What's new in GINA

GINA Global Strategy for Asthma Management and Prevention

This slide set is restricted for academic and educational purposes only.
No additions or changes may be made to slides. Use of the slide set or of individual slides for commercial or promotional purposes requires approval from GINA.

Definition of asthma

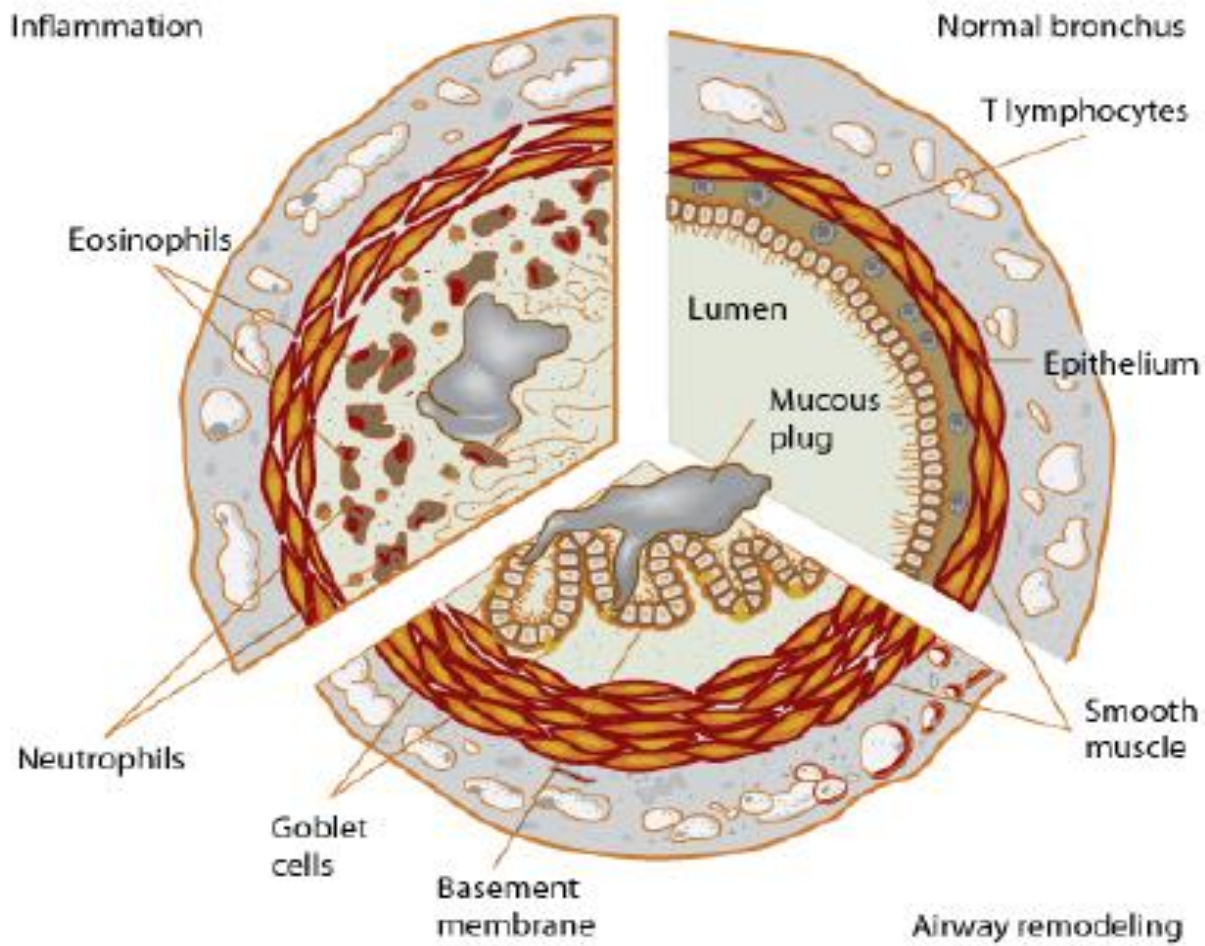
Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation.

It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airflow limitation.

The diagnosis of asthma is based on the history of characteristic symptom patterns and evidence of variable expiratory airflow limitation.

Test before treating, wherever possible, i.e. document the evidence for the diagnosis of asthma before starting ICS-containing treatment, as it is often more difficult to confirm the diagnosis once asthma control has improved.

Pathophysiology



Source: DiPiro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM: *Pharmacotherapy: A Pathophysiologic Approach, 8th Edition*: www.accesspharmacy.com

GINA goal of asthma management

The goal is to achieve the **best possible long-term asthma outcomes** for each patient:

- Long-term symptom control, which may include:
  - Few/no asthma symptoms, quickly relieved
  - No sleep disturbance
  - Unimpaired physical activity
- Long-term asthma risk minimization, which may include:
  - No exacerbations
  - Improved or stable personal best lung function
  - No requirement for maintenance oral corticosteroids
  - No medication side-effects

When discussing best possible long-term outcomes with a patient, consider:

- Their asthma phenotype
- Clinical features
- Multimorbidity
- Risk factors (e.g. poor adherence, smoking, persistent airflow limitation)
- Availability, cost and adverse effects of medications
- The patient's goals (these may be different from medical goals)

- Assessing symptom control is not enough! Patients with few asthma symptoms can still have severe or fatal exacerbations related to individual risk factors or external triggers (viruses, allergen, pollution)
- Encourage referral for expert advice for patients with difficult-to-treat or severe asthma

