PEDIATRIC GUIDELINE AND MEDICATION UPDATES

WHAT CHW'S NEED TO KNOW (AND DON'T NEED TO KNOW)



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MY GOALS FOR TODAY

- Review commonly used medications (and acronyms!) in pediatric asthma management
 - SABAs, LABAs, LAMAs, ICS, ICS-LABA, etc.
- Highlight new guidelines for the use of combination steroid/formoterol inhalers (from GINA and NAEPP/NHLBI)
 - SMART vs AIR
 - Experience from the group?





GINA: Global Initiative for Asthma NAEPP: National Asthma Education and Prevention Program NHLBI: National Heart/Lung/Blood Institute/

LET'S KEEP THIS INTERACTIVE!

- I will stop screen sharing from time to time to encourage discussion
- You may also ask questions at any time via chat or handraise
- I will try to define any acronyms or abbreviations, but please post in the chat if
 I am not clear - I encourage participants to answer each other!



LET'S START WITH A PATIENT!

- You are conducting a virtual home visit with 8 year-old Ephedra and her family
- The family expresses frustration that Ephedra's asthma has "gotten worse" this winter, since she has been sick so much
- She has been coughing most nights, and coughs frequently when playing.
 - When she gets a cold, the cough lasts for weeks
- She has never been admitted, but has been to urgent care twice in the last year and both times she received a steroid syrup.



ADDITIONAL INFORMATION

- Environment:
 - Ephedra spends time at her parents' apartment, in a part-time after-school program and at her grandmother's house
 - Grandma has a small dog, and smokes outside. She has carpets and drapery
 - Her parents' apartment is small and clean, there have been mold issues in the past. No known pests.
- Asthma medications:
 - Albuterol as needed (using it at least once a day)
 - Controller: low dose Flovent (fluticasone 44mcg), twice daily
 - Uses spacer, and all medications are up to date, sometimes mix up 2 inhalers





WHAT ARE YOU CONCERNED ABOUT FOR EPHEDRA?

BACKGROUND: ASTHMA TREATMENT STEPS

GINA	MILD		MODERATE		SEVERE		
	Step I	Step 2	Step	3	Step 4	Step 5	
NAEPP		PERSISTENT					
	INTERMITTENT	Mild	Moderate		Severe		
	Step I	Step 2	Step 3	Step 4	Step 5	Step 6	

ASTHMA MEDICATIONS: RECEPTOR TARGETS



BACKGROUND: RELIEVER MEDICATIONS

- Beta-2-agonists relax the smooth muscle of the lower airways
 - Also cause increase in heart rate, flushing, jitteriness
- Albuterol ("short-acting" beta-agonist = SABA)
 - Onset within minutes, peak @15-30 min, duration ~4 hours
 - Levalbuterol (Xopenex) is basically the same thing...



- Formoterol/salmeterol ("long-acting" beta-agonist = LABA)
 - Duration ~12 hours, formoterol has rapid onset
 - "SMART" (single maintenance and reliever therapy): inhalers contain formoterol + an inhaled corticosteroid (ICS)
 - More on these later...

BACKGROUND: CONTROLLERS

- Anti-inflammatory medications
- ICS = inhaled corticosteroid
 - Safest and most effective initial therapy for step 2 patients
 - Qvar, Flovent, Alvesco, Asmanex, Pulmicort
 - Adjust the DOSE to the patient's age, severity (dose = strength + frequency)
 - ICS-LABA = inhaled corticosteroid/long-acting beta-agonist
 - ICS-formoterol: Dulera and Symbicort -> rapid onset
 - ICS-salmeterol: Advair -> not for immediate relief
- LTRA = leukotriene receptor antagonist
 - Montelukast (Singulair), etc
 - Tablet once daily, not as effective
 - Neuropsychiatric side effects in older kids





OTHER MEDICATIONS TO KNOW

• Other **reliever** medications:

- Atrovent = ipratropium bromide (IB: anti-cholinergic bronchodilator)
 - Generally not recommended for home use in pediatric asthma

• Other controllers:

- LAMA = long-acting muscarinic antagonist
 - Tiotropium (Spiriva) inhaler
 - Only recommended as an add-on for older/more severe cases
- Theophylline = methylxanthine (similar to caffeine)
 - Oral, need to monitor blood levels



ASTHMA MEDICATIONS: RECEPTOR TARGETS



WHAT STEP IS EPHEDRA NOW?



should be employed on an ongoing basis, depending on the individual's clinical situation.

