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Maine Medical Association

Department of Health and Human Services
Maine People Living Safe, Healthy and Productive Lives

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Adult & Pediatric Asthma: Evidence-Based Prescribing Update

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Please grab a piece of note paper and a writing instrument or open your phone notes

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- None of the individuals in control of content for this activity have relevant financial relationships to disclose
- I have no conflicts of interest
- See additional disclosure on slide 12 regarding images of pharmaceutical products

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Learning Objectives

- Categorize medications used in treating asthma
- Apply the newer recommendation for nearly universal inhaled corticosteroids
- Review step-wise asthma therapy

Background Facts

- Most common chronic noncommunicable disease worldwide
- Most common pediatric disease & cause for hospitalization
- Most cases have reversible episodes of airway limitation, followed by inflammation
- Up to 90% of asthma deaths though to be preventable

Diagnosis

- Review history/symptoms
- Confirm using spirometry-avoid empiric trials
- Demonstrate reversibility (FEV1 increase) after bronchodilator

* for a detailed diagnosis algorithm, see page 23, https://ginasthma.org/wp-content/uploads/2022/07/GINA-Main-Report-2022-FINAL-22-07-01-WMS.pdf

Goals of Treatment

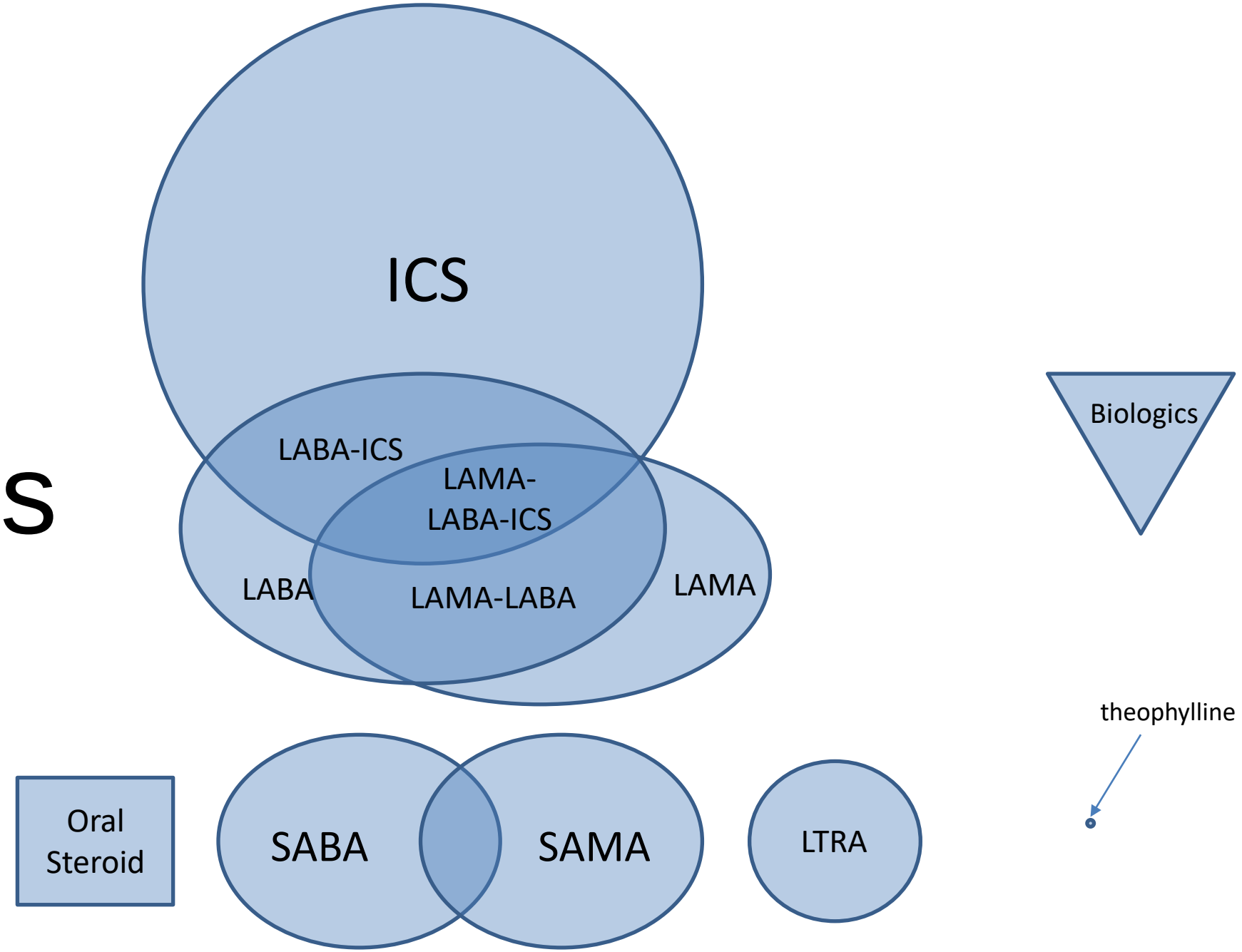
- Achieve symptom-free asthma control
- Prevent exacerbations & hospitalizations
- Prevent decline in lung function
- Avoid adverse effects of (or unnecessary) medications

