study entry and that
29 the improvement shown in comparison to both baseline and to the control treatments
30 support the switch to MART.

1 **How the recommendations might affect practice**

2 The recommendations will result in more people being switched to MART than to
3 other treatment options, but MART is used at present, and the change should not be
4 disruptive.

5 [Return to recommendations](#)

6 **Medicines for initial management in children aged 5 to 11**

7 [Recommendation 1.8.1](#)

8 **Why the committee made the recommendation**

9 Evidence for children aged 5-11 showed that regular paediatric low-dose ICS plus
10 SABA as needed was superior to SABA alone, particularly in reducing
11 exacerbations. Using regular ICS did not cause more side effects and was not
12 associated with greater adrenal suppression. There was no evidence for ICS/LABA
13 combination inhalers used as needed in this age group. The committee therefore
14 recommended regular paediatric low-dose ICS as the preferred treatment option for
15 children aged 5-11. However, in view of the evidence supporting the use of
16 ICS/LABA as needed combination inhalers in adults, they made a [research](#)
17 [recommendation to test the benefits of this combination in children](#).

18 **How the recommendation might affect practice**

19 The recommendation for treatment of newly diagnosed asthma in children is in line
20 with current practice.

21 [Return to recommendations](#)

22 **Medicine combination and sequencing in children aged 5 to 11**

23 [Recommendations 1.8.2 to 1.8.7](#)

24 **Why the committee made the recommendations**

25 The committee recommended regular low-dose ICS plus SABA as needed as initial
26 treatment for children diagnosed with asthma. Several studies were available which
27 directly addressed the question of optimal add-on therapy for children whose asthma
28 is not controlled on this treatment. This evidence showed that MART was superior to

1 both regular moderate-dose ICS plus SABA as needed and to regular low-dose
2 ICS/LABA plus SABA as needed. It reduced the number of exacerbations, reduced
3 the need for reliever inhaler and caused fewer adverse events. The economic
4 analysis done for this guideline update also supported the clinical evidence and the
5 committee's discussion, with the MART regimen associated with fewer costs and
6 more quality-adjusted life years (QALYs) than both ICS/LABA plus SABA as needed
7 and ICS plus SABA as needed.

8 The results for the comparison of regular low-moderate dose ICS plus SABA as
9 needed with regular low-dose ICS/LABA plus SABA as needed were equivocal, with
10 fewer exacerbations on regular treatment with low-moderate dose ICS but more
11 hospital admissions.

12 The committee agreed that paediatric low-dose MART is the best treatment for a
13 child whose asthma is uncontrolled on regular paediatric low-dose ICS. They noted
14 that MART is currently not licensed in the UK below the age of 12, although the key
15 study recruited children younger than this, with a minimum age of 4. In addition,
16 there were concerns that some children might struggle to use a dry-powder inhaler
17 when particularly breathless. The committee therefore agreed to recommend MART
18 as the preferred treatment providing the child is able to manage the MART regimen
19 and the healthcare professional is willing to prescribe it.

20 For children whose asthma is uncontrolled on regular paediatric low-dose ICS and
21 who are unable to manage the MART regimen, the choice of treatment would be
22 between adding an LTRA, adding a LABA, or increasing the maintenance ICS dose.
23 The evidence did not show one option to be clearly superior in terms of benefits or
24 adverse events, although the committee noted that prescribers should warn people
25 of possible neuropsychiatric problems with montelukast. (See the [MHRA drug safety
26 update on the risk of neuropsychiatric reactions in people taking montelukast.](#)) The
27 committee agreed that adding an LTRA to the regular ICS treatment should be tried
28 first as this limits the child's exposure to ICS and is less expensive than using
29 ICS/LABA inhalers. They used their knowledge and expertise to recommend further
30 steps if asthma control is not achieved.

1 The committee also agreed that if asthma control was not achieved on a regular
2 moderate dose of ICS (either as paediatric moderate-dose MART or regular
3 paediatric moderate-dose ICS/LABA plus SABA as needed), an opinion should be
4 sought from a specialist in asthma care before escalating to a paediatric high-dose
5 ICS regimen.

6 **How the recommendations might affect practice**

7 The recommendation for MART as the preferred step-up treatment is new, but this is
8 not intended for children who are stable on current therapy and introducing it should
9 not be disruptive. It will bring advantages in terms of reducing asthma attacks. In
10 addition, MART will not be suitable for some children, and the recommendations for
11 treatment in this group are in line with current practice. Overall, the changes are
12 modest and will be cost-effective for the NHS.

13 [Return to recommendations](#)

14 **Medicines for management in children under 5**

15 [Recommendations 1.9.1 to 1.9.6](#)

16 **Why the committee made the recommendations**

17 Evidence was available for 5 treatment options: SABA alone used as needed;
18 regular ICS plus SABA as needed; SABA/ICS combination inhaler used as needed;
19 regular SABA/ICS combination inhaler; and regular montelukast. The evidence did
20 not encompass all possible comparisons of the 5 options, but overall, those that
21 included the use of an ICS clearly showed greater benefits than those without an
22 ICS, and regular ICS (either ICS alone or ICS/SABA) was superior to intermittent
23 ICS/SABA. The most important benefits of regular ICS were seen in reducing
24 exacerbations or hospital admissions. There was no advantage to using regular
25 ICS/SABA instead of regular ICS alone.

26 In making recommendations for this age group, the committee took into account the
27 difficulty of making a firm diagnosis of asthma. Episodes of cough and wheezing can
28 occur with recurrent viral infections and be difficult to distinguish from asthma, and
29 there are concerns about treating young children with long-term ICS when they may
30 not need them.

1 The committee were aware of evidence outside the review of diagnostic tests
2 showing that asthma is more likely than recurrent viral wheeze when the episodes
3 are frequent or severe, when they occur in the absence of other signs of viral illness
4 and when the child shows other evidence of atopy. They made recommendations on
5 the staged introduction of ICS as part of the diagnostic process in infants. They
6 agreed that young children with recurrent wheeze and features suggesting asthma
7 should be treated empirically with a low dose of ICS for 8-12 weeks, and then this
8 can be stopped. If symptoms soon re-appear after stopping ICS, this suggests that
9 the ICS was beneficial rather than the improvement being due to the natural
10 remission of a viral episode. Once the presence of asthma is established with
11 reasonable certainty the committee agreed that regular paediatric low-dose ICS
12 should be restarted, with subsequent steps added if needed.

13 As diagnosis in this age group is so difficult, the committee agreed that thresholds for
14 referral to an asthma specialist should be low.

15 **How the recommendations might affect practice**

16 The recommendations for treatment of newly diagnosed asthma in children are in
17 line with current NICE recommendations.

18 [Return to recommendations](#)

19 **Self-management**

20 [Recommendation 1.14.5](#)

21 **Why the committee made the recommendation**

22 The evidence for children and young people found that increasing the dose of
23 inhaled corticosteroid (ICS) when asthma control deteriorates did not result in any
24 benefits or harms compared to the usual dose in terms of reducing subsequent
25 asthma exacerbations. It was limited to only 1 study with a small number of
26 participants who had a personalised action plan. The committee also looked at
27 studies in adults, but agreed that the evidence was not applicable because of the
28 high average age of participants.

1 The committee discussed the importance of a personalised action plan to guide
2 children and young people if their asthma worsens and to reassure them that they
3 are in control of their treatment. Children and young people who find that increasing
4 their dose of ICS is helpful when their asthma control worsens should be able to
5 continue to do this as an agreed strategy in their action plan. However, based on
6 their experience the committee members agreed that it is important to review the
7 child or young person's self-management plan if their asthma control is deteriorating.
8 Reviews involve checking current medicines and inhaler technique, discussing any
9 factors that may be triggering symptoms, discussing adherence and education
10 needs, and reviewing their action plan. They should be carried out as needed, in
11 addition to annual review.

12 The committee discussed the importance of an individualised approach for children
13 and young people, because they have varied and changing support needs at
14 different ages. Studies have shown that most child asthma deaths involve children
15 who have frequent but mild symptoms that are not responding to management in
16 their personalised action plan. This recommendation should help to ensure that
17 these children and young people receive the support that they need if they start to
18 have problems with their asthma control.

19 The committee agreed that further research is needed to give clearer guidance on
20 increasing the dose of ICS in children and young people within a self-management
21 programme and [made a research recommendation on increasing the dose of ICS
22 within a personalised self-management programme for children and young people](#) to
23 promote further research and inform future practice.

24 **How the recommendation might affect practice**

25 The recommendation will lead to an increase in the review of self-management
26 programmes for children and young people and reduce the variation in current
27 practice for this. The increase in resources needed for this is likely to be offset by a
28 reduction in the cost of treating asthma exacerbations.

29 [Return to recommendations](#)

1 **Risk-stratified care**

2 [Recommendation 1.15.1](#)

3 **Why the committee made the recommendation**

4 The studies featured differing ways of attempting to improve asthma care for people
5 judged to be at high risk of adverse outcomes. Therefore, firm conclusions on the
6 overall benefits were hard to reach. In addition, the factors used to identify the high-
7 risk population were not identical across the different studies. The committee
8 therefore were unable to define precisely how to identify people at risk although they
9 agreed that poor prescription pick up rates, overuse of SABA inhalers and previous
10 exacerbations are very likely to be relevant.

11 Most of the studies showed some reduction in A&E attendance or hospitalisation
12 after risk stratification. The committee particularly noted 2 UK studies in which at-risk
13 patients were identified by alerts on GP computer systems. These indicated that risk-
14 stratified care helped healthcare professionals to better identify people who needed
15 a course of oral steroids. This then successfully reduced the number of
16 hospitalisations and the need for out-of-hours contacts and A&E attendance for
17 asthma exacerbations. An associated health economic review showed that risk
18 stratification is likely to be cost-effective.

19 Based on this evidence and their clinical experience, the committee agreed there
20 should be a benefit in identifying people 'at risk' of poor asthma outcomes and
21 recommended that primary care services should consider introducing a risk-
22 stratification system which then allows care to be adjusted according to the greater
23 needs of some people.

24 **How the recommendation might affect practice**

25 Many general practices have some form of alert system in operation already, but
26 others do not. For those, the recommendation will result in a change in practice. The
27 committee were uncertain how many different systems are in current use, but in the
28 absence of comparative data, they could not recommend that some practices would
29 need to change from their current system.

30 [Return to recommendations](#)

1 **Context**

2 The [NICE guideline on asthma](#) was published in 2017 and BTS/SIGN last updated
3 their [asthma guideline](#) in 2019. The guidelines overlap in the clinical areas included,
4 and healthcare practitioners in the UK have been using both sets of guidance.