NHLBI

Figure I.c: Stepwise Approach for Management of Asthma in Individuals Ages 5-11 Years



GINA

BOTH guidelines: Not well-controlled at Step 2

STEP 3

AT DO THE GUIDELINES SAY ABOUT EPHEDRA Low dose ICS-



NHLBI

Children 6-11 years



STEP 3

Confirm

dose ICS, OR

very low dose*

ICS-formoterol

GINA

BOTH guidelines: Step up to Step 3

KEY MEDICATION RECOMMENDATIONS FOR CHW'S

NAEPP (2020)

- Kids 0-4:
 - Intermittent ICS for viral wheezing (step 1)
- Kids 5-11:
 - SMART^I (at step 3)
- Adol/adult \geq I 2:
 - SMART^I (at step 3)

GINA (2025)

- Kids 0-4:
 - Intermittent ICS for viral wheezing (step 2)
- Kids 5-11
 - Use ICS with SABA for relief (step I)
 - SMART¹ (option at step 3, preferred at step 4)
- Adol/adult \geq l 2:
 - ICS-form preferred reliever at all steps (AIR²)
 - If SABA for relief, use with ICS
 - SMART^I (at step 3)

 2 AIR = Anti-inflammatory reliever

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 - Intermittent ICS for viral wheezing (step 2)
- Kids 5-11
 - Use ICS with SABA for relief (step I)
 - SMART¹ (option at step 3, preferred at step 4)
- Adol/adult \geq 12:
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WHAT IS SMART?

- Single-inhaler Maintenance and Reliever Therapy
 - Inhaled corticosteroid (ICS) and formoterol (rapid-onset LABA)
- The ONLY inhalers to use for this are those that contain ICSformoterol Dulera, Symbicort or Breyna (NOT Advair, Wixela or Breo)



WHAT IS THE EVIDENCE FOR SMART IN KIDS?

• Studied in:

- Mostly ≥12 (two RCTs Included kids 4-11)
- Patients with mod-severe persistent asthma (step 3)
- Most studies funded by Symbicort
- Comparisons:
 - Superior to same and higher dose ICS-LABA + SABA
 - Superior to higher dose ICS + SABA
- Guideline recommendations (Off-label use only!)
 - NHLBI: preferred at step 3 for kids ≥5
 - GINA: option at step 3 for kids 5-11 preferred for \geq 12



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SMART vs AIR

SINGLE INHALER WITH CORTICOSTEROID (ICS) AND FORMOTEROL* (RAPID-ONSET LABA)

SMART Single-Inhaler Maintenance and Reliever Therapy

Use every day for control







AIR

Anti-Inflammatory Reliever Therapy

Use for relief only



*The LABA SALMETEROL Cannot be used for these regimens

MOVING AWAY FROM SABA ALONE: RATIONALE

- Patients with intermittent asthma symptoms can still have severe or fatal exacerbations (no more "mild" asthma)
- Adherence to daily ICS is poor in patients with infrequent symptoms
- Airway inflammation varies over time, present even in intermittent asthma
- Over-use of SABA is associated with increased risk of severe exacerbations
 - (unclear if reflects danger of SABA, or danger of uncontrolled asthma)
- Presumed minimal risk of addition of ICS to reliever medication, when used correctly
 - CAVEAT children are growing, and these inhalers are not dosed for children

MOVING AWAY FROM SABA ALONE: EVIDENCE FOR AIR

- Evidence: In adults/adolescents with "mild" (step 2) asthma:
 - Reduced exacerbations compared to both PRN SABA alone AND to daily ICS + SABA (O'Byrne, Beasley, Bateman)
 - Lower total steroid dose when compared to daily ICS + SABA
- CAVEATS:
 - Studies did NOT include children (<12), and those including adolescents were limited
 - Participation of patients with step I/intermittent asthma was limited
 - All studies sponsored by Astra-Zeneca (Symbicort)
- What about exercise?
 - Growing evidence that AIR can be used pre-exercise as well

