PEDIATRIC ASTHMA

PEARLS FOR MANAGEMENT IN PRIMARY CARE

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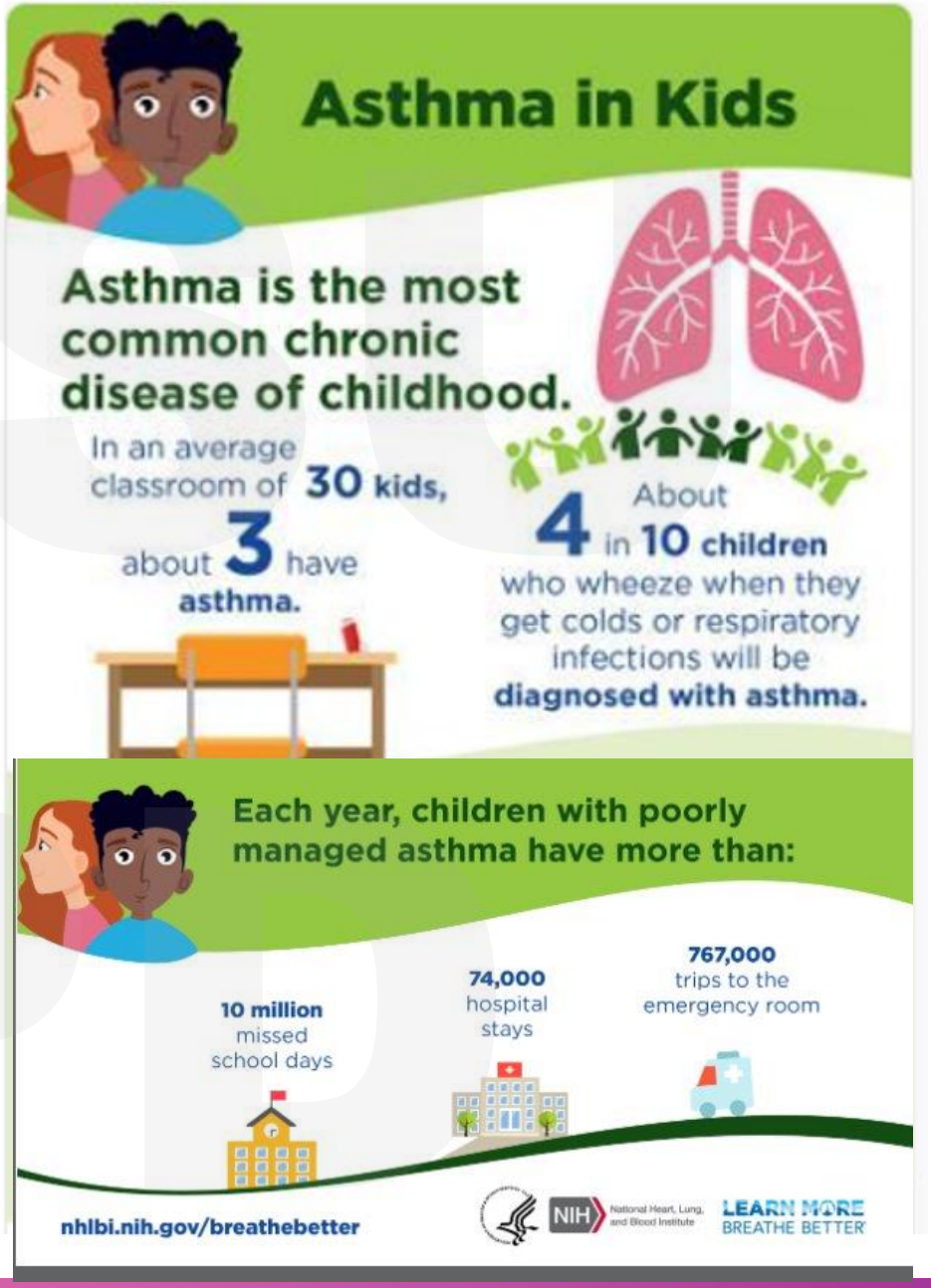
OBJECTIVES

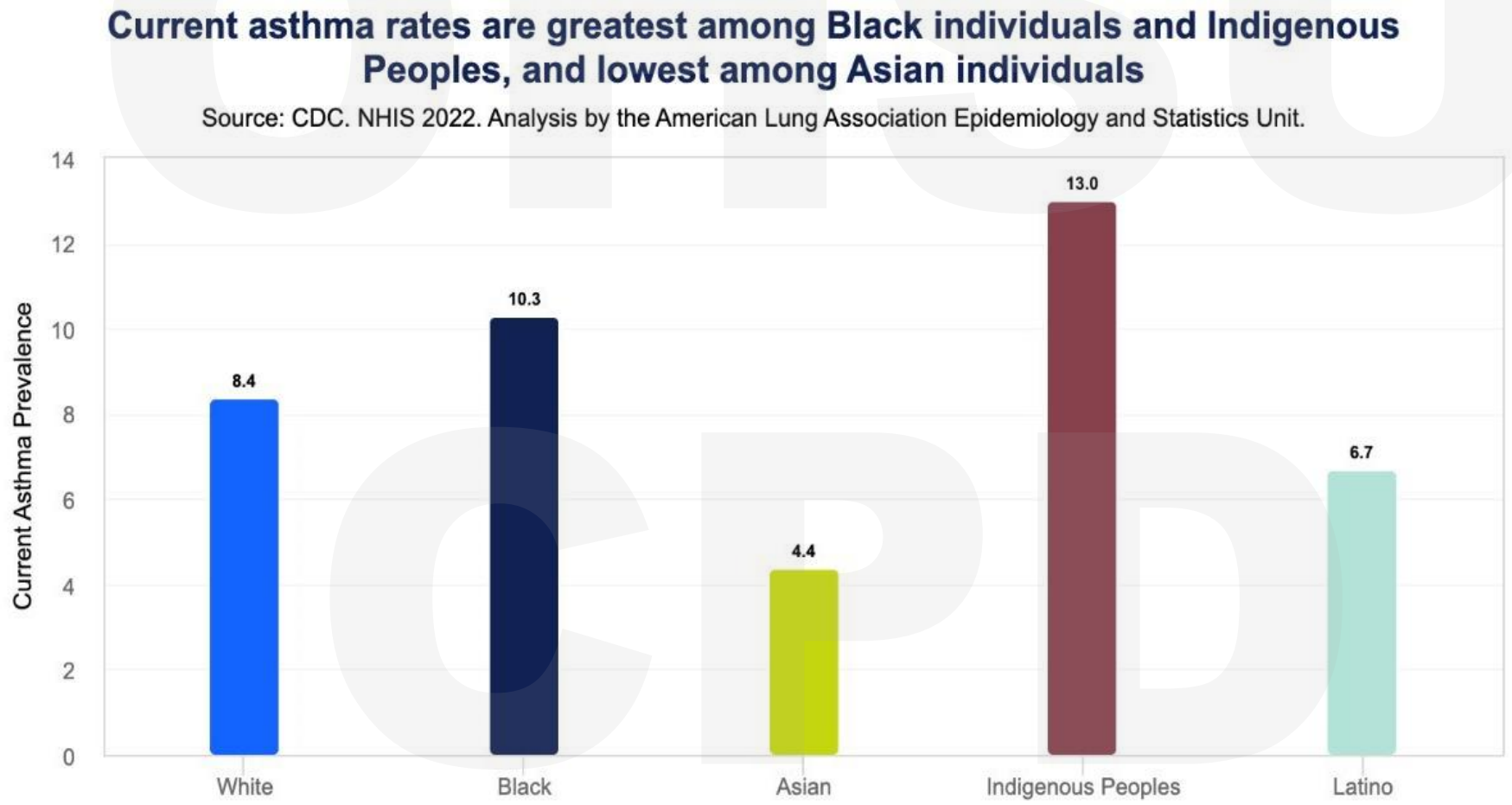
- **Quick review of pediatric asthma prevalence and pathophysiology**
- Recognize asthma symptoms in young children and initiate appropriate therapy
- Apply guideline-based stepwise therapy to children of all ages
- Identify when to refer to a specialist

ASTHMA PREVALENCE

- Leading chronic disease of childhood
- 10% of children in the US have asthma (6.9% in OR)
- 60% experience an asthma exacerbations annually
  - >700,000 ER visits
  - >70,000 hospitalizations



