



USAsthma SUMMIT 2023

GINA 2023 Updates and the Future of Asthma Care

Angela Hogan, MD

Children Hospital of the King's Daughters

Global Initiative for Asthma (GINA) 2023 Updates and the Future of Asthma Care

**Angela Duff Hogan, MD, FAAP,
FACAAI, FAAAAI**

Children's Specialty Group

Children's Hospital of the King's Daughters

Eastern Virginia Medical School

Division of Allergy and Immunology

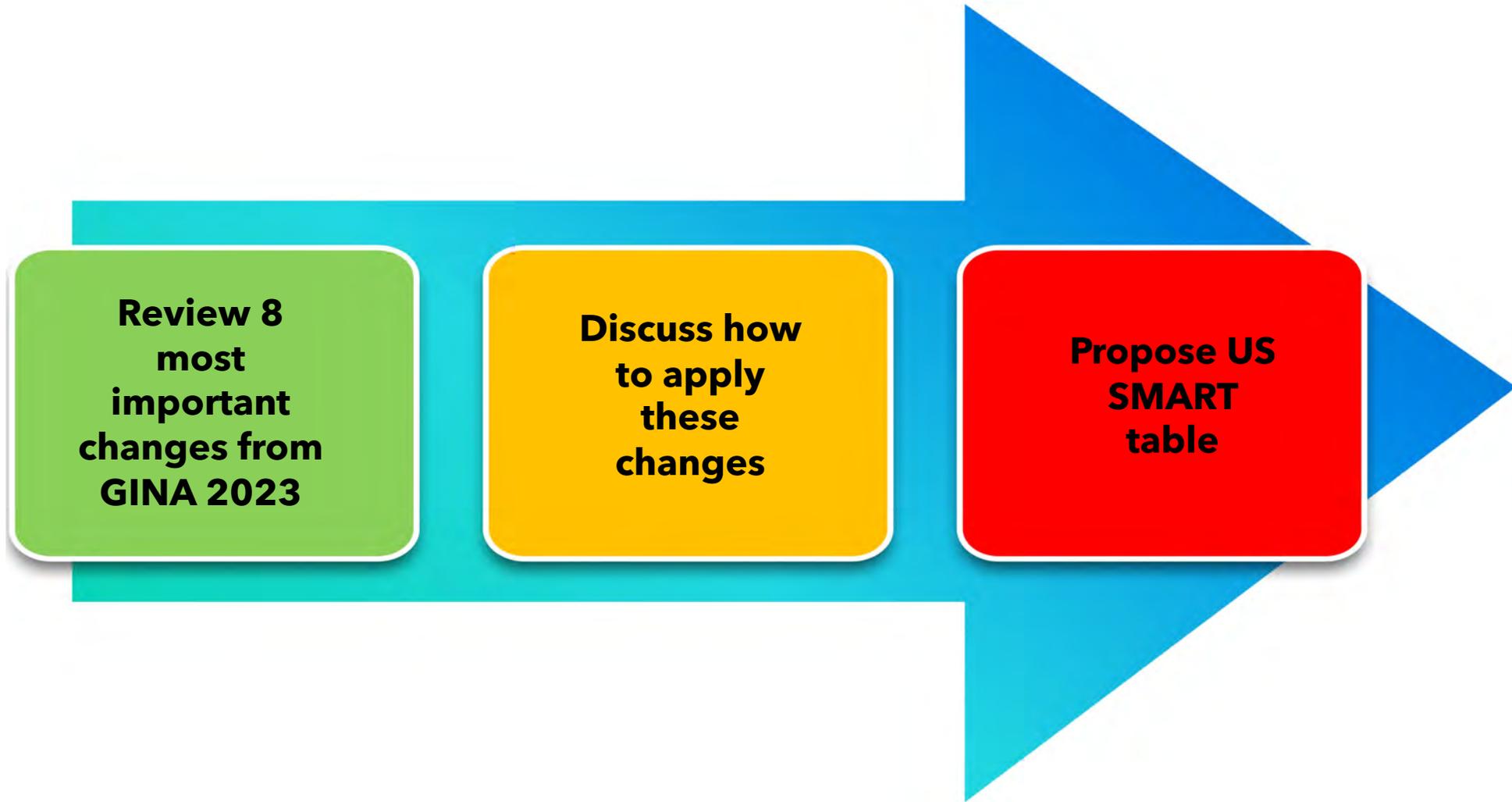
Norfolk, VA



Disclosures

- A. It is my obligation to disclose to you that I am was on the **Speakers Bureau for GlaxoSmithKline in 2023**
- B. I have no relevant financial relationships with the manufacturer(s) of any commercial product(s) and/or provider of commercial services discussed in this activity
- C. I **do not** intend to discuss an unapproved/investigative use of a commercial product/device in my presentation.

Our Goal Today....





Asthma is not one disease

- Differences in risk factors for development
- Differences in triggers
- Differences in symptoms
- Differences in severity
- Differences in response to therapy
- Differences in effects of comorbid conditions