KEY MEDICATION RECOMMENDATIONS FOR CHW'S

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- Kids 0-4:
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- Kids 5-11:
 - SMART¹ (at step 3)

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• **Adol/adult** ≥ **I** 2:

NO SABA ALONE

- GINA (2025)
- Kids 0-4:
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 - Use ICS with SABA for relief (step 1)
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SUMMARY

ICS-FORMOTEROL

- Maintenance and/or quick relief
- SMART or AIR



ICS-SALMETEROL

Maintenance ONLY





ICS-ALBUTEROL

- Quick relief ONLY
- FDA approved > 18



SMART/AIR: REMAINING QUESTIONS



Insurance coverage:

- Off-label for reliever use, coverage varies case by case
- Dulera/Symbicort/Breyna = 120 puffs (1 month supply)

• Max daily dose:

- Kids < 12:8 puffs daily (4 reliever puffs)</p>
- Kids \geq 12: 12 puffs daily (8 reliever puffs)

Lack of data

- Real world acceptability by patients!
- Not well studied in kids <12 (currently underway)</p>
- Urgent/ED response
- Efficacy/safety with truly intermittent asthma unknown

WHAT WOULD <u>YOU</u> DO?

 Start SMART inhaler (Symbicort/Dulera/Breyna) for control and relief (NAEPP 2020)

OR

 Start ICS-LABA inhaler (Symbicort/Dulera/Breyna/Advair, etc) for control, and keep albuterol for relief (GINA 2025)

EXAMPLE ASTHMA ACTION PLAN FOR SMART

- I-2 puffs as needed for quick relief
- Include maximum daily # of puffs
- For red zone, should continue to use until reaches ER/healthcare



ASTHMA ACTION PLAN FOR AIR

- I-2 puffs as needed for quick relief
- Include maximum daily # of puffs
- For red zone, should continue to use until reaches ER/healthcare



San Francisco Conorel Hospitel

WHAT ABOUT EPHEDRA'S LITTLE BROTHER?

- Datura, I5 months, has had 3 episodes of wheezing with colds in the last year.
 - He got albuterol and oral steroids in the clinic the first 2 times
 - Used albuterol for several weeks for cough all 3 times
 - In between colds he has NO symptoms

- Does he have asthma?
- What should we do for him?



DIAGNOSIS OF ASTHMA IN KIDS ≤5 (GINA 2025)



Recurrent acute wheezing

• Or: I episode wheeze + asthma-like sx in between

Timely response to bronchodilator ("reversibility")



No other likely cause

KEY MEDICATION RECOMMENDATIONS FOR CHW'S

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GINA (2025)

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- Kids 5-11
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- Adol/adult \geq 12:
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 - If SABA for relief, use with ICS
 - SMART¹ (at step 3)

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WHAT DOES THIS MEAN FOR OUR PATIENT?

- Datura has **recurrent viral wheezing (**≥2-3 per year)
- Both guidelines recommend short-term daily high-dose ICS at onset of cold symptoms, for 14 days
 - Example: Flovent 110 mcg, 2 puffs twice daily for 14 days
- Caregiver buy-in and education are crucial!



ASTHMA ACTION PLAN FOR VIRAL-INDUCED WHEEZE

- Use of higher dose ICS at onset of cold symptoms, until all symptoms have resolved (10-14 days)
- For red zone, should continue to use reliever until reaches ER/healthcare



Pediatric Advice: (628) 206-8383

HOW COULD YOU HELP THIS FAMILY?