ASTHMA DISPARITIES



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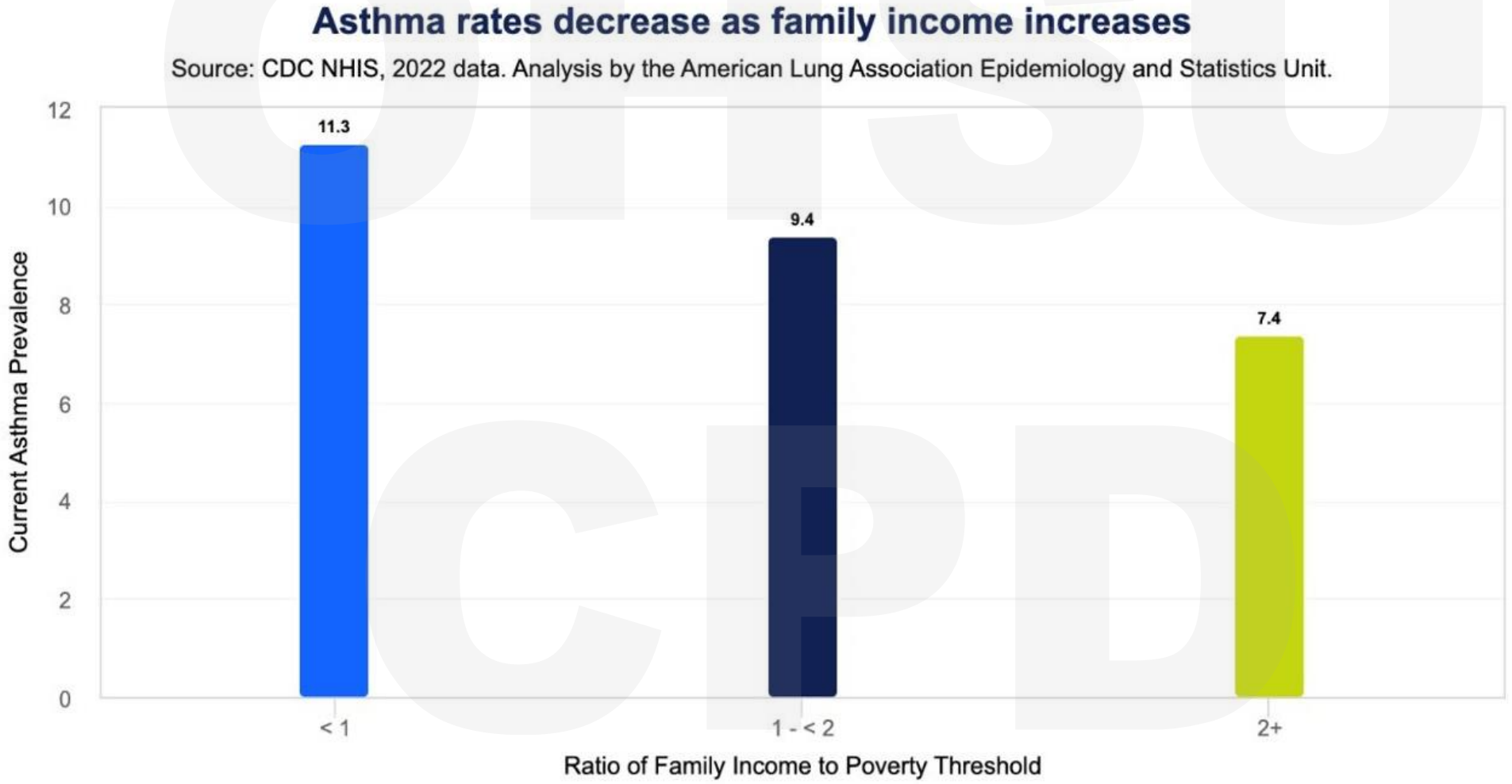
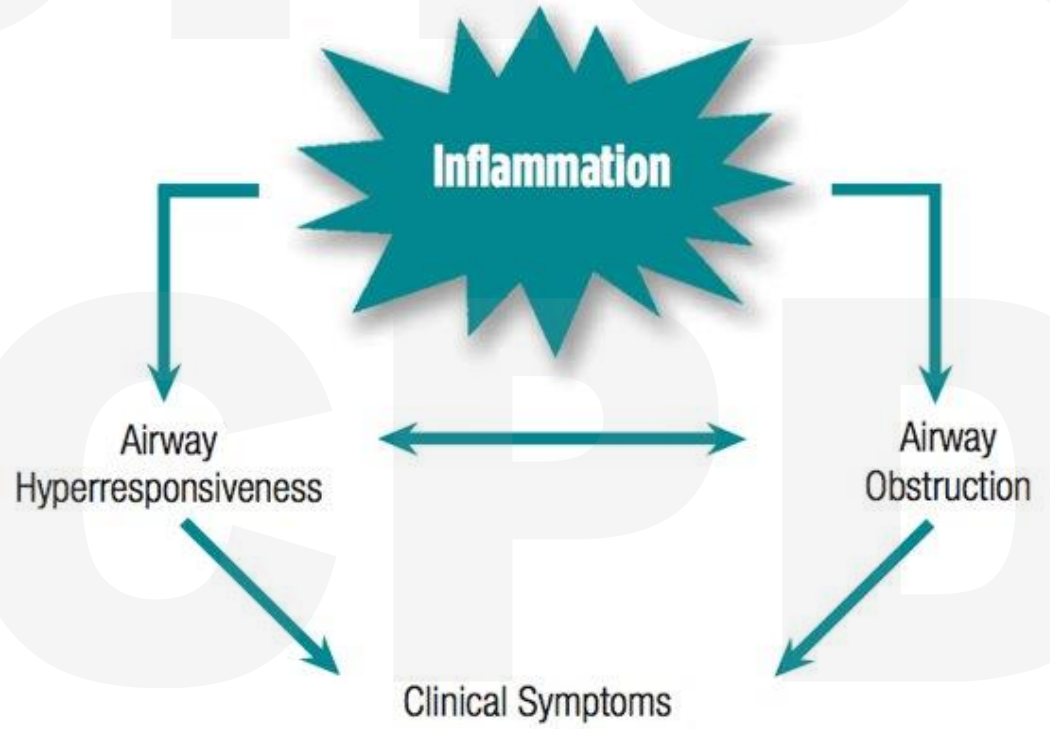


QUICK ASTHMA REVIEW

- Asthma is a chronic lung disease characterized by hyperresponsiveness of the airways to various stimuli resulting in airway obstruction that is reversible either spontaneously or with treatment.



QUICK ASTHMA REVIEW

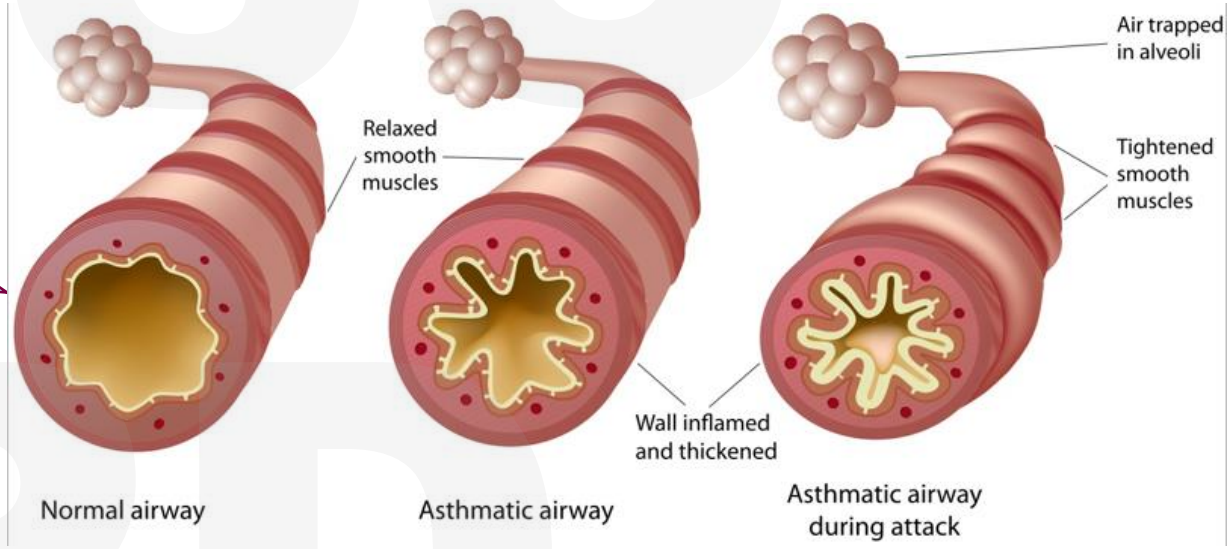
Airway obstruction results from:

- Bronchoconstriction
- Inflammation
- Excess mucus

*** SQUEEZE ***
*** SWELL ***
*** SNOT ***

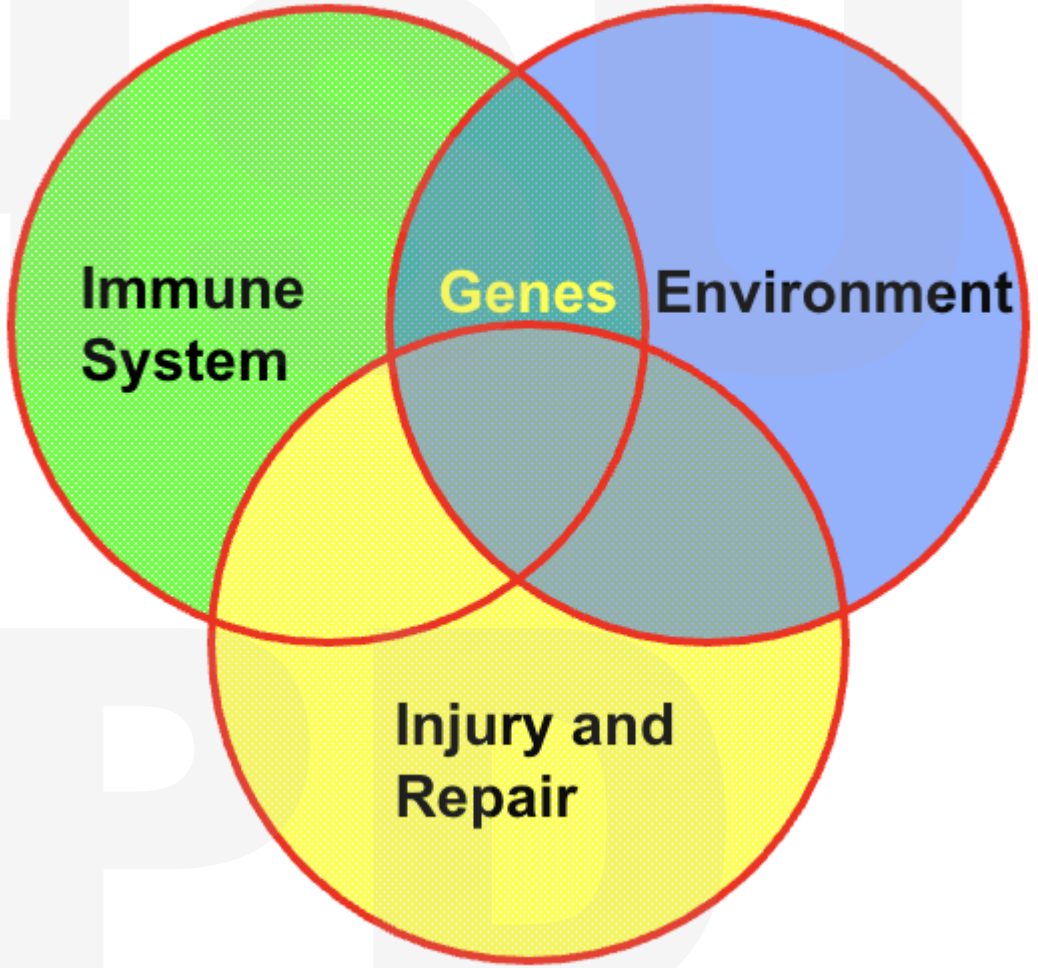
Clinical Symptoms

- Wheezing
- Shortness of breath
- Chest tightness
- Dry cough



ASTHMA TRIGGERS

WHAT CAUSES ASTHMA?



OBJECTIVES

- Quick review of pediatric asthma prevalence and pathophysiology
- **Recognize asthma symptoms in young children and initiate appropriate therapy**
- Apply guideline-based stepwise therapy to children of all ages
- Identify when to refer to a specialist

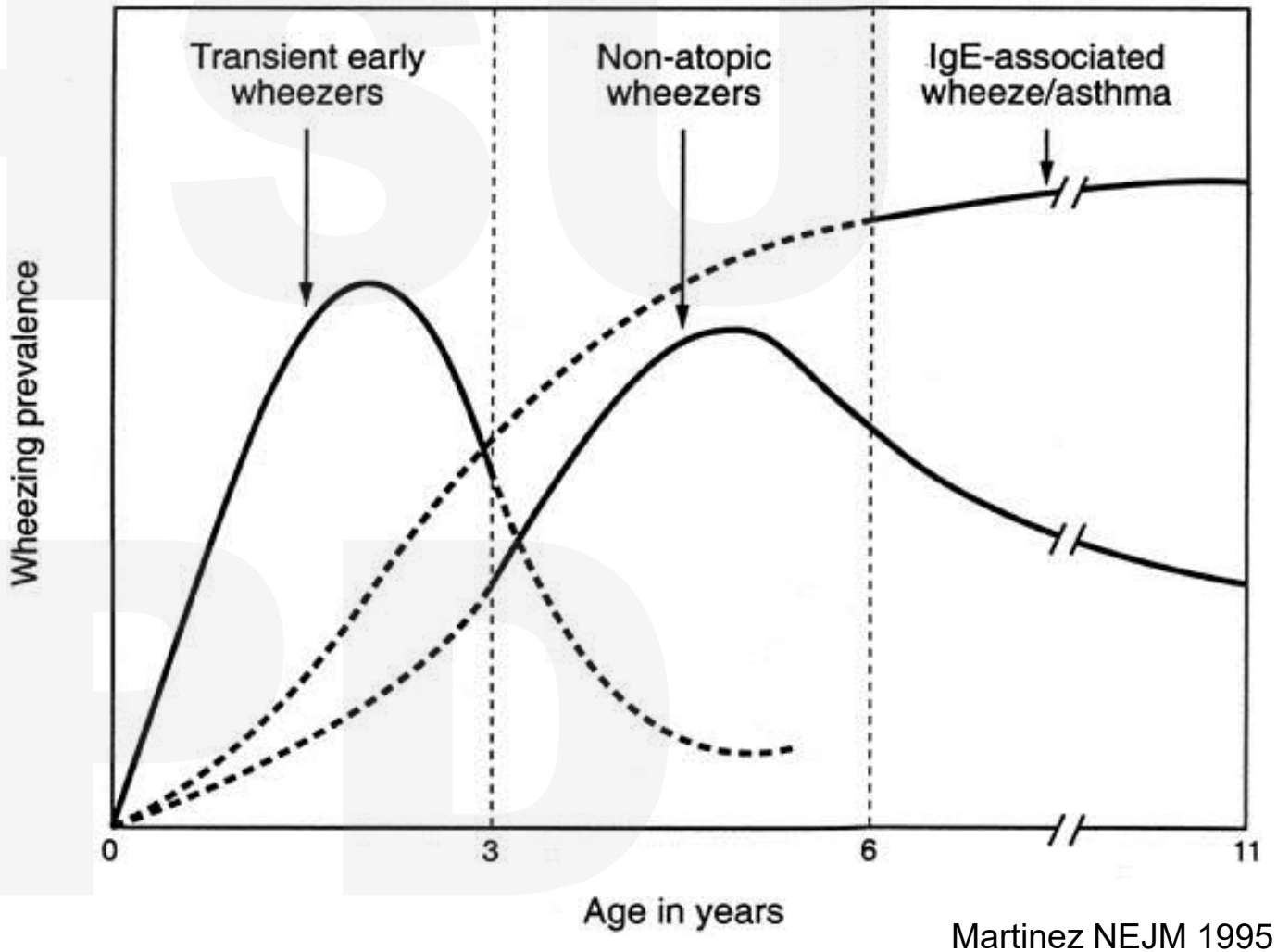
CASE 1

- Wells is a 2yo male with wheezing.
  - Attends daycare and gets frequent URIs with wheezy breathing, + provider-heard wheezing
  - ER visit for RSV at age 9 months, good response to albuterol neb documented
  - Also wheezes with laughing and excitement, and gets winded with playing with siblings
  - normal birth hx, infantile eczema, dad has asthma
- **Does he have asthma?!**
  a) **YES**
  b) **NO**
  c) **Likely**
  d) **Too young to diagnose**

Does he have asthma?!

EARLY WHEEZING

- Wheezing is common under age 3 years
- ~59% of preschool children who wheeze have NO asthma symptoms > age 6

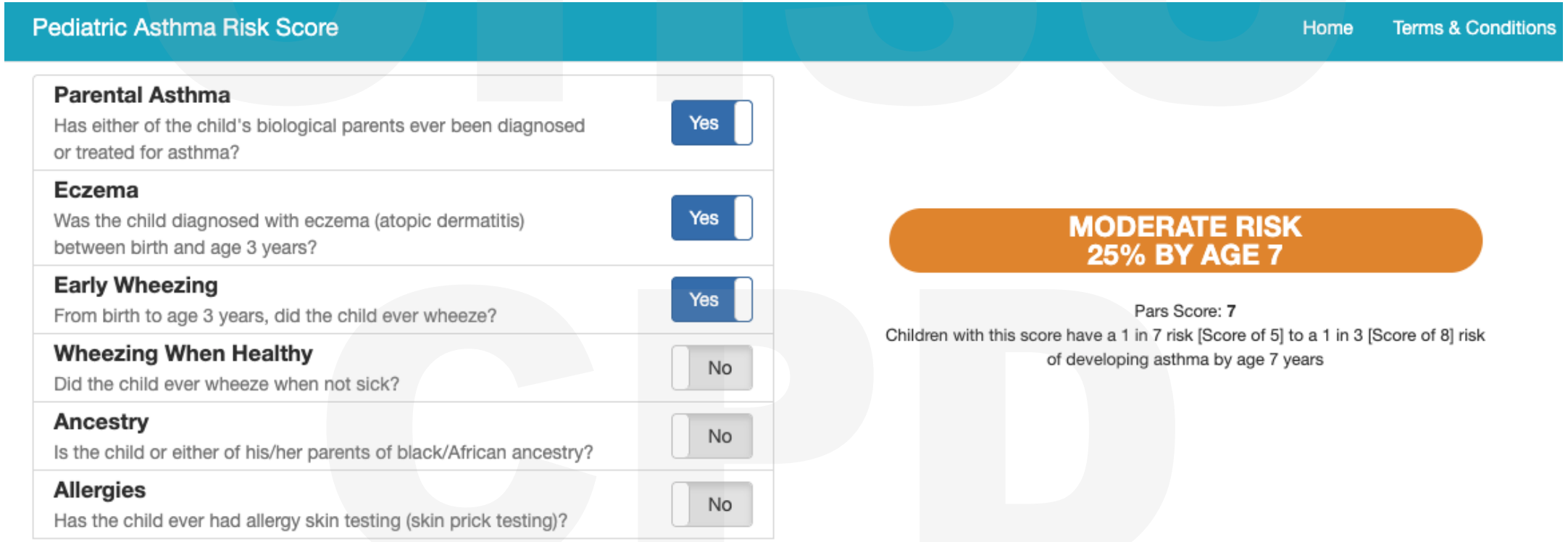


Martinez NEJM 1995

ASTHMA RISK FACTORS

- Family history
- Atopy
- Infections in early infancy: rhinovirus, RSV
- Cigarette smoke exposure
- Prematurity
- Obesity
- Microbial exposure: hygiene hypothesis