Asthma is a Big Deal

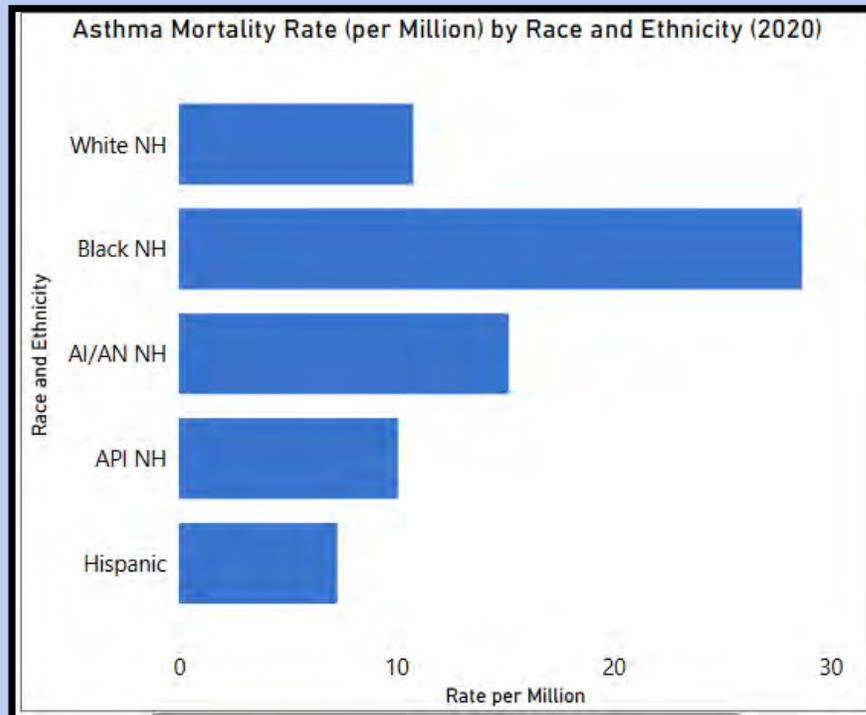
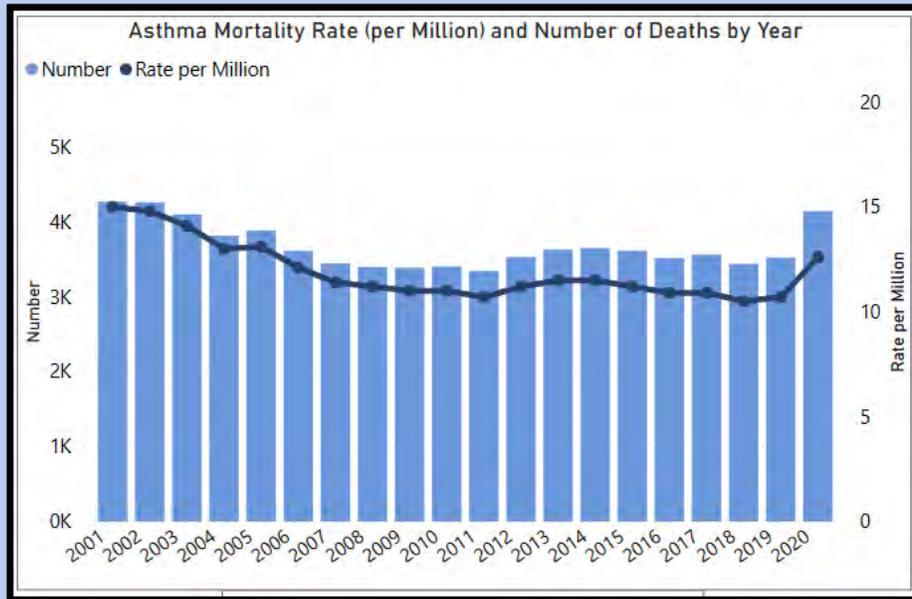
- Asthma is most common chronic disease of childhood in U.S.¹
- 6.2% of children under age 18 years currently have asthma (2022)²
- 50% of children with asthma have uncontrolled asthma²
- Children with poorly controlled asthma have 2X annual costs for their disease compared with children with well controlled asthma
- Children with severe asthma (5% of asthmatics) account for 50% of asthma health care dollars
- Socioeconomic costs- \$56 billion annually²



1 Chipps, BE. et al. The pediatric asthma yardstick. Ann Allergy Asthma Immunol 120 (2018)559-579.

2. [FastStats - Asthma \(cdc.gov\)](https://www.cdc.gov/fastats/) 3. <https://aafa.org/asthma/asthma-facts/>