NEW ASTHMA GUIDELINES: CHW ROLE

- Adjusting expectations for family
 - Normalize evolution of understanding/evidence
 - Empower families to reach out if not working!
- Education
 - Using medication in a new way (ONE inhaler for control and rescue!)
 - New medications and devices
 - **Pharmacy** navigation: new formularies, uncertainty about coverage
 - Asthma symptom recognition and response (Action Plan!)
 - Reasons to seek care

ORIGINS

- **Ephedra**: *Ephedra sinica* (ma-huang) herb used in China for more than 5000 years to treat asthma
 - Later found to contain ephedrine (alpha/beta agonist, similar to epinephrine)
- Datura: Datura stramonium (jimsonweed, thornapple plant)
 - Inhaled by smoking a "cigarette" made of the leaves, later found to have anticholinergic/antimuscarinic properties (similar to ipratopium, tiotropium)





Von Mutius E, NEJM, 2012 Chu EK, Am J Resp and Crit Care Med, 2006

QUESTIONS/COMMENTS/IDEAS



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Figure I.b: Stepwise Approach for Management of Asthma in Individuals Ages 0-4 Years

			2 2			
Treatment	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
Preferred	PRN SABA and At the start of RTI: Add short course daily ICS 4	Daily low-dose ICS and PRN SABA	Daily medium- dose ICS and PRN SABA	Daily medium- dose ICS-LABA and PRN SABA	Daily high-dose ICS-LABA and PRN SABA	Daily high-dose ICS-LABA + oral systemic corticosteroid and PRN SABA
Alternative		Daily montelukast* or Cromolyn,* and PRN SABA		Daily medium- dose ICS + montelukast* and PRN SABA	Daily high- dose ICS + montelukast* and PRN SABA	Daily high-dose ICS + montelukast*+ oral systemic corticosteroid and PRN SABA
			For children age 4 and Step 4 on Man Asthma in Individu diagram.	years only, see Step 3 agement of Persistent als Ages 5-11 Years		
			Assess Contro	al		

Step down if possible (if asthma is well controlled for at least 3 consecutive months)

Consult with asthma specialist if Step 3 or higher is required. Consider consultation at Step 2.

Control assessment is a key element of asthma care. This involves both impairment and risk. Use of objective measures, self-reported control, and health care utilization are complementary and should be employed on an ongoing basis, depending on the individual's clinical situation.

Abbreviations: ICS, inhaled corticosteroid; LABA, long-acting beta₂-agonist; SABA, inhaled short-acting beta₂-agonist; RTI, respiratory tract infection; PRN, as needed

- ▲ Updated based on the 2020 guidelines.
- Cromolyn and montelukast were not considered for this update and/or have limited availability for use in the United States. The FDA issued a Boxed Warning for montelukast in March 2020.

NAEPP 2020

Figure I.c: Stepwise Approach for Management of Asthma in Individuals Ages 5-11 Years

	Intermittent Asthma	Manag	ement of Persist	ent Asthma in Ind	lividuals Ages 5-	11 Years
Treatment	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
Preferred	PRN SABA	Daily low-dose ICS and PRN SABA	Daily and PRN combination low-dose ICS-formoterol A	Daily and PRN combination medium-dose ICS-formoterol A	Daily high-dose ICS-LABA and PRN SABA	Daily high-dose ICS-LABA + oral systemic corticosteroid and PRN SABA
Alternative		Daily LTRA,* or Cromolyn,* or Nedocromil,* or Theophylline,* and PRN SABA	Daily medium- dose ICS and PRN SABA or Daily Iow-dose ICS-LABA, or daily Iow-dose ICS + LTRA,* or daily Iow-dose ICS +Theophylline,* and PRN SABA	Daily medium- dose ICS-LABA and PRN SABA or Daily medium- dose ICS + LTRA* or daily medium- dose ICS + Theophylline,* and PRN SABA	Daily high-dose ICS + LTRA* or daily high-dose ICS + Theophylline,* and PRN SABA	Daily high-dose ICS + LTRA* + oral systemic corticosteroid or daily high-dose ICS + Theophylline* + oral systemic corticosteroid, an PRN SABA
		Steps 2-4: Conditional immunotherapy as an in individuals ≥ 5 years initiation, build up, and	Consider On	nalizumab** 🔺		
			Assess	Control		
	First ch Step up Step do Consult wi Control as: of objectiv should be	eck adherence, inha if needed; reassess own if possible (if as th asthma specialist sessment is a key el re measures, self-rep employed on an on	eler technique, envi s in 2-6 weeks othma is well contro t if Step 4 or higher ement of asthma c ported control, and going basis, depen	ronmental factors, olled for at least 3 c r is required. Consid are. This involves be health care utilizat ding on the individu	and comorbid cor onsecutive months; ler consultation at s oth impairment and ion are complemen ual's clinical situatio	hditions. Step 3. I risk. Use tary and m.
Abbreviation	should be	osteroid; LABA, long-a	going basis, depen acting beta ₂ -agonist;	LTRA, leukotriene rec	eptor antagonist;	n.

