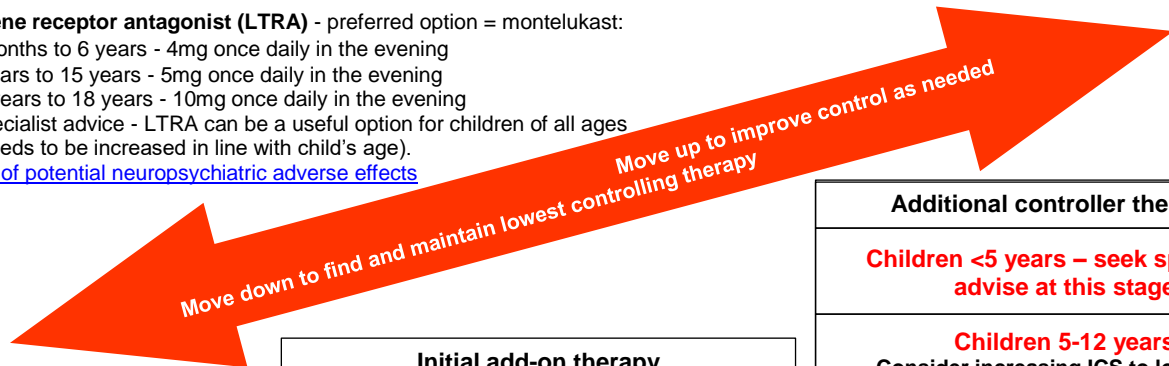


Asthma - suspected	Asthma - diagnosed
<b>Diagnosis and assessment</b>	<b>Evaluation:</b> ● assess symptoms, measure lung function, check inhaler technique and adherence ● adjust dose ● update self-management plan ● move up and down as appropriate ● eliminate trigger factors

● Starting dose of ICS should be appropriate to the severity of the disease then titrate to the lowest dose at which control is maintained

**Leukotriene receptor antagonist (LTRA)** - preferred option = montelukast:  
 Child 6 months to 6 years - 4mg once daily in the evening  
 Child 6 years to 15 years - 5mg once daily in the evening  
 Child 15 years to 18 years - 10mg once daily in the evening  
 (Local specialist advice - LTRA can be a useful option for children of all ages - dose needs to be increased in line with child's age).  
[Be aware of potential neuropsychiatric adverse effects](#)



**Consider trial of very low to low dose ICS (6 weeks monitored initiation)**

**MDI with spacer** \*:  
 Soprobec/Clenil 50mcg - 100mcg P2 bd (licensed for 'Children')

[Alternative MDI option:  
 Flixotide Evohaler 50mcg P1-2 bd (licensed > 4yrs)]

**DPI** \*:  
 Easyhaler Budesonide 100mcg P1-2 bd (licensed ≥ 6yrs)  
 Pulmicort Turbohaler 100 P1-2 bd (licensed ≥ 5yrs)

\* NICE TA10 (2010): MDI with spacer = 1st choice inhaler device option in child < 5yrs (if ≥ 3yrs use of DPI can also be considered)

Infrequent, short-lived wheeze

**Regular preventer**

**Children < 12yrs**  
**ICS very low dose** (ICS = preferred 1<sup>st</sup> line preventer option in adults & children)  
**MDI + spacer:** Soprobec/Clenil 50mcg P2 bd/100mcg P1 bd  
**DPI:** EasyHaler budesonide 100 P1 bd (licensed ≥ 6yrs)

OR

**Children < 5yrs**  
**LTRA** (dose in box above) – trial for 6 weeks minimum, stop if no improvement

**Children 12-18 years**  
**ICS low dose**  
**MDI + spacer:** Soprobec/Clenil 100mcg P2 bd  
**DPI:** Easyhaler budesonide 200 P1 bd

**Initial add-on therapy**

**Children < 5 years**  
 - add LTRA (dose above) if on ICS

**Children 5-12 years**  
**ICS very low dose**  
 - add LABA  
 Combisal / Seretide Evohaler 50 P1 bd (licensed ≥ 4yrs), Flutiform 50/5mcg P1 bd (licensed ≥ 5yrs)  
**[Please note:** involves off label prescribing – lower than usual licensed LABA dose]

**For DPI only,** ICS (very low dose) + LABA combination is available: Symbicort 100/6 Turbohaler P1 bd (licensed ≥ 6yrs)