Asthma treatment is not ‘set and forget’, and not just medications

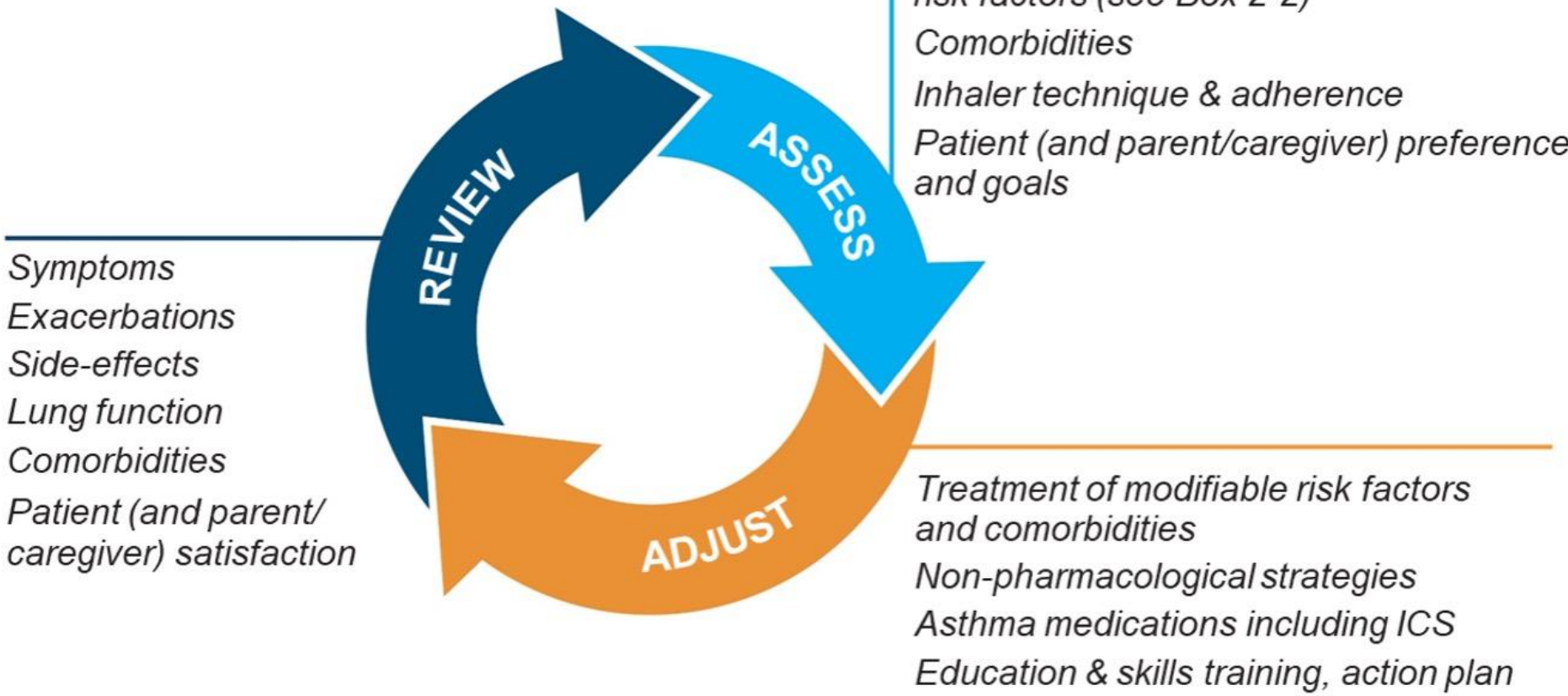


FIGURE 3–4c. CLASSIFYING ASTHMA SEVERITY IN YOUTHS ≥12 YEARS OF AGE AND ADULTS

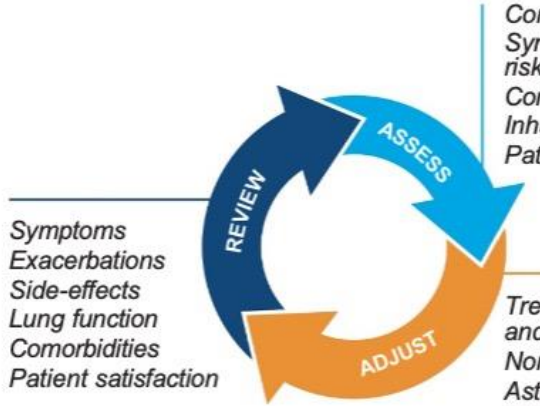
- **Classifying severity for patients who are not currently taking long-term control medications.**

Components of Severity		Classification of Asthma Severity (Youths ≥12 years of age and adults)			
			Persistent		
		Intermittent	Mild	Moderate	Severe
Impairment Normal FEV_1/FVC: 8–19 yr 85% 20–39 yr 80% 40–59 yr 75% 60–80 yr 70%	Symptoms	≤2 days/week	>2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	≤2x/month	3–4x/month	>1x/week but not nightly	Often 7x/week
	Short-acting $beta_2$-agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week but not >1x/day	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung function	• Normal FEV_1 between exacerbations • FEV_1 >80% predicted • FEV_1/FVC normal	• FEV_1 ≥80% predicted • FEV_1/FVC normal	• FEV_1 >60% but <80% predicted • FEV_1/FVC reduced 5%	• FEV_1 <60% predicted • FEV_1/FVC reduced >5%
Risk	Exacerbations requiring oral systemic corticosteroids	0–1/year (see note)	≥2/year (see note) →		
		← Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time for patients in any severity category. →			
		Relative annual risk of exacerbations may be related to FEV_1			

- Key changes in GINA include division of the treatment figure for adults and adolescents into two tracks.
  - Track 1 (preferred) has low-dose ICS-formoterol as the reliever at all steps: as needed only in Steps 1-2 (mild asthma), and with daily maintenance ICS-formoterol (maintenance-and-reliever therapy, “MART”) in Steps 3-5.
  - Track 2 (alternative) has as-needed SABA across all steps, plus regular ICS (Step 2) or ICS-long-acting b2-agonist (Steps 3-5).

GINA 2024 – Adults & adolescents 12+ years

Personalized asthma management
Assess, Adjust, Review
for individual patient needs



Confirmation of diagnosis if necessary
Symptom control & modifiable risk factors (see Box 2-2)
Comorbidities
Inhaler technique & adherence
Patient preferences and goals

Symptoms
Exacerbations
Side-effects
Lung function
Comorbidities
Patient satisfaction

Treatment of modifiable risk factors and comorbidities
Non-pharmacological strategies
Asthma medications including ICS (as below)
Education & skills training

TRACK 1: PREFERRED CONTROLLER and RELIEVER
Using ICS-formoterol as the reliever* reduces the risk of exacerbations compared with using a SABA reliever, and is a simpler regimen

STEPS 1 – 2	STEP 3	STEP 4	STEP 5
As-needed-only low dose ICS-formoterol	Low dose maintenance ICS-formoterol	Medium dose maintenance ICS-formoterol	Add-on LAMA Refer for assessment of phenotype. Consider high dose maintenance ICS-formoterol, ± anti-IgE, anti-IL5/5R, anti-IL4Rα, anti-TSLP

RELIEVER: As-needed low-dose ICS-formoterol*

See GINA severe asthma guide

TRACK 2: Alternative **CONTROLLER and RELIEVER**
Before considering a regimen with SABA reliever, check if the patient is likely to adhere to daily controller treatment

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Take ICS whenever SABA taken*	Low dose maintenance ICS	Low dose maintenance ICS-LABA	Medium/high dose maintenance ICS-LABA	Add-on LAMA Refer for assessment of phenotype. Consider high dose maintenance ICS-LABA, ± anti-IgE, anti-IL5/5R, anti-IL4Rα, anti-TSLP

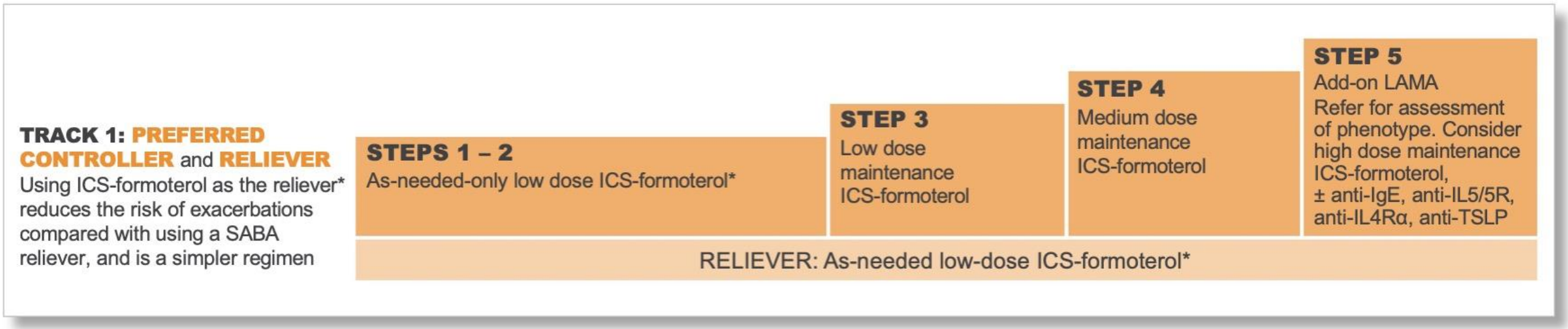
RELIEVER: As-needed ICS-SABA*, or as-needed SABA

