JAPC recognises this local asthma guidance (based on NICE NG80) differs from SIGN/BTS guidance. The evidence base considered by SIGN/BTS and NICE guideline group is broadly similar, but the methodology used to produce the guidance is significantly different:

- SIGN/BTS methodology is a multidisciplinary, clinically-led process which undertakes critical appraisal of the literature and provides clinically-relevant recommendations.
- NICE undertake critical appraisal of the literature with health economic modelling. These different processes have resulted in differing recommendations.

NICE recognise where the recommendations represent a change from traditional clinical practice, people whose asthma is well controlled on their current treatment should not have their treatment changed purely to follow this guidance.

Uncontrolled asthma is defined as asthma that has an impact on a person’s lifestyle or restricts their normal activities.

Take into account the possible reasons for uncontrolled asthma, before starting or adjusting medicines. These may include:

- Alternative diagnosis
- Lack of adherence
- Suboptimal inhaler technique
- Smoking (active or passive)
- Occupational exposures
- Psychosocial factors
- Seasonal or environmental factors

After adjusting maintenance treatment, review the response to treatment changes in 4 to 8 weeks.

If asthma is uncontrolled in adults on a low dose of inhaled corticosteroid (ICS) as maintenance therapy, offer a leukotriene receptor antagonist (LTRA) in addition to the ICS. (The economic evaluation found that the most cost effective treatment option for patients uncontrolled on low dose ICS alone was to trial ICS+LTRA).

Monitor asthma control at every review. If control is suboptimal confirm the patient’s adherence to prescribed treatment. Patients do not always take their medicines exactly as prescribed. Recognise that non-adherence is common and that most patients are non-adherent sometimes. Routinely assess adherence in a non-judgemental way whenever you prescribe or review medicines.

Monitor the use of short-acting beta₂ agonist (SABA); patients requiring more than 12 SABA’s a year should prompt an asthma review.

Clinician should ensure that patients receive the smallest dose of an ICS that provides optimal control of asthma, to reduce the risk of side-effects.

Inhalers should be prescribed by brand name to ensure the patient receives the device they are familiar with.
Diagnosis of asthma

Currently there is no gold standard test available to diagnose asthma. Both NICE and BTS/SIGN have tried to address the issue of over- and under-diagnosis of asthma.

Diagnosis should be based on clinical assessment supported by objective tests that seek to demonstrate variable airflow obstruction or the presence of airway inflammation. Objective tests include:

- Obstructive spirometry
- Bronchodilator reversibility test
- Peak flow variability
- FENO
- Direct bronchial challenge test with histamine or methacholine

The two guidance differ on the use of FENO:

- NICE places FENO testing in a prominent position in the diagnosis of asthma.
- BTS/SIGN - positive FeNO test indicates the presence of eosinophilic inflammation and increases the probability of asthma, where the structured clinical assessment suggests an intermediate probability

Full details regarding the diagnosis and monitoring of asthma can be found in NICE NG80 and BTS.
**Management of adults aged 17 years and over, with newly diagnosed asthma**

For a small cohort of patients consider SABA for symptom relief for infrequent short-lived wheeze and normal lung function

(BTS/SIGN recommend initiation of treatment in association with an ICS)

---

**Offer low dose inhaled corticosteroid (ICS), as first-line maintenance therapy**

- With SABA for symptom relief

---

**Offer low dose inhaled ICS plus LTRA as maintenance therapy**

- With SABA for symptom relief

---

**Offer low dose inhaled ICS plus LABA, with or without LTRA treatment** *(Discuss with the patient whether or not to continue LTRA treatment, taking into account the degree of response)*

- With SABA for symptom relief

---

If MART not considered appropriate for the patient

**Offer low dose inhaled ICS plus LABA within a MART* regimen, with or without LTRA treatment** *(MART is the preferred option for most patients, by virtue of cost reduction and number of exacerbations)*

- Low dose ICS + LABA within a MART* regimen
  - (see Table 2 for MART doses)

---

**Consider ↑inhaled ICS to moderate dose plus LABA, as fixed dose combination inhaler, with or without a LTRA treatment, plus SABA**

- with MART regimen, with or without a LTRA treatment

---

**Consider ↑inhaled ICS to high dose plus LABA as fixed, with or without LTRA treatment**

- With SABA for symptom relief

---

*If asthma uncontrolled- check diagnosis, inhaler technique, adherence, exposure to smoking & triggers and suitability of current treatment