OR

**ICS very low dose**  
 - add LTRA  
 For dose info see box above

**Children 12-18 years**  
**ICS low dose**  
 - add inhaled LABA  
 Combisal/Seretide Evohaler 50 P2 bd  
 Flutiform 50/5mcg P2 bd

**DPI:**  
 Symbicort 200/6 P1 bd (licensed ≥ 12yrs)

**Additional controller therapies**

**Children < 5 years – seek specialist advise at this stage**

**Children 5-12 years**  
**Consider increasing ICS to low dose:**  
**MDI + spacer:** Soprobec/Clenil 100mcg P2 bd  
**DPI:** EasyHaler budesonide 200 P1 bd d  
OR  
**Add LABA or LTRA** (if not already in use):

**ICS low dose + LABA:**  
**MDI + spacer:** Combisal/ Seretide Evohaler 50 P2 bd, Flutiform 50/5mcg P2 bd  
**DPI:** Symbicort 100/6 P2 bd (licensed ≥ 6yrs)

**LTRA** (dose info in box above)

**Children 12-18 years**  
**Consider increasing ICS to medium dose:**  
**MDI + spacer:** Soprobec/Clenil 200mcg P2 bd (off label use), QVAR 100mcg (extra-fine particles) P2 bd (licensed ≥ 12yrs)  
**DPI:** Easyhaler budesonide 200 P2 bd  
OR  
**Add LABA or LTRA** (if not already in use):

**ICS medium dose + LABA**  
**MDI + spacer:** Combisal / Seretide Evohaler 125 P2 bd, Flutiform 125/5 P2 bd  
**DPI:** Fusacomb Easyhaler 50/250 P1 bd, Relvar 92/22 P1 od  
OR  
**LTRA** (dose info in box above)

**If no response to LABA/LTRA, consider stopping LABA/LTRA**

**Specialist therapies**

All patients whose asthma is not adequately controlled on recommended initial or additional controller therapies should be referred for specialist care

**For definition of ICS doses** (very low, low & medium) – please see page 2

**Children on medium to high dose ICS should have a Steroid Treatment Card** (due to the risk of adrenal insufficiency)

**Preferred products listed above** (if a patient cannot use or declines listed inhalers then alternative products in recommended classes are available – choice of product should be based on BTS/SIGN asthma guideline). Please prescribe inhalers **by BRAND (not generically)** where possible to avoid the risk of patient being given an unfamiliar inhaler device which they are not able to use properly.

**Short acting β2 agonists (e.g. salbutamol 100mcg/dose MDI via spacer) as required – consider stepping up therapy if using three doses a week or more**  
**All asthma patients who have been prescribed more than 12 short-acting reliever inhalers in the previous 12 months should be invited for urgent review of their asthma control, with the aim of improving their asthma through education and change of treatment if required (The National Review of Asthma Deaths 2014).**

## From BTS/SIGN Asthma guidelines (2019 update):

Table 13: Categorisation of inhaled corticosteroids by dose – children\* (see also Figure 3)

ICS	Dose		
	Very low dose	Low dose	Medium dose#
<b>Pressurised metered dose inhalers (pMDI) with spacer</b>			
<b>Beclometasone dipropionate</b>			
Non-proprietary	50 micrograms two puffs twice a day	100 micrograms two puffs twice a day	200 micrograms two puffs twice a day
Clenil Modulite	50 micrograms two puffs twice a day	100 micrograms two puffs twice a day	200 micrograms two puffs twice a day
Qvar (extrafine) Qvar autohaler Qvar Easi-breathe	n/a	50 micrograms two puffs twice a day	100 micrograms two puffs twice a day
Soprobec	50 micrograms two puffs twice a day	100 micrograms two puffs twice a day	200 micrograms two puffs twice a day
<b>Ciclesonide</b>			
Alvesco Aerosol inhaler	n/a	80 micrograms two puffs once a day	160 micrograms two puffs once a day
<b>Fluticasone propionate</b>			
Flixotide Evohaler	50 micrograms one puff twice a day	50 micrograms two puffs twice a day	125 micrograms two puffs twice a day
<b>Dry powder inhalers (DPI)</b>			
<b>Budesonide</b>			
Non-proprietary Easyhaler	n/a	100 micrograms two puffs twice a day	200 micrograms two puffs twice a day
Pulmicort Turbohaler	100 micrograms one puff twice a day	100 micrograms two puffs twice a day 200 micrograms one puff twice a day	200 micrograms two puffs twice a day 400 micrograms one puff twice a day
<b>Fluticasone propionate</b>			
Flixotide Accuhaler	50 micrograms one puff twice a day	100 micrograms one puff twice a day	250 micrograms one puff twice a day
<b>Mometasone</b>			
Asmanex Twisthaler	n/a	200 micrograms one puff twice a day	n/a
<b>Combination inhalers</b>			
<b>Budesonide with formoterol</b>			
Symbicort Turbohaler	100/6 one puff twice a day	100/6 two puffs twice a day 200/6 one puff twice a day	n/a
<b>Fluticasone propionate with salmeterol</b>			
Combisal MDI	n/a	50/25 two puffs twice a day	n/a
Seretide Accuhaler	n/a	100/50 one puff twice a day	n/a
Seretide Evohaler	n/a	50/25 two puffs twice a day	n/a