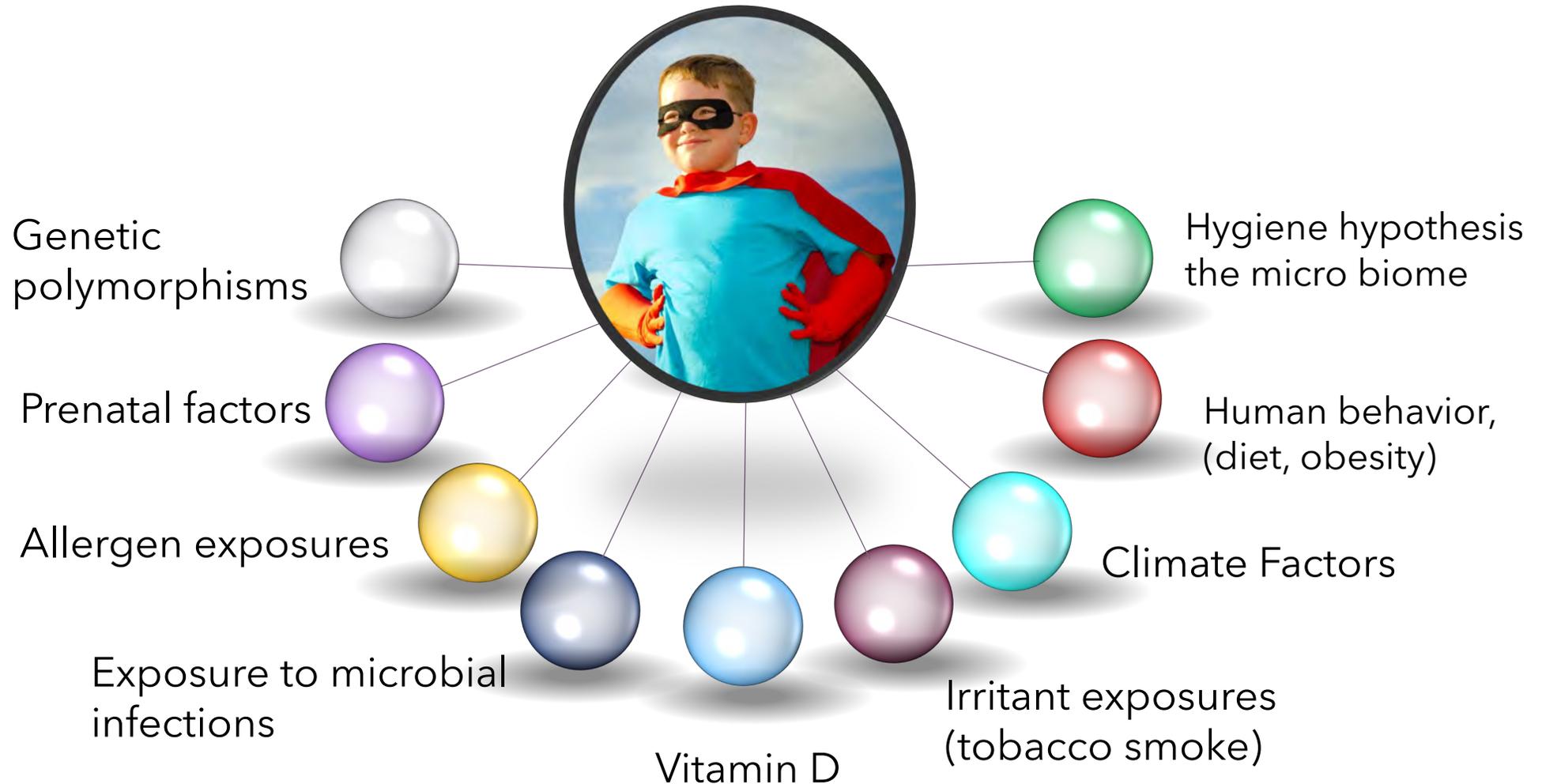
CDC Asthma Mortality



- Percent of children under age 18 years who currently have asthma: 6.2% (2022)
- In 2019, **44.3%** of children ≤ 18 with asthma reported having **one or more asthma attacks in the past year¹**
- In 2020, deaths due to asthma rose for the first time in 20 years
- **On average, 11 people in the U.S. die from asthma each day**
- Black people in the U.S. are nearly 3X more likely to die from asthma than white people in the U.S.

• <https://www.cdc.gov/asthma/data-visualizations/>

Potential Mechanisms Leading To Childhood Asthma



What is GINA?

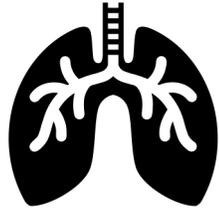


**Global Strategy for
Asthma Management and Prevention**

- ✿ Global Initiative for Asthma
- ✿ Celebrating 30 years of working to improve lives of people with asthma
- ✿ Is a global strategy report based on twice yearly updates of the asthma literature with evidence-based recommendations
- ✿ What are the key changes for 2023?

1

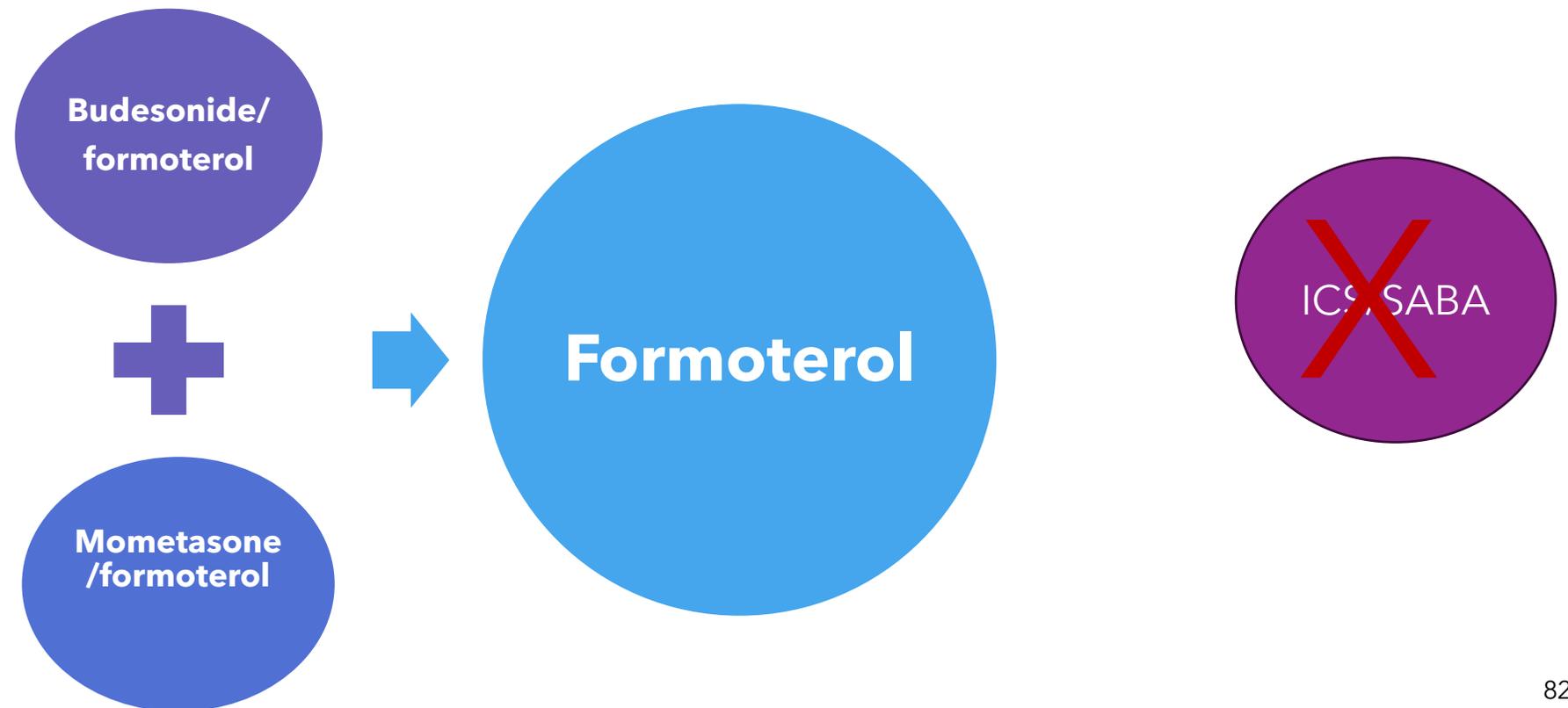
2023 First Key Change: Terminology



- **Maintenance** replaces **Controller** - any asthma treatment prescribed for everyday use
- **Reliever** refers to an asthma inhaler used **as-needed** for quick relief of symptoms (SABAs, ICS- formoterol and ICS-SABA)