---

**Consider seeking advice from an Asthma Specialist**

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**Consider a trial of an additional drug (e.g. a long acting muscarinic receptor antagonist or theophylline)**

---

*If asthma uncontrolled- check diagnosis, inhaler technique, adherence, exposure to smoking & triggers and suitability of current treatment*
### Formulary choices for the treatment of adult asthma

<table>
<thead>
<tr>
<th>Drug</th>
<th>Brand name</th>
<th>Device</th>
<th>Traffic light classification</th>
<th>Licensed indication</th>
<th>Daily dose range</th>
<th>Cost per device*</th>
<th>30 day cost</th>
<th>Annual cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SABA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salbutamol 100mcg</td>
<td>Salbutamol MDI</td>
<td>MDI</td>
<td>Green</td>
<td>Asthma</td>
<td>2 puffs as required</td>
<td>£1.50 (200 dose)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Salbutamol easyhaler 100mcg</td>
<td>Easyhaler salbutamol</td>
<td>DPI</td>
<td>Green</td>
<td>Asthma</td>
<td>2 puffs as required</td>
<td>£3.31 (200 dose)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Salbutamol Easi-breathe 100mcg</td>
<td>Salamol Easi-breathe</td>
<td>DPI</td>
<td>Green</td>
<td>Asthma</td>
<td>2 puffs as required</td>
<td>£6.30 (200 dose)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>LTRA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montelukast tablets</td>
<td>Montelukast</td>
<td>Oral tablet</td>
<td>Green</td>
<td>Asthma (adults &amp; children &gt;15 yrs)</td>
<td>2 puffs as required</td>
<td>£1.87 x 28</td>
<td>£2.00</td>
<td>£24</td>
</tr>
<tr>
<td><strong>Inhaled Corticosteroid</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Beclometasone 100mcg MDI (standard particle size)</td>
<td>Clenil modulite 100mcg</td>
<td>MDI</td>
<td>Green</td>
<td>Asthma (adults &amp; children)</td>
<td>2 puffs BD</td>
<td>£7.42 (200 dose)</td>
<td>£4.45</td>
<td>£53</td>
</tr>
<tr>
<td>Beclometasone 50mcg DPI extrafine particle size</td>
<td>QVAR 50mcg</td>
<td>DPI</td>
<td>Green</td>
<td>Asthma (adults &amp; children &gt;12 yrs)</td>
<td>2 puffs BD</td>
<td>£7.87 (200 dose)</td>
<td>£4.72</td>
<td>£57</td>
</tr>
<tr>
<td>Budesonide 100mcg</td>
<td>Easyhaler budesonide 100mcg</td>
<td>DPI</td>
<td>Green</td>
<td>Asthma (adults &amp; children &gt;6 yrs)</td>
<td>1-2 puffs BD</td>
<td>£8.86 (200 dose)</td>
<td>£2.66</td>
<td>£32</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 puffs BD</td>
<td>£8.86 (200 dose)</td>
<td>£3.32</td>
<td>£64</td>
</tr>
<tr>
<td><strong>LABA/ICS combination products</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beclometasone/ formoterol 100/6mcg Extrafine particle size</td>
<td>&quot;Fostair 100/6 or &quot;Fostair Nexthaler 100/6&quot;</td>
<td>MDI or Breath-actuated DPI</td>
<td>Green 1st line</td>
<td>Asthma (adults &gt; 18yrs)</td>
<td>1 puff BD</td>
<td>£29.32 (120 dose)</td>
<td>£14.66</td>
<td>£176</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 puffs BD</td>
<td>£29.32 (120 dose)</td>
<td>£29.32</td>
<td>£352</td>
</tr>
<tr>
<td>Beclometasone/ formoterol 200/6mcg extrafine particle size</td>
<td>&quot;Fostair 200/6 or &quot;Fostair Nexthaler 200/6&quot;</td>
<td>MDI or Breath-actuated DPI</td>
<td>Green 1st line</td>
<td>Asthma (adults &gt; 18yrs)</td>
<td>2 puffs BD</td>
<td>£29.32 (120 dose)</td>
<td>£29.32</td>
<td>£352</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budesonide/formoterol (100/6mcg)</td>
<td>Fobumix 80/4.5</td>
<td>DPI</td>
<td>Green alternative ICS/LABA</td>
<td>Asthma (adults &gt; 18yrs)</td>
<td>1 puff BD</td>
<td>£21.50 (120 dose)</td>
<td>£10.75</td>
<td>£129</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 puffs BD</td>
<td>£21.50 (120 dose)</td>
<td>£21.50</td>
<td>£258</td>
</tr>
<tr>
<td>Budesonide/formoterol (200/6mcg)</td>
<td>Fobumix 160/4.5</td>
<td>DPI</td>
<td>Green alternative ICS/LABA</td>
<td>Asthma (adults &gt; 18yrs)</td>
<td>1 puff BD</td>
<td>£21.50 (120 dose)</td>
<td>£10.75</td>
<td>£129</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 puffs BD</td>
<td>£21.50 (120 dose)</td>
<td>£21.50</td>
<td>£258</td>
</tr>
<tr>
<td>Budesonide/formoterol (400/12mcg)</td>
<td>Fobumix 320/9</td>
<td>DPI</td>
<td>Green alternative ICS/LABA</td>
<td>Asthma (adults &gt; 18yrs)</td>
<td>1 puff BD</td>
<td>£21.50 (60 dose)</td>
<td>£13.99</td>
<td>£168</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 puffs BD</td>
<td>£27.97 (120 dose)</td>
<td>£27.97</td>
<td>£336</td>
</tr>
</tbody>
</table>