\* Different products and doses are licensed for different age groups and some are not licensed for use in children. Prior to prescribing, the relevant summary of product characteristics (SPC) should be checked ([www.medicines.org.uk/emc](http://www.medicines.org.uk/emc)).  
# Medium doses (shaded boxes) should only be used after referring the patient to specialist care.

**TELEHEALTH** e.g. automated reminders & computer-based educational games (to improve knowledge or affect behaviour) may be considered as an option for supporting self-management in children/young people, for example:

[My Spira](#) - augmented reality inhaler training game/app (iOS/android) 9-13yrs old  
[Asthma Dodge](#) - a mobile game to help the understanding of asthma (iOS/android)  
[lggy and the Inhalers](#) – educational videos on asthma  
<https://www.rightbreathe.com/> - automated medication reminders via app

#### OTHER USEFUL WEB LINKS:

[Asthma UK advice for parents of children with asthma](#)  
[Beat Asthma resources tailored for the needs of young people](#)  
[Beat Asthma resources tailored to the needs of families and children](#)

#### INHALER DEVICES:

In young children, MDI and spacer are the preferred method of delivery of  $\beta_2$  agonists (SABA & LABA) 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.

#### ANY NEW ASTHMA MEDICATION INITIATED MUST BE REVIEWED AFTER A SUITABLE PERIOD:

- Basic principle: asthma can be effectively treated and most patients can achieve good control of their asthma
- Assess clinical response/benefit (aim for COMPLETE CONTROL of asthma symptoms)
- Assess tolerability (side effects)
- STOP treatment if not producing the desired clinical benefit / is poorly tolerated e.g. if a LTRA is being trialled in preference to ICS
- **Healthcare professionals should be aware that the best predictor of future asthma attacks is current control.**

#### Measuring the efficacy of an asthma intervention:

- Wherever practicable, children should be asked about their own symptoms; do not rely solely on parental/carer report
- Symptomatic asthma control is best measured using a validated questionnaire such as Childhood Asthma Control Test ([C-ACT](#)) 4-11yrs old or Test for Respiratory and Asthma Control in Kids ([TRACK](#)) 0-5yrs old

#### ADHERENCE

- **Always ask children & young people** (or parent/carer if this is not practicable) **about adherence with medications**. For example ask, “How many times a week do you forget or miss out your preventer inhaler?”, also review **prescription refill frequency** (frequency of issues compared to quantity issued and gap between issues), look for evidence of potential:
  - Underuse of preventer therapies such as inhaled corticosteroids (ICS) and/or
  - Overuse/over reliance on inhaled short acting beta agonist (SABA) (risk factors identified by the [National Review of Asthma Deaths \(NRAD\)](#) )
- For guidance on managing non-adherence, see the [NICE guideline on medicines adherence CG76 \(2009\)](#)

#### CHECKING INHALER TECHNIQUE

- Checking and correcting inhaler technique using a [standardised checklist](#) takes only 2-3 minutes and leads to improved asthma control
- Most patients (up to 80%) cannot use their inhaler correctly. This contributes to poor symptom control and exacerbations
- To ensure effective inhaler use, **choose** the most appropriate device for the patient (before prescribing: consider medication, physical problems, patient skill and cost)
- Always prescribe a spacer when initiating treatment with an MDI and a replacement spacer at least annually thereafter
- Ensure all children & young people can use their inhaler device at every asthma review, either routine or unscheduled and whenever a new type of device is supplied:
  - Ask the patient to show you how they use the inhaler
  - **Check** their technique against a device specific checklist
  - **Correct** using a physical demonstration, paying attention to incorrect steps. Check technique again, up to 2–3 times if necessary
  - **Confirm** that you have checklists for each of the inhalers you prescribe, and can demonstrate correct technique on them
  - Training devices which test inspiratory flow rate include the In Check (Clement Clark) device, 2-Tone Trainer (Canday Medical), Mag-Flo (Fyne Dynamics) & AIM (Vitalograph).