Learning assessment question 1

- You have a 3rd year medical student/health professions student rotating with you this month
- On day 1, you see 2 patients with asthma & assign the student homework
- On day 2, the student reports back they are having difficulty keeping all the different asthma medicines straight
- What classes of asthma medicines are your highest priority for you to review with the student? (write a list on paper)

Drug Classes

Drug Classes



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Mitigation for potential Commercial Bias

- The following image of available branded asthma treatments was produced by the Asthma and Allergy Network whose funders include pharmaceutical corporate sponsors
- The evaluation to include this image considered:
  - it is being presented in an educational manner
  - It is not intended as marketing
  - It is fair and balanced (all available products are represented equally + listed in alphabetical order)

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Respiratory Treatments 2021

DPI = DOSE INDICATOR G = GENERIC AVAILABLE DISEASE STATES: A = ASTHMA C = COPD

Allergy & Asthma NETWORK

AllergyAsthmaNetwork.org

800.878.4403

American College of Allergy, Asthma & Immunology

CHEST FOUNDATION

Allergy & Asthma Network is a national nonprofit organization dedicated to ending needless death and suffering due to asthma, allergies and related conditions through outreach, education, advocacy and research.

*used by permission

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SHORT-ACTING BETA$_2$-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer quick relief of symptoms such as coughing, wheezing and shortness of breath for 3-6 hours

- **ProAir® Digihaler™** 90 mcg albuterol sulfate inhalation powder — DPI 1 2 3, A
- **ProAir® HFA** 90 mcg albuterol sulfate — DPI 1 2 3, A G
- **ProAir RespiClick®** 90 mcg albuterol sulfate inhalation powder — DPI 1 2 3, A
- **Proventil® HFA** 90 mcg albuterol sulfate — DPI 1 2 3, A G
- **Ventolin® HFA** 90 mcg albuterol sulfate — DPI 1 2 3, A G
- **Xopenex HFA®** 45 mcg levalbuterol tartrate — A G

LONG-ACTING BETA$_2$-AGONIST BRONCHODILATORS

relax tight muscles in airways and offer lasting relief of symptoms such as coughing, wheezing and shortness of breath for at least 12 hours

- **Serevent® Diskus®** 50 mcg salmeterol xinafoate inhalation powder — DPI 1 2 3, A C
- **Striverdi® Respimat®** 2.5 mcg olodaterol hydrochloride — DPI 1 2 3, C

INHALED CORTICOSTEROIDS

reduce and prevent swelling of airway tissue; they do not relieve sudden symptoms of coughing, wheezing or shortness of breath

- **Alvesco® HFA** 80, 160 mcg ciclesonide — DPI 1 2 3, A
- **ArmonAir® Digihaler™** 55, 113, 232 mcg fluticasone propionate inhalation powder — DPI 1 2 3, A
- **Arnuity® Ellipta®** 50, 100, 200 mcg fluticasone furoate inhalation powder — DPI 1 2 3, A
- **Asmanex® HFA** 50, 100, 200 mcg mometasone furoate — DPI 1 2 3, A
- **Asmanex® Twisthaler®** 110, 220 mcg mometasone furoate inhalation powder — DPI 1 2 3, A
- **Flovent® Diskus®** 50, 100, 250 mcg fluticasone propionate inhalation powder — DPI 1 2 3, A
- **Flovent® HFA** 44, 110, 220 mcg fluticasone propionate — DPI 1 2 3, A
- **Pulmicort Flexhaler®** 90, 180 mcg budesonide inhalation powder — DPI 1 2 3, A
- **QVAR® Redihaler™** 40, 80 mcg beclomethasone dipropionate — DPI 1 2 3, A