* Cromolyn, Nedocromil, LTRAs including montelukast, and Theophylline were not considered in this update and/or have limited availability for use in the United States, and/or have an increased risk of adverse consequences and need for monitoring that make their use less desirable. The FDA issued a Boxed Warning for montelukast in March 2020.

** Omalizumab is the only asthma biologic currently FDA-approved for this age range.

NAEPP 2020

Figure I.d: Stepwise Approach for Management of Asthma in Individuals Ages 12 Years and Older

Intermittent Asthma	Manag	ement of Persist	ent Asthma in Inc	lividuals Ages 12	+ Years
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
PRN SABA	Daily low-dose ICS and PRN SABA or PRN concomitant ICS and SABA*	Daily and PRN combination low-dose ICS- formoterol A	Daily and PRN combination medium-dose ICS-formoterol A	Daily medium-high dose ICS-LABA + LAMA and PRN SABA •	Daily high-dose ICS-LABA + oral systemic corticosteroids + PRN SABA
	Daily LTRA* and PRN SABA or Cromolyn,* or Nedocromil,* or Zileuton,* or Theophylline,* and PRN SABA	Daily medium- dose ICS and PRN SABA or Daily low-dose ICS-LABA, or daily low-dose ICS + LAMA, * or daily low-dose ICS + LTRA,* and PRN SABA or Daily low-dose ICS + Theophylline* or Zileuton,* and PRN SABA	Daily medium- dose ICS-LABA or daily medium-dose ICS + LAMA, and PRN SABA * or Daily medium- dose ICS + LTRA,* or daily medium- dose ICS + Theophylline,* or daily medium-dose ICS + Zileuton,* and PRN SABA	Daily medium-high dose ICS-LABA or daily high-dose ICS + LTRA,* and PRN SABA	
	Steps 2-4: Conditional immunotherapy as an a in individuals a 5 years initiation, build up, and	ly recommend the use o adjunct treatment to star of age whose asthma is i maintenance phases of	f subcutaneous ndard pharmacotherapy controlled at the immunotherapy A	Consider adding (e.g., anti-IgE, ar anti-IL4	Asthma Biologics nti-ILS, anti-ILSR, 4/IL13)**
First ch Step up Step do Consult wi Control as: of objectiv	eck adherence, inha if needed; reassess wm if possible (if as th asthma specialist sessment is a key el e measures, self-rep emploved on an on	Assess ler technique, envi in 2-6 weeks ithma is well contro t if Step 4 or higher ement of asthma co ported control, and poing basis, dependent	Control ronmental factors, A illed for at least 3 cr is required. Consid are. This involves be health care utilizati ding on the individu	and comorbid cor onsecutive months er consultation at 5 oth impairment and on are complemen ral's clinical situatio	nditions.) Step 3. f risk. Use tary and m.
	STEP 1 PRN SABA PRN SABA PRN SABA First ch Step up Step do Consult wi Control as: of objectiv	Intermittent Asthma Manage STEP 1 STEP 2 PRN SABA Daily low-dose ICS and PRN SABA or PRN concomitant ICS and SABAA Daily LTRA* and PRN SABA or Cromolyn,* or Nedocromil,* or Zileuton,* or Nedocromil,* or Zileuton,* or Nedocromil,* or Zileuton,* or Nedocromil,* or Steps 2-4: Conditional immunotherapy as an in individuals a 5 years in individuals a 5 years in individuals a 5 years Step down if possible (if an Consult with asthma specialist Control assessment is a key el of objective measures, self-rep	Intermittent Asthma STEP 1 STEP 2 STEP 3 PRN SABA Daily low-dose ICS and PRN SABA or Daily and