Back this up by promoting/providing inhaler technique leaflets or online resources such as videos demonstrating correct technique (web link can be sent direct to a patient/parent’s mobile phone by SMS (txt) message). Sources include:

- SWYAPC website – [inhaler leaflets](#) & [inhaler videos](#)
- RightBreathe website: <https://www.rightbreathe.com/> (available both as website & smartphone app: [iOS \(Apple\)](#) & [android](#) )
- Asthma UK website: <https://www.asthma.org.uk/advice/inhaler-videos/>

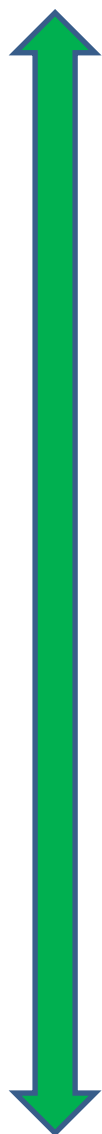
#### NON-PHARMACOLOGICAL MANAGEMENT:

- **Smoking cessation** - Counsel parents/child on risks of smoking / second-hand smoke including negative impact on their asthma and on the effectiveness of asthma treatments such as ICS – encourage smoking cessation, preferably via the local NHS Smoking Cessation Service
- **Weight loss interventions** (including dietary and exercise-based programmes) should be considered for overweight and obese children with asthma to improve asthma control
- **Air pollution** – may provoke acute asthma attacks or aggravate existing chronic asthma - information on current levels of air pollution, recommended actions and health advice is available from the [Daily Air Quality Index](#) including the [Pollution forecast](#)
- **Depression/anxiety** – in young people with asthma the presence of an anxiety or depressive disorder is associated with increased asthma symptom burden (including increased A&E attendance for asthma)

## The Pharmacological management of stable asthma in children < 18yrs

MDI – Metered dose inhaler  
 DPI – Dry powder inhaler  
 BAAI – Breath actuated aerosol inhaler  
 BDP – Beclometasone dipropionate.