PEDIATRIC ASTHMA RISK SCORE



https://pars.research.cchmc.org/

ASTHMA IS A CLINICAL DIAGNOSIS

Symptoms

- Wheeze
- Shortness of breath
- Chest tightness
- Cough

Pattern

- Variable in timing and intensity
- Worse at night
- Triggered by exercise, allergens, cold air, ect
- Worse with viral infections

DIAGNOSIS IS CONFIRMED BY RESPONSE TO ASTHMA THERAPY

- SABA (albuterol)
  - Observe response on exam or spirometry
- Inhaled corticosteroids, ICS-LABA
  - Symptomatic improvement with a 4-6+ week trial
- Systemic corticosteroids
  - Symptomatic improvement with prednisone or dexamethasone

Symptoms don't respond to asthma therapy?

a) Insufficient dose used or

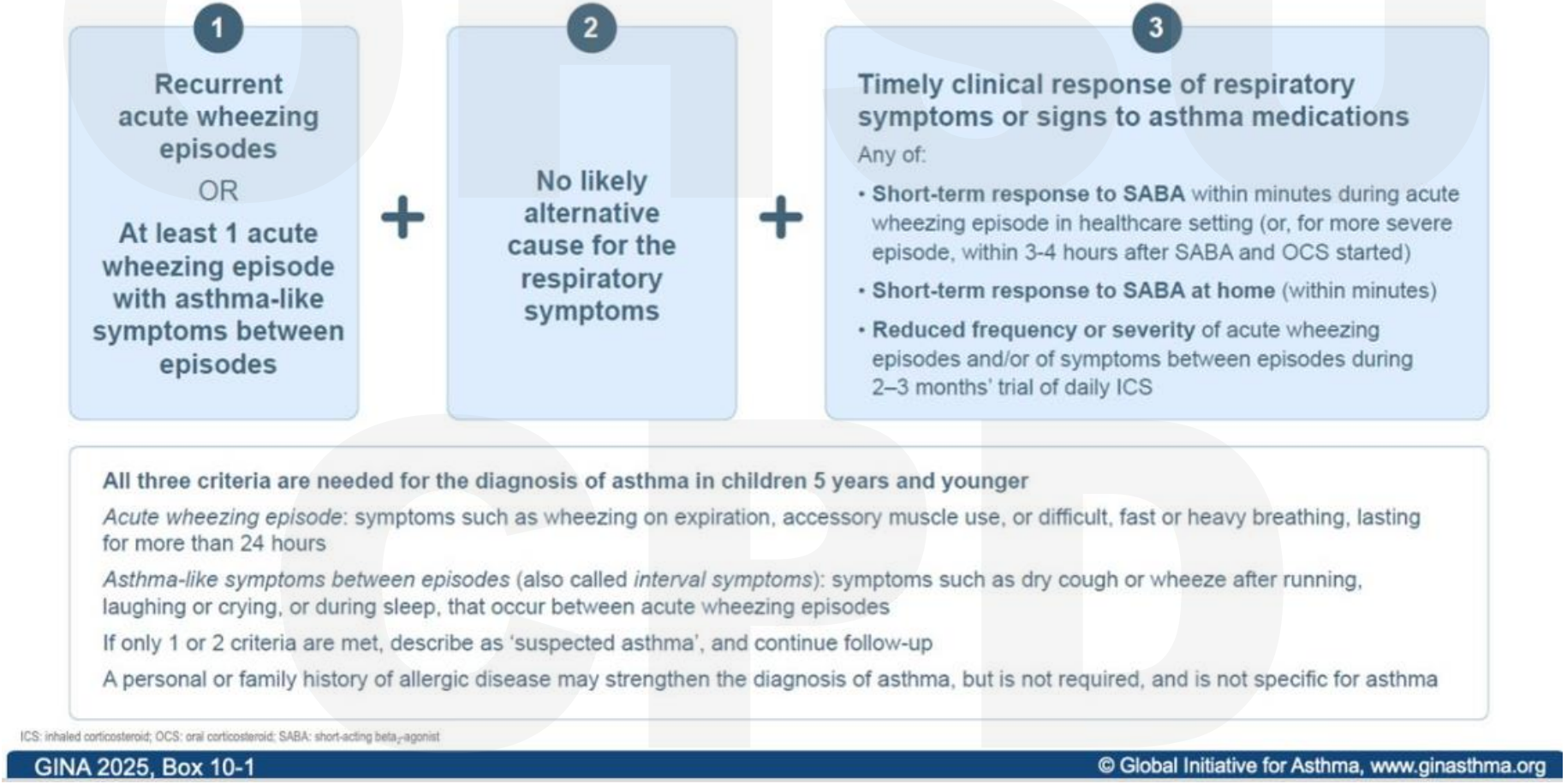
b) Not asthma!

NOT ASTHMA: ALTERNATIVE DIAGNOSES

Red Flag	Possible Diagnosis
Sudden onset of symptoms	Foreign body
Coughing and choking when eating or drinking	Oropharyngeal dysphagia with aspiration
Poor growth and low body mass index	Cystic fibrosis, immune deficiency
Cough with laying down, spitting up/vomiting	GERD
Cough with laying down, allergic salute, nasal discharge	Sinusitis, post-nasal drip
Family history of sterile males	Cystic fibrosis, immotile cilia syndrome
Chronic rhinorrhea and recurrent sinus infections	Cystic Fibrosis, immotile cilia syndrome
Acute onset in teenager, inspiratory WOB, stridor	Vocal cord dysfunction
Chronic wet productive cough	Bronchiectasis
More than two episodes of pneumonia	Immune deficiency

DIAGNOSING ASTHMA ≤5 YEARS

NEW in GINA 2025:



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  - Also wheezes with laughing and excitement, and gets winded with playing with siblings
  - normal birth hx, infantile eczema, dad has asthma
- **Does he have asthma?!**
  - **a) YES**
  - **b) NO**
  - **c) Likely**
  - **d) Too young to diagnose**
- **How do you treat?**
  - **a) Albuterol as needed**
  - **b) Albuterol + inhaled steroid as needed**
  - **c) Daily inhaled steroid + albuterol as needed**

How do you treat?

Albuterol as needed 0%

Albuterol + inhaled steroid as needed 0%

Daily inhaled steroid + albuterol as needed 0%

INITIATING ASTHMA THERAPY ≤5 YEARS

Indications for a treatment trial to confirm the diagnosis of asthma in a child aged 5 years or younger

- **Consider a trial of as-needed SABA** for 2–3 months if the child has:
  - Infrequent or no mild wheezing episodes, not requiring unscheduled medical care, with or without…
  - Mild intermittent asthma-like symptoms between episodes (e.g., twice a week or less)

- **Consider a trial of daily ICS plus as-needed SABA** for 2–3 months if the child has:
  - One or more acute wheezing episodes requiring acute care, OCS, or hospital admission in the past year, and/or
  - Asthma-like symptoms more than twice/week

GINA 2025

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  - **d) Too young to diagnose**
- **How do you treat?**
  - **a) Albuterol as needed**
  - **b) Albuterol + inhaled steroid as needed**
  - **c) Daily inhaled steroid + albuterol as needed**

CAN KIDS "GROW OUT OF ASTHMA"?

- **No.** Asthma is a lifelong condition. However...
- Asthma can be difficult to diagnose in young kids.
  - ~59% of preschool children who wheeze have NO asthma symptoms by age 6
  - Risk factors for asthma: atopic history, parents with asthma, wheezing outside of colds
- Asthma can be **well controlled**
- Some kids experience clinical remission of asthma (not a permanent cure)
  - ≥12 months with no asthma symptoms or exacerbations, stable lung function

ASSESS ASTHMA CONTROL

Symptomatic Control — Rule of 2s

Lung Function — Spirometry

Rule of 2s:

Asthma is <u>well controlled</u> when:

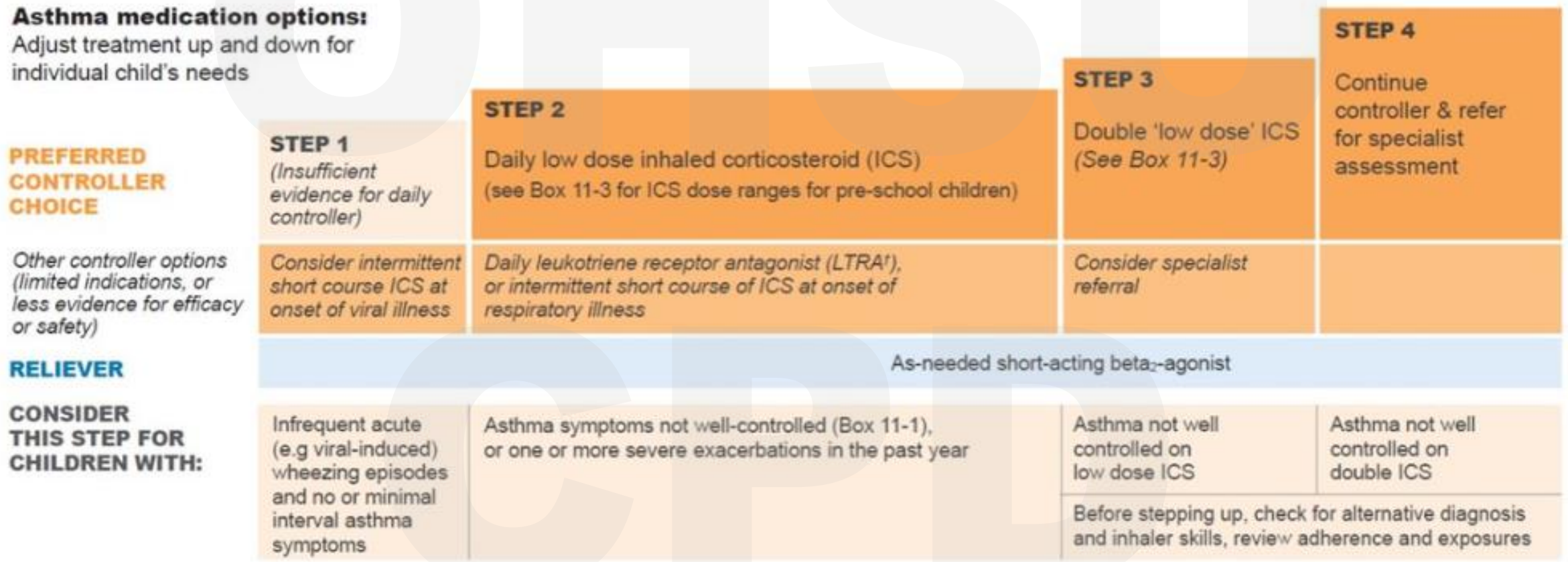
- **≤ 2 times / week**: daytime symptoms or rescue inhaler use
- **≤ 2 times / month**: nighttime cough
- **≤ 2 times / year**: exacerbations requiring oral steroids

Assess control over 3 months, <u>step up vs step down therapy</u> as appropriate.

OBJECTIVES

- Quick review of pediatric asthma prevalence and pathophysiology
- Recognize asthma symptoms in young children and initiate appropriate therapy
- **Apply guideline-based stepwise therapy to children of all ages**
- Utilize asthma action plans
- Identify when to refer to a specialist

CHILDREN 0-5 YEARS



GUIDANCE FOR AGES 0-5

Step 1: short courses ICS + albuterol

- START on day 1 of cough or cold symptoms, STOP when symptoms resolve
  - ICS: fluticasone 44mcg 2 puffs morning, 2 puffs evening
  - Albuterol: 2 puffs before fluticasone morning and evening. Increase to 4 puffs every 4 hours for worsening cough/wheeze/shortness of breath

Step 2: daily ICS

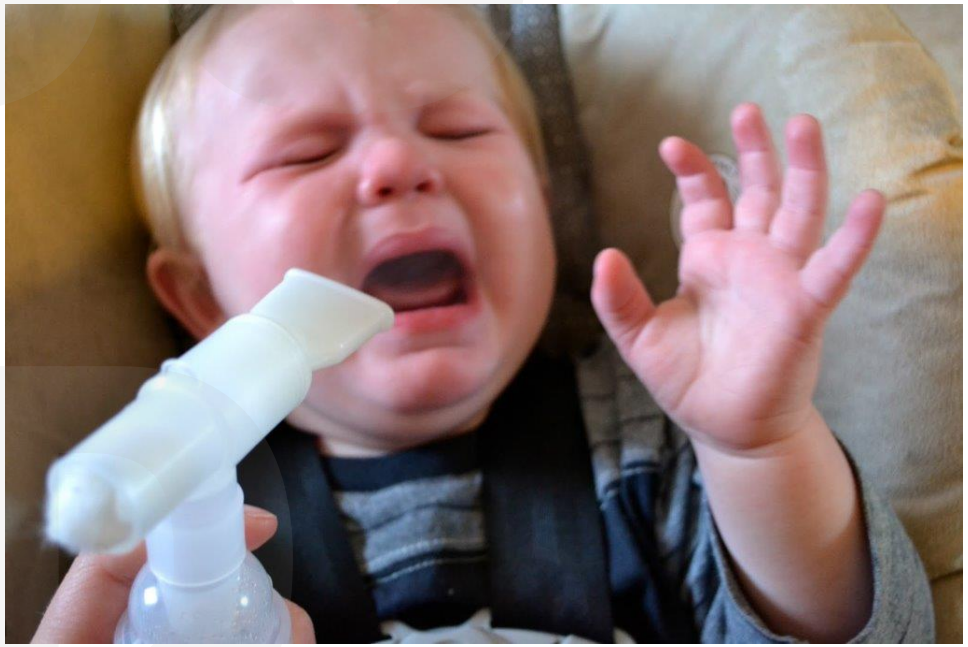
- ICS: Fluticasone 44mcg 2 puffs morning, 2 puffs evening
- Albuterol 2-4 puffs every 4 hours as needed, EARLY use with new colds

Low dose ICS options

- Fluticasone 44mcg
- Mometasone 50mcg (ASMANEX)

PEARLS FOR AGES 0-5

- Metered Dose Inhaler (MDI) + mask spacer is the ONLY appropriate inhaler for this age group
  - No breath-activated inhalers
  - Appeal for insurance coverage if denied
- MDI + mask spacer preferred over nebulizer
- No evidence for increasing ICS dose when sick



CASE 2

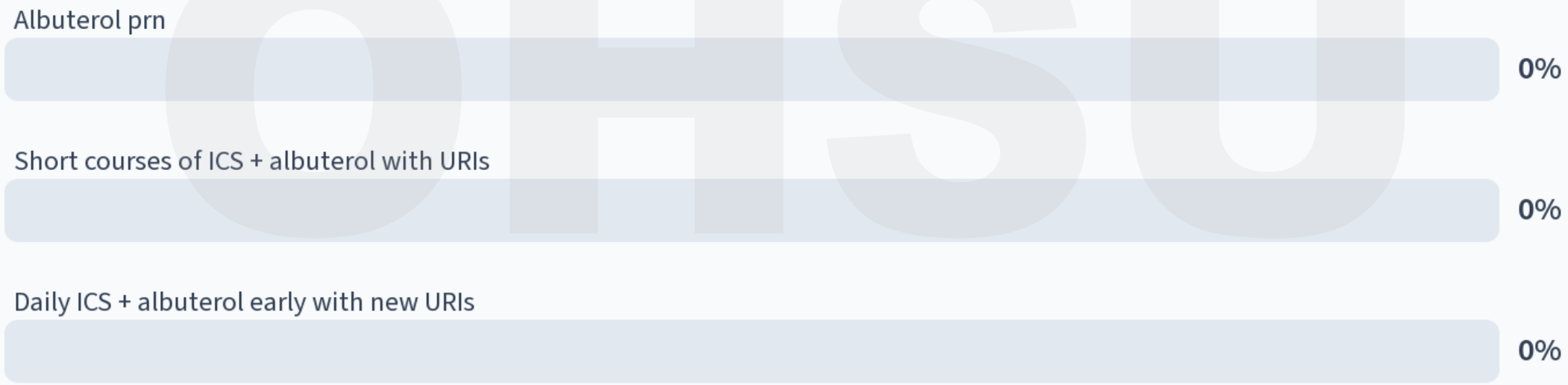
Zahra is a 4 year old female with mild asthma triggered by viral illness. She has been taking low dose ICS twice daily and has been well controlled through the fall-winter despite multiple URIs from pre-K. Starts albuterol at onset of cold symptoms, cough resolves within 1 week, no exacerbations requiring oral steroids. No symptoms or albuterol use between colds. What do you recommend?

A. Albuterol prn

B. Short courses of ICS + albuterol with URIs

C. Daily ICS + albuterol early with new URIs

What do you recommend?



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A. Albuterol prn

B. Short courses of ICS + albuterol with URIs

C. Daily ICS + albuterol early with new URIs

CASE 3

Mario is a 4 year old male with mild asthma triggered by viral illness. This winter he has had multiple ER visits and 3 oral steroid courses. He has been taking low dose ICS twice daily with spacer, reports good adherence. What do you recommend?

A. Albuterol prn

B. Short courses of ICS + albuterol with URIs

C. Increase dose of daily ICS + albuterol early with new URIs

What do you recommend?

CASE 3

Mario is a 4 year old male with mild asthma triggered by viral illness. This winter he has had multiple ER visits and 3 oral steroid courses. He has been taking low dose ICS twice daily with spacer, reports good adherence. What do you recommend?

A. Albuterol prn

B. Short courses of ICS + albuterol with URIs

C. Increase dose of daily ICS + albuterol early with new URIs

CHILDREN 6-11 YEARS

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 (MART)*	Medium-dose ICS-LABA, OR low-dose ICS-formoterol MART* OR refer for expert advice	Refer for phenotypic assessment ± higher dose ICS-LABA or add-on therapy, e.g. LAMA, 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†*	*Only 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)				

ICS: inhaled corticosteroids; Ig: immunoglobulin; IL: interleukin; LABA: long-acting beta$_2$-agonist; LTRA: leukotriene receptor antagonist; MART: maintenance-and-reliever therapy with ICS-formoterol; OCS: oral corticosteroid; SABA: short-acting beta2-agonist; *Anti-inflammatory reliever; †If prescribing LTRA, advise patient/caregiver about risk of neuropsychiatric adverse effects. See reference table on page 45 for MART doses. See reference table on page 44 for total daily ICS doses.