- **AIR**-Anti-inflammatory reliever
 - ICS-formoterol, ICS-SABA
 - Provides rapid relief plus a little ICS
 - Reduces risk of exacerbations compared to SABA reliever
 - Can be used before exercise or allergen exposure
 - Steps 1 and 2
- **MART**-Maintenance and reliever therapy
 - refers **only** ICS-formoterol
 - previously called SMART-single-inhaler maintenance and reliever therapy
 - Steps 3-5

MART Therapy



GINA 2023 - Adults and adolescents Track 1



Maintenance and reliever therapy (MART) with ICS-formoterol

PREFERRED

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

As-needed-only ICS-formoterol ('AIR-only')

STEPS 1 - 2
As-needed-only low dose ICS-formoterol*

STEP 3
Low dose maintenance ICS-formoterol*

STEP 4
Medium dose maintenance ICS-formoterol

STEP 5
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*

*An anti-inflammatory reliever (AIR)

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**GINA
TRACK 1
with ICS-
formoterol
is
preferred!**

Step treatment down or up by changing number of maintenance doses

Dial up doses for increased symptoms

Avoids confusion about inhaler technique with different devices

A single medication for both symptom relief and maintenance treatment

Simplicity
of TRACK 1

$1+2=3$



GINA has the Science for ICS-formoterol



- **Steps 1-2:** significant evidence for ICS-formoterol effectiveness and safety compared with SABA alone, or low dose ICS plus as needed SABA (4 x 12 month studies, **n ~ 10,000**)

(Crossingham et al. Cochrane 2021)



- **Steps 3-5:** significant evidence for effectiveness and safety of MART versus regimens with as needed SABA (**n~30,000**)

(Sobieraj et al. JAMA 2018, Cates et al. Cochrane 2013)



- Both ICS and the formoterol contribute to reduction in severe exacerbations. Safety established up to total 12 inhalations in any day in large studies

(Tattersfield et al. Lancet 2001, Pauwels RA, et al. *Eur. Respir. J.*, 2003, Rabe KF et al Lancet 2006)

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Addition of ICS-SABA for Adults and Adolescents

January 11, 2023

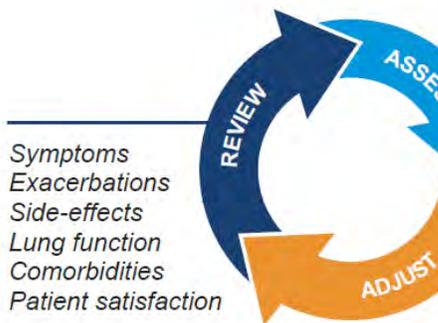
- FDA approved albuterol and budesonide inhalation aerosol for the as-needed treatment or prevention of bronchoconstriction and to reduce the risk of asthma attacks in patients with asthma **18** years of age and older.
- It is the first combination of an inhaled corticosteroid (ICS) and a short-acting beta-agonist to be approved in the U.S.



GINA 2023 – Adults & adolescents 12+ years

Personalized asthma management

Assess, Adjust, Review for individual patient needs

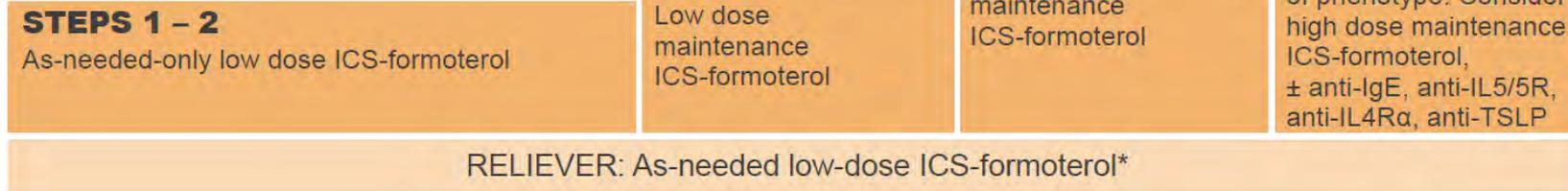


Don't use **two** kinds of LABAs since clinical evidence for safety and efficacy is lacking.



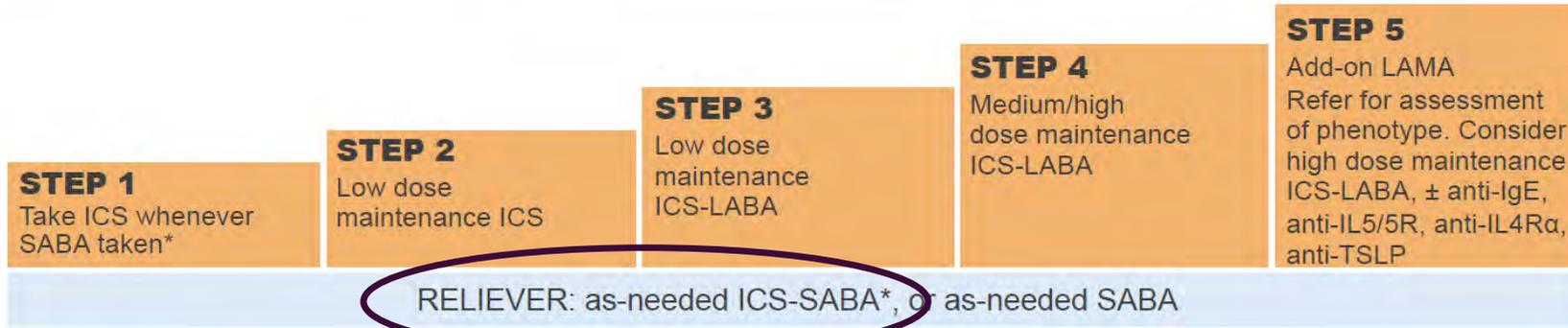
TRACK 1: PREFERRED CONTROLLER and RELIEVER

Using ICS-formoterol as the reliever* reduces the risk of exacerbations compared with using a SABA reliever, and is a simpler regimen



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



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

	<i>Low dose ICS whenever SABA taken*, or daily LTRA, or add HDM SLIT</i>	<i>Medium dose ICS, or add LTRA, or add HDM SLIT</i>	<i>Add LAMA or LTRA or HDM SLIT, or switch to high dose ICS</i>	<i>Add azithromycin (adults) or LTRA. As last resort consider adding low dose OCS but consider side-effects</i>
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See GINA severe asthma guide