5 However, these guidelines differ in their approach to diagnosis. Concern has been
6 raised about the recommendations to use fractional exhaled nitric oxide (FeNO)
7 measurement and spirometry more widely, contained in NICE guidance. Likewise,
8 there are significant differences in several aspects of the treatment approach in
9 each. BTS, NICE and SIGN agreed that updating and unifying current guidance
10 would be helpful for healthcare professionals.

11 This update to national asthma guidelines is timely for people with asthma and their
12 healthcare teams. There have been various initiatives that aim to improve outcomes
13 for people with asthma in the UK, but outcomes nevertheless remain poor. Mortality
14 from asthma continues to increase in the UK, and it remains a leading cause of
15 morbidity. According to the Office for National Statistics, there were more than 1,400
16 asthma deaths in the UK in 2018, an increase of 8% compared with 2017. For
17 outcomes to improve, people with asthma need excellent, evidence-based care.

18 There are many uncertainties about the best way to diagnose, monitor and treat
19 asthma. For example, there have been recent developments in our understanding of
20 the value of physiological tests. Also, there are new options for the use of inhaled
21 corticosteroids and what to do when treatment needs to be stepped up or down. The
22 evidence in these areas of uncertainty has been reviewed and the relevant
23 recommendations updated.

24

1 **Finding more information and committee details**

2 To find NICE or SIGN guidance on related topics, including guidance in
3 development, see the [NICE topic page on asthma](#) and [SIGN guidelines](#).

4 For details of the guideline committee see the [committee member list](#).

5 **Update information**

6 **June 2024**

7 We have reviewed the evidence on diagnosis, treatment and monitoring for people
8 with asthma.

9 Recommendations are marked **[2024]** if the evidence has been reviewed.

10 **Recommendations that have been deleted, or changed without an** 11 **evidence review**

12 We propose to delete some recommendations from the 2017 and 2019 guidelines.
13 [Table 1a](#) and table 1b set out these recommendations and includes details of
14 replacement recommendations. If there is no replacement recommendation, an
15 explanation for the proposed deletion is given.

16 For recommendations ending **[amended 2024]**, we have made changes that could
17 affect the intent without reviewing the evidence. Reasons for the changes are given
18 in [table 2](#). Yellow shading is used to highlight these changes in recommendations
19 that we are not consulting on (shaded in grey).

20 For recommendations shaded in grey and ending **[NICE 2017]**, **[NICE 2017,**
21 **amended 2021]**, **[BTS/SIGN 2019]** or **[NICE 2020]**, we have not reviewed the
22 evidence. In some cases minor changes have been made – for example, to update
23 links, or bring the language and style up to date – without changing the intent of the
24 recommendation. Minor changes are listed in [table 3](#).

25 See also the [previous NICE guideline and supporting documents](#) and the [BTS/SIGN](#)
26 [guideline](#).

1 **Table 1a Recommendations that have been deleted from the NICE guideline**

Recommendation in 2017 guideline	Comment
Initial clinical assessment	
Do not use a history of atopic disorders alone to diagnose asthma. [1.1.3]	Deleted as redundant. Committee unanimously agree that no-one would do this.
Testing for asthma	
Do not offer the following as diagnostic tests for asthma: <ul style="list-style-type: none"> • skin prick tests to aeroallergens • serum total and specific IgE • peripheral blood eosinophil count • exercise challenge (to adults aged 17 and over). [1.1.8] 	Deleted because the first 3 of these now have a potential role in the new diagnostic pathways for either adults or children.
Use skin prick tests to aeroallergens or specific IgE tests to identify triggers after a formal diagnosis of asthma has been made. [1.1.9]	Deleted because skin prick testing now included as part of the diagnostic pathway for children i.e. it may be used before a formal diagnosis is confirmed. The potential role of allergen testing after diagnosis is not part of our scope.
Objective tests for diagnosing asthma in adults, young people and children aged 5 and over	
People responsible for planning diagnostic service support to primary care should think about establishing asthma diagnostic hubs to achieve economies of scale and improve the practicality of implementing the recommendations in this guideline. [1.3.1]	This is not commonly in place across the UK and therefore it has been removed because of implementation concerns.
Offer a FeNO test to adults (aged 17 and over) if a diagnosis of asthma is being considered. Regard a FeNO level of 40 parts per billion (ppb) or more as a positive test. [1.3.2]	Replaced by recommendation 1.2.1.
Consider a FeNO test in children and young people (aged 5 to 16) if there is diagnostic uncertainty after initial assessment and they have either: <ul style="list-style-type: none"> • normal spirometry or • obstructive spirometry with a negative bronchodilator reversibility (BDR) test. • Regard a FeNO level of 35 ppb or more as a positive test. <p>Note: apply the principles in recommendation 1.2.2 for young</p>	Replaced by recommendation 1.2.4.

children unable to do the FeNO test adequately. [1.3.3]	
Be aware that a person's current smoking status can lower FeNO levels both acutely and cumulatively. However, a high level remains useful in supporting a diagnosis of asthma. [1.3.4]	Deleted because this information is now included in the rationale.
Offer spirometry to adults, young people and children aged 5 and over if a diagnosis of asthma is being considered. Regard a forced expiratory volume in 1 second/forced vital capacity (FEV1/FVC) ratio of less than 70% (or below the lower limit of normal if this value is available) as a positive test for obstructive airway disease (obstructive spirometry). [1.3.5]	Deleted because spirometry as a stand alone test is no longer recommended in the diagnostic pathway (although it is included as part of a bronchodilator reversibility test).
Offer a BDR test to adults (aged 17 and over) with obstructive spirometry (FEV1/FVC ratio less than 70%). Regard an improvement in FEV1 of 12% or more, together with an increase in volume of 200 ml or more, as a positive test. [1.3.6]	Replaced by recommendation 1.2.2.
Consider a BDR test in children and young people (aged 5 to 16) with obstructive spirometry (FEV1/FVC ratio less than 70%). Regard an improvement in FEV1 of 12% or more as a positive test. [1.3.7]	Replaced by recommendation 1.2.5
Monitor peak flow variability for 2 to 4 weeks in adults (aged 17 and over) if there is diagnostic uncertainty after initial assessment and a FeNO test and they have either: <ul style="list-style-type: none"> • normal spirometry or • obstructive spirometry, reversible airways obstruction (positive BDR) but a FeNO level of 39 ppb or less. Regard a value of more than 20% variability as a positive test. [1.3.8]	Deleted because PEF variability is not included in the new diagnostic pathway. Sequences including PEF variability were not among the most cost-effective options.
Consider monitoring peak flow variability for 2 to 4 weeks in adults (aged 17 and over) if there is diagnostic uncertainty after initial assessment and they have:	Deleted because PEF variability is not included in the new diagnostic pathway. Sequences including PEF variability were not among the most cost-effective options.

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<ul style="list-style-type: none"> • obstructive spirometry and • irreversible airways obstruction (negative BDR) and • a FeNO level between 25 ppb and 39 ppb. <p>Regard a value of more than 20% variability as a positive test. [1.3.9]</p>	
<p>Monitor peak flow variability for 2 to 4 weeks in children and young people (aged 5 to 16) if there is diagnostic uncertainty after initial assessment and a FeNO test and they have either:</p> <ul style="list-style-type: none"> • normal spirometry or • obstructive spirometry, irreversible airways obstruction (negative BDR) and a FeNO level of 35 ppb or more. <p>Regard a value of more than 20% variability as a positive test. [1.3.10]</p>	<p>Deleted because PEF variability is not included in the new diagnostic pathway. Sequences including PEF variability were not among the most cost-effective options.</p>
<p>Offer a direct bronchial challenge test with histamine or methacholine to adults (aged 17 and over) if there is diagnostic uncertainty after a normal spirometry and either a:</p> <ul style="list-style-type: none"> • FeNO level of 40 ppb or more and no variability in peak flow readings or • FeNO level of 39 ppb or less with variability in peak flow readings. <p>Regard a PC20 value of 8 mg/ml or less as a positive test. [1.3.11]</p>	<p>Replaced by recommendation 1.2.3.</p>
<p>Consider a direct bronchial challenge test with histamine or methacholine in adults (aged 17 and over) with:</p> <ul style="list-style-type: none"> • obstructive spirometry without bronchodilator reversibility and • a FeNO level between 25 ppb and 39 ppb and • no variability in peak flow readings (less than 20% variability over 2 to 4 weeks). <p>Regard a PC20 value of 8 mg/ml or less as a positive test. [1.3.12]</p>	<p>Replaced by recommendation 1.2.3.</p>
<p>If a direct bronchial challenge test with histamine or methacholine is unavailable, suspect asthma and review the diagnosis after treatment, or refer to a centre with access to a histamine or methacholine challenge test. [1.3.13]</p>	<p>Deleted because it discourages centres from making bronchial challenge tests more readily available.</p>
<p>Diagnosis in children and young people aged 5 to 16</p>	

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<p>Diagnose asthma in children and young people (aged 5 to 16) if they have symptoms suggestive of asthma and:</p> <ul style="list-style-type: none"> • a FeNO level of 35 ppb or more and positive peak flow variability or • obstructive spirometry and positive bronchodilator reversibility. [1.3.14] 	<p>Replaced by recommendations 1.2.4 and 1.2.5.</p>
<p>Suspect asthma in children and young people (aged 5 to 16) if they have symptoms suggestive of asthma and:</p> <ul style="list-style-type: none"> • a FeNO level of 35 ppb or more with normal spirometry and negative peak flow variability or • a FeNO level of 35 ppb or more with obstructive spirometry but negative bronchodilator reversibility and no variability in peak flow readings or • normal spirometry, a FeNO level of 34 ppb or less and positive peak flow variability. <p>Do not rule out other diagnoses if symptom control continues to remain poor after treatment. Review the diagnosis after 6 weeks by repeating any abnormal tests and reviewing symptoms. [1.3.15]</p>	<p>Deleted because FeNO measurement is now at start of diagnostic pathway and elevated level allows a diagnosis of asthma.</p>
<p>Refer children and young people (aged 5 to 16) for specialist assessment if they have obstructive spirometry, negative bronchodilator reversibility and a FeNO level of 34 ppb or less. [1.3.16]</p>	<p>Replaced by recommendation 1.2.7.</p>
<p>Consider alternative diagnoses and referral for specialist assessment in children and young people (aged 5 to 16) if they have symptoms suggestive of asthma but normal spirometry, a FeNO level of 34 ppb or less and negative peak flow variability. [1.3.17]</p>	<p>Replaced by recommendation 1.2.7.</p>
<p>Diagnosis in adults aged 17 and over</p>	
<p>Diagnose asthma in adults (aged 17 and over) if they have symptoms suggestive of asthma and:</p> <ul style="list-style-type: none"> • a FeNO level of 40 ppb or more with either positive bronchodilator reversibility or positive peak flow 	<p>Replaced by recommendation 1.2.1 and recommendation 1.2.2.</p>