**Note:** 
- *ICS dose* indicates the inhaled corticosteroid dose used in combination with the LABA. 
- Costs are based on 30-day supply. 
- Drug names are provided for reference; consult with a healthcare professional for specific recommendations. 

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**Asthma management in adults ≥17 years**

Date originally produced: September 2013  Updated: March 2018  Review date: February 2020

Page 4 of 8
**Budesonide/formoterol (400/12mcg)**

<table>
<thead>
<tr>
<th>Device</th>
<th>Fostair MART</th>
<th>Symbicort SMART</th>
<th>DuoResp Spiromax MART</th>
<th>Fobumix MART</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Device</strong></td>
<td>Beclometasone/formoterol 100/6</td>
<td>Budesonide/formoterol 100/6 or budesonide/formoterol 200/6</td>
<td>Budesonide/formoterol 160/4.5 only</td>
<td>Budesonide/formoterol 80/4.5 or Budesonide/formoterol 160/4.5</td>
</tr>
<tr>
<td><strong>Maintenance dose</strong></td>
<td>1 puff twice a day</td>
<td>100/6 strength- 2 puffs daily 200/6 strength- 2 puffs daily, For some patients 2 puffs twice daily may be appropriate</td>
<td>2 puffs daily, increased if necessary to 2 puffs twice a day for some patients</td>
<td>2 puffs daily, Maintenance dose of 2 inhalations twice daily may be appropriate.</td>
</tr>
<tr>
<td><strong>As required dose</strong></td>
<td>1 additional puff as needed, if symptoms persist an additional puff can be taken</td>
<td>1 puff as required, if symptoms persist an additional puff can be taken. No more than 6 puffs on any single occasion</td>
<td>1-2 puffs to relieve symptoms as needed. Not more than 6 puffs should be taken on any single occasion</td>
<td>1—2 puffs to relieve symptoms as needed; max 6 puffs on any single occasion.</td>
</tr>
<tr>
<td><strong>Maximum in 24 hours</strong></td>
<td>8 puffs in 24 hours</td>
<td>Normally 8 puffs in 24 hours 12 puffs in 24 hours for a limited period</td>
<td>12 puffs in 24 hours for a limited period</td>
<td>Normally 8 puffs in 24 hours 12 puffs daily can be used for a limited period</td>
</tr>
<tr>
<td><strong>Maximum cost per 24 hours</strong></td>
<td>£1.95</td>
<td>£1.87 - £2.80</td>
<td>£2.80</td>
<td>£1.43 - £2.15</td>
</tr>
</tbody>
</table>

(*Price per MIMs online Jan 2018 and DT) (**-100 micrograms of beclometasone dipropionate extrafine in Fostair are equivalent to 250 micrograms of beclometasone dipropionate in a non-extrafine formulation)

(† Fobumix 160/4.5 is available in 120 dose and 60 dose inhalers, however it is cost-effective to use the 120 dose inhaler compared to the 60 dose inhaler)
ICS doses
The doses in this table should be used as a guide and should not be interpreted as a definitive statement of the relative potencies of the different inhaled steroids.