GUIDANCE FOR AGES 6-11

Step 1: low dose ICS whenever SABA is taken

- Albuterol: 2-4 puffs every 4 hours as needed for cough/wheeze/shortness of breath
- ICS: fluticasone 44mcg 2 puffs whenever albuterol is used

Step 2: daily ICS

- ICS: Fluticasone 44mcg 2 puffs morning, 2 puffs evening
- Albuterol 2-4 puffs every 4 hours as needed, EARLY use with new colds

TABLE 6. Low, medium and high daily metered doses of inhaled corticosteroids

Adults and adolescents

Inhaled corticosteroid	Total daily ICS dose (mcg)		
	Low	Medium	High
Beclometasone dipropionate (pMDI)	200–500	>500–1000	>1000
Beclometasone dipropionate (DPI or pMDI, extrafine particle)	100–200	>200–400	>400
Budesonide (DPI or pMDI)	200–400	>400–800	>800
Ciclesonide (pMDI, extrafine particle)	80–160	>160–320	>320
Fluticasone furoate (DPI)	100		200
Fluticasone propionate (DPI)	100–250	>250–500	>500
Fluticasone propionate (pMDI)	100–250	>250–500	>500
Mometasone furoate (DPI)	Depends on DPI device		
Mometasone furoate (pMDI)	200–400		400

Children 6–11 years

Inhaled corticosteroid	Total daily ICS dose (mcg)		
	Low	Medium	High
Beclometasone dipropionate (pMDI)	100–200	>200–400	>400
Beclometasone dipropionate (pMDI, extrafine particle)	50–100	>100–200	>200
Budesonide (DPI)	100–200	>200–400	>400
Budesonide (nebules)	250–500	>500–1000	>1000
Ciclesonide (pMDI, extrafine particle)	80	>80–160	>160
Fluticasone furoate (DPI)	50		–
Fluticasone propionate (DPI)	50–100	>100–200	>200
Fluticasone propionate (pMDI)	50–100	>100–200	>200
Mometasone furoate (pMDI)	100		200

DPI: dry-powder inhaler; ICS: inhaled corticosteroid; pMDI: pressurized metered-dose inhaler*

Notes:

This table shows suggested total daily ICS doses for low dose, medium dose and high dose, not dose equivalence. The table shows metered doses.

SMART FOR AGES 6-11

SMART is preferred for Step 3+

SMART uses ICS-formoterol only

Step 3: low dose ICS-formoterol for MART

- budesonide-formotorol 80-4.5mcg
  - Control: 1 puff twice daily
  - Rescue: 1 puff as needed
  - MAX 8 puffs/day

- Symbicort (budesonide-formotorol)
- Breyna (budesonide-formotorol)
- Dulera (mometasone-formoterol)

PEARLS FOR AGES 6-11

- SABA-only therapy not recommended in any step!
- MDI + spacer still preferred
    - Assess technique for breath activated/diskus inhalers if preferred by insurance
- Verify medication, dosage, technique

CASE 4

Marty is a 9 year old male with asthma triggered by allergies (dust mite, dog dander) and exertion. He has good adherence to daily fluticasone 44mcg, 2 puffs twice daily with spacer. For the past two months he has been using albuterol more than half the days at recess, and last week he had flu A requiring oral steroids. What do you recommend?

A. Continue fluticasone 44mcg 2 puffs twice daily, add montelukast

B. Stop fluticasone, start budesonide-formoterol 80-4.5mcg 1 puff twice daily (SMART)

C. Continue fluticasone 44mcg 2 puffs twice daily

D. ICS + albuterol prn

What do you recommend?

Continue fluticasone 44mcg 2 puffs twice daily, add montelukast

0%

Stop fluticasone, start budesonide-formoterol 80-4.5mcg 1 puff twice daily (SMART)

0%

Continue fluticasone 44mcg 2 puffs twice daily

0%

ICS + albuterol prn

0%

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B. Stop fluticasone, start budesonide-formoterol 80-4.5mcg 1 puff twice daily (SMART)

C. Continue fluticasone 44mcg 2 puffs twice daily

D. ICS + albuterol prn

ADULTS & ADOLESCENTS 12+

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
AIR-only*: low-dose ICS-formoterol as needed

STEP 3
MART* with low-dose maintenance ICS-formoterol

STEP 4
MART* with medium-dose maintenance ICS-formoterol

STEP 5
Add-on LAMA
Refer for assessment of phenotype. Consider trial of high-dose maintenance ICS-formoterol. Consider anti-IgE, anti-IL5/5R, anti-IL4Rα, anti-TSLP

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

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
Reliever only; if SABA, take ICS with each dose

STEP 2
Low dose maintenance ICS

STEP 3
Low dose maintenance ICS-LABA

STEP 4
Medium dose maintenance ICS-LABA

STEP 5
Add-on LAMA
Refer for assessment of phenotype. Consider trial of high-dose maintenance ICS-LABA. Consider anti-IgE, anti-IL5/5R, anti-IL4Rα, anti-TSLP

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

*AIR: Anti-inflammatory reliever; HDM: house dust mite; Ig: immunoglobulin; ICS: inhaled corticosteroids; IL: interleukin; LABA: long-acting beta$_2$-agonist; LAMA: long-acting muscarinic antagonist; MART: maintenance-and reliever therapy with ICS-formoterol; OCS: oral corticosteroid; SLIT: sublingual immunotherapy; TSLP: thymic stromal lymphopoietin. †If prescribing LTRA, advise patient/caregiver about risk of neuropsychiatric adverse effects.
See page 44 for information about doses of ICS-formoterol and frequency of use.

SMART FOR AGES 12+

SMART is preferred for Step 3+

Step 3: low dose ICS-formoterol for MART

- budesonide-formotorol 160-4.5mcg
  - Control: 1 puff twice daily
  - Rescue: 1 puff as needed
  - MAX 12 puffs/day

SMART uses ICS-formoterol only

- Symbicort (budesonide-formotorol)
- Breyna (budesonide-formotorol)
- Dulera (mometasone-formoterol)

SMART

SINGLE MAINTENANCE AND RELIEVER THERAPY

- Strong evidence for ICS-formoterol for SMART in ages 6+
  - For ages 6-11, 57-72% risk reduction (oral steroids, ER visits, hospitalizations)
- Strong evidence for as needed ICS-formoterol for ages 12+
  - Reduces severe exacerbations requiring oral steroids by 60-65%
  - Reduce ER visits/hospitalizations compared to daily ICS + prn albuterol
  - Lower average ICS dose than daily maintenance ICS

SMART PEARLS

- ICS-formoterol ONLY
  - Symbicort (budesonide-formotorol)
  - Breyna (budesonide-formotorol)
  - Dulera (mometasone-formoterol)

- Daily max dose
  - Age 6-11: 8 puffs
  - Age 12+: 12 puffs

- Prescribe 2 inhalers for control + rescue
  - May need to appeal for insurance coverage
  - Insurance will not cover >2 inhalers

- Thorough family education + written educational materials

TABLE 7. Anti-inflammatory relievers (AIR) and MART– recommended inhalers and doses

For as-needed use of ICS-formoterol, patients should take one inhalation whenever needed for symptom relief. If symptoms have not improved after a few minutes, another dose can be taken. Patients do not need to wait a certain number of hours before taking more reliever doses, but they should not take more than the maximum total number of inhalations in a single day. Most patients need far less than this. If a patient feels that they need more doses than the recommended maximum total in any day, they should seek medical advice the same day. ICS-formoterol can also be taken before exercise or allergen exposure, instead of a SABA reliever.

Age (years)	Inhaler: metered dose per inhalation [delivered dose] in micrograms	GINA Step	Dosing	Maximum total in any one day[#]
6–11	Budesonide-formoterol 100/6 [80/4.5] **DPI***	Step 3	MART: 1 inhalation once daily plus 1 as needed	8 inhalations in any day
		Step 4	MART: 1 inhalation twice daily plus 1 as needed	
12–17	Budesonide-formoterol 200/6 [160/4.5] **DPI** or **pMDI**	Step 1–2	AIR-only: 1 inhalation as needed	12 inhalations in any day
		Step 3	MART: 1 inhalation twice (or once) daily plus 1 as needed	
		Steps 4–5	MART: 2 inhalations twice daily plus 1 as needed	
≥ 18	Budesonide-formoterol 200/6 [160/4.5] **DPI** or **pMDI**	Step 1–2	AIR-only: 1 inhalation as needed	12 inhalations in any day
		Step 3	MART: 1 inhalation twice (or once) daily plus 1 as needed	
		Steps 4–5	MART: 2 inhalations twice daily plus 1 as needed	
	Beclometasone-formoterol 100/6 **DPI**[†] Beclometasone-formoterol 100/6 **pMDI**[†]	Step 3	MART: 1 inhalation twice (or once) daily plus 1 as needed	12 inhalations in any day[‡]
		Steps 4–5	MART: 2 inhalations twice daily plus 1 as needed	

AIR: anti-inflammatory reliever; DPI: dry-powder inhaler; MART: maintenance-and-reliever therapy; pMDI: pressurized metered-dose inhaler

*Children: budesonide-formoterol is not recommended for Step 5 MART in children. There are no studies of budesonide-formoterol AIR-only at Steps 1–2 in children.