<p>variability or bronchial hyperreactivity or</p> <ul style="list-style-type: none"> • a FeNO level between 25 ppb and 39 ppb and a positive bronchial challenge test or • positive bronchodilator reversibility and positive peak flow variability irrespective of FeNO level. [1.3.18] 	
<p>Suspect asthma in adults (aged 17 and over) with symptoms suggestive of asthma, obstructive spirometry and:</p> <ul style="list-style-type: none"> • negative bronchodilator reversibility, and either a FeNO level of 40 ppb or more, or a FeNO level between 25 ppb and 39 ppb and positive peak flow variability or • positive bronchodilator reversibility, a FeNO level between 25 ppb and 39 ppb and negative peak flow variability. <p>Do not rule out other diagnoses if symptom control continues to remain poor after treatment. Review the diagnosis after 6 to 10 weeks by repeating spirometry and objective measures of asthma control and reviewing symptoms. [1.3.19]</p>	<p>Deleted because PEF variability is no longer included in the diagnostic pathway and because the committee did not think it is helpful to have an equivocal range for FeNO level.</p>
<p>Consider alternative diagnoses, or referral for a second opinion, in adults (aged 17 and over) with symptoms suggestive of asthma and:</p> <ul style="list-style-type: none"> • a FeNO level below 40 ppb, normal spirometry and positive peak flow variability or • a FeNO level of 40 ppb or more but normal spirometry, negative peak flow variability, and negative bronchial challenge test or • obstructive spirometry with bronchodilator reversibility, but a FeNO level below 25 ppb, and negative peak flow variability or • positive peak flow variability but normal spirometry, a FeNO level below 40 ppb, and a negative bronchial challenge test or • obstructive spirometry with negative bronchodilator reversibility, a FeNO level below 25 ppb, and negative peak flow variability (if measured). [1.3.20] 	<p>Deleted because these combinations of results will not arise with new diagnostic recommendations.</p>

Diagnosis in people who are unable to perform an objective test	
If an adult, young person or child with symptoms suggestive of asthma cannot perform a particular test, try to perform at least 2 other objective tests. Diagnose suspected asthma based on symptoms and any positive objective test results. [1.3.21]	Deleted because in new diagnostic recommendations there are already 2 options at most of the steps in the pathway up to the point of bronchial challenge testing.
Principles of pharmacological treatment	
If inhaled corticosteroid (ICS) maintenance therapy is needed, offer regular daily ICS rather than intermittent or 'when required' ICS therapy. [1.5.3]	Replaced by recommendation 1.8.1.
Adjust maintenance therapy ICS doses over time, aiming for the lowest dose required for effective asthma control. [1.5.4]	Replaced by recommendations 1.10.1 to 1.10.3.
Pharmacological treatment pathway for adults	
Offer a short-acting beta ₂ agonist (SABA) as reliever therapy to adults (aged 17 and over) with newly diagnosed asthma. [1.6.1]	Replaced by recommendation 1.7.1.
For adults (aged 17 and over) with asthma who have infrequent, short-lived wheeze and normal lung function, consider treatment with SABA reliever therapy alone. [1.6.2]	Replaced by recommendation 1.7.1.
Offer a low dose of an ICS as the first-line maintenance therapy to adults (aged 17 and over) with: <ul style="list-style-type: none"> symptoms at presentation that clearly indicate the need for maintenance therapy (for example, asthma-related symptoms 3 times a week or more, or causing waking at night) or asthma that is uncontrolled with a SABA alone. [1.6.3] 	Replaced by recommendation 1.7.2.
If asthma is uncontrolled in adults (aged 17 and over) on a low dose of ICS as maintenance therapy, offer a leukotriene receptor antagonist (LTRA) in addition to the ICS and review the response to treatment in 4 to 8 weeks. [1.6.4]	No direct replacement. Sequencing of treatment in adults now covered in recommendations 1.7.4 to 1.7.6.
If asthma is uncontrolled in adults (aged 17 and over) on a low dose of ICS and an LTRA as maintenance therapy, offer a long-acting beta ₂ agonist (LABA) in combination with	No direct replacement. Sequencing of treatment in adults now covered in recommendations 1.7.4 to 1.7.6.

<p>the ICS, and review LTRA treatment as follows:</p> <ul style="list-style-type: none"> • discuss with the person whether or not to continue LTRA treatment • take into account the degree of response to LTRA treatment. [1.6.5] 	
<p>If asthma is uncontrolled in adults (aged 17 and over) on a low dose of ICS and a LABA, with or without an LTRA, as maintenance therapy, offer to change the person's ICS and LABA maintenance therapy to a MART regimen with a low maintenance ICS dose. [1.6.6]</p>	<p>No direct replacement. Sequencing of treatment in adults now covered in recommendations 1.7.4 to 1.7.6.</p>
<p>If asthma is uncontrolled in adults (aged 17 and over) on a MART regimen with a low maintenance ICS dose, with or without an LTRA, consider increasing the ICS to a moderate maintenance dose (either continuing on a MART regimen or changing to a fixed dose of an ICS and a LABA, with a SABA as a reliever therapy). [1.6.7]</p>	<p>No direct replacement. Sequencing of treatment in adults now covered in recommendations 1.7.4 to 1.7.6.</p>
<p>If asthma is uncontrolled in adults (aged 17 and over) on a moderate maintenance ICS dose with a LABA (either as MART or a fixed-dose regimen), with or without an LTRA, consider:</p> <ul style="list-style-type: none"> • increasing the ICS to a high maintenance dose (this should only be offered as part of a fixed-dose regimen, with a SABA used as a reliever therapy) or • a trial of an additional drug (for example, a long-acting muscarinic receptor antagonist or theophylline) or • seeking advice from a healthcare professional with expertise in asthma. [1.6.8] 	<p>The addition of a LAMA and seeking advice from an asthma specialist are now covered in recommendations 1.7.6 and 1.7.7. The committee did not want to suggest using high dose ICS before seeking a specialist opinion on safety grounds, and this bullet point has been omitted from the new recommendations.</p>
<p>Pharmacological treatment pathway for children and young people aged 5 to 16</p>	
<p>Offer a SABA as reliever therapy to children and young people (aged 5 to 16) with newly diagnosed asthma. [1.7.1]</p>	<p>Deleted as recommendation on its own might imply SABA only is an acceptable treatment. SABA as needed now incorporated into appropriate recommendations (1.8.1, 1.8.2, 1.8.4 to 1.8.6).</p>
<p>For children and young people (aged 5 to 16) with asthma who have infrequent,</p>	<p>Deleted as SABA alone is no longer recommended.</p>

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<p>short-lived wheeze and normal lung function, consider treatment with SABA reliever therapy alone. [1.7.2]</p>	
<p>Offer a paediatric low dose of an ICS as the first-line maintenance therapy to children and young people (aged 5 to 16) with:</p> <ul style="list-style-type: none"> • symptoms at presentation that clearly indicate the need for maintenance therapy (for example, asthma-related symptoms 3 times a week or more, or causing waking at night) or • asthma that is uncontrolled with a SABA alone. [1.7.3] 	<p>Replaced by recommendation 1.8.1.</p>
<p>If asthma is uncontrolled in children and young people (aged 5 to 16) on a paediatric low dose of ICS as maintenance therapy, consider an LTRA in addition to the ICS and review the response to treatment in 4 to 8 weeks. [1.7.4]</p>	<p>No direct replacement. Sequencing of treatment in children aged 5-11 now covered in recommendations 1.8.1 to 1.8.6.</p>
<p>If asthma is uncontrolled in children and young people (aged 5 to 16) on a paediatric low dose of ICS and an LTRA as maintenance therapy, consider stopping the LTRA and starting a LABA in combination with the ICS. [1.7.5]</p>	<p>No direct replacement. Sequencing of treatment in children aged 5-11 now covered in recommendations 1.8.1 to 1.8.6</p>
<p>If asthma is uncontrolled in children and young people (aged 5 to 16) on a paediatric low dose of ICS and a LABA as maintenance therapy, consider changing their ICS and LABA maintenance therapy to a MART regimen with a paediatric low maintenance ICS dose. Ensure that the child or young person is able to understand and comply with the MART regimen. [1.7.6]</p>	<p>No direct replacement. Sequencing of treatment in children aged 5-11 now covered in recommendations 1.8.1 to 1.8.6.</p>
<p>If asthma is uncontrolled in children and young people (aged 5 to 16) on a MART regimen with a paediatric low maintenance ICS dose, consider increasing the ICS to a paediatric moderate maintenance dose (either continuing on a MART regimen or changing to a fixed dose of an ICS and a LABA, with a SABA as a reliever therapy). [1.7.7]</p>	<p>No direct replacement. Sequencing of treatment in children aged 5-11 now covered in recommendations 1.8.1 to 1.8.6.</p>
<p>If asthma is uncontrolled in children and young people (aged 5 to 16) on a paediatric moderate maintenance ICS</p>	<p>Replaced in part by recommendation 1.8.7. The options of increasing to high dose ICS or adding a theophylline have</p>

<p>dose with LABA (either as MART or a fixed-dose regimen), consider seeking advice from a healthcare professional with expertise in asthma and consider either:</p> <ul style="list-style-type: none"> increasing the ICS dose to paediatric high maintenance dose (only as part of a fixed-dose regimen, with a SABA used as a reliever therapy) or a trial of an additional drug (for example, theophylline). [1.7.8] 	<p>been deleted as the committee agreed that a referral to an asthma specialist is more appropriate.</p>
<p>Pharmacological treatment pathway for children under 5</p>	
<p>Offer a SABA as reliever therapy to children under 5 with suspected asthma. This should be used for symptom relief alongside all maintenance therapy. [1.8.1]</p>	<p>Replaced by recommendation 1.9.1.</p>
<p>Consider an 8-week trial of a paediatric moderate dose of an ICS in children under 5 with:</p> <ul style="list-style-type: none"> symptoms at presentation that clearly indicate the need for maintenance therapy (for example, asthma-related symptoms 3 times a week or more, or causing waking at night) or suspected asthma that is uncontrolled with a SABA alone. [1.8.2] 	<p>Replaced by recommendation 1.9.2.</p>
<p>After 8 weeks, stop ICS treatment and continue to monitor the child's symptoms:</p> <ul style="list-style-type: none"> if symptoms did not resolve during the trial period, review whether an alternative diagnosis is likely if symptoms resolved then reoccurred within 4 weeks of stopping ICS treatment, restart the ICS at a paediatric low dose as first-line maintenance therapy if symptoms resolved but reoccurred beyond 4 weeks after stopping ICS treatment, repeat the 8-week trial of a paediatric moderate dose of ICS. [1.8.3] 	<p>Replaced by recommendations 1.9.3 and 1.9.4.</p>
<p>If suspected asthma is uncontrolled in children under 5 on a paediatric low dose of ICS as maintenance therapy, consider an LTRA in addition to the ICS. [1.8.4]</p>	<p>Replaced by recommendation 1.9.5</p>