*Anti-inflammatory reliever (AIR)

ICS-SABA vs. SABA

Maintenance
ICS-LABA or
Medium dose ICS
Reliever
ICS-SABA
vs
SABA alone

Mandala Study: Double-blind randomized trial, uncontrolled moderate-severe asthma, hx severe exacerbations randomized to prn ICS-SABA or prn SABA with maintenance meds

PRN use of 2 puffs budesonide-albuterol (80/90 mcg dose) taken for symptom relief, increased time to first severe exacerbation by 41% compared with as needed 2 puffs 90 mcg albuterol

No head-to-head comparisons between ICS-LABA/ICS-SABA and MART (ICS-formoterol)

ICS-SABA not recommended for regular use and use as reliever-- 2 different inhalers, more complex for patients than TRACK 1

1. Papi, A. N Engl J Med 2022; 386:2071-2083.

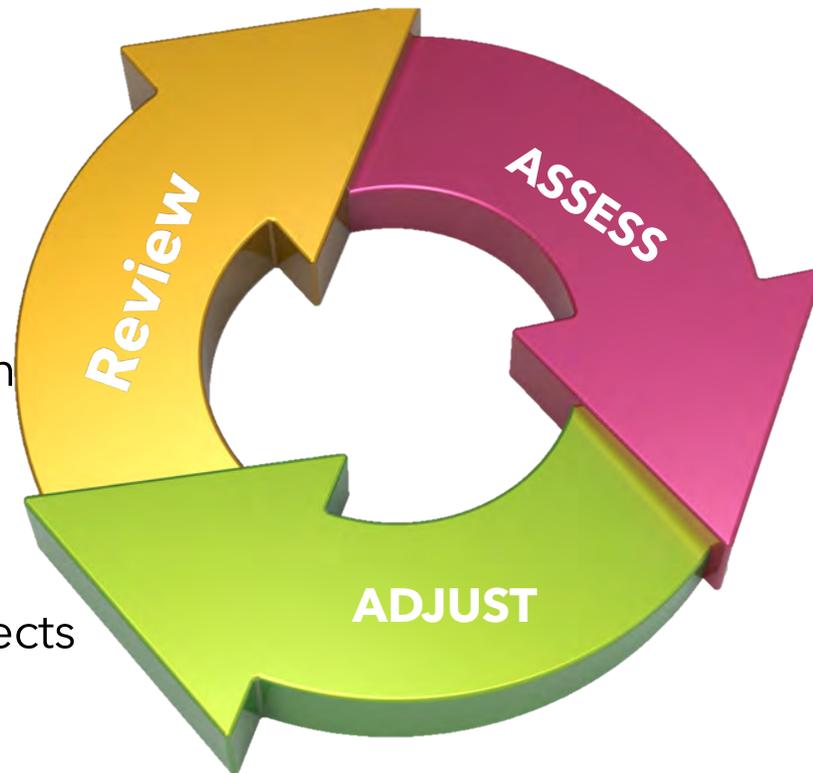
2. https://ginasthma.org/wp-content/uploads/2023/07/GINA-2023-Full-report-23_page_75

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New commentary and continued emphasis on asthma management cycle

• **Goals of asthma treatment**

- ✿ Few asthma symptoms
- ✿ No sleep disturbance
- ✿ No exercise limitation
- ✿ Maintain normal lung function
- ✿ Prevent flare ups
- ✿ Prevent asthma deaths
- ✿ Minimize medication side effects



Assess:

- Symptom control and modifiable risk factors
- Comorbidities
- Inhaler technique and adherence.
- Patient's goals and preferences,

Adjust: management based on assessments

- Treatment of modifiable risk factors and comorbidities
- Relevant non-pharmacological strategies
- Adjustment of medication up/down
- Education and skills training

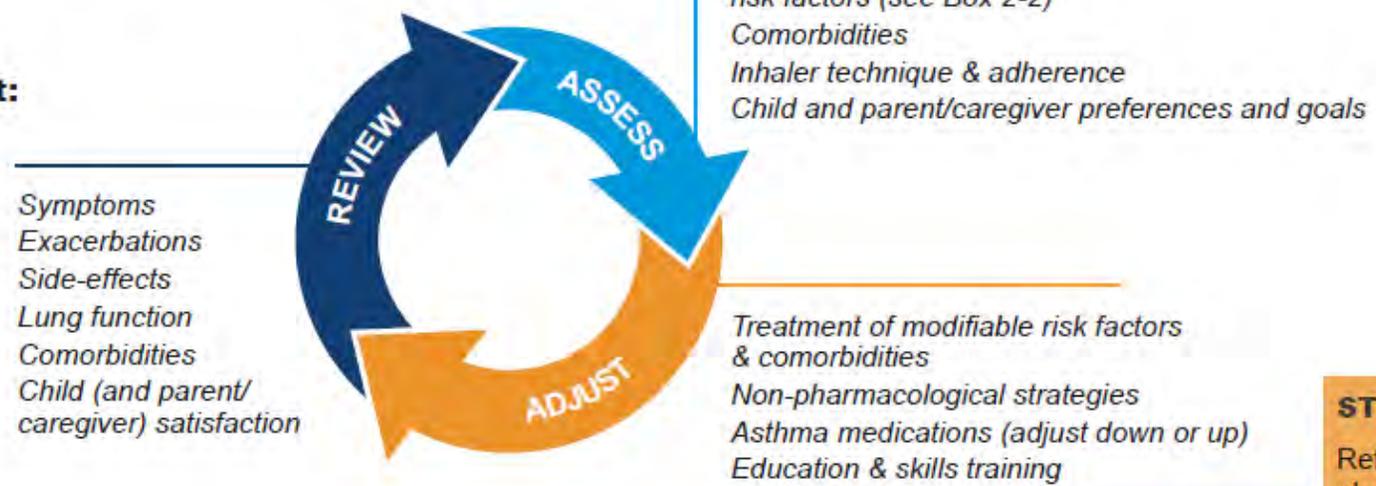
Review: the goals of treatment

- Symptoms
- Exacerbations
- Side effects
- Lung function
- Comorbidities
- Patient satisfaction



Personalized asthma management:

Assess, Adjust, Review



Asthma medication options:

Adjust treatment up and down for individual child's needs

PREFERRED CONTROLLER

to prevent exacerbations and control symptoms

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

RELIEVER

As-needed SABA (or ICS-formoterol reliever* in MART in Steps 3 and 4)

*Anti-inflammatory relievers (AIR)

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Changes in GINA 2023 Difficult to Treat and Severe Asthma



- Double-blind study of withdrawal of mepolizumab in adults with severe eosinophilic asthma found more exacerbations in those who stopped mepolizumab than those who continued treatment
- Regardless of regulatory approvals, GINA recommends biologic therapy for asthma **only** if asthma is severe and **only** if treatment has been optimized
- Head-to-head studies are needed
- Non-asthma indications for a biologic therapy are mentioned only if the condition is relevant to asthma management or it is commonly associated with asthma
- Severe asthma guide published in mid 2023 in large format



GINA 2023 recommends biological therapy for asthma only if: Asthma is severe and treatment has been optimized

	omalizumab	dupilumab	mepolizumab	benralizumab	tezepelumab
Age	6 years	6 years	6 years	12 years	12 years
Where administered?	Home or office	Home	Home or office	Home or office	Home or office
How Often?	Every 2 or 4 weeks	6-11yr: Every 2 or 4 weeks 12 yr: Every 2 weeks	Every 4 weeks	Every 8 weeks after a build up phase of every 4 weeks x3	Every 4 weeks
Forms	Prefilled syringe	Prefilled syringe and pen	Prefilled syringe 6-11yr Prefilled pen ≥12	Prefilled pen home prefilled syringe office	Prefilled pen home prefilled syringe office
Other conditions	•Chronic hives (12yr) •CRSwNP (18 yr)	•AD (>6 mo) •EoE (12yr) •CRSwNP(18yr) •PN (18 yr)	•CRSwNP (18yr) •EGPA (18yr) •HES (12 yr)		
Special considerations	anaphylaxis	Live vaccines? When?	Herpes zoster		Live vaccines? When?
MOA	Anti-IgE	Anti IL-4/13 R	Anti-IL-5	Anti-IL-5R	Anti-TSLP

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Treatment in children ≤ 5 years- Step 1 Clarification

	Step 1	Step 2	Step 3	Step 4
Preferred controller	Insufficient evidence for daily controller	Daily low dose ICS	Double "low dose" ICS	Continue controller and refer
Other controller options	Consider intermittent short course ICS at illness onset	Daily LTRA, or intermittent short course ICS at illness onset	Low dose ICS + LTRA; Consider referral	Add LTRA, or increase ICS frequency or add intermittent ICS
Reliever	As needed SABA			



- All children who experience wheezing episodes should have inhaled SABA for relief of symptoms
- Use of SABA more than 2X week over one month period indicates need for a trial of low dose ICS
- SABAs are generally ineffective for bronchiolitis

GINA 2023 – Children 5 years and younger



Personalized asthma management:

Assess, Adjust, Review response

Symptoms
Exacerbations
Side-effects
Risk factors
Comorbidities
Parent/caregiver satisfaction



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

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

PREFERRED CONTROLLER CHOICE

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

RELIEVER

CONSIDER THIS STEP FOR CHILDREN WITH:

	STEP 1 (Insufficient evidence for daily controller)	STEP 2 Daily low dose inhaled corticosteroid (ICS) (see table of ICS dose ranges for pre-school children)	STEP 3 Double 'low dose' ICS (See Box 6-7)	STEP 4 Continue controller & refer for specialist assessment
	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
	As-needed short-acting beta ₂ -agonist			
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. Symptom pattern consistent with asthma, and asthma symptoms not well-controlled or ≥3 exacerbations per year.	Asthma diagnosis, and asthma not well-controlled on low dose ICS	Asthma not well-controlled on double ICS	Before stepping up, check for alternative diagnosis, check inhaler skills, review adherence and exposures

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Practical Guidance on Medication Dosing

Preferred TRACK 1

- 🧠 Reassure patients that ICS-formoterol will work as well as the SABA reliever
- 🧠 Advise patients to have two inhalers, if possible, 1 home & 1 backpack/bag
- 🧠 Rinse and spit out after maintenance doses but not needed with reliever doses
- 🧠 Have a MART action plan

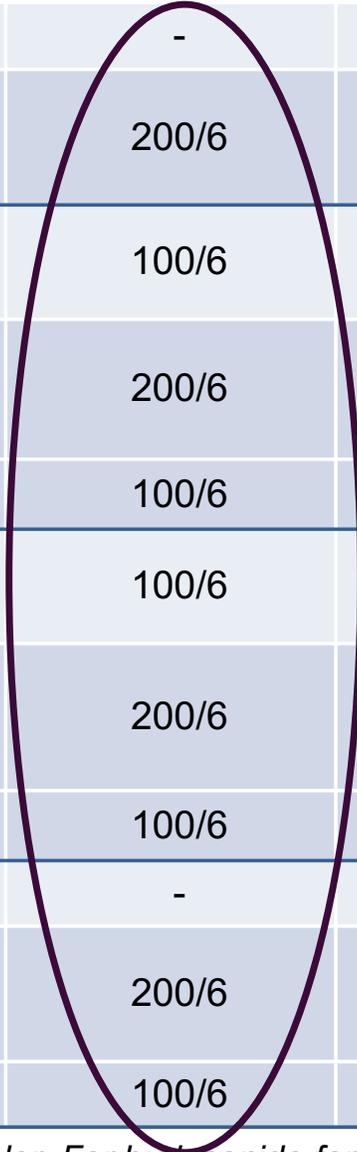




How many puffs in the US?



