

Supplementary Materials, Appendix

Table S1. Literature review and recommendations for quality-of-care indicators.

Study/resource	Spirometry	ACT/ questionnaire	Asthma education (WAAP, counselling)	Asthma medication possession ratio	PEFR	FeNO	Allergen testing
GINA ^{1,7}	√	√	√		√	√	√
MOH, Singapore ^{6,11,12}	√	√	√		√		
Ko ⁴¹	√	√			√	√	
Osborne ⁴²	√	√					√
Mangione- Smith ⁴³			√		√		
Kavut ⁴⁴		√	√				
To ⁴⁵	√	√	√				
Gibson ⁴⁶			√		√		
Mishra ⁴⁷		√	√		√		
Blackburn ⁴⁸				√			
Hansen ⁴⁹	√				√		√
Wu ⁵⁰			√		√		√

ACT: Asthma Control Test; FeNO: fractional exhaled nitric oxide; GINA: Global Initiative for Asthma; MOH: Ministry of Health; PEFR: peak expiratory flow rate; WAAP: Written Action Asthma Plan

Table S2. GINA 2015 step definitions.⁷

GINA Step 1	As needed short-acting beta ₂ -agonist	Consider low-dose ICS Low-dose ICS: budesonide 200-400 mcg per day Low-dose ICS: fluticasone 100-250 mcg per day Low-dose ICS: beclomethasone 200-500 mcg per day
GINA Step 2 (regular daily low-dose ICS)	Budesonide (Pulmicort) 200 mcg, 1 puff BD only	Low-dose ICS: budesonide 200-400 mcg per day
	Fluticasone propionate (Flixotide) 50 mcg, 2 puff or 125 mcg, 1 puff BD only	Low-dose ICS: fluticasone 100-250 mcg per day
	Beclomethasone (Becotide 50 mcg, 2-4 puff BD; Becloforte 200 mcg, 1 puff BD)	Low-dose ICS: beclomethasone 200-500 mcg per day
	Daily montelukast only, no ICS	
GINA Step 3 (low-dose ICS-LABA or medium-dose ICS)	Fluticasone propionate-salmeterol (Seretide 25/50 2 puff BD)	
	Budesonide-formoterol (Symbicort Turbuhaler 160/4.5 1 puff BD; Symbicort Rapihaler)	
	Fluticasone furoate-vilanterol (Relvar Ellipta 100/25 1 puff OM)	
	Fluticasone propionate-formoterol (Flutiform 50/5 2 puff BD)	
	Budesonide (Pulmicort) 200 mcg, 2 puff BD only	Medium-dose ICS: budesonide 400-800 mcg per day
	Fluticasone propionate (Flixotide) 125 mcg, 2 puff BD	Medium-dose ICS: fluticasone 250-500 mcg per day
	Beclomethasone (Becloforte) 200 mcg 2 puff BD	Medium-dose ICS: beclomethasone 500-1000 mcg per day
	Low-dose ICS (see GINA 2) with montelukast	

GINA Step 4 (medium to high-dose ICS-LABA; or ICS-LABA in combination with add on drugs)	High-dose fluticasone propionate-salmeterol (Seretide) 25/250 2 puff BD Medium-dose fluticasone propionate-salmeterol (Seretide) 25/125 2 puff BD	High-dose ICS: fluticasone >500 per day Medium-dose ICS: fluticasone 250-500 mcg per day
	High-dose budesonide-formoterol (Symbicort) 160/4.5 >2 puff BD* Medium-dose budesonide-formoterol (Symbicort) 160/4.5 2 puff BD	High-dose ICS: budesonide >800 per day Medium-dose ICS: budesonide 400-800 mcg per day
	High-dose fluticasone furoate-vilanterol (Relvar Ellipta) 200/25 1 puff OM	
	High-dose fluticasone propionate-formoterol (Flutiform) 250/10 2 puff BD Medium-dose fluticasone propionate-formoterol (Flutiform) 125/5 2 puff BD	
	Any dose of ICS-LABA (Symbicort/Seretide/Relvar/Flutiform/Foster) with Tiotropium or Umeclidinium	
	Any dose of ICS-LABA with montelukast	
GINA Step 5	Any asthma patient on long-term Prednisolone (at least 3 months duration) regardless of inhalers	
	Any asthma patient on biologics therapy (mepolizumab, benralizumab, omalizumab) regardless of inhalers	

*More than 2 puff BD includes Single Maintenance and Reliever Therapy (SMART)

BD: bis in die or twice per day; GINA: Global Initiative for Asthma; ICS: inhaled corticosteroids; LABA: long-acting beta agonist; OM: omni mane or every morning