If suspected asthma is uncontrolled in children under 5 on a paediatric low dose of ICS and an LTRA as maintenance therapy, stop the LTRA and refer the child to a healthcare professional with expertise in asthma for further investigation and management. [1.8.5]	Replaced by recommendation 1.9.6.
Self-management	
For children and young people aged 5 to 16 with deteriorating asthma who have not been taking their ICS consistently, explain that restarting regular use may help them to regain control of their asthma. The evidence for increasing ICS doses to self-manage deteriorating asthma control is limited. [1.10.4]	Deleted because committee regard first sentence as unnecessarily obvious.
Risk stratified care	
Consider using risk stratification to identify people with asthma who are at increased risk of poor outcomes, and use this information to optimise their care. Base risk stratification on factors such as non-adherence to asthma medicines, psychosocial problems and repeated episodes of unscheduled care for asthma. [1.12.1]	Replaced by recommendation 1.15.1 and associated rationale.
Monitoring asthma control	
Consider using a validated questionnaire (for example, the Asthma Control Questionnaire or Asthma Control Test) to monitor asthma control in adults (aged 17 and over). [1.13.2]	Replaced by recommendation 1.5.2.
Monitor asthma control at each review in adults, young people and children aged 5 and over using either spirometry or peak flow variability testing. [1.13.3]	Deleted as committee could find no evidence to support routine use of either spirometry or PEF.
Do not routinely use FeNO to monitor asthma control. [1.13.4]	Replaced by recommendation 1.5.4.
Consider FeNO measurement as an option to support asthma management in people who are symptomatic despite using inhaled corticosteroids. (This recommendation is from NICE's diagnostics guidance on measuring fractional exhaled nitric oxide concentration in asthma.) [1.13.5]	Replaced by recommendation 1.5.4.
Do not use challenge testing to monitor asthma control. [1.13.6]	Deleted because unnecessary; challenge testing is not used (and has never been used) for monitoring purposes in NHS.

<ul style="list-style-type: none"> • Observe and give advice on the person's inhaler technique: • at every consultation relating to an asthma attack, in all care settings • when there is deterioration in asthma control • when the inhaler device is changed • at every annual review • if the person asks for it to be checked. [1.13.7] 	<p>Replaced by recommendation 1.6.6.</p>
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2 **Table 1b Recommendations that have been deleted from the BTS/SIGN**
 3 **guideline**

Recommendation in 2019 guideline	Comment
Initial structured clinical assessment	
<p>Compare the results of diagnostic tests undertaken whilst a patient is asymptomatic with those undertaken when a patient is symptomatic to detect variation over time. [C, 3.1.3]</p>	<p>No equivalent recommendation in new guideline. The BTS/SIGN recommendation is valid but can only be applied if tests have been repeated.</p>
<p>Operators should be trained to undertake quality-assured spirometry and be experienced in providing tests in the relevant age groups [GPP, 3.2.2]</p>	<p>This is a good practice point rather than a recommendation. All physiological and laboratory measurements should be quality assured and the committee did not feel that this needed to be stated.</p>
<p>Carry out quality-assured spirometry using the lower limit of normal to demonstrate airway obstruction, provide a baseline for assessing response to initiation of treatment and exclude alternative diagnoses.</p> <ul style="list-style-type: none"> • Obstructive spirometry with positive bronchodilator reversibility increases the probability of asthma. • Normal spirometry in an asymptomatic patient does not rule out the diagnosis of asthma. [D, 3.2.2] 	<p>Recommendation deleted. Spirometry alone is not part of the recommended diagnostic sequence (although it will be performed because bronchodilator reversibility testing is recommended).</p>
<p>Referral for challenge tests should be considered in adults with no evidence of airflow obstruction on initial assessment in whom other objective tests are inconclusive but asthma remains a possibility. [3.2.3]</p>	<p>Covered by recommendation 1.2.3 and 1.2.7.</p>

<p>A peak flow recorded when symptomatic (eg during the assessment of an asthma attack) may be compared with a peak flow when asymptomatic (eg after recovery from an asthma attack) in order to confirm variability. [GPP, 3.2.3]</p>	<p>Recommendation deleted. PEF recording is not part of the suggested diagnostic pathway.</p>
<p>In adults, serial peak-flow records may demonstrate variability in symptomatic patients, but should be interpreted with caution and with regard to the clinical context. There is no evidence to support the routine use of peak-flow monitoring in the diagnosis of asthma in children. [GPP, 3.2.3]</p>	<p>Recommendation deleted. PEF recording is not part of the suggested diagnostic pathway.</p>
<p>Serial peak flows (at least four readings a day) are the initial investigation of choice in suspected occupational asthma. [GPP, 3.2.3]</p>	<p>Recommendation deleted. The committee agreed that diagnosis of occupational asthma should only be performed by specialists in occupational medicine.</p>
<p>Use measurement of FeNO (if available) to find evidence of eosinophilic inflammation. A positive test increases the probability of asthma but a negative test does not exclude asthma. [D, 3.2.4]</p>	<p>FeNO measurement is supported in new pathway: recommendations 1.2.1 and 1.2.4.</p>
<p>In patients with a high probability of asthma:</p> <ul style="list-style-type: none"> • record the patient as likely to have asthma and commence a carefully monitored initiation of treatment (typically six weeks of inhaled corticosteroids) • assess the patient's status with a validated symptom questionnaire, ideally corroborated by lung function tests (FEV1 at clinic visits or by domiciliary serial peak flows to capture times with/without symptoms) • with a good symptomatic and objective response to treatment, confirm the diagnosis of asthma and record the basis on which the diagnosis was made • if the response is poor or equivocal, check inhaler technique and adherence, arrange further tests and consider alternative diagnoses. [GPP, 3.3.2] 	<p>No equivalent recommendation in new guideline. The committee did not adopt the strategy of dividing pre-test probability of asthma into low, intermediate or high.</p>
<p>If there is a low probability of asthma and/or an alternative diagnosis is more likely, investigate for the alternative diagnosis, reconsidering asthma if the clinical picture changes or an alternative</p>	<p>No equivalent recommendation in new guideline. The committee did not adopt the strategy of dividing pre-test probability of asthma into low, intermediate or high.</p>

diagnosis is not confirmed. If reconsidering asthma, undertake or refer for further tests to investigate for a diagnosis of asthma. [GPP, 3.3.3]	
In children with an intermediate probability of asthma who cannot perform spirometry: <ul style="list-style-type: none"> • consider watchful waiting if the child is asymptomatic • Offer a carefully monitored initiation of treatment if the child is symptomatic. [3.3.4] 	Similar to NICE recommendation 1.2.1 in intent (but the concept of low, intermediate or high probability of asthma has not been adopted for this update).
Spirometry, with bronchodilator reversibility as appropriate, is the preferred initial test for investigating intermediate probability of asthma in adults, and in children old enough to produce reliable results on testing. [D, 3.3.4]	No equivalent recommendation in new guideline. The committee did not adopt the strategy of dividing pre-test probability of asthma into low, intermediate or high.
In adults and children with an intermediate probability of asthma and airways obstruction identified through spirometry, undertake reversibility tests and/or a monitored initiation of treatment assessing the response to treatment by repeating lung function tests and objective measures of asthma control. [GPP, 3.3.4]	No equivalent recommendation in new guideline. The committee did not adopt the strategy of dividing pre-test probability of asthma into low, intermediate or high.
In adults and children with an intermediate probability of asthma and normal spirometry results, undertake challenge tests and/or measurement of FeNO to identify eosinophilic inflammation. [GPP, 3.3.4]	No equivalent recommendation in new guideline. The committee did not adopt the strategy of dividing pre-test probability of asthma into low, intermediate or high.
Streamlined referral pathways should be developed for tests which are not routinely available in primary care. [C, 3.4]	No equivalent recommendation in new guideline.
Use a previous record of skin-prick tests, blood eosinophilia of 4% or more, or a raised allergen-specific IgE to corroborate a history of atopic status, but do not offer these tests routinely as a diagnostic test for asthma. [3.2.4]	This recommendation is superseded by new diagnostic recommendations (section 1.2).
Monitoring asthma	
The core components of an asthma review that should be assessed and recorded on at least an annual basis are current symptoms, future risk of attacks, management strategies, supported self management, and growth in children. [GPP, 4]	This is a good practice point rather than a recommendation. Some elements of it are covered separately in recommendations 1.5.1, 1.5.2, 1.6.1 and 1.15.1.

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When asking about asthma symptoms, use specific questions, such as the Royal College of Physicians ‘3 Questions’ or questions about reliever use, with positive responses prompting further assessment with a validated questionnaire to assess symptom control. [GPP, 4.2]	Use of validated questionnaires is covered in recommendation 1.5.3.
Whenever practicable, children should be asked about their own symptoms; do not rely solely on parental report. [GPP, 4.2]	This is a good practice point rather than a recommendation. Not included within a recommendation as it is not asthma-specific.
Assess risk of future asthma attacks at every asthma review by asking about history of previous attacks, objectively assessing current asthma control, and reviewing reliever use. [D/B/D, 4.3.3]	Assessment of risk of future asthma attacks is not in scope (although it is related to recommendation 1.15.1 on risk stratification).
In children, regard comorbid atopic conditions, younger age, obesity, and exposure to environmental tobacco smoke as markers of increased risk of future asthma attacks. [B/D, 4.3.3]	Assessment of risk of future asthma attacks is not in scope (although it is related to recommendation 1.15.1 on risk stratification).
In adults, regard older age, female gender, reduced lung function, obesity, smoking, and depression as markers of a slightly increased risk of future asthma attacks. [D, 4.3.3]	Assessment of risk of future asthma attacks is not in scope (although it is related to recommendation 1.15.1 on risk stratification).
Clinicians should target care (including tailoring frequency of review, optimising pharmacological therapy, personalising supported self management) to reduce the patient’s risk status. [GPP, 4.3.3]	Targeting care for people at highest risk is covered in recommendation 1.15.1.
Healthcare policy should target vulnerable groups, ensure equitable access to care, and promote reduction in environmental tobacco smoke. [GPP, 4.3.3]	This is a good practice point rather than a recommendation. Not included within a recommendation as the guideline is focused on patient level care rather than healthcare policy.
In individuals with severe asthma, assess risk of future asthma attacks at each visit by asking structured questions about asthma control, reviewing history of previous attacks and measuring lung function. [D/D, 4.3.4]	Severe asthma – out of scope of BTS/SIGN/NICE guideline but will be considered in new BTS/SIGN standalone guideline on uncontrolled asthma.
Except in specialist asthma clinics, the routine use of FeNO testing to monitor asthma in adults or children is not recommended. [B, 4.4.2]	This advice has changed following evidence review. FeNO monitoring is covered in recommendation 1.5.3.
The routine use of sputum eosinophilia to monitor asthma in adults or children is not recommended. [B, 4.4.3]	Recommendation deleted. Committee agreed that sputum eosinophilia monitoring is rarely done, and if it has a role it is more likely to be in severe asthma which is out of scope.