Other controller options (limited indications, or less evidence for efficacy or safety – see text)

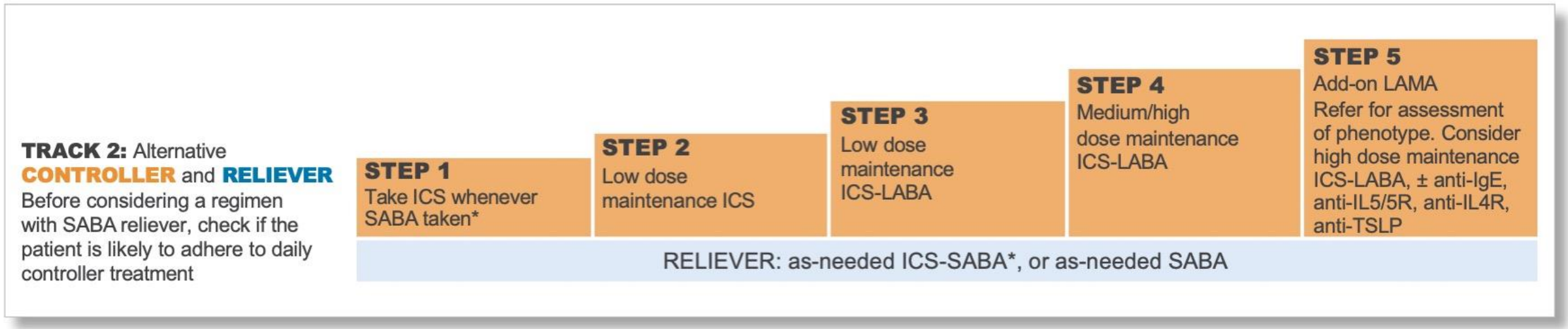
Low dose ICS whenever SABA taken, or daily LTRA†, or add HDM SLIT*	*Medium dose ICS, or add LTRA†, or add HDM SLIT*	*Add LAMA or add LTRA† or add HDM SLIT, or switch to high dose ICS-only*	*Add azithromycin (adults) or add LTRA†. As last resort consider adding low dose OCS but consider side-effects*

*Anti-inflammatory reliever; †advise about risk of neuropsychiatric adverse effects

GINA 2024 Box 4-6



*Anti-inflammatory reliever



*Anti-inflammatory reliever

Other controller options (limited indications, or less evidence for efficacy or safety – see text)	*Low dose ICS whenever SABA taken*, or daily LTRA†, or add HDM SLIT*	*Medium dose ICS-only, or add LTRA†, or add HDM SLIT*	*Add LAMA or add LTRA† or add HDM SLIT, or switch to high dose ICS-only*	*Add azithromycin (adults) or add LTRA†. As last resort consider adding low dose OCS but consider side-effects*

*Anti-inflammatory reliever; †advise about risk of neuropsychiatric adverse effects

EDITORIAL
GINA 2019

GINA 2019: a fundamental change in asthma management

Treatment of asthma with short-acting bronchodilators alone is no longer recommended for adults and adolescents

Helen K. Reddel[1], J. Mark FitzGerald[2], Eric D. Bateman[3], Leonard B. Bacharier[4], Allan Becker[5], Guy Brusselle[6], Roland Buhl[7], Alvaro A. Cruz[8], Louise Fleming[9], Hiromasa Inoue[10], Fanny Wai-san Ko[11], Jerry A. Krishnan[12], Mark L. Levy[13], Jiangtao Lin[14], Søren E. Pedersen[15], Aziz Sheikh[16], Arzu Yorgancioglu[17] and Louis-Philippe Boulet[18]

Why not treat with inhaled short-acting beta$_2$-agonists (SABA) alone?

- SABA treats the symptoms, but not the disease
- People with apparently mild asthma can have severe or fatal exacerbations *(Dusser, 2007)*
  - Up to 27% asthma deaths are in patients with occasional symptoms *(Bergstrom, 2008)*
  - Exacerbation triggers are unpredictable (viral, allergen, pollution, stress)
  - Even 4–5 **lifetime** OCS courses increase the cumulative risk of adverse events including osteoporosis, diabetes, cataract, heart failure, pneumonia *(Price et al, J Asthma Allerg 2018)*
- **Regular** use of SABA, even for 1–2 weeks, is associated with increased AHR, reduced bronchodilator effect, increased allergic response, increased eosinophils *(e.g. Cockcroft 2006)*
  - Can lead to a vicious cycle encouraging overuse
  - Over-use of SABA is associated with ↑ exacerbations and ↑ mortality *(e.g. Suissa 1994, Nwaru 2020)*
- Starting treatment with SABA **trains** the patient to regard it as their primary asthma treatment
  - Poor adherence with ICS is almost inevitable
- There is strong evidence for a more effective and safer alternative than SABA alone, or ICS plus as-needed SABA: **as-needed ICS-formoterol**

The blue one's good because you can just have a couple of squirts and get back to what you were doing

Cole et al, BMJ Open 2013

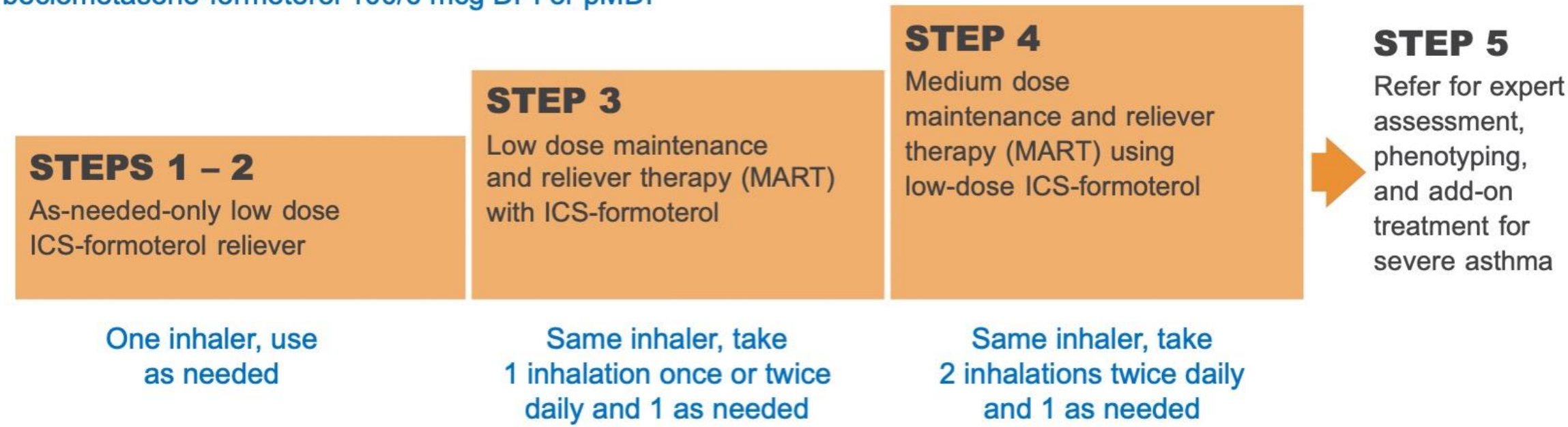
GINA Track 1, Steps 3–5: Maintenance and reliever therapy (MART) with low-dose ICS-formoterol