MUSCARINIC ANTAGONISTS (ANTICHOLINERGIC)

relieve cough, sputum production, wheeze and chest tightness associated with chronic lung diseases

Short-acting

- **Atrovent® HFA** 17 mcg ipratropium bromide — DPI 1 2 3, C

Long-acting

- **Incruse® Ellipta®** 62.5 mcg umeclidinium inhalation powder — DPI 1 2 3, C
- **Spiriva® HandiHaler®** 18 mcg tiotropium bromide inhalation powder — C
- **Spiriva® Respimat®** 1.25, 2.5 mcg tiotropium bromide — DPI 1 2 3, A C
- **Tudorza™ Pressair™** 400 mcg aclidinium bromide inhalation powder — DPI 1 2 3, C

COMBINATION MEDICATIONS

contain both short-acting beta$_2$-agonist and short-acting muscarinic antagonist

- **Combivent® Respimat®** 20/100 mcg ipratropium bromide and albuterol — DPI 1 2 3, C

COMBINATION MEDICATIONS

contain both inhaled corticosteroid and long-acting beta$_2$-agonist (LABA)

- **Advair Diskus®** 100/50, 250/50, 500/50 mcg fluticasone propionate and salmeterol inhalation powder — DPI 1 2 3, A C G
- **Advair® HFA** 45/21, 115/21, 230/21 mcg fluticasone propionate and salmeterol xinafoate — DPI 1 2 3, A G
- **AirDuo® Digihaler™** 55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol inhalation powder — DPI 1 2 3, A
- **AirDuo® RespiClick®** 55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol inhalation powder — DPI 1 2 3, A G
- **Breo® Ellipta®** 100/25, 200/25 mcg fluticasone furoate and vilanterol inhalation powder — DPI 1 2 3, A C
- **Dulera®** 50/5, 100/5, 200/5 mcg mometasone furoate and formoterol fumarate dihydrate — DPI 1 2 3, A
- **Symbicort®** 80/4.5, 160/4.5 mcg budesonide and formoterol fumarate dihydrate — DPI 1 2 3, A C G
- **Wixela™ Inhub™** 100/50, 250/50, 500/50 mcg fluticasone propionate and salmeterol xinafoate (approved generic of Advair Diskus) — DPI 1 2 3, A C

contain both long-acting beta$_2$-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

- **Anoro® Ellipta®** 62.5/25 mcg umeclidinium and vilanterol inhalation powder — DPI 1 2 3, C
- **Bevespi Aerosphere®** 9/4.8 mcg glycopyrrolate and formoterol fumarate — DPI 1 2 3, C
- **Duaklir® Pressair®** 400, 12 mcg aclidinium bromide and formoterol fumarate — DPI 1 2 3, C
- **Stiolto™ Respimat®** 2.5/2.5 mcg tiotropium bromide and olodaterol — DPI 1 2 3, C

contain inhaled corticosteroid, long-acting beta$_2$-agonist (LABA) and long-acting muscarinic antagonist (LAMA)

- **Trelegy® Ellipta®** 200/62.5/25 mcg, 100/62.5/25 mcg fluticasone furoate, umeclidinium and vilanterol inhalation powder — DPI 1 2 3, A C
- **Breztri Aerosphere™** 160/9/4.8 mcg budesonide, glycopyrrolate and formoterol fumarate — C

BIOLOGICS

target cells and pathways that cause airway inflammation; delivered by injection or IV

- **Cinqair®** reslizumab — A
- **Dupixent®** dupilumab — A
- **Fasenra™** benralizumab — A
- **Nucala®** mepolizumab — A
- **Xolair®** omalizumab — A

BRONCHIAL THERMOPLASTY

A minimally invasive procedure that uses mild heat to reduce airway smooth muscle, leading to fewer severe asthma flares, ER visits, and days lost from activities. www.btforasthma.com — A

PDE4 INHIBITORS

ease lung inflammation and reduce exacerbations

- **Daliresp®** 250, 500 mcg roflumilast — C

Reviewed by Dennis Williams, PharmD

ICS

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Benefits of Low-Dose ICS

- ↑ Quality of life
- ↑ Lung function
- ↑ Control of airway inflammation
- ↓ Airway hyper-responsiveness
- ↓ Asthma symptoms
- ↓ Exacerbations
- ↓ Mortality