Pharmacological management	
Lung function measurements cannot be used reliably to guide asthma management in children under five years of age. [GPP, 7]	This is a good practice point rather than a recommendation. Lung function monitoring is not recommended in the new guidance (section 1.5).
Prescribe an inhaled short-acting β_2 agonist as short-term reliever therapy for all patients with symptomatic asthma. [A/B/D, 7.1]	Recommendation deleted because the new guidance emphasises the role of MART in which SABAs are not needed. Use of SABA is included in recommendations 1.8.1, 1.8.4 to 1.8.6, and 1.9.1.
Anyone prescribed more than one 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. [GPP, 7.1.1]	This advice is not given directly in the new guidance but overuse of SABA is cited in the rationale for the Risk Stratification recommendation.
Inhaled corticosteroids are the recommended preventer drug for adults and children for achieving overall treatment goals. [A/A/A, 7.2.1]	ICS are recommended for all age groups both as first line treatment and at all stages of treatment escalation (sections 1.7, 1.8 and 1.9).
Inhaled corticosteroids should be considered for patients with any of the following asthma-related features: <ul style="list-style-type: none"> • asthma attack in the last two years • using inhaled β_2 agonists three times a week or more • symptomatic three times a week or more • waking one night a week. [B/C, 7.2.1] 	ICS are recommended for all age groups both as first line treatment and at all stages of treatment escalation (sections 1.7, 1.8 and 1.9).
Start patients at a dose of inhaled corticosteroids appropriate to the severity of disease. [GPP, 7.2.2]	Starting doses of ICS are covered in recommendations 1.7.1 and 1.7.2 for adults, and 1.8.1 and 1.9.1 for children.
A reasonable starting dose of inhaled corticosteroids will usually be low dose for adults and very low dose for children. [GPP, 7.2.2]	Starting doses of ICS are covered in recommendations 1.7.1 and 1.7.2 for adults, and 1.8.1 and 1.9.1 for children.
Titrate the dose of inhaled corticosteroid to the lowest dose at which effective control of asthma is maintained. [7.2.2]	Not directly transferred to new guideline, but principle is implicit in section on decreasing therapy (section 1.10).
Give inhaled corticosteroids initially twice daily (except ciclesonide which is given once daily). [A/A/A, 7.2.3]	Starting doses of ICS are covered in recommendations 1.7.1 and 1.7.2 for adults, and 1.8.1 and 1.9.1 for children.
Once-a-day inhaled corticosteroids at the same total daily dose can be considered if good control is established. [A/A, 7.2.3]	Recommendation deleted because the new guidance recommends MART at most treatment points.
Titrate the dose of inhaled corticosteroid to the lowest dose at which effective	Detailed advice on increasing and decreasing doses is given within sections 1.6 to 1.10.

control of asthma is maintained. [GPP, 7.2.5]	
Monitor growth (height and weight centile) of children with asthma on an annual basis. [GPP, 7.2.5]	Recommendation deleted as non-asthma specific. Monitoring growth is part of management of all chronic childhood diseases.
The lowest dose of inhaled corticosteroids compatible with maintaining asthma control should be used. [GPP, 7.2.5]	No specific equivalent of this good practice point but detailed advice on adjusting doses is given within sections 1.6 to 1.10.
Specific written advice about steroid replacement in the event of a severe intercurrent illness or surgery should be part of the management plan. [GPP, 7.2.5]	This is a good practice point rather than a recommendation. It is for children and based on risk associated mainly with doses of ICS which the new guideline does not recommend (referral to asthma specialist is recommended before prescribing higher doses of ICS).
The child should be under the care of a specialist paediatrician for the duration of the treatment. [GPP, 7.2.5]	Referral to specialist is covered in recommendation 1.8.7.
Clinicians should be aware that higher doses of inhaled corticosteroids may be needed in patients who are smokers or ex-smokers. [B, 7.2.6]	Recommendation deleted. The committee are aware of this adverse effect of smoking, but at an individual patient level the advice regarding titrating ICS dose to treatment response is the same in smokers and non-smokers.
The first choice as add-on therapy to inhaled corticosteroids in adults is an inhaled long-acting β_2 agonist, which should be considered before increasing the dose of inhaled corticosteroid. [A, 7.3.2]	Recommendation deleted. New recommendations on treatment sequencing in adults are in Section 1.7.
In children aged five and over, an inhaled long-acting β_2 agonist or a leukotriene receptor antagonist can be considered as initial add-on therapy. [B, 7.3.2]	Recommendation deleted. New recommendations on treatment sequencing in children aged 5-11 are in Section 1.8.
Long-acting inhaled β_2 agonists should only be started in patients who are already on inhaled corticosteroids, and the inhaled corticosteroid should be continued. [GPP, 7.3.3]	Recommendation deleted. However, in all treatment recommendations for all age groups a LABA is never recommended without an ICS (see sections 1.7 to 1.9).
Combination inhalers are recommended to: <ul style="list-style-type: none"> • guarantee that the long-acting β_2 agonist is not taken without inhaled corticosteroid • improve inhaler adherence. [GPP, 7.3.4] 	Recommendation deleted. However, recommendations are now based heavily on MART which is founded on use of a combination inhaler.

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<p>Consider the option of combined maintenance and reliever therapy in adult patients who have a history of asthma attacks on medium dose ICS or ICS/LABA. [A, 7.3.5]</p>	<p>Recommendation deleted. MART is now recommended more prominently (see sections 1.7 and 1.8).</p>
<p>If asthma control remains suboptimal after the addition of an inhaled long-acting β_2 agonist then</p> <ul style="list-style-type: none"> • increase the dose of inhaled corticosteroids from low dose to medium dose in adults or from very low dose to low dose in children (5–12 years), if not already on these doses. <p>or</p> <ul style="list-style-type: none"> • consider adding a leukotriene receptor antagonist. [D/D, 7.4.2] 	<p>Recommendation deleted. New recommendations on treatment sequencing for adults are in Section 1.7 and for children in Section 1.8.</p>
<p>All patients whose asthma is not adequately controlled on recommended initial or additional controller therapies should be referred for specialist care. [GPP, 7.5]</p>	<p>Recommendations on stage at which referral should be made are given for each age group (see recommendations 1.7.7, 1.7.12, 1.8.7 and 1.9.6).</p>
<p>If control remains inadequate after stopping a LABA and increasing the dose of inhaled corticosteroid, consider sequential trials of add-on therapy, ie leukotriene receptor antagonists or theophyllines. [GPP, 7.5.2]</p>	<p>Recommendation deleted. New recommendations on treatment sequencing for adults are in Section 1.7 and for children in Section 1.8.</p>
<p>If asthma control remains inadequate on medium-dose (adults) or low-dose (children) of inhaled corticosteroid plus a long-acting β_2 agonist or a leukotriene receptor antagonist, the following interventions can be considered:</p> <ul style="list-style-type: none"> • increase the inhaled corticosteroids to high dose (adults)/medium dose (children 5–12 years)* or • add a leukotriene receptor antagonist (if not already trialled) or • add tiotropium (adults) or • add a theophylline. <p>* at high doses of inhaled corticosteroid via a pMDI, a spacer should be used. [D/D, 7.5.2]</p>	<p>Recommendation deleted. New recommendations on treatment sequencing for adults are in Section 1.7 and for children in Section 1.8.</p>
<p>If a trial of an add-on treatment is ineffective, stop the drug (or in the case of increased dose of inhaled corticosteroid, reduce to the original dose). [GPP, 7.5.2]</p>	<p>Recommendation deleted. New recommendations on treatment sequencing for adults are in Section 1.7 and for children in Section 1.8.</p>
<p>Although there are no controlled trials, children (all ages) who are under</p>	<p>Recommendation deleted because severe asthma is out of scope. It will</p>

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specialist care may benefit from a trial of higher doses ICS (greater than 800 micrograms/day) before moving to use of oral steroids. [GPP, 7.5.2]	be reviewed in the BTS/SIGN standalone guidance on uncontrolled asthma.
For the small number of patients not controlled on high-dose therapies, use daily steroid tablets in the lowest dose providing adequate control. [GPP, 7.5.3]	Recommendation deleted because severe asthma is out of scope. It will be reviewed in the BTS/SIGN standalone guidance on uncontrolled asthma.
Patients requiring frequent or continuous use of oral corticosteroids should be under the care of a specialist asthma service. [GPP, 7.5.3]	Recommendation deleted because severe asthma is out of scope. It will be reviewed in the BTS/SIGN standalone guidance on uncontrolled asthma.
Omalizumab given by subcutaneous injection may be considered in eligible patients with a high oral corticosteroid burden. [B/B, 7.5.4]	Recommendation deleted because severe asthma is out of scope. It will be reviewed in the BTS/SIGN standalone guidance on uncontrolled asthma.
Mepolizumab (subcutaneous), reslizumab (intravenous) and benralizumab (subcutaneous) may be considered in eligible patients with a high oral corticosteroid burden. [A, 7.5.4]	Recommendation deleted because severe asthma is out of scope. It will be reviewed in the BTS/SIGN standalone guidance on uncontrolled asthma.
Immunosuppressants (methotrexate, ciclosporin and oral gold) may be given as a three-month trial, once other drug treatments have proved unsuccessful. Their risks and benefits should be discussed with the patient and their treatment effects carefully monitored. Treatment should be in a centre with experience of using these medicines. [GPP, 7.5.5]	Recommendation deleted because severe asthma is out of scope. It will be reviewed in the BTS/SIGN standalone guidance on uncontrolled asthma.
The use of subcutaneous immunotherapy is not recommended for the treatment of asthma in adults or children. [B/B, 7.5.6]	Recommendation deleted because subcutaneous immunotherapy is not included in scope.
Sublingual immunotherapy is not recommended for the treatment of asthma in children or adults. [B/B, 7.5.6]	Recommendation deleted because sublingual immunotherapy is not included in scope.
Bronchial thermoplasty may be considered for the treatment of adult patients (aged 18 and over) with severe asthma who have poorly-controlled asthma despite optimal medical therapy. [B, 7.5.7]	Recommendation deleted because severe asthma is out of scope. It will be reviewed in the BTS/SIGN standalone guidance on uncontrolled asthma.