- MART with ICS-formoterol reduces the risk of severe exacerbations requiring oral corticosteroids, compared with other regimens plus SABA reliever, with similar symptom control
  - 32% reduction compared with same dose ICS-LABA *(Sobieraj, JAMA 2018)*
  - 23% reduction compared with higher dose ICS-LABA *(Sobieraj, JAMA 2018)*
  - 17% reduction compared with conventional best practice *(Cates et al, Cochrane 2013)*
- Not just an anti-inflammatory effect
  - Formoterol as reliever reduces risk of severe exacerbations compared with SABA reliever, but greater reduction if the reliever is ICS-formoterol *(Rabe, Lancet 2006)*
- MART is more effective than ICS-LABA plus SABA reliever in both eosinophilic and non-eosinophilic asthma
  - Benefit of MART further increased with higher blood eosinophils *(Brusselle et al, ERJ 2021)*
- MART is approved in ~120 countries

TRACK 1, Steps 1–4: PREFERRED CONTROLLER and RELIEVER for adults and adolescents.

Using ICS-formoterol as an anti-inflammatory reliever (AIR), with or without maintenance ICS-formoterol, reduces the risk of exacerbations compared with using a SABA reliever, and is a simpler regimen, with a single medication across treatment steps.

For budesonide-formoterol 200/6 mcg [160/4.5] DPI or pMDI*, or beclometasone-formoterol 100/6 mcg DPI or pMDI



*In some countries, a budesonide-formoterol pMDI with 100/3 [80/2.25] mcg per actuation is available for AIR-only or MART. For this pMDI, the recommended number of inhalations is double those shown above above.

Which formulations and doses of ICS-formoterol can be used as anti-inflammatory relievers in AIR-only or MART?

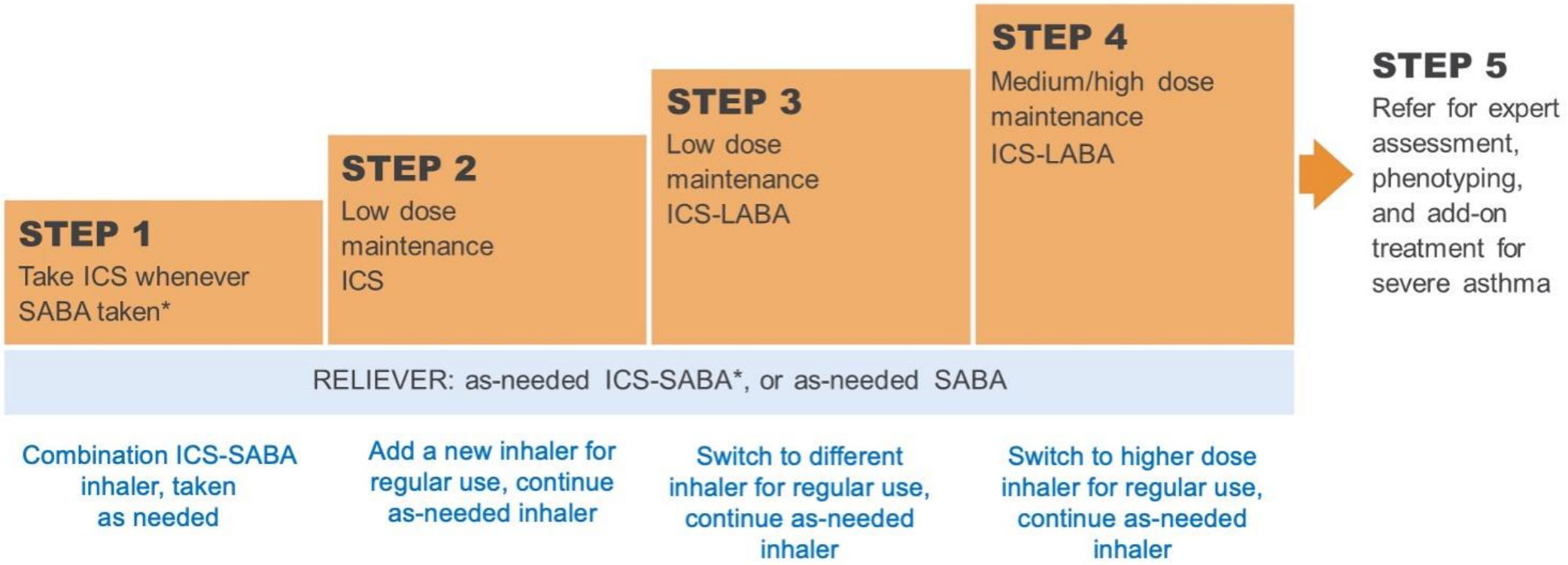
- **Budesonide-formoterol**
  - Adults and adolescents: 200/6 mcg metered dose [160/4.5 delivered dose] by DPI or pMDI, 1 inhalation per dose*
  - Children 6–11 years: 100/6 mcg metered dose [80/4.5 delivered dose] by DPI or pMDI, 1 inhalation per dose*
- **Beclometasone-formoterol**
  - Adults: 100/6 mcg metered dose by DPI or pMDI, 1 inhalation per dose; no data in adolescents or children to date
- Use of higher or lower dose formulations than these is **not** recommended*
- The maximum total dose of formoterol **in any one day** (reliever plus maintenance doses, if used) with any formulation is 72 mcg [54 mcg delivered dose] for adults/adolescents, and 48 mcg [36 mcg delivered dose] for children 6–11 years
- ICS-formoterol is the only ICS-LABA that can be used as an anti-inflammatory reliever

*In some countries, a budesonide-formoterol pMDI with 100/3 [80/2.25] mcg per actuation is available for adults and adolescents, and a pMDI with 50/3 mcg [40/2.25] per actuation is available for children. For these pMDIs, the recommended number of inhalations is double that for the formulations above.