PRN combination low-dose ICS- formoterol A Daily and PRN combination low-dose ICS- formoterol A Daily LTRA' and PRN SABA or Daily LTRA' and PRN SABA or Daily medium- dose ICS and PRN SABA or Daily wedium- dose ICS and PRN SABA or Daily bow-dose ICS- formoterol A Daily LTRA' and PRN SABA or Daily bow-dose ICS LICS-LABA, or daily low-dose ICS + LTRA,' and PRN SABA Or Daily low-dose ICS + Zileuton,' or Theophylline,' and PRN SABA Or Daily low-dose ICS-LABA, or daily low-dose ICS + LTRA,' and PRN SABA Or Steps 2-4: Conditionally recommend the use of immunotherapy as an adjunct treatment to station in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of age whose asthma is in individuals a 5 years of	Intermittent Asthma Management of Persistent Asthma in Inc. STEP 1 STEP 2 STEP 3 STEP 4 PRN SABA Daily low-dose ICS and PRN SABA or ICS and SABA Daily and PRN combination or Daily LTRA' and PRN SABA or Cromolyn,* or Nedocromit,* or Zileuton,* or PRO SABA Daily medium- dose ICS and SABA Daily medium- dose ICS- and PRN SABA Daily medium- dose ICS and PRN SABA or Cromolyn,* or Nedocromit,* or Zileuton,* or Deby Willine,* and PRN SABA Daily low-dose ICS-LABA, or daily low-dose ICS + LTRA,* and PRN SABA Daily medium- dose ICS + LTRA,* or Daily low-dose ICS + LTRA,* and PRN SABA Daily medium- dose ICS + LTRA,* and PRN SABA Daily medium- dose ICS + LTRA,* and PRN SABA Steps 2-4: Conditionally recomment the use of subcutaneous mindviduals s 5 years of age whose attima is controlled at the initiation, build up, and maintenace phases of immunotherapy in individuals a 5 years of age whose astima is controlled at the initiation, build up, and maintenace phases of immunotherapy • First check adherence, inhaler technique, environmental factors, 4 • Step up if needed; reassess in 2-6 weeks • Step down if possible (if asthma is well controlled for at least 3 cc Consult with asthma specialist if Step 4 or higher is required. Conside Control assessment is a key element of asthma care. This involves bo of objective measures, self-reported control, and health care utilization	Intermittent Asthma Management of Persistent Asthma in Individuals Ages 12 STEP 1 STEP 2 STEP 3 STEP 4 STEP 5 PRN SABA Daily low-dose ICS and PRN SABA or PRN concomitant ICS formoterol A Daily and PRN combination iow-dose ICS-iomoterol A Daily medium-dose ICS-formoterol A Daily medium-dose ICS-LABA + LAMA and PRN SABA or Daily UTRA* and PRN SABA Daily medium- dose ICS and SABAA Daily medium- dose ICS - LABA, or daily medium-dose ICS + LAMA, and PRN SABA Daily wedium- dose ICS - LABA, or daily medium-dose ICS + LAMA, and PRN SABA Daily wedium- dose ICS + LAMA, and PRN SABA Daily wedium- dose ICS + LAMA, and PRN SABA Daily wedium- dose ICS + LTRA,* and PRN SABA Daily wedium- dose ICS + LTRA,* or Daily low-dose ICS + LTRA,* and PRN SABA Daily wedium- dose ICS + LTRA,* or daily medium- dose ICS + ZIRUA,* or da

 Cromolyn, Nedocromil, LTRAs including Zileuton and montelukast, and Theophylline were not considered for this update, and/or have limited availability for use in the United States, and/or have an increased risk of adverse consequences and need for monitoring that make their use less desirable. The FDA issued a Boxed Warning for montelukast in March 2020.