<ul style="list-style-type: none"> • Patients being considered for bronchial thermoplasty should be assessed to confirm the diagnosis of asthma, that uncontrolled asthma is the cause of their ongoing symptoms, and that they are adherent with current treatment. • An asthma specialist with expertise in bronchial thermoplasty should assess patients prior to undergoing treatment, and treatment should take place in a specialist centre with the appropriate resources and training, including access to an intensive care unit. • Patients undergoing bronchial thermoplasty should have their details entered onto the UK Severe Asthma Registry. [GPP, 7.5.7] 	<p>Recommendation deleted because severe asthma is out of scope. It will be reviewed in the BTS/SIGN standalone guidance on uncontrolled asthma.</p>
<p>For most patients, exercise-induced asthma is an expression of poorly-controlled asthma and regular treatment including inhaled corticosteroids should be reviewed. [GPP, 7.7.2]</p>	<p>Recommendation deleted because exercise-induced asthma is out of scope.</p>
<p>If exercise is a specific problem in patients taking inhaled corticosteroids who are otherwise well controlled, consider adding one of the following therapies:</p> <ul style="list-style-type: none"> • leukotriene receptor antagonists • long-acting β_2 agonists • sodium cromoglicate or nedocromil sodium • theophyllines. [A/C, 7.7.2] 	<p>Recommendation deleted because exercise-induced asthma is out of scope.</p>
<p>Immediately prior to exercise, inhaled short-acting β_2 agonists are the drug of choice. [A/A, 7.7.2]</p>	<p>Recommendation deleted because exercise-induced asthma is out of scope.</p>
<p>In adult patients with allergic bronchopulmonary aspergillosis, a four-month trial of itraconazole should be considered. [C, 7.7.4]</p>	<p>Recommendation deleted because allergic bronchopulmonary aspergillosis (ABPA) is out of scope.</p>
<p>Careful monitoring for side effects, particularly hepatic, is recommended. [GPP, 7.7.4]</p>	<p>Recommendation deleted because ABPA is out of scope.</p>
<p>Asthma in adolescents</p>	
<p>Clinicians seeing adolescents with any cardiorespiratory symptoms should ask about symptoms of asthma. [11.2]</p>	<p>Committee did not regard this as within the remit of this section which should be about adolescent-specific advice in established asthma.</p>
<p>Healthcare professionals should be aware that complementary and</p>	<p>This recommendation has been deleted because non-pharmacological</p>

alternative medicine use is common in adolescents and should ask about its use. [11.8.2]	management of asthma is outside scope and committee were therefore unsure what action should follow the enquiry.
Adolescent preference for inhaler device should be taken into consideration as a factor in improving adherence to treatment. [11.10]	Replaced by recommendation 1.13.3 It was agreed that 1.13.3 said much the same and this statement (it was a good practice point, not a recommendation) was redundant.
Consider prescribing a more portable device (as an alternative to a pMDI with spacer) for delivering bronchodilators when away from home. [11.10]	Covered by recommendations on inhalers (1.6.4 and 1.6.6).
School-based clinics may be considered for adolescents with asthma to improve attendance. [11.11.2]	Not included in new guideline because of concerns about strength of evidence and uncertain costs.
Peer-led interventions for adolescents in the school setting should be considered. [11.11.2]	Not included in new guideline because of concerns about strength of evidence and uncertain costs.
Integration of school-based clinics with primary care services is essential. [11.11.2]	Not included in new guideline because of concerns about strength of evidence and uncertain costs.
In the initial period after transition to adult services in secondary care, adolescents are best seen by one consultant to build their confidence and encourage attendance. [11.11.3]	Replaced by text at start of section on asthma in adolescents: For guidance on transitioning to adult services, see the NICE guideline on transition from children's to adults' services for young people using health or social care services and the Scottish Parliament Information Centre briefing on transitions of young people with service and care needs between child and adult services in Scotland .
Design of individual or group education sessions delivered by healthcare professionals should address the needs of adolescents with asthma. [11.12.1]	Not included in new guideline because there is no guidance on general asthma education for other age groups.
Asthma in pregnancy	
Use sodium cromoglicate and nedocromil sodium as normal during pregnancy. [12.3.6]	These agents are no longer available.
Advise women that an acute asthma attack is rare in labour. [12.4]	Not included because management in labour is out of scope. Cross-reference made to NICE guideline on intrapartum care for women with existing medical conditions or obstetric complications and their babies .
Advise women to continue their usual asthma medications in labour. [12.4]	Not included because management in labour is out of scope. Cross-reference made to NICE guideline on intrapartum

	care for women with existing medical conditions or obstetric complications and their babies.
If anaesthesia is required, regional blockade is preferable to general anaesthesia in women with asthma due to the potential risk of bronchospasm with certain inhaled anaesthetic agents. [12.4]	Not included because management in labour is out of scope. Cross-reference made to NICE guideline on intrapartum care for women with existing medical conditions or obstetric complications and their babies.
Women receiving steroid tablets at a dose exceeding prednisolone 7.5 mg per day for more than two weeks prior to delivery should receive parenteral hydrocortisone 100 mg 6–8 hourly during labour. [12.4]	Not included because management in labour is out of scope. Cross-reference made to NICE guideline on intrapartum care for women with existing medical conditions or obstetric complications and their babies.
Use prostaglandin F2 α with extreme caution in women with asthma because of the risk of inducing bronchoconstriction. [12.4]	Not included because management in labour is out of scope. Cross-reference made to NICE guideline on intrapartum care for women with existing medical conditions or obstetric complications and their babies.
Encourage women with asthma to breastfeed. [12.5]	Recommendation deleted because breastfeeding is encouraged generally, not just for people with asthma.
Use asthma medications as normal during lactation, in line with manufacturers' recommendations. [12.5]	The section covers pregnancy, not post-pregnancy. All medications should be used in line with manufacturers' recommendations.
Inhaler devices	
In children aged 5–12, a pMDI + spacer is as effective as any other hand-held inhaler. [8.2.2]	Not included as this is a statement of effectiveness rather than a recommendation. Choice of inhaler remains important for all ages and is covered in recommendations 1.6.4 to 1.6.8.
In adults, a pMDI \pm spacer is as effective as any other hand-held inhaler, but patients may prefer some types of DPI. [8.2.2]	Not included as this is a statement of effectiveness rather than a recommendation. Choice of inhaler remains important for all ages and is covered in recommendations 1.6.4 to 1.6.8
In children aged 5–12 years, a pMDI + spacer is as effective as any DPI. [8.3]	Not included as this is a statement of effectiveness rather than a recommendation. Choice of inhaler remains important for all ages and is covered in recommendations 1.6.4 to 1.6.

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<p>In adults, a pMDI ± spacer is as effective as any DPI. [8.3]</p>	<p>Not included as this is a statement of effectiveness rather than a recommendation. Choice of inhaler remains important for all ages and is covered in recommendations 1.6.4 to 1.6.8.</p>
<p>Generic prescribing of inhalers should be avoided as this might lead to people with asthma being given an unfamiliar inhaler device which they are not able to use properly.</p>	<p>This recommendation has been deleted because the general principle of showing people how to use their device is covered in 1.6.6.</p>
<p>In young children, a pMDI and spacer is the preferred method of delivery of β_2 agonists and inhaled corticosteroids. A face mask is required until the child can breathe reproducibly using the spacer mouthpiece. Where this is ineffective a nebuliser may be required.</p>	<p>Not included as this is a statement of effectiveness rather than a recommendation. Choice of inhaler remains important for all ages and is covered in recommendations 1.6.4 to 1.6.8.</p>
<p>The spacer should be compatible with the pMDI being used. A change in spacer may alter effective dose delivered.</p> <p>The drug should be administered by repeated single actuations of the metered dose inhaler into the spacer, each followed by inhalation.</p> <p>There should be minimal delay between pMDI actuation and inhalation.</p> <p>Tidal breathing is as effective as single breaths.</p> <p>Spacers should be cleaned in accordance with manufacturer's recommendations.</p> <p>Drug delivery via a spacer may vary significantly due to static charge. Metal and other antistatic spacers are not affected in this way.</p> <p>Plastic spacers should be replaced at least every 12 months but some may need changing at 6 months. [8.5]</p>	<p>Not included as this degree of detail is above that in standard NICE guidelines.</p>
<p>Prescribers, pharmacists and patients should be aware that there are significant differences in the global warming potential of different MDIs and that inhalers with low global-warming potential should be used when they are likely to be equally effective. Where there is no alternative to MDIs, lower volume HFA134a inhalers should be used in preference to large volume or HFA227ea inhalers. [8.6]</p>	<p>Recommendation not transferred to new guideline in same form, but environmental consideration is included as a key factor in inhaler choice in recommendation 1.6.4.</p>
<p>Medicines adherence</p>	

<p>Questions about adherence should be open ended, acknowledge that poor adherence is the norm, and avoid use of potentially judgmental terminology. The questions are designed to stimulate an open discussion.</p> <ul style="list-style-type: none"> • Explore perceived benefits (“How do you think that the inhaler is helping you control your asthma?” “Are there times when you find that you don’t need your inhaler?”) • Ask about adverse reactions (“How much bother do you have from side effects?”) • Acknowledge general concerns about regular medication (“Some people worry about taking regular medication... what do you think?”) • Acknowledge practical difficulties with regular medication (“People sometimes find it difficult to remember to take regular treatment...”) • Ask about adherence over a specific time period (“How often did you use your preventer inhaler last week?”) [5.4] 	<p>Replaced by:</p> <p>Check adherence, using prescription records, and inhaler technique at every asthma-related healthcare review. Use the principles outlined in the NICE guidelines on shared decision making (endorsed by SIGN for use in Scotland) and medicines adherence. [1.11.1]</p>
<p>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. [5.4.3]</p>	<p>Replaced by:</p> <p>Check adherence, using prescription records, and inhaler technique at every asthma-related healthcare review. Use the principles outlined in the NICE guidelines on shared decision making (endorsed by SIGN for use in Scotland) and medicines adherence. [1.11.1]</p>
<p>Initiatives to promote adherence to regular treatment should consider:</p> <ul style="list-style-type: none"> • information requirements, for example individual and/or group sessions, written/electronic materials, ongoing access to information • practical facilitators, for example simple dosage regimes, dose counters, reminders • behavioural support, for example regular monitoring including assessment of medication use with 	<p>Replaced by:</p> <p>Check adherence, using prescription records, and inhaler technique at every asthma-related healthcare review. Use the principles outlined in the NICE guidelines on shared decision making (endorsed by SIGN for use in Scotland) and medicines adherence. [1.11.1]</p>