AIR: anti-inflammatory reliever; BDP: beclometasone dipropionate; DPI: dry powder inhaler; MART: maintenance and reliever therapy with ICS-formoterol; pMDI: pressurized metered dose inhaler

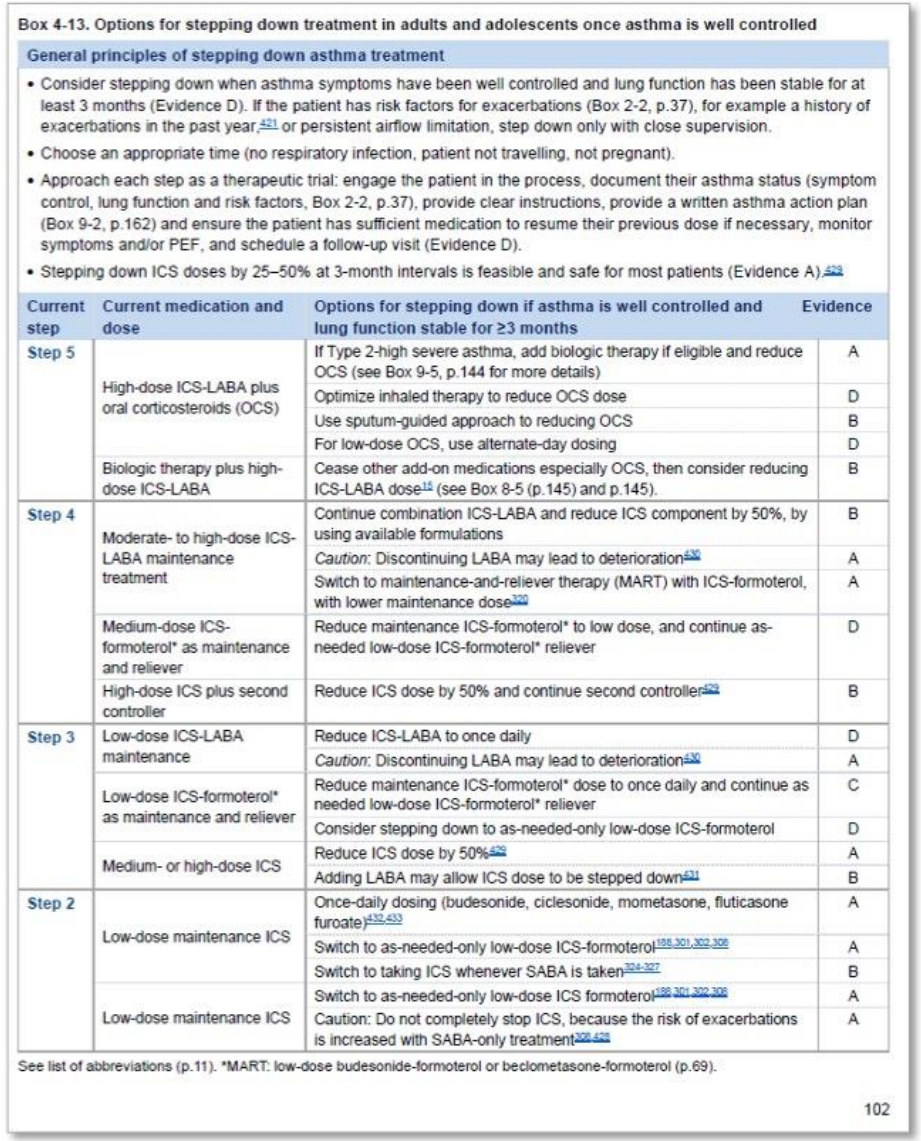
TRACK 2, Steps 1–4: Alternative CONTROLLER and RELIEVER for adults and adolescents, with ICS-SABA reliever

If maintenance and reliever medications are in different types of inhaler device, or if changing steps requires a change in device, train patient in correct inhaler technique. Make sure the patient knows which inhaler should be taken regularly, and which one as needed.



Stepping down asthma treatment

- Consider stepping down when symptoms are well-controlled and lung function stable for ≥3 months
  - If patient has exacerbation risk factors, e.g. severe exacerbation in past year, step down only with close supervision
- Choose an appropriate time
- Treat each step as a therapeutic trial
  - Engage the patient in the process
  - Document asthma status
  - Provide clear instructions and an action plan
  - Sufficient medication to resume previous dose
  - Monitor symptoms and/or PEF
  - Schedule a follow-up visit
- Do not stop ICS-containing treatment
  - In severe asthma, do not stop maintenance ICS-LABA



Box 4-13. Options for stepping down treatment in adults and adolescents once asthma is well controlled

General principles of stepping down asthma treatment

- Consider stepping down when asthma symptoms have been well controlled and lung function has been stable for at least 3 months (Evidence D). If the patient has risk factors for exacerbations (Box 2-2, p.37), for example a history of exacerbations in the past year,[421] or persistent airflow limitation, step down only with close supervision.
- Choose an appropriate time (no respiratory infection, patient not travelling, not pregnant).
- Approach each step as a therapeutic trial: engage the patient in the process, document their asthma status (symptom control, lung function and risk factors, Box 2-2, p.37), provide clear instructions, provide a written asthma action plan (Box 9-2, p.162) and ensure the patient has sufficient medication to resume their previous dose if necessary, monitor symptoms and/or PEF, and schedule a follow-up visit (Evidence D).
- Stepping down ICS doses by 25–50% at 3-month intervals is feasible and safe for most patients (Evidence A).[429]

Current step	Current medication and dose	Options for stepping down if asthma is well controlled and lung function stable for ≥3 months	Evidence
Step 5	High-dose ICS-LABA plus oral corticosteroids (OCS)	If Type 2-high severe asthma, add biologic therapy if eligible and reduce OCS (see Box 9-5, p.144 for more details)	A
		Optimize inhaled therapy to reduce OCS dose	D
		Use sputum-guided approach to reducing OCS	B
		For low-dose OCS, use alternate-day dosing	D
	Biologic therapy plus high-dose ICS-LABA	Cease other add-on medications especially OCS, then consider reducing ICS-LABA dose[15] (see Box 8-5 (p.145) and p.145).	B
Step 4	Moderate- to high-dose ICS-LABA maintenance treatment	Continue combination ICS-LABA and reduce ICS component by 50%, by using available formulations	B
		Caution: Discontinuing LABA may lead to deterioration[430]	A
		Switch to maintenance-and-reliever therapy (MART) with ICS-formoterol, with lower maintenance dose[320]	A
	Medium-dose ICS-formoterol* as maintenance and reliever	Reduce maintenance ICS-formoterol* to low dose, and continue as-needed low-dose ICS-formoterol* reliever	D
	High-dose ICS plus second controller	Reduce ICS dose by 50% and continue second controller[429]	B
Step 3	Low-dose ICS-LABA maintenance	Reduce ICS-LABA to once daily	D
		Caution: Discontinuing LABA may lead to deterioration[430]	A
	Low-dose ICS-formoterol* as maintenance and reliever	Reduce maintenance ICS-formoterol* dose to once daily and continue as needed low-dose ICS-formoterol* reliever	C
		Consider stepping down to as-needed-only low-dose ICS-formoterol	D
	Medium- or high-dose ICS	Reduce ICS dose by 50%[429]	A
		Adding LABA may allow ICS dose to be stepped down[431]	B
Step 2	Low-dose maintenance ICS	Once-daily dosing (budesonide, ciclesonide, mometasone, fluticasone furoate)[432,433]	A
		Switch to as-needed-only low-dose ICS-formoterol[188,301,302,308]	A
		Switch to taking ICS whenever SABA is taken[324-327]	B
	Low-dose maintenance ICS	Switch to as-needed-only low-dose ICS formoterol[188,301,302,308]	A
		Caution: Do not completely stop ICS, because the risk of exacerbations is increased with SABA-only treatment[328,428]	A

See list of abbreviations (p.11). *MART: low-dose budesonide-formoterol or beclometasone-formoterol (p.69).