Most  
Cost  
Effective



Least  
Cost  
Effective

PRN therapy	Very low dose ICS	Very low dose ICS + LABA	Low dose ICS +/- LABA	Medium dose ICS +/- LABA
Salbutamol 100mcg/dose inhaler (MDI) 2 puffs prn <b>£21.90</b>  Salbutamol 100mcg/dose dry powder inhaler (DPI) 2 puffs prn <b>£48.33</b>  Salbutamol 200mcg/dose dry powder inhaler (DPI) – 1 puff prn: Ventolin Accuhaler <b>£87.60</b>  Easyhaler Salbutamol <b>£48.40</b>  Salbutamol 100mcg/dose breath actuated inhaler (BAAI) 2 puffs prn <b>£91.98</b>  Terbutaline Turbohaler 500mcg/dose (DPI) 1 puff prn <b>£100.98</b>	<b>200mcg BDP equivalent/day:</b>  Soprobec inhaler 50mcg/dose (MDI) ‡ 2 puffs bd <b>£20.29</b> or 100mcg/dose (MDI) ‡ 1 puff bd <b>£20.33</b>  Clenil Modulite inhaler 50mcg/dose (MDI) ‡ 2 puffs bd <b>£27.01</b> or 100mcg/dose (MDI) ‡ 1 puff bd <b>£27.08</b>  Easyhaler budesonide 100mcg/dose (DPI) 1 puff bd ¥¥ <b>£32.34</b>  Fluticasone (Flixotide) 50mcg/dose Evohaler (MDI) 1 puff bd ** <b>£39.72</b>  Fluticasone (Flixotide) 50mcg/dose Accuhaler (DPI) 1 puff bd ** <b>£48.67</b>  Budesonide (Pulmicort) Turbohaler 100/dose (DPI) 1 puff bd ¥ <b>£52.01</b>	<b>200mcg BDP equivalent/day:</b>  Symbicort 100/6 Turbohaler (DPI) 1 puff bd ¥¥ <b>£170.33</b>	<b>400mcg BDP equivalent/day:</b>  <b>ICS:</b> Soprobec inhaler 100mcg/dose (MDI) ‡ 2 puffs bd <b>£40.07</b>  Clenil Modulite inhaler 100mcg/dose (MDI) ‡ 2 puff bd <b>£54.17</b>  Qvar Easi-Breathe 50mcg/dose (BAAI) 2 puffs bd † <b>£56.50</b> Qvar 50mcg/dose inhaler (MDI) 2 puffs bd † <b>£57.45</b> Qvar Autohaler 50mcg/dose (BAAI) 2 puffs bd † <b>£57.45</b>  Easyhaler budesonide 200mcg/dose (DPI) 1 puff bd ¥¥ <b>£64.64</b> 100mcg/dose (DPI) 2 puff bd ¥¥ <b>£64.68</b>  Budesonide (Pulmicort) Turbohaler 100/dose (DPI) 2 puffs bd ¥ or 200/dose (DPI) 1 puff bd ¥ <b>£104.02</b>  <b>ICS/LABA:</b> Combisal 25/50 (MDI) 2 puffs bd ■ <b>£164.25</b> Symbicort 200/6 Turbohaler (DPI) 1 puff bd † <b>£170.33</b> Flutiform 50/5 (MDI) 2puffs bd ¥ <b>£175.20</b> Seretide 50 Evohaler (MDI) 2 puffs bd ■ <b>£219</b> Seretide 100 Accuhaler (DPI) 1 puff bd ■ <b>£219</b> Symbicort 100/6 Turbohaler (DPI) 2 puffs bd ¥¥ <b>£340.67</b>	<b>800-100mcg BDP equivalent/day:</b>  <b>ICS:</b> Clenil Modulite inhaler 200mcg/dose (MDI) 2 puff bd *** <b>£118.04</b>  Qvar Easi-Breathe 100mcg/dose (BAAI) 2 puffs bd † <b>£123.73</b> Qvar 100mcg/dose inhaler (MDI) 2 puffs bd † <b>£125.63</b> Qvar Autohaler 100mcg/dose (BAAI) 2 puffs bd † <b>£125.63</b>  Easyhaler budesonide 200mcg/dose (DPI) 2 puff bd ¥¥ <b>£129.28</b>  Budesonide (Pulmicort) Turbohaler 200/dose (DPI) 2 puff bd ¥ or 400/dose (DPI) 1 puff bd ¥ <b>£208.05</b>  Fluticasone (Flixotide) 125mcg/dose Evohaler (MDI) 2 puffs bd †† <b>£258.66</b>  <b>ICS/LABA:</b> Combisal 25/125 (MDI) 2 puffs bd † <b>£214.01</b> Fusacomb Easyhaler 50/250 1puff bd † <b>£261.58</b> Relvar 92/22 (DPI) 1 puff daily † <b>£267.67</b> Seretide 125 Evohaler (MDI) 2 puffs bd † <b>£285.31</b> Flutiform 125/5 (MDI) 2 puffs bd † <b>£340.67</b> Symbicort 400/12 Turbohaler (DPI) 1 puff bd † <b>£340.67</b> Seretide 250 Accuhaler (DPI) 1 puff bd † <b>£425.83</b>

Montelukast:  
 4mg chewable tabs 1od **£16.16**, granules 1od **£70**  
 5mg daily 1od **£18.90**  
 10mg daily 1od **£18.64**

Costs based on quoted doses over 365 days (without a spacer).  
 Prices from Drug Tariff August 2019 & dm+d

‡ Licensed for 'Children' (no specific age in SPC)  
 \*\* Licensed for children > 4 years old  
 ■ Licensed for children ≥4yrs (Seretide / Combisal max licensed dose of fluticasone propionate component in children = 100mcg daily)  
 ¥ Licensed for children ≥ 5yrs  
 ¥¥ Licensed for children ≥ 6yrs  
 † Licensed for children ≥ 12 years  
 † † Flixotide Evohaler: maximum licensed fluticasone propionate dose in children is 200 micrograms twice daily. Adults & > 16 years dose: 100 – 1000mcg bd  
 \*\*\* Not licensed in children

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