<p>feedback, counselling, psychological therapies</p> <ul style="list-style-type: none"> • context – accessible proactive asthma care, for example Chronic Care Mode • consultation skills required to achieve shared decision making: adherence is more likely when the patient and the healthcare professional agree that the action is appropriate. [5.4.3] 	
<p>To assess adherence, ask specific questions about medication use and assess prescribing and any other data available. Explore attitudes to medication as well as practical barriers to adherence in a non-judgemental way. See SIGN 8.1 re training in use of inhaler devices. [5.4.2]</p>	<p>Replaced by: Check adherence, using prescription records, and inhaler technique at every asthma-related healthcare review. Use the principles outlined in the NICE guidelines on shared decision making (endorsed by SIGN for use in Scotland) and medicines adherence. [1.11.1]</p>
<p>Self-management</p>	
<p>A consultation for an upper respiratory tract infection or other known trigger is an opportunity to rehearse with the patient their self-management in the event of their asthma deteriorating. [5.2.2]</p>	<p>Recommendation not transferred to new guideline, but principle is included in recommendation 1.14.2.</p>
<p>Consider adherence before recommending increasing ICS as patients who are highly adherent (>90%) may have a ceiling effect and gain no additional benefit from increasing ICS at the onset of an attack. Weigh the benefit/risk ratio of recommending quadrupling ICS at the start of an asthma attack in people already on high dose ICS especially if they are experiencing frequent attacks and/or are still requiring oral steroids. For people on fixed-dose combination inhalers, increasing the dose of ICS may best be achieved by adding a single ICS inhaler. [5.2.3]</p>	<p>Replaced by recommendation 1.14.4.</p>
<p>In personalised asthma action plans for adults, consider advising quadrupling ICS at the onset of an asthma attack and for up to 14 days in order to reduce the risk of needing oral steroids. [5.2.3]</p>	<p>Covered in recommendation 1.14.4.</p>
<p>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</p>	<p>This recommendation has been deleted because the committee, while supporting the sentiment, agreed that it does not recommend specific actions.</p>

empower patients and train and motivate professionals as well as providing an environment that promotes self management and monitors implementation. [5.5.2]	
Occupational asthma	
In suspected work-related asthma, the diagnosis of asthma should be confirmed using standard objective criteria. [13.3]	This recommendation has been deleted because the committee agreed that confirmation of occupational asthma should be made by appropriate specialists, and making recommendations within this guideline would imply that non-specialists should do it.
Objective diagnosis of occupational asthma should be made using serial peak-flow measurements, with at least four readings per day. [13.3.1]	This recommendation has been deleted because the committee agreed that confirmation of occupational asthma should be made by appropriate specialists, and making recommendations within this guideline would imply that non-specialists should do it.
Skin-prick testing or tests for specific IgE should be used in the investigation of occupational asthma caused by high molecular weight agents. [13.3.2]	This recommendation has been deleted because the committee agreed that confirmation of occupational asthma should be made by appropriate specialists, and making recommendations within this guideline would imply that non-specialists should do it.
Skin-prick testing or tests for specific IgE should not be used in the investigation of occupational asthma caused by low molecular weight agents. [13.3.2]	This recommendation has been deleted because the committee agreed that confirmation of occupational asthma should be made by appropriate specialists, and making recommendations within this guideline would imply that non-specialists should do it.
A single measurement of non-specific reactivity should not be used for the validation of occupational asthma. [13.3.3]	This recommendation has been deleted because the committee agreed that confirmation of occupational asthma should be made by appropriate specialists, and making recommendations within this guideline would imply that non-specialists should do it.
Relocation away from exposure should occur as soon as diagnosis is confirmed, and ideally within 12 months of the first work-related symptoms of asthma. [13.4]	This recommendation has been deleted because the committee agreed that confirmation of occupational asthma and work-related management decisions should be made by appropriate specialists, and making recommendations within this guideline

	would imply that non-specialists should do it.
Organisation and delivery of care	
Training for primary care clinicians should include educational outreach visits using multifaceted programmes that include consultation training including goal setting. [14]	Not included in new guideline because of concerns about strength of evidence and uncertain costs.
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 dose therapies, those with asthma attacks or from groups with more complex needs. [14.3.1]	This recommendation has been deleted because audit is not included the guideline scope.
Consider including psychoeducational interventions in clinics for adults and children with difficult asthma. [14.3.3]	This recommendation has been deleted because severe asthma is not in guideline scope.
Consider a multifaceted approach to school-based asthma education programmes targeting children's healthcare professionals as well as the children themselves. [14.5]	Not included in new guideline because of concerns about strength of evidence and uncertain costs.
Establish intensive clinic-based programmes for people from ethnic minority groups who have attended emergency care. [14.6]	Not included in new guideline because of concerns about strength of evidence and uncertain costs.
Lay-led self-management programmes for people with asthma are not recommended. 14.7]	Recommendation deleted. The committee were uncertain whether there is sufficient evidence for a "do not" recommendation.
Consider training pharmacists to provide education for people with asthma. [14.8]	This recommendation has been deleted because the training of healthcare professionals is outside guideline remit, and the recommendation was a good practice point (BTS/SIGN guideline recommends further research).

1 **Table 2 Amended recommendation wording (change to intent) without an**
 2 **evidence review**

Recommendation in 2017 NICE guideline	Recommendation in 2019 BTS/SIGN guideline	Recommendation in draft guideline	Reason for change
Do not use symptoms alone without an objective test to diagnose asthma. [1.1.2]		Do not confirm a diagnosis of asthma without a suggestive clinical history and supporting objective test. [1.1.2]	Wording changed as original suggests that it is enough to do a test irrespective of result.
Treat people immediately if they are acutely unwell at presentation, and perform objective tests for asthma (for example, fractional exhaled nitric oxide [FeNO], spirometry and peak flow variability) if the equipment is available and testing will not compromise treatment of the acute episode. [1.1.5]		Treat people immediately if they are acutely unwell at presentation, and perform objective tests for asthma (for example, eosinophil count, fractional exhaled nitric oxide [FeNO], spirometry or peak flow with bronchodilator reversibility) if the equipment is available. [1.1.5]	Committee opinion is that original recommendation encourages non-performance of tests.
Diagnosing asthma in young children			
If a child is unable to perform objective tests when they are aged 5: <ul style="list-style-type: none"> • continue to treat based on observation and clinical judgement • try doing the tests again every 6 to 12 months until satisfactory results are obtained • consider referral for specialist assessment if the child repeatedly 	In children with an intermediate probability of asthma who cannot perform spirometry: <ul style="list-style-type: none"> • consider watchful waiting if the child is asymptomatic • Offer a carefully monitored initiation of treatment if the child is symptomatic. [3.3.4] 	If a child is unable to perform objective tests when they are aged 5: <ul style="list-style-type: none"> • continue to treat based on observation and clinical judgement • try doing the tests again every 6 to 12 months until satisfactory results are obtained • refer for specialist assessment if the child's asthma is not responding to treatment. [1.3.2] 	Bullet 3 amended. Previous version states referral should occur if not responding to treatment and repeated efforts have been made to test. The committee agree that failure to respond merits referral in its own right.

<p>cannot perform objective tests and is not responding to treatment. [1.2.2]</p>			
<p>Principles of pharmacological treatment</p>			
<p>Take into account the possible reasons for uncontrolled asthma, before starting or adjusting medicines for asthma in adults, young people and children. These may include:</p> <ul style="list-style-type: none"> • alternative diagnoses • lack of adherence • suboptimal inhaler technique • smoking (active or passive) • occupational exposures • psychosocial factors • seasonal or environmental factors. [1.5.1] 	<p>Before initiating a new drug therapy practitioners should check adherence with existing therapies (see section 5.4), check inhaler technique (see section 8) and eliminate trigger factors (see section 6). [7]</p>	<p>Take into account and try to address the possible reasons for uncontrolled asthma before starting or adjusting medicines for asthma in adults, young people and children. These may include:</p> <ul style="list-style-type: none"> • alternative or additional diagnoses (for example, obesity) • lack of adherence (see the recommendation on adherence) • suboptimal inhaler technique • smoking (active or passive), including vaping using e-cigarettes • occupational exposures • psychosocial factors (for example, anxiety and depression, relationships and social networks) • seasonal factors • environmental factors (for example, air pollution, indoor mould exposure). [1.6.1] 	<p>Stem changed to emphasise that factors contributing to poor asthma control should be dealt with if possible. Bullets cover the same points as before but examples added as committee believe these are helpful.</p>
<p>After starting or adjusting medicines for asthma, review the response to treatment in 4 to 8 weeks (see the</p>		<p>After starting or adjusting medicines for asthma, review the response to treatment in 8 to 12 weeks (see the</p>	<p>Timing adjusted because evaluating response to treatment will depend on which</p>

section on monitoring asthma control). [1.5.2]		recommendations on monitoring asthma control). [1.6.3]	aspect of control is critical for that person. If it is flare-ups of asthma, 4-6 weeks may be too short an interval.
	Choice of reliever inhaler for stable asthma should be based on patient preference and assessment of correct use. Many patients will not be prepared to carry a spacer. [8.2.2]	Base the choice of inhaler(s) for asthma on: <ul style="list-style-type: none"> • an assessment of correct technique • the lowest environmental impact among suitable devices • the preference of the person receiving the treatment. See the patient decision aid on asthma inhalers and climate change. [1.6.4]	Reworded version of original, plus importance of environmental issues added as per our response to Stakeholder consultation on the scope.
	Prescribe inhalers only after patients have received training in the use of the device and have demonstrated satisfactory technique. [8.1]	Give people with asthma information on their inhaler treatments. This should include the medicines they contain, how they work, when they should be taken and the correct technique to use for each device. [1.6.5]	Giving appropriate information is a good general principle. In addition, the Committee consensus is that people are more likely to use inhalers as intended if they understand why they have been prescribed.
Ensure that a person with asthma can use their inhaler device: <ul style="list-style-type: none"> • at any asthma review, either routine or unscheduled • whenever a new type of device is supplied. [1.5.5] 	Prescribe inhalers only after patients have received training in the use of the device and have demonstrated satisfactory technique. [8.1]	Observe the person using their inhaler device (and spacer if used) to check they can use it properly: <ul style="list-style-type: none"> • at every asthma review, either routine or unscheduled • at every consultation 	Recommendation 1.5.5 overlapped with recommendation 1.13.7 in NICE 2017 guideline. The latter is more detailed, and the committee reasoned that this should be moved to the Inhaler section and 1.5.5

		<ul style="list-style-type: none"> •when there is deterioration in asthma control • when the inhaler device is changed (for example, when a person switches to a generic device) • when the person asks for it to be checked or changed. <p>If the person is assessed as being unable to use a device properly, find an alternative. [1.6.6]</p>	<p>then becomes redundant. The retained recommendation covers the points made in BTS/SIGN 8.1 with the exception of the last point which states that the device should be changed if needed; this has been added.</p>
<p>Observe and give advice on the person's inhaler technique:</p> <ul style="list-style-type: none"> • at every consultation relating to an asthma attack, in all care settings • when there is deterioration in asthma control • when the inhaler device is changed • at every annual review • if the person asks for it to be checked. [1.13.7] 		Covered in 1.6.6	See preceding comment.
	<ul style="list-style-type: none"> • The choice of device may be determined by the choice of drug. • If the patient is unable to use a device satisfactorily an alternative should be found. • The patient should have their ability to use the prescribed inhaler device (particularly for 	Partly covered by 1.6.4	The points made in BTS/SIGN 8.4 are covered by the recommendations in the Inhaler section and the Principles of Pharmacological treatment section in the updated guideline.