102

GINA 2024 – Children 6–11 years

Personalized asthma management:
Assess, Adjust, Review

Confirmation of diagnosis if necessary
Symptom control & modifiable risk factors (see Box 2-2)
Comorbidities
Inhaler technique & adherence
Child and parent/caregiver preferences and goals

Symptoms
Exacerbations
Side-effects
Lung function
Comorbidities
Child and parent/ caregiver satisfaction

Treatment of modifiable risk factors & comorbidities
Non-pharmacological strategies
Asthma medications including ICS
Education & skills training

Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
PREFERRED CONTROLLER to prevent exacerbations and control symptoms	Low dose ICS taken whenever SABA taken*	Daily low dose inhaled corticosteroid (ICS) (see table of ICS dose ranges for children)	Low dose ICS-LABA, OR medium dose ICS, OR very low dose ICS-formoterol maintenance and reliever therapy (MART)	Refer for expert advice, OR medium dose ICS-LABA, OR low dose ICS-formoterol maintenance and reliever therapy (MART)	Refer for phenotypic assessment ± higher dose ICS-LABA or add-on therapy, e.g. anti-IgE, anti-IL4Rα, anti-IL5
Other controller options (limited indications, or less evidence for efficacy or safety)		*Daily leukotriene receptor antagonist (LTRA†), or low dose ICS taken whenever SABA taken**	*Low dose ICS + LTRA†*	*Add tiotropium or add LTRA†*	*As last resort, consider add-on low dose OCS, but consider side-effects*
RELIEVER	As-needed SABA (or ICS-formoterol reliever* in MART in Steps 3 and 4)				

*Anti-inflammatory reliever; †advise about risk of neuropsychiatric adverse effects

Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
PREFERRED CONTROLLER to prevent exacerbations and control symptoms	Low dose ICS taken whenever SABA taken*				
Other controller options (limited indications, or less evidence for efficacy or safety)					
RELIEVER	As-needed SABA (or ICS-formoterol reliever* in MART in Steps 3 and 4)				

*Anti-inflammatory reliever

Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
PREFERRED CONTROLLER to prevent exacerbations and control symptoms		**Daily low dose inhaled corticosteroid (ICS)** (see table of ICS dose ranges for children)			
Other controller options (limited indications, or less evidence for efficacy or safety)		*Daily leukotriene receptor antagonist (LTRA†), or low dose ICS taken whenever SABA taken**			
RELIEVER	As-needed SABA (or ICS-formoterol reliever* in MART in Steps 3 and 4)				

*Anti-inflammatory reliever; †advise about risk of neuropsychiatric adverse effects

Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
PREFERRED CONTROLLER to prevent exacerbations and control symptoms			Low dose ICS-LABA, OR medium dose ICS, OR very low dose ICS-formoterol maintenance and reliever (MART)		
Other controller options (limited indications, or less evidence for efficacy or safety)			*Low dose ICS + LTRA†*		
RELIEVER	As-needed SABA (or ICS-formoterol reliever* in MART in Steps 3 and 4)				

*Anti-inflammatory reliever; †advise about risk of neuropsychiatric adverse effects

GINA 2024 Box 4-12, 4/6 slides

Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
PREFERRED CONTROLLER to prevent exacerbations and control symptoms				Refer for expert advice, OR medium dose ICS-LABA, OR low dose ICS-formoterol maintenance and reliever therapy (MART)	
Other controller options (limited indications, or less evidence for efficacy or safety)				*Add tiotropium or add LTRA†*	
RELIEVER	As-needed SABA (or ICS-formoterol reliever* in MART in Steps 3 and 4)				

*Anti-inflammatory reliever; †advise about risk of neuropsychiatric adverse effects

Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
PREFERRED CONTROLLER to prevent exacerbations and control symptoms					Refer for phenotypic assessment ± higher dose ICS-LABA or add-on therapy, e.g. anti-IgE, anti-IL4Rα, anti-IL5
Other controller options (limited indications, or less evidence for efficacy or safety)					*As last resort, consider add-on low dose OCS, but consider side-effects*
RELIEVER	As-needed SABA (or ICS-formoterol reliever* in MART in Steps 3 and 4)				

*Anti-inflammatory reliever

MART for children 6–11 years: medications and doses

- MART is an option for this agegroup in Steps 3 and 4
- Recommended doses: budesonide-formoterol 100/6 mcg [80/4.5 mcg delivered dose] DPI or pMDI
  - Step 3: 1 inhalation **once** daily plus 1 inhalation as needed*
  - Step 4: 1 inhalation **twice** daily plus 1 inhalation as needed*
- Evidence for MART to date in children is with budesonide-formoterol 100/6 [80/4.5] DPI
  - In children 4–11 years with a history of at least one exacerbation, MART 100/6 [80/4.5] mcg 1 inhalation once daily plus 1 inhalation as needed reduced severe exacerbations compared with the same dose of budesonide-formoterol or with 4 times the dose of ICS alone, plus SABA reliever *(O'Byrne 2005; Bisgaard 2006)*
- Maximum total dose in any one day (maintenance and reliever doses)
  - 8 inhalations* of budesonide-formoterol 100/6 mcg [80/4.5 mcg delivered dose]
- **Very few patients ever need this much!**
- Several RCTs are underway with AIR-only and MART in children
- Do not use ICS-formoterol as the reliever with other maintenance ICS-LABAs

*In some countries, a budesonide-formoterol pMDI with 50/3 [40/2.25] mcg per actuation is available. For this pMDI, the recommended number of inhalations is double that for the 100/6 [80/4.5] mcg formulation above.

Remission of asthma

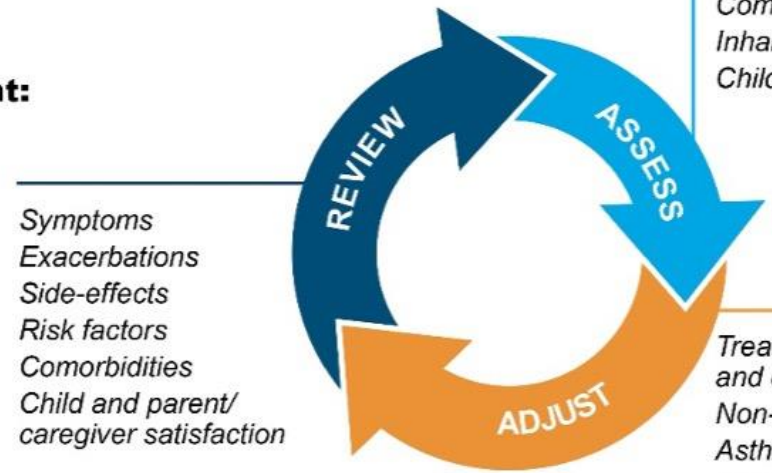
- Children vs adults
- Clinical vs complete remission
- “Off treatment” vs “on treatment”
- Multiple definitions, operationalized in many ways
  - Often assessed over only 12 months
  - “No exacerbations” and “no maintenance OCS” assessed from electronic medical record or patient interview
  - “No symptoms over 12 months” often assessed from Asthma Control Questionnaire (i.e. the last 7 days!)
- No validated tools for assessment of symptoms over periods longer than 4 weeks