<table>
<thead>
<tr>
<th></th>
<th>Low dose</th>
<th>Moderate dose</th>
<th>High dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beclometasone dipropionate&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard particle CFC-free inhalers</td>
<td>200-500 micrograms per day in 2 divided doses</td>
<td>600-1000 micrograms per day in 2 divided doses</td>
<td>1,200-2,000 micrograms per day in 2 divided doses</td>
</tr>
<tr>
<td>Extra-fine particle CFC-free inhalers&lt;sup&gt;2&lt;/sup&gt;</td>
<td>100-200 micrograms per day in 2 divided doses</td>
<td>300-400 micrograms per day in 2 divided doses</td>
<td>500-800 micrograms per day in 2 divided doses</td>
</tr>
<tr>
<td>Budesonide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry powder inhalers</td>
<td>200-400 micrograms per day as a single dose or in 2 divided doses</td>
<td>600-800 micrograms per day as a single dose or in 2 divided doses</td>
<td>1,000-1,600 micrograms per day in 2 divided doses</td>
</tr>
<tr>
<td>Fluticasone propionate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metered dose and dry powder inhalers&lt;sup&gt;3&lt;/sup&gt;</td>
<td>100-250 micrograms per day in 2 divided doses</td>
<td>300-500 micrograms per day in 2 divided doses&lt;sup&gt;a&lt;/sup&gt;</td>
<td>600-1,000 micrograms per day in 2 divided doses&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fluticasone furoate&lt;sup&gt;4&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry powder inhaler</td>
<td></td>
<td>100 micrograms as a single daily dose</td>
<td>200 micrograms as a single daily dose</td>
</tr>
<tr>
<td>Ciclesonide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metered dose inhaler</td>
<td>80-160 micrograms per day as a single dose</td>
<td>240-320 micrograms per day as a single dose or in 2 divided doses</td>
<td>400-640 micrograms per day in 2 divided doses</td>
</tr>
<tr>
<td>Mometasone furoate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry powder inhaler</td>
<td>200 micrograms per day as a single dose a day</td>
<td>400 micrograms per day in 2 divided doses</td>
<td>Up to 800 micrograms per day in 2 divided doses</td>
</tr>
</tbody>
</table>

<sup>1</sup> CFC-containing beclometasone dipropionate MDIs are no longer available, so are not included. The MHRA advises that beclometasone dipropionate CFC-free inhalers should be prescribed by brand name (Drug safety update, July 2008).

<sup>2</sup> Extra-fine particle CFC-free inhalers include brands such as Qvar and Fostair, which are more potent than standard particle CFC-free inhalers. Fostair and Fostair NEXThaler are combination products containing beclometasone dipropionate with formoterol. 100 micrograms of beclometasone dipropionate via Qvar products are approximately equivalent to 200 micrograms of beclometasone dipropionate in standard particle CFC-free inhalers. 100 micrograms of beclometasone dipropionate via Fostair products are approximately equivalent to 250 micrograms of beclometasone dipropionate in standard particle CFC-free inhalers.

<sup>3</sup> Flixotide Evohaler and Flixotide Accuhaler are licensed up to 2,000 micrograms per day (in 2 divided doses), which is approximately equivalent to 4,000 micrograms per day of budesonide. The manufacturer’s SPC advises that, because of the risk of systemic effects, doses of fluticasone propionate above 1,000 micrograms per day should be prescribed only for adults aged 17 years and over with severe asthma where additional clinical benefit is expected, demonstrated by either an improvement in pulmonary function and/or symptom control, or by a reduction in oral corticosteroid therapy.

<sup>a</sup> Fluticasone doses changed to be in line with GINA.

<sup>4</sup> At the time of publication (February 2018), fluticasone furoate was only available in a combination product, Relvar Ellipta (fluticasone furoate with vilanterol). The manufacturer’s SPC states that in people with asthma, fluticasone furoate 100 micrograms once daily is approximately equivalent to fluticasone propionate 250 micrograms twice daily, and fluticasone furoate 200 micrograms once daily is approximately equivalent to fluticasone propionate 500 micrograms twice daily. See also the NICE evidence summary Asthma: fluticasone furoate/vilanterol (Relvar Ellipta) combination inhaler (2014).
Asthma self-management plan

All patients with asthma should receive self-management education and a written personalised asthma plan. However remember some patients will have specific needs. Less than 50% of people use their medicines as prescribed. Advise on:

- When and how to take their medicines
- Correct inhaler technique
- Avoidance of known trigger factors
- Recognising poor control.