	<p>any change in device) assessed by a competent healthcare professional (see section 8.1).</p> <ul style="list-style-type: none"> • The medication needs to be titrated against clinical response to ensure optimum efficacy. • Reassess inhaler technique as part of the structured clinical review (see section 14.3). [8.4] 		
	<p>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. [8.4]</p>	<p>Prescribe the same type of device to deliver preventer and reliever treatments where more than one inhaler is needed. [1.6.7]</p>	<p>Rec amended to remove background information and focus on what healthcare professionals need to do.</p>
	<p>Patients should be encouraged to ask the pharmacy they use if they can recycle their used inhalers. [8.6]</p>	<p>Encourage people to take their used inhalers to their pharmacy for disposal. [1.6.8]</p>	<p>Changed to more active form.</p>
Asthma in pregnancy			
	<p>Use steroid tablets as normal when indicated during pregnancy for women with severe asthma. Steroid tablets should never be withheld because of pregnancy. Women should be advised that the benefits of treatment with oral steroids outweigh the risks. [12.3.4]</p>	<p>Offer oral corticosteroids during pregnancy if needed to treat exacerbations of asthma. Advise that the benefits of treatment with oral corticosteroids outweigh the risks. [1.12.4]</p>	<p>Original BTS/SIGN recommendation specifies severe asthma, but exacerbations can arise in mild or moderate asthma.</p>
	<p>If leukotriene receptor antagonists are required to achieve adequate control of asthma then they should not be withheld during pregnancy. [12.3.5]</p>	<p>If leukotriene receptor antagonists or long-acting muscarinic receptor antagonists are needed to achieve asthma control, they should not be</p>	<p>The original recommendation from BTS/SIGN 12.3.5 reflects the continued warning about LTRAs in pregnancy in BNF. LAMA treatment for</p>

		stopped during pregnancy. [1.12.5]	asthma also subject to warnings from manufacturers so committee have added them to the recommendation.
Asthma in adolescents			
	Adolescents with asthma (and their parents and carers) should be encouraged to avoid exposure to environmental tobacco smoke, and should be informed about the risks and urged not to start smoking. [11.8.1]	Ask adolescents with asthma if they vape or smoke. Encourage them to stop, give them advice and signpost them to local NHS stop smoking services. (1.13.2)	The committee thought the recommendation should now include vaping. And they wanted to add the reference to stop smoking services as a positive pointer to where help can be obtained.
Self-management			
For children and young people aged 5 to 16 with a diagnosis of asthma, include advice in their self-management programme on contacting a healthcare professional for a review if their asthma control deteriorates (see the section on monitoring asthma control). [1.10.3]		Include advice in self-management programmes on contacting a healthcare professional for a review if asthma control deteriorates (see the recommendations on monitoring asthma control). [1.14.5]	Advice in 1.10.3 also applies to those over age of 16.
	A hospital admission represents a window of opportunity to review self-management skills. No patient should leave hospital without a written personalised asthma action plan. [5.2.2] An acute consultation offers the opportunity to determine what action the patient has already taken to deal	Review self-management plans during: <ul style="list-style-type: none"> hospital admission, including virtual wards – ensure the person has a written personalised asthma action 	Reworded version of BTS/SIGN recommendations focusing on the action points.

	with the asthma attack. Their self-management strategy may be reinforced or refined and the need for consolidation at a routine follow up considered. [5.2.2]	<p>plan and check inhaler technique</p> <ul style="list-style-type: none"> acute consultations in primary care or emergency department annual reviews. [1.14.2] 	
	Education should include personalised discussion of issues such as trigger avoidance and occupational exposure to support people and their families living with asthma. [5.2.2]	Education is covered in 1.14.1	Covered in 1.14.1.
	Every opportunity should be taken to remind patients and carers of the importance of achieving a smoke-free environment. [5.2.2]	Covered in 1.14.1 and 1.14.3.	Covered in 1.14.1 and 1.14.3.
	Brief simple education linked to patient goals is most likely to be acceptable to patients. [5.2.2]	Education is covered in 1.14.1	Covered in 1.14.1.
	Prior to discharge, inpatients should receive written personalised asthma action plans, given by healthcare professionals with expertise in providing asthma education. [5.3.2]	Covered in 1.14.2	Covered in 1.14.2.
	Culturally appropriate supported self-management education should be provided for people with asthma from ethnic minority groups. Addressing language barriers is insufficient. Consideration should be given to:	Provide self-management education in line with the recommendations on education programmes in the section on enabling patients to actively participate in their care in the NICE guideline on patient experience in adult	The committee did not include the list of bullet points as they were not sure of the effectiveness and cost-effectiveness.

	<ul style="list-style-type: none"> translation of materials into community languages with ethnically appropriate pictures asthma educators fluent in community languages identifying culturally appropriate support agencies within the local community inclusion of culturally specific beliefs and practices reference to culturally appropriate role models involvement of a local community health worker to support clinical teams. [5.3.5] 	NHS services. [1.14.8]	
Decreasing maintenance therapy			
Consider decreasing maintenance therapy when a person's asthma has been controlled with their current maintenance therapy for at least 3 months. [1.11.1]	<p>Patients should be maintained at the lowest possible dose of inhaled corticosteroid. Reduction in inhaled corticosteroid 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. [7.6]</p>	At annual review discuss with the person (or their family or carer, if appropriate) the potential risks and benefits of decreasing their maintenance therapy when their asthma has been controlled on their current maintenance therapy. [1.10.1]	Added 'at annual review' as this is the obvious opportunity for this discussion. '3 months' deleted as committee regarded this as redundant – in practice a reduction would not be attempted unless there has been a longer period of stability.
Discuss with the person (or their family or carer if appropriate) the potential risks and benefits of decreasing maintenance therapy. [1.11.2]		Covered in 1.10.1	Covered in 1.10.1.

<p>When reducing maintenance therapy:</p> <ul style="list-style-type: none"> • Stop or reduce dose of medicines in an order that takes into account the clinical effectiveness when introduced, side effects and the person's preference. • Only consider stopping ICS treatment completely for people who are using low dose ICS alone as maintenance therapy and are symptom free. [1.11.3] 	<p>Regular review of patients as treatment is decreased is important. When deciding which drug to decrease 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. [7.6]</p>	<p>When reducing maintenance therapy:</p> <ul style="list-style-type: none"> • Stop or reduce dose of medicines in an order that takes into account the clinical effectiveness when introduced, side effects and the person's preference. • If considering step down treatment for people who are using low dose inhaled corticosteroid alone or low dose MART (maintenance and reliever therapy), step down to low dose ICS/formoterol combination inhaler as needed. [1.10.2] 	<p>NICE - Bullet 2 amended to take account of new treatment recommendations.</p>
<p>Organisation and delivery of care</p>			
	<p>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. [14.3.1]</p>	<p>In primary care, people with asthma should be reviewed at least annually by a healthcare professional with appropriate training in asthma management. The review should incorporate a written personalised action plan. [1.16.1]</p>	<p>Changed “regularly” to “at least annually” because “regularly” could mean anything including periods longer than yearly.</p>

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1 **Table 3 Minor changes to recommendation wording (no change to intent)**

Recommendation numbers in current guideline	Comment
1.13.1, 14.4.1, 14.4.3 (BTS/SIGN)	Recommendations have been edited into the direct style (in line with current NICE style for recommendations in guidelines) where possible. Yellow highlighting has not been applied to these changes.
1.1.1 (NICE), 3.3.1 (BTS/SIGN)	Amalgamation of similar recommendations in the 2 guidelines.
1.3.22 (BTS/SIGN)	Deleted 'single entry'.
1.1.7 (NICE)	Deleted 'empirically'.
1.3.1 (NICE)	Clinical commissioning groups deleted.
1.1.10 (NICE), 8.1 (BTS/SIGN)	Amalgamation of similar recommendations from the 2 guidelines.
1.13.1 (NICE)	Minor wording changes for clarity.
12.1.2, 12.3 (BTS/SIGN)	Recommendations amalgamated.
12.3.1-12.3.3 (BTS/SIGN)	Recommendations combined.
11.10 (BTS/SIGN)	Wording made active, and minor changes for clarity. Text about checking inhaler technique is deleted because it is covered elsewhere in the guideline.
1.10.1 (NICE), 5.2.2 (BTS/SIGN)	Amalgamation of similar recommendations from the 2 guidelines.
5.3.1 (BTS/SIGN)	Reworded to make active; deleted 'community' in relation to pharmacists.
5.3.3 (BTS/SIGN)	Minor wording change for clarity.
1.9.1 (NICE)	Additional advice added to recommendation in line with BTS/SIGN recommendation 5.4.2.
1.10.2 (NICE)	Minor change for clarification.

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3 **March 2021:** In recommendations 1.14.1 and 1.14.3, NICE clarified that approaches
4 to minimising indoor air pollution and reducing exposure to outdoor air pollution
5 should be included in a personalised action plan because pollution can trigger and
6 exacerbate asthma. Links were added to the NICE guidelines on air pollution:
7 outdoor air quality and health and indoor air quality at home in recommendation.

8 **February 2020:** NICE reviewed the evidence on increasing the dose of inhaled
9 corticosteroids within a self-management programme in children and young people
10 with asthma and removed a recommendation. A new recommendation on self-

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1 management in children and young people was made. This recommendation is
2 marked [2020].

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