Remission of asthma

- Remission from childhood wheezing or asthma, off treatment
  - Parents/caregivers often ask if their child will 'grow out of their asthma'
  - Rates vary depending on population and age, e.g. 59% at age 6, 15% at age 26
  - Asthma often recurs: remission is not cure, and patients may develop persistent airflow limitation
  - Say to parent/caregiver 'Their asthma has gone quiet for a while'
- Remission in adults, on treatment
  - Current reports are mostly for patients with severe asthma treated with biologic therapy
  - Remission also seen in non-severe asthma with ICS-containing treatment, and sometimes spontaneously
  - Research needed to identify pathways in patients who have ongoing respiratory symptoms, e.g. multimorbidity, anxiety and/or depression, moderate or severe persistent airflow limitation
- Evidence about goal-setting tells us that treatment goals for patients should be personalized and achievable
- Avoid encouraging automatic step-up of therapy
  - Treat comorbidities and modifiable risk factors first (including poor inhaler technique and poor adherence); use non-pharmacologic strategies; if high-dose ICS or ICS-LABA is used, limit to 3–6 months whenever possible
  - Use GINA Track 1 regimen to reduce exacerbations using *lower* ICS doses

GINA 2024 – Children 5 years and younger

Personalized asthma management:
Assess, Adjust, Review response



Exclude alternative diagnoses
Symptom control & modifiable risk factors
Comorbidities
Inhaler technique & adherence
Child and parent/caregiver preferences and goals

Symptoms
Exacerbations
Side-effects
Risk factors
Comorbidities
Child and parent/ caregiver satisfaction

Treat modifiable risk factors and comorbidities
Non-pharmacological strategies
Asthma medications
Education & skills training

Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4
PREFERRED CONTROLLER CHOICE	*(Insufficient evidence for daily controller)*	Daily low dose inhaled corticosteroid (ICS) (see Box 11-3 for ICS dose ranges for pre-school children)	Double 'low dose' ICS *(See Box 11-3)*	Continue controller & refer for specialist assessment
Other controller options (limited indications, or less evidence for efficacy or safety)	*Consider intermittent short course ICS at onset of viral illness*	*Daily leukotriene receptor antagonist (LTRA†), or intermittent short course of ICS at onset of respiratory illness*	*Low dose ICS + LTRA† Consider specialist referral*	*Add LTRA†, or increase ICS frequency, or add intermittent ICS*
RELIEVER	As-needed short-acting beta$_2$-agonist			
CONSIDER THIS STEP FOR CHILDREN WITH:	Infrequent viral wheezing and no or few interval symptoms	Symptom pattern not consistent with asthma but wheezing episodes requiring SABA occur frequently, e.g. ≥3 per year. Give diagnostic trial for 3 months. Consider specialist referral.	Asthma diagnosis, and asthma not well-controlled on low dose ICS	Asthma not well-controlled on double ICS
		Symptom pattern consistent with asthma, and asthma symptoms not well-controlled or ≥3 exacerbations per year.	Before stepping up, check for alternative diagnosis, check inhaler skills, review adherence and exposures	

*†Advise about risk of neuropsychiatric adverse effects

Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4
PREFERRED CONTROLLER CHOICE	*(Insufficient evidence for daily controller)*			
Other controller options (limited indications, or less evidence for efficacy or safety)	*Consider intermittent short course ICS at onset of viral illness*			
RELIEVER	As-needed short-acting beta$_2$-agonist			
CONSIDER THIS STEP FOR CHILDREN WITH:	Infrequent viral wheezing and no or few interval symptoms			

Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4
PREFERRED CONTROLLER CHOICE		Daily low dose inhaled corticosteroid (ICS) (see Box 11-3 of ICS dose ranges for pre-school children)		
Other controller options (limited indications, or less evidence for efficacy or safety)		*Daily leukotriene receptor antagonist (LTRA†), or intermittent short course of ICS at onset of respiratory illness*		
RELIEVER	As-needed short-acting beta$_2$-agonist			
CONSIDER THIS STEP FOR CHILDREN WITH:		Symptom pattern not consistent with asthma but wheezing episodes requiring SABA occur frequently, e.g. ≥3 per year. Give diagnostic trial for 3 months. Consider specialist referral.		
		Symptom pattern consistent with asthma, and asthma symptoms not well-controlled or ≥3 exacerbations per year.		

*†Advise about risk of neuropsychiatric adverse effects

Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4
PREFERRED CONTROLLER CHOICE			Double 'low dose' ICS *(See Box 11-3)*	
Other controller options (limited indications, or less evidence for efficacy or safety)			*Low dose ICS + LTRA[†] Consider specialist referral*	
RELIEVER	As-needed short-acting beta$_2$-agonist			
CONSIDER THIS STEP FOR CHILDREN WITH:			Asthma diagnosis, and asthma not well-controlled on low dose ICS	
			Before stepping up, check for alternative diagnosis, check inhaler skills, review adherence and exposures	

*[†]Advise about risk of neuropsychiatric adverse effects

Asthma medication options:
Adjust treatment up and down for individual child's needs

	STEP 1	STEP 2	STEP 3	STEP 4
PREFERRED CONTROLLER CHOICE				Continue controller & refer for specialist assessment
Other controller options (limited indications, or less evidence for efficacy or safety)				*Add LTRA†, or increase ICS frequency, or add intermittent ICS*
RELIEVER	As-needed short-acting beta$_2$-agonist			
CONSIDER THIS STEP FOR CHILDREN WITH:				Asthma not well-controlled on double ICS
				Before stepping up, check for alternative diagnosis, check inhaler skills, review adherence and exposures

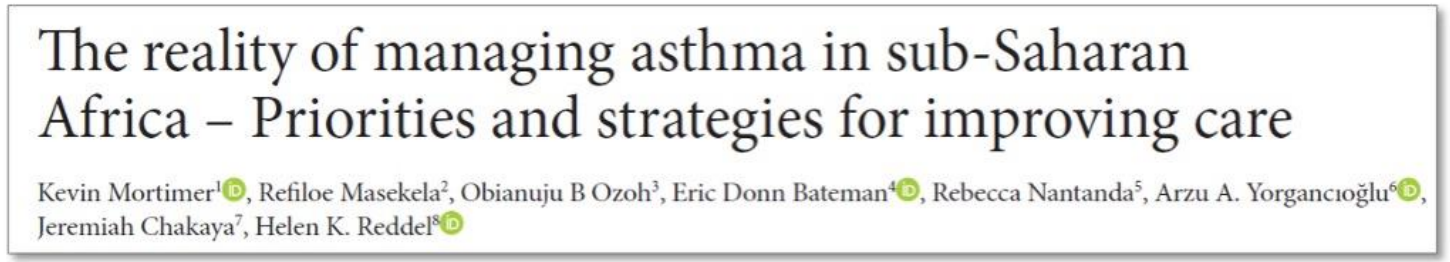
*†Advise about risk of neuropsychiatric adverse effects