Decreasing maintenance treatment

Consider decreasing maintenance treatment when a person’s asthma has been controlled with their current maintenance therapy **for at least** 3 months.

Criteria for stepping down

(See local step down guidance)

- Doses of medication can be reduced by 25-50% every 3 months for stable patients while maintaining symptom control.
- After treatment is stepped down the patient should have their treatment reviewed within 4-8 weeks.
- Stepping down should be explained to the patient and be part of their personalised asthma action plan.
- Only consider stopping ICS treatment completely for people who are using low dose ICS alone as maintenance therapy and are symptom-free.

Uncontrolled asthma

Uncontrolled asthma has an impact on a person’s lifestyle or restricts their normal activities. Uncontrolled asthma is defined as

- 3 or more days a week with symptoms or
- 3 or more days a week requiring use of a SABA or
- 1 or more nights a week with awakening due to asthma.

Monitoring asthma control ([http://www.pcrs-uk.org/opinions/asthma_review_final.pdf](http://www.pcrs-uk.org/opinions/asthma_review_final.pdf))

If there is evidence of poorly controlled asthma the following should be considered and addressed appropriately:

- Review/confirm asthma diagnosis
- Check inhaler technique at every review and ask the patient to demonstrate.
- Check medication adherence. Is the patient taking the medicines as prescribed? Look at prescribing history to see if it is consistent with the amount the patient should have taken.
- Offer smoking cessation advice to patients/parents/carers. Advocate a smoke-free home and car. Smoking reduces the effect of inhaled steroids and increased doses may be needed in current and ex-smokers.
- Link with rhinitis. Asthma and rhinitis co-exist in the majority of patients. Diagnosis of co-morbid rhinitis should be actively pursued in all patients with uncontrolled asthma.
- Adjusting therapy. After consideration of diagnosis, adherence, inhaler technique, smoking status, triggers and concomitant rhinitis, patients with poorly controlled asthma should be advised to step-up their medication. It is equally important to consider stepping down treatment in patients who are consistently well controlled.
- After adjusting maintenance treatment, review the response to treatment changes in 4 to 8 weeks.
Assessment of asthma control

Various tools are available for use to assess asthma control. Examples of available tools include:

<table>
<thead>
<tr>
<th>Tool</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma control questionnaire (ACQ)</td>
<td>Well validated in adults and children ≥5 years. A composite scoring system with a strong bias to symptoms.</td>
</tr>
<tr>
<td>Asthma control test or children's asthma control test (ACT)</td>
<td>Validated in adults and children ≥4 years. 95% range for repeat measure and minimally clinically important difference not defined</td>
</tr>
<tr>
<td>Mini asthma quality of life questionnaire or paediatric asthma quality of life questionnaire</td>
<td>Well validated quality of life questionnaire. Scores usually reported as the mean of responses across the four domains with values lying between 1 and 7. Higher scores indicate better quality of life.</td>
</tr>
<tr>
<td>Royal College of Physicians (RCP) 3 questions</td>
<td>Not well validated in adults or children, but simple to use</td>
</tr>
</tbody>
</table>

(Adapted from BTS/SIGN 2016)

- Monitor asthma control at each review in patient’s ≥17 years of age using either spirometry or peak flow variability testing.
- NICE states do not use FENO to monitor asthma control.

For an acute asthma attack in adults, the BTS/SIGN recommend

Use a SABA (Salbutamol) via a large-volume spacer to relieve acute symptoms.
- For an adult, give 4 puffs initially, followed by 2 puffs every 2 minutes according to response, up to 10 puffs.
- For a child, give a puff every 30–60 seconds, up to 10 puffs. Each puff should be given one at a time and inhaled with five tidal breaths. Repeat every 10–20 minutes according to clinical response.
- Prescribe a short course of oral prednisolone 40–50 mg once a day for 5 days.

Role of Tiotropium in asthma

There is limited role for the use of a LAMA in asthmatic patients. Tiotropium (Spiriva Respimat) may be considered in patients with airflow obstruction under the supervision of a specialist. (See SPC for further information)

Combination inhalers

There is no difference in efficacy in giving inhaled steroid and LABA in combination or in separate inhalers. Combination inhalers have the advantage of guaranteeing that the LABA is not taken without inhaled steroids and are, therefore recommended by MHRA and NICE as the use of LABA alone has been associated with asthma deaths.