

Figure 2. Stepwise approach to asthma pharmacological treatment

The decision regarding choice or adjustment of preventer treatment is mainly guided by asthma symptoms, risk of poor asthma outcomes, and presence of **BREATHE** factors.

Age	Treatment category	Step 1–2	Step 3	Step 4 (consider specialist referral)	Step 5 (refer to a specialist)
≥ 12 years	Preventer options	Daily <ul style="list-style-type: none"> Low-dose ICS LTRA^a 	Daily <ul style="list-style-type: none"> Low-dose ICS-LABA Low-dose ICS + LTRA^a Medium-dose ICS 	Daily <ul style="list-style-type: none"> Medium-dose ICS-LABA Medium-dose ICS + LTRA^a High-dose ICS 	Continue treatment as per Step 4 and consider add-on treatment with biologic agent for asthma ^e , or low-dose OCS
		As needed <ul style="list-style-type: none"> Low-dose ICS-formoterol^b Low-dose ICS whenever SABA is used^c 	MART^d <ul style="list-style-type: none"> Daily low-dose ICS-formoterol + as-needed low-dose ICS-formoterol 	Possible adjustments to daily preventer options above: <ul style="list-style-type: none"> Add LTRA^a to medium-dose ICS-LABA or high-dose ICS Increase to high-dose ICS-LABA or high-dose ICS + LTRA^a Add tiotropium 	
	Reliever	As-needed SABA inhaler (as-needed ICS-formoterol ^b is the reliever if this option is chosen in Step 1–2, or if MART ^d is chosen in Step 3 or above)			
6–11 years	Preventer options	Daily <ul style="list-style-type: none"> Low-dose ICS LTRA^a 	Daily <ul style="list-style-type: none"> Low-dose ICS-LABA Low-dose ICS + LTRA^a Medium-dose ICS 	Daily <ul style="list-style-type: none"> Medium-dose ICS-LABA Medium-dose ICS + LTRA^a 	Continue treatment as per Step 4 and consider add-on treatment with biologic agent for asthma ^e , or low-dose OCS
		As needed <ul style="list-style-type: none"> Low-dose ICS whenever SABA is used^c 	MART^f <ul style="list-style-type: none"> Daily low-dose ICS-formoterol + as-needed low-dose ICS-formoterol 	Possible adjustments to daily preventer options above: <ul style="list-style-type: none"> Add LTRA^a to medium-dose ICS-LABA Increase to high-dose ICS-LABA or high-dose ICS + LTRA^a Add tiotropium 	
	Reliever	As-needed SABA inhaler (as-needed ICS-formoterol is the reliever if MART ^f is chosen in Step 3)			

		Step 1–2 <i>Consider specialist referral</i>	Step 3 <i>Consider specialist referral</i>	Step 4	Step 5
0–5 years	Preventer options	Daily <ul style="list-style-type: none"> Low-dose ICS LTRA^a 	Daily <ul style="list-style-type: none"> Double low-dose ICS Low-dose ICS + LTRA^a If on LTRA^a in Step 1–2, switch to low-dose ICS 	Refer to a specialist	
	Reliever	As-needed SABA inhaler			

In children aged 0 to 5 years, long-term treatment with SABA alone (without a preventer) for asthma could be used only if the child fulfils all of the following criteria:

- No history of ICU admission or intubation for asthma
- No more than 3 exacerbations over the past year
- Normal lung function test over the past year (if available)
- No night awakening due to asthma over the past 4 weeks
- No exercise limitations due to asthma over the past 4 weeks
- Asthma symptoms no more than once over the past 4 weeks
- SABA used no more than once over the past 4 weeks

When one or more criteria above are not met, start or continue the child on preventer treatment.

ICS, inhaled corticosteroid; ICU, intensive care unit; LABA, long-acting beta₂ agonist; LTRA, leukotriene receptor antagonist; MART, maintenance and reliever therapy; OCS, oral corticosteroid; SABA, short-acting beta₂ agonist

Preventer options are listed in no particular order within each treatment step. **Black bolding** denotes preventer options with the most evidence available. Refer to the Appendix for ICS dose categories (low, medium, high). The steps are not scaled to proportion of patients expected to be on each step.

a Please refer to the Health Sciences Authority (HSA) Drug Safety Information No. 71 "Advisory on restriction on the use of montelukast and neuropsychiatric effects".

b Locally registered: budesonide-formoterol.

c Off-label; ICS and SABA are only available locally as separate inhalers.

d Locally registered: budesonide-formoterol for patients aged 12 years and older; beclomethasone-formoterol for patients aged 18 years and older.

e Locally registered: omalizumab (anti-immunoglobulin E) for patients aged 6 years and older with severe persistent allergic asthma; mepolizumab (anti-interleukin-5) for patients aged 12 years and older with severe eosinophilic asthma; benralizumab (anti-interleukin-5) for patients aged 18 years and older with severe eosinophilic asthma; dupilumab (anti-interleukin-4 receptor α) not locally registered for asthma (approved by U.S. Food and Drug Administration (FDA) and European Medicines Agency (EMA) for patients aged 12 years and older with asthma).

f Off-label for patients aged less than 12 years; published trial on budesonide-formoterol included patients aged 6–11 years.⁴⁵