[#]If a patient needs to take more than this number of inhalations in a day, they should seek medical attention the same day.

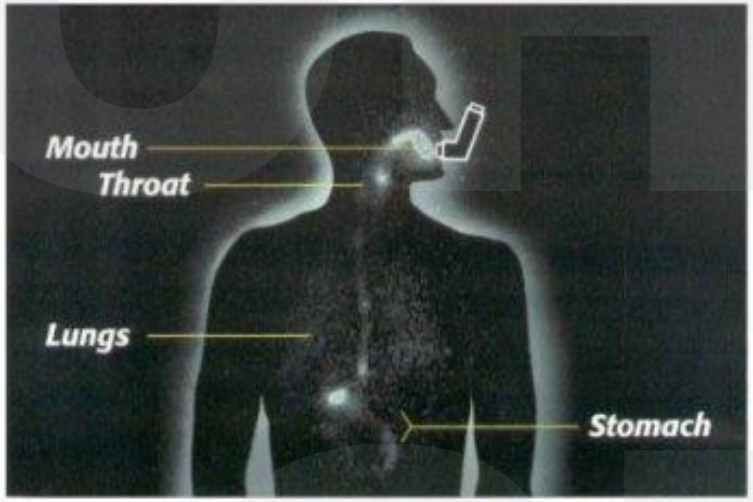
[†]Adults: There are no studies of beclometasone-formoterol for as-needed-only treatment

[‡]For MART with beclometasone-formoterol, GINA suggests patients can use up to 12 inhalations total in one day if needed, based on extensive formoterol safety data, including from studies of budesonide-formoterol

For more inhaler options, see Box 4-8 in the full 2025 GINA Report

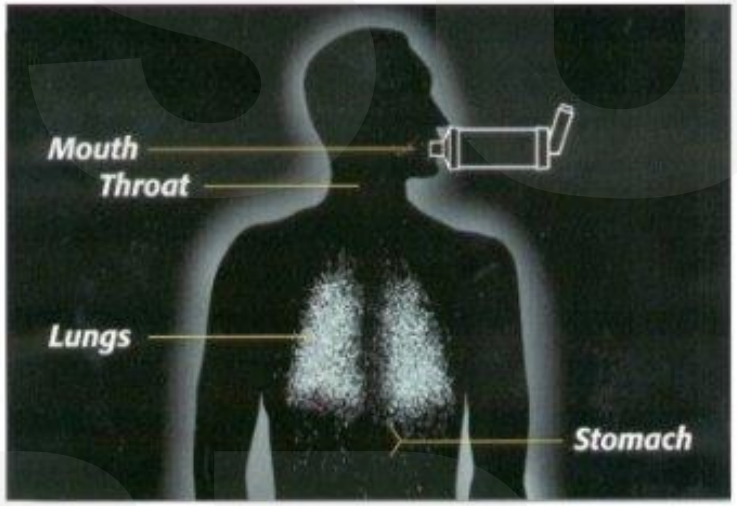
PEARLS FOR 12+

Why use a Spacer with an Inhaler?



Inhaler alone

When an inhaler is used alone, medicine ends up in the mouth, throat, stomach and lungs.



Inhaler used with spacer device

When an inhaler is used with a spacer device, more medicine is delivered to the lungs.

"Comparative respiratory deposition of ^{99m}Tc labeled particles of albuterol using a metered dose inhaler, a metered does inhaler with Aerochamber® spacer and OptiChamber® spacer in healthy human volunteers using gamma-scintigraphy," R. Beihn, PhD, Scintiprox, Inc., Indianapolis, IN and D. Doherty, MD, Dept. of Pulmonology, University of Kentucky Medical Center, Lexington, KY, 1997.

Images kindly provided by Respironics HealthScan Inc.

Allies Against Asthma, Center for Pediatric Research, 855 W. Brambleton Ave., Norfolk, VA 23510, 757-668-6435

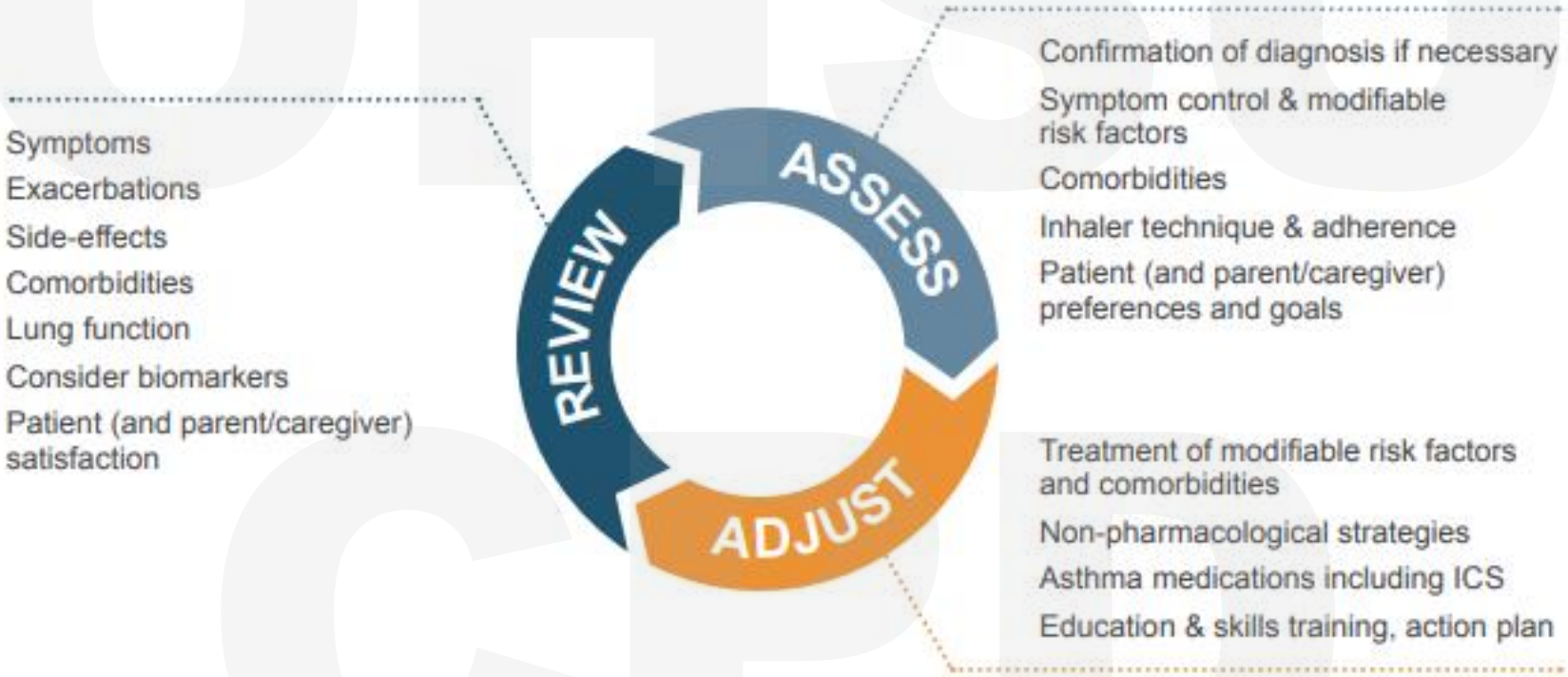
COUNSELING PARENTS ON ASTHMA MEDICATIONS

- Inhaled steroid concerns
  - Daily inhaled steroids reduce oral steroid use, prevent long term lung damage
  - Monitor clinically for side effects, monitor height on growth chart
- Montelukast
  - ICS preferred
  - Good option for kids with allergies and exertional symptoms
  - Review possible behavior side effect
    - Monitor for significant change from baseline behavior/mood or new onset nightmares
    - Side effects will quickly resolve when medication is stopped

Montelukast dosing

- 4mg (≤ 5yr)
- 5mg (6-14yr)
- 10mg (15yr+)

ASSESS ASTHMA CONTROL



ASTHMA CONTROL TEST

- Validated questionnaire for classifying well controlled vs not well controlled asthma
- Score >19 = asthma is well controlled

Childhood Asthma Control Test for children 4 to 11 years.

How to take the Childhood Asthma Control Test

- Step 1 Let your child respond to **the first four questions (1 to 4)**. If your child needs help reading or understanding the question, you may help, but let your child select the response. Complete the remaining **three questions (5 to 7)** on your own and without letting your child's response influence your answers. There are no right or wrong answers.
- Step 2 Write the number of each answer in the score box provided.
- Step 3 Add up each score box for the total.
- Step 4 Take the test to the doctor to talk about your child's total score.

19 or less

If your child's score is 19 or less, it may be a sign that your child's asthma is not controlled as well as it could be. No matter what the score, bring this test to your doctor to talk about your child's results.

Have your child complete these questions.

1. How is your asthma today?

0	1	2	3	SCORE
Very bad	Bad	Good	Very good	

2. How much of a problem is your asthma when you run, exercise or play sports?

0	1	2	3	
It's a big problem, I can't do what I want to do.	It's a problem and I don't like it.	It's a little problem but it's okay.	It's not a problem.	