Step	Age (years)	Medication and device (check patient can use inhaler)	Metered dose (mcg/inhalation)	Delivered dose (mcg/inhalation)	Dosage
Steps 1–2 (AIR-only)	6–11	(No evidence)	-	-	-
	12–17	Budesonide-formoterol DPI	200/6	160/4.5	1 inhalation whenever needed
	≥18				
Step 3 MART	6–11	Budesonide-formoterol DPI	100/6	80/4.5	1 inhalation once daily, PLUS 1 inhalation whenever needed
	12–17	Budesonide-formoterol DPI	200/6	160/4.5	1 inhalation once or twice daily, PLUS 1 inhalation whenever needed
	≥18				
≥18	BDP-formoterol pMDI	100/6	84.6/5.0		
Step 4 MART	6–11	Budesonide-formoterol DPI	100/6	80/4.5	1 inhalation twice daily, PLUS 1 inhalation whenever needed
	12–17	Budesonide-formoterol DPI	200/6	160/4.5	2 inhalations twice daily, PLUS 1 inhalation whenever needed
	≥18				
≥18	BDP-formoterol pMDI	100/6	84.6/5.0		
Step 5 MART	6–11	(No evidence)	-	-	-
	12–17	Budesonide-formoterol DPI	200/6	160/4.5	2 inhalations twice daily, PLUS 1 inhalation whenever needed
	≥18				
≥18	BDP-formoterol pMDI	100/6	84.6/5.0		



DPI: dry powder inhaler; pMDI: pressurized metered dose inhaler. For budesonide-formoterol pMDI with 3 mcg [2.25 mcg] formoterol, use double number of puffs

Budesonide-Formoterol Math Questions?



- Meds are DPI **200/6 and 100/6 in Europe**¹
- **Steps 1-2** are 1 puff prn
- **Step 3**
 - (6-11yo) 1 puff daily
 - (≥12yo) 1-2 puffs daily
- **Step 4**
 - (6-11yo) 1 puffs bid
 - (≥12yo) 2 puffs bid
- **Step 5**
 - (6-11yo) no evidence
 - (≥12yo) 2 puffs bid

1
puff
prn

- GINA says for pMDIs containing 3 mcg formoterol (2.25 delivered dose) take 2 inhalations each time
- In US have budesonide-formoterol---
160/4.5 and 80/4.5
- In US have mometasone-formoterol--
200/5 and 100/5 and 50/5
- **4.5 and 5 are not 6 or 3**
- **US 2020 Focused updates to the Asthma Management Guidelines** The maximum total daily dose of formoterol should not exceed **eight puffs (36 mcg) for ages 4-11 years and 12 puffs (54 mcg) for ages 12 years and older.**

1. [2023 GINA Main Report - Global Initiative for Asthma - GINA \(ginasthma.org\)](https://www.ginasthma.org/)

2. <https://www.nhlbi.nih.gov/resources/2020-focused-updates-asthma-management-guidelines>

So how many rescue puffs?

- In all SMART trials including 2 studies using pMDIs, as-needed dose has been **one inhalation** of ICS-formoterol
- pMDIs in the United States are **approved only** for two inhalations per dose to ensure dosing consistency
- GINA recommended to take one inhalation whenever needed for symptom relief, repeat after a few minutes if needed
- Smart regimens are not FDA approved for any age group in the US
- **GINA said "There is insufficient data** to assess whether other ICS-formoterol combinations (e.g., mometasone-formoterol pMDI) can be used for SMART"
- Currently, **GINA advises against** assuming that results obtained with budesonide-formoterol and beclometasone-formoterol combinations will apply to other ICS-formoterol combinations



Action plan for MART with ICS-formoterol



A Practical Guide to Implementing SMART in Asthma Management

Helen K. Reddel, MB, BS, PhD^{a,*}, Eric D. Bateman, MB, ChB, MD^{b,*}, Michael Schatz, MD, MS^c, Jerry A. Krishnan, MD, PhD^d, and Michelle M. Cloutier, MD^e *Sydney, Australia; Cape Town, South Africa; Chicago, Ill; and Farmington, Conn*

Reddel et al, *JACI in Practice* 2022; 10: S31-s38

This article includes a writable action plan template That can be modified for other combination ICS-formoterol inhalers, and for as-needed-only ICS-formoterol

For additional action plans with ICS-formoterol reliever, see National Asthma Council Australia Action plan library www.nationalasthma.org.au/health-professionals/asthma-action-plans

My Asthma Action Plan

For Single Inhaler Maintenance and Reliever Therapy (SMART) with budesonide/formoterol

Name: _____ Action plan provided by: _____

Date: _____ Doctor: _____

Usual best PEF: _____ L/min (if used) Doctor's phone: _____

Normal mode

My SMART Asthma Treatment is:

- budesonide/formoterol 160/4.5 (12 years or older)
- budesonide/formoterol 80/4.5 (4-11 years)

My Regular Treatment Every Day:

(Write in or circle the number of doses prescribed for this patient)

Take [1, 2] inhalation(s) in the morning and [0, 1, 2] inhalation(s) in the evening, every day

Reliever

Use 1 inhalation of budesonide/formoterol whenever needed for relief of my asthma symptoms

I should always carry my budesonide/formoterol inhaler

My asthma is stable if:

- I can take part in normal physical activity without asthma symptoms

AND

- I do not wake up at night or in the morning because of asthma

Asthma Flare-up

If over a Period of 2-3 Days:

- My asthma symptoms are getting worse OR NOT improving
- OR
- I am using more than 6 budesonide/formoterol reliever inhalations a day (if aged 12 years or older) or more than 4 inhalations a day (if aged 4-11 years)

I should:

- Continue to use my regular everyday treatment PLUS 1 inhalation budesonide/formoterol whenever needed to relieve symptoms
- Start a course of prednisolone
- Contact my doctor

Course of Prednisolone Tablets:

Take _____ mg prednisolone tablets per day for _____ days OR

Asthma Emergency

Signs of an Asthma Emergency:

- Symptoms getting worse quickly
- Extreme difficulty breathing or speaking
- Little or no improvement from my budesonide/formoterol reliever inhalations

If I have any of the above danger signs, I should dial _____ for an ambulance and say I am having a severe asthma attack.

While I am waiting for the ambulance start my asthma first aid plan:

- Sit upright and stay calm.
- Take 1 inhalation of budesonide/formoterol. Wait 1-3 minutes. If there is no improvement, take another inhalation of budesonide/formoterol (up to a maximum of 6 inhalations on a single occasion).
- If only albuterol is available, take 4 puffs as often as needed until help arrives.
- Start a course of prednisolone tablets (as directed) while waiting for the ambulance.
- Even if my symptoms appear to settle quickly, I should see my doctor immediately after a serious attack.