- ** The AHRQ systematic reviews that informed this report did not include studies that examined the role of asthma biologics (e.g. anti-IgE, anti-IL5, anti-IL5R, anti-IL4/IL13). Thus, this report does not contain specific recommendations for the use of biologics in asthma in Steps 5 and 6.
- Data on the use of LAMA therapy in individuals with severe persistent asthma (Step 6) were not included in the AHRQ systematic review and thus no recommendation is made.

NAEPP 2020

GINA 2025 Children 5 years and younger

Personalized asthma management: Sym Assess, Adjust, Review response Side Com Lung Child		ASSESSING ASSESSING ASSESSING ADJUST	ASSESS Symptom control & modifiable risk factors Comorbidities Inhaler technique & adherence Child and parent/caregiver preferences and goals Treatment of modifiable risk factors and comorbidities Non-pharmacological strategies Asthma medications Education & skills training				
Asthma medication Adjust treatment up and individual child's needs	options: I down for	STEP 2	STEP 3	STEP 4 Continue controller & refer			
PREFERRED CONTROLLER CHOICE	STEP 1 (Insufficient evidence for daily controller)	Daily low dose inhaled corticosteroid (ICS) (see Box 11-3 for ICS dose ranges for pre-school children)	See Box 11-3)	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	Consider specialist referral				
RELIEVER	As-needed short-acting beta ₂ -agonist						
CONSIDER THIS STEP FOR CHILDREN WITH:	Infrequent acute (e.g viral-induced) wheezing episodes and no or minimal interval asthma symptoms	Asthma symptoms not well-controlled (Box 11-1), or one or more severe exacerbations in the past year	Asthma not well controlled on low dose ICS Before stepping up, check t and inhaler skills, review ad	Asthma not well controlled on double ICS for alternative diagnosis dherence and exposures			

ICS: inhaled corticosteroid; LTRA: leukotriene receptor antagonist. For ICS doses in children, see Box 11-3 (p.195) †If prescribing LTRA, advise parent/caregi risk of neuropsychiatric adverse effects.

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Box 4-12. Personalized management for children 6–11 years to control symptoms and minimize future risk

GINA 2025 Children 6–11 years Personalized asthma management: Assess, Adjust, Review Side-effec Comorbidi Lung funct Child and		s tions cts fities ction parent/caregiver satisfaction	Confirmation of diagnosis if necessary Symptom control & modifiable risk factors Comorbidities Inhaler technique & adherence Child and parent/caregiver preferences and goals Treatment of modifiable risk factors and comorbidities Non-pharmacological strategies Asthma medications including ICS Education & skills training, action plan			
Asthma medication Adjust treatment up and individual child's needs PREFERRED CONTROLLER to prevent exacerbations and control symptoms	a options: I down for STEP 1 Low dose ICS taken whenever SABA taken*	STEP 2 Daily low dose inhaled corticosteroid (ICS) (see table of ICS dose ranges for children)	STEP 3 Low-dose ICS-LABA, OR medium-dose ICS, OR very low- dose ICS-formoterol maintenance and reliever (MART)*	STEP 4 Medium-dose ICS-LABA, OR low-dose ICS- formoterol MART* OR refer for expert advice	STEP 5 Refer for phenotypic assessment ± higher dose ICS-LABA or add-on therapy, e.g. LAMA, anti-IgE, anti- IL4Ra, anti-IL5	
Other controller options (limited indications, or less evidence for efficacy or safety)	ā	Daily leukotriene receptor antagonist (LTRA†), or low dose ICS taken whenever SABA taken*	Low dose ICS + LTRA†	Add tiotropium or add LTRA†	Only as last resort, consider add-on low dose OCS, but consider side-effects	
RELIEVER	c ^o	As-needed SABA (or ICS-form	noterol reliever* in MAR	T in Steps 3 and 4)		

See list of abbreviations (p.11). *Anti-inflammatory reliever therapy (AIR); see Box 4-8. †If prescribing leukotriene receptor antagonists, note concerns about potential neuropsychiatric adverse effects.³⁰⁹ For initial asthma treatment in children aged 6–11 years, see Box 4-10 (p.94) and 4-11 (p.95). See Box 4-2 (p.71) for low, medium and high ICS doses in children. See Box 4-8 (p.84) for MART doses for children 6–11 years.



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