3. Do you cough because of your asthma?

0	1	2	3	
Yes, all of the time.	Yes, most of the time.	Yes, some of the time.	No, none of the time.	

4. Do you wake up during the night because of your asthma?

0	1	2	3	
Yes, all of the time.	Yes, most of the time.	Yes, some of the time.	No, none of the time.	

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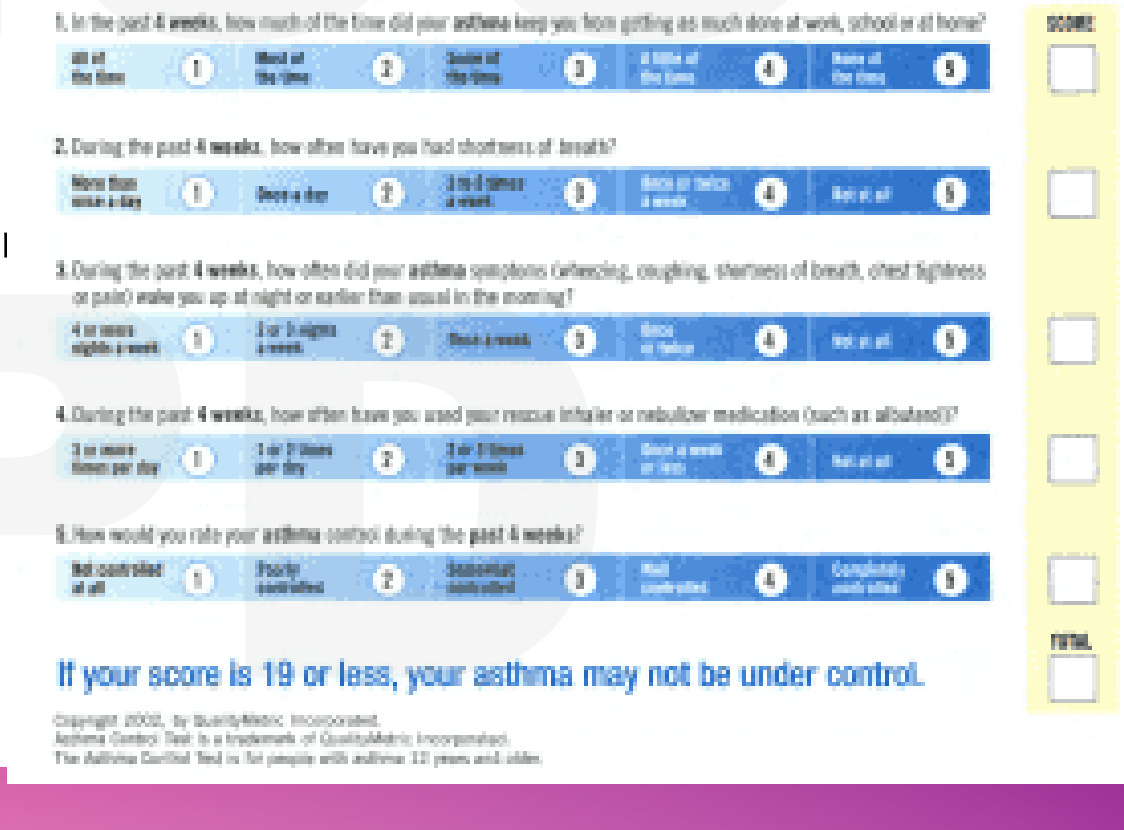


1. In the past 4 weeks, how much of the time did your asthma keep you from getting as much done at work, school or at home?

1	2	3	4	5	SCORE
All of the time	Most of the time	Some of the time	A little of the time	None of the time	

2. During the past 4 weeks, how often have you had shortness of breath?

1	2	3	4	5	
More than once a day	Once a day	3 to 6 times a week	Once or twice a week	Not at all	

3. During the past 4 weeks, how often did your asthma symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?

1	2	3	4	5	
4 or more nights a week	2 or 3 nights a week	Once a week	Once or twice	Not at all	

4. During the past 4 weeks, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?

1	2	3	4	5	
3 or more times per day	1 or 2 times per day	2 or 3 times per week	Once a week or less	Not at all	

5. How would you rate your asthma control during the past 4 weeks?

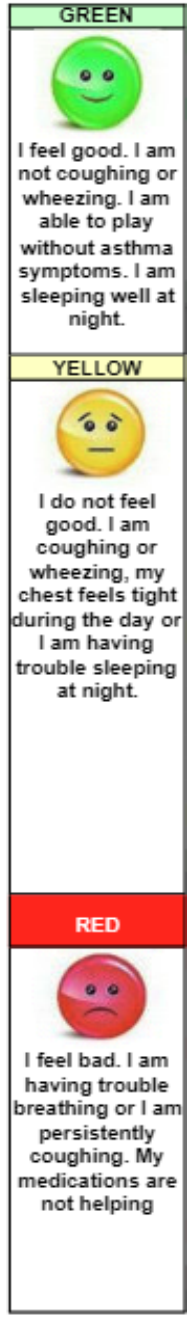
1	2	3	4	5	
Not controlled at all	Poorly controlled	Somewhat controlled	Well controlled	Completely controlled	

TOTAL

If your score is 19 or less, your asthma may not be under control.

ASTHMA ACTION PLANS

- **Individualized** written instructions from the child's healthcare provider
- Outlines **daily management** (green zone)+ **how to handle worsening symptoms** (yellow/red zone)
- Improves recognition of early symptoms
- Clarifies when to give quick-relief medication
- Reduces emergency visits and absenteeism



ASTHMA ACTION PLAN

Asthma and Allergy Foundation of America
aafa.org

Name:	Date:
Doctor:	Medical Record #:
Doctor's Phone #: Day	Night/Weekend
Emergency Contact:	
Doctor's Signature:	

Personal Best Peak Flow: _____

The colors of a traffic light will help you use your asthma medicines.

GREEN means Go Zone!
Use preventive medicine.

YELLOW means Caution Zone!
Add quick-relief medicine.

RED means Danger Zone!
Get help from a doctor.

GO

You have *all* of these:
- Breathing is good
- No cough or wheeze
- Sleep through the night
- Can work & play

Peak flow: from _____ to _____

Use these daily controller medicines:

MEDICINE	HOW MUCH	HOW OFTEN/WHEN
For asthma with exercise, take:		

CAUTION

You have *any* of these:
- First signs of a cold
- Exposure to known trigger
- Cough
- Mild wheeze
- Tight chest
- Coughing at night

Peak flow: from _____ to _____

Continue with green zone medicine and add:

MEDICINE	HOW MUCH	HOW OFTEN/ WHEN

CALL YOUR ASTHMA CARE PROVIDER.

DANGER

Your asthma is getting worse fast:
- Medicine is not helping
- Breathing is hard & fast
- Nose opens wide
- Trouble speaking
- Ribs show (in children)

Peak flow: reading below _____

Take these medicines and call your doctor now.

MEDICINE	HOW MUCH	HOW OFTEN/WHEN

GET HELP FROM A DOCTOR NOW! Your doctor will want to see you right away. It's important!
If you cannot contact your doctor, go directly to the emergency room. DO NOT WAIT.
Make an appointment with your asthma care provider within two days of an ER visit or hospitalization.

https://aafa.org/asthma/asthma-treatment/asthma-treatment-action-plan/

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

Other Instructions

_____

_____

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**

_____

_____

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.

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.

https://allergyasthmanetwork.org/images/Asthma/SMART_Action_Plan

WHEN TO REFER TO SPECIALIST

- Need for additional education and guidance
- Patient not meeting goals of therapy
- Life threatening exacerbations
- Continuous oral corticosteroid or high dose inhaled steroid, > 2 bursts of prednisone/year
- > step 3 or 4 care
- Differential diagnosis not clear

SUMMARY

- Asthma is common childhood disease causing significantmorbidity/mortality and economic burden
- Asthma is a clinical diagnosis
- Good asthma care is good asthma control – reduce impairment and risk
- Review medication formulation AND spacer technique
- Refer to Peds Pulm if dx not clear, not responding to therapy or significantdisease

RESOURCES FOR ASTHMA MANAGEMENT

- 2025 Global Initiative for Asthma (GINA) Guidelines: (https://ginasthma.org/reports)
- 2025 GINA Pocket Guide: https://ginasthma.org/pocket-guide)
- 2020 National Institutes of Health (NIH) Asthma Guidelines (NAEPP EPR-4): (https://www.nhlbi.nih.gov/health-topics/guidelines-for-diagnosis-management-of-asthma)
- Asthma Action Plan
    - https://aafa.org/asthma/asthma-treatment/asthma-treatment-action-plan/
    - https://www.lung.org/lung-health-diseases/lung-disease-lookup/asthma/managing-asthma/create-an-asthma-action-plan
- Pediatric Asthma Risk Score: https://pars.research.cchmc.org/
- Asthma Control Test (ACT) and Childhood ACT (c-ACT): https://www.asthma.com/additional-resources/childhood-asthma-control-test.html
- Test for Respiratory and Asthma Control in Kids (TRACK): https://www.mdcalc.com/calc/3942/track-test-respiratory-asthma-control-kids
- Comparison of National and Global Asthma Guidelines: (Respiratory Care, 2023): https://pubmed.ncbi.nlm.nih.gov/36566032