Other changes in GINA 2024 include…

- Cough variant asthma
  - Common in some countries
  - Spirometry may be normal, diagnosed with bronchial provocation test
  - Treatment as for asthma, with inhaled corticosteroids
- Bronchodilator responsiveness
  - Proposal by ERS/ATS Technical Committee to change criterion from an increase from baseline in FEV_1 or FVC by ≥12% and ≥200 mL, to an increase from baseline in FEV_1 or FVC by >10% predicted
  - Based on long-term analyses of mortality
  - Not yet compared with other diagnostic tests for asthma, so not recommended for clinical use
- Montelukast (leukotriene receptor antagonist)
  - Consistent advice throughout GINA 2024 to advise patients/caregivers about potential neuropsychiatric effects
  - Increased attention in social media
- Pulmonary rehabilitation for asthma
  - Systematic review demonstrated benefit for functional exercise capacity and quality of life in people with asthma *(Osadnik et al, Cochrane Database 2022)*

Oral bronchodilators are NOT recommended

- Salbutamol tablets/syrup, and oral theophylline are **not recommended**
  - Slow onset of action
  - Less effective for symptom relief than inhaled bronchodilators
  - More adverse effects
  - They do not treat the airway inflammation that is characteristic of asthma
- Advocate for global access to essential inhaled medicines for all
- In the meantime, if only oral agents are available, see article below about which/how to use


The reality of managing asthma in sub-Saharan Africa – Priorities and strategies for improving care

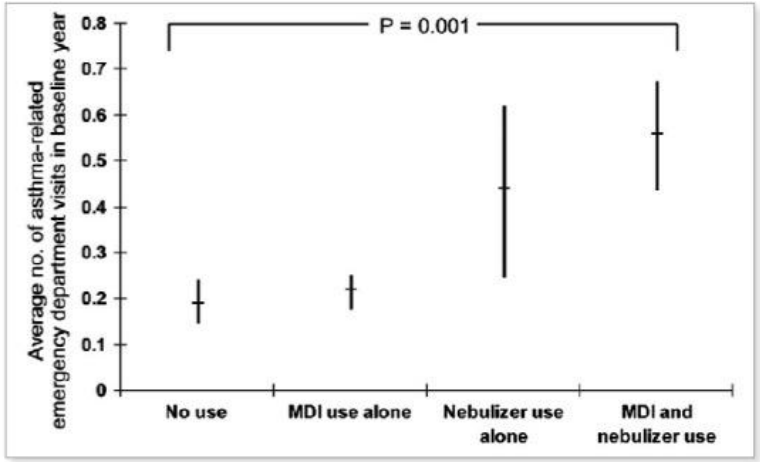
Kevin Mortimer[1], Refiloe Masekela[2], Obianuju B Ozoh[3], Eric Donn Bateman[4], Rebecca Nantanda[5], Arzu A. Yorgancıoğlu[6], Jeremiah Chakaya[7], Helen K. Reddel[8]

Mortimer et al, JPATS 2022

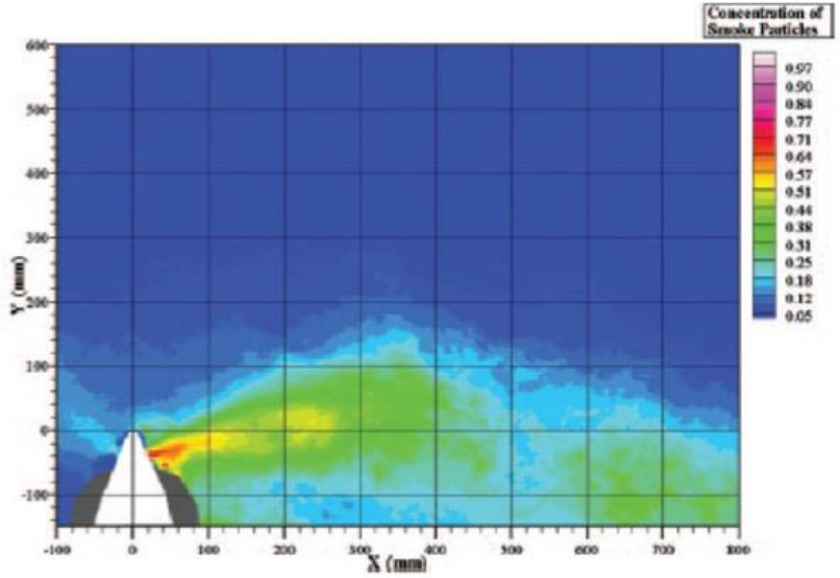
Home nebulization of SABA is not recommended

Home nebulization of SABA is associated with increased risk

- Increased risk of severe exacerbations
  - ED visits for asthma (aHR 6.3) *(Paris, 2008)*
  - Relapse after ED visit for asthma (OR 2.2) *(Emerman, 1999)*
  - Asthma hospitalisations (aHR 21.6) *(Paris, 2008)*
- Increased risk of asthma mortality
  - aOR 4.6 *(Abramson, 2000)*
- Increased risk of transmission of infection
  - SARS Co-V-1: 138 hospital workers infected from index case
  - Potential infection of family members
- SABA by pMDI and spacer provides quicker relief and less risk



Paris et al, Ann Allergy Asthma Immunol 2008



Hui et al, Chest 2009

Inhaler choice and environmental considerations

- Inhaled corticosteroids markedly reduce the risk of asthma exacerbations and death
  - But limited availability and access in low and middle income countries
- Many inhaler types available, with different techniques
- Some inhalers are not suitable for some patients. For example:
  - DPIs are not suitable for children ≤5 years and some elderly
  - pMDIs difficult for patients with arthritis or weak muscles
  - Capsule devices are difficult for patients with tremor
- Most patients don't use their inhaler correctly
  - More than one inhaler → more errors
- Incorrect technique → more symptoms → worse adherence → more exacerbations → higher environmental impact
- Propellants in current pMDIs have 25x global warming potential compared with dry powder inhalers
  - New propellants are being developed but not yet approved
- Choice of inhaler is important!

Take home messages

1- Never salbutamol alone and never use regular even for 1 week always with ICS (or systemic in attacks)

2- ICS-Formoterol best for ages>12 years even as needed in mild persistent.
In 6-12 years in moderate persistent is best option.

3- Never step down before 2 months

4- LTRA is second option always

5- Atrovent is not for MT treatment

6- Antihistamines just in Rhinitis not asthma

Theophylline not totally advise and never without ICS in asthma

More than 70% of asthma patients have Rhinitis

Be care about GERD

No D/C of asthma med in and respiratory infection and common colds

Treatment failure:

Check medication and use

Review technique of spray with patient. All ages take MDI with spacer

Check Co-morbids in asthma and treat

Reduce triggers as you can: smoke, pets, air pollutions, stress

www.ginasthma.org

GINA Global Strategy for Asthma Management and Prevention