Other Instructions

Modified from Australian action plan with permission from National Asthma Council Australia and AstraZeneca Australia

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SMART/MART Therapy in US

		Step 1-2 (AIR-Only)	Step 3		Step 4		Maximum daily inhalations
Age Group	Budesonide -Formoterol		Maintenance	Reliever	Maintenance	Reliever	
≥ 12 y old	160/4.5	1 puff as needed	One puff twice daily or once daily	One puff as needed	Two inhalations twice daily	One inhalation as needed	12
6-11 y old	80/4.5	No evidence	One inhalation once daily	One puff as needed	One inhalation twice daily	One inhalation as needed	8
≥ 12 y old	mometasone-formoterol 100/5 mg	1 puff as needed	One puff twice daily or once daily	One puff as needed	Two inhalations twice daily	One inhalation as needed	12
6-11 y old	mometasone-formoterol 50/5 mg	No evidence	One inhalation once daily	One puff as needed	One inhalation twice daily	One inhalation as needed	8

(Example of action plan template for budesonide/formoterol. A similar action plan could be constructed for other ICS/formoterol formulations, eg, mometasone/formoterol)

<h2 style="margin: 0;">My Asthma Action Plan</h2> <p style="margin: 0;">For Single Inhaler Maintenance and Reliever Therapy (SMART) with budesonide/formoterol</p>	Name: _____ Action plan provided by: _____	
	Date: _____ Doctor: _____	
	Usual best PEF: _____ L/min <i>(if used)</i> Doctor's phone: _____	
<h3>Normal mode</h3> <p>My SMART Asthma Treatment is:</p> <p><input type="checkbox"/> budesonide/formoterol 160/4.5 (12 years or older)</p> <p><input type="checkbox"/> budesonide/formoterol 80/4.5 (4-11 years)</p> <p>My Regular Treatment Every Day:</p> <p><i>(Write in or circle the number of doses prescribed for this patient)</i></p> <p>Take [1, 2] inhalation(s) in the morning and [0, 1, 2] inhalation(s) in the evening, every day</p> <p>Reliever</p> <p>Use 1 inhalation of budesonide/formoterol whenever needed for relief of my asthma symptoms</p> <p>I should always carry my budesonide/formoterol inhaler</p> <p>My asthma is stable if:</p> <ul style="list-style-type: none"> I can take part in normal physical activity without asthma symptoms <p>AND</p> <ul style="list-style-type: none"> I do not wake up at night or in the morning because of asthma <p>Other Instructions</p> <p>_____</p> <p>_____</p>	<h3>Asthma Flare-up</h3> <p>If over a Period of 2-3 Days:</p> <ul style="list-style-type: none"> My asthma symptoms are getting worse OR NOT improving OR I am using more than 6 budesonide/formoterol reliever inhalations a day (if aged 12 years or older) or more than 4 inhalations a day (if aged 4-11 years) <p>I should:</p> <p><input type="checkbox"/> Continue to use my regular everyday treatment PLUS 1 inhalation budesonide/formoterol whenever needed to relieve symptoms</p> <p><input type="checkbox"/> Start a course of prednisolone</p> <p><input type="checkbox"/> Contact my doctor</p> <p>Course of Prednisolone Tablets:</p> <p>Take _____ mg prednisolone tablets per day for _____ days OR</p> <p>_____</p> <p>_____</p> <p>If I need more than 12 budesonide/formoterol inhalations (total) in any day (or more than 8 inhalations for children 4-11 years), I MUST see my doctor or go to the hospital the same day.</p>	<h3>Asthma Emergency</h3> <p>Signs of an Asthma Emergency:</p> <ul style="list-style-type: none"> Symptoms getting worse quickly Extreme difficulty breathing or speaking Little or no improvement from my budesonide/formoterol reliever inhalations <p>If I have any of the above danger signs, I should dial _____ for an ambulance and say I am having a severe asthma attack.</p> <p>While I am waiting for the ambulance start my asthma first aid plan:</p> <ul style="list-style-type: none"> Sit upright and stay calm. Take 1 inhalation of budesonide/formoterol. Wait 1-3 minutes. If there is no improvement, take another inhalation of budesonide/formoterol (up to a maximum of 6 inhalations on a single occasion). If only albuterol is available, take 4 puffs as often as needed until help arrives. Start a course of prednisolone tablets (as directed) while waiting for the ambulance. Even if my symptoms appear to settle quickly, I should see my doctor immediately after a serious attack.

Other changes



- Pulse oximetry: FDA safety communication
 - Potential overestimation of oxygen saturation in people with dark skin color
- Risk of drug interactions between salmeterol or vilanterol and ritonavir-boosted nirmatrelvir (NMV/r)
 - Risk of cardiovascular adverse effects (*Carr et al, JACI 2023; 151: 809-817*)
 - Drug interaction websites recommend cessation of the LABA for duration of treatment, without warning about risks
 - Options (if available): prescribe alternative antiviral therapy, or switch to ICS or ICS-formoterol for duration of therapy plus 5 days. Remember to teach correct technique if prescribing a new inhaler
 - (ICS effects unlikely given short duration of treatment)
- FeNO-guided treatment: well-conducted multinational study in children found no reduction in exacerbations (*Turner et al, Lancet Respir Med 2022*). Update of Cochrane reviews awaited
- Updated advice about describing asthma severity
 - Consider using the term 'apparently mild asthma' in health professional education: patients with apparently mild asthma can still have severe or fatal asthma exacerbations
- See GINA report for full list of changes

Use track 2 for low income countries

Imaging to evaluate comorbidities/alternate diagnosis

Consider pertussis in all ages

ACQ-5 recommended, not ACQ 6 or 7

Environmental considerations for inhaler choice

COVID 19 advice - stay on medications

FENO - limitations as guiding tool; does not predict exacerbations

Digital interventions

Nasal and sinus disease

Pediatric to Adult transitioning

Fragility fractures

Non-pharmacologic strategies (e.g. physical activity reduces ED visits)

Outdoor Air pollution

Influenza Vaccine Safety

GINA 2023: Other Changes



**Angela
Hogan, MD**

**Angela.hogan
@chkd.org**

Thank you