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ICS-LABA

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SABA

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LABA

**don't use as monotherapy in asthma!

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SAMA & LAMAs

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LAMA-LABA & LAMA-LABA-ICS

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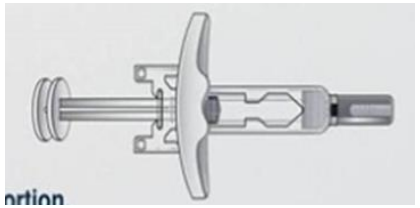
Biologics

Tezspire (tezepelumab-ekko)



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Learning assessment question 2

- You and the student see Mira, a 28 year old with appropriately diagnosed asthma who reports she had an old prescription for an albuterol inhaler and it has run out. You recommended an office visit instead of refilling it over the phone.
- What are the markers for poorly controlled asthma that you will look for in Mira and review with the student?
- Write down your list-aim for at least 3 items

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When to re-assess asthma control

- Using albuterol > 2x per week
- Awakening >2x per month (or witnessed coughing in sleep in kids)
- Oral steroid use
- Repeat office visits for symptoms
- ED visit or hospitalization

MaineCare preferred Formulary

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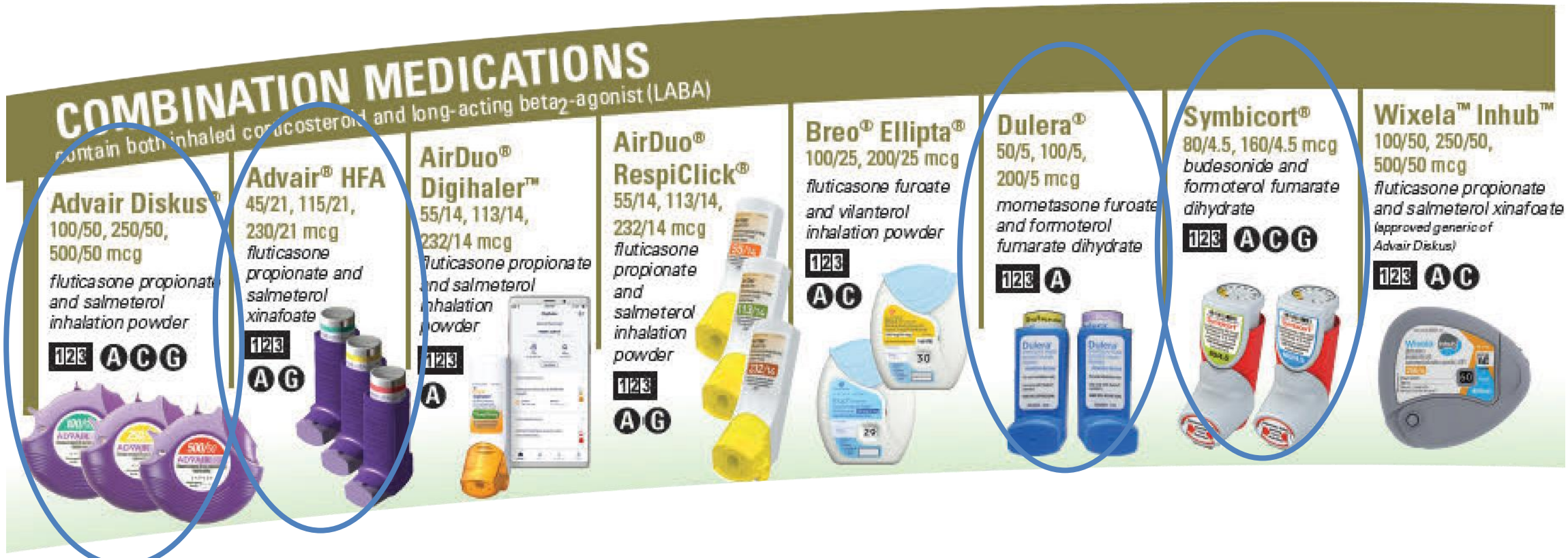
MaineCare preferred Formulary



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MaineCare preferred Formulary

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2 SETS OF ASTHMA GUIDELINES

- Global Initiative for Asthma (GINA)-Annual updates to reports
- National Institutes of Health-National Heart, Lung and Blood Institute (NIH-NHLBI)- 2020 Focused Updates to the Asthma Management Guidelines

AGE GROUPS FOR ASTHMA RECS

- 12 and older is considered ADULT
- 5-12 (grade school age)
- Under 5 (toddler/preschool age)

Pre-treatment Assessment

ASSESS:

- Confirmation of diagnosis
- Symptom control & modifiable risk factors (including lung function)
- Comorbidities
- Inhaler technique & adherence
- Child and parent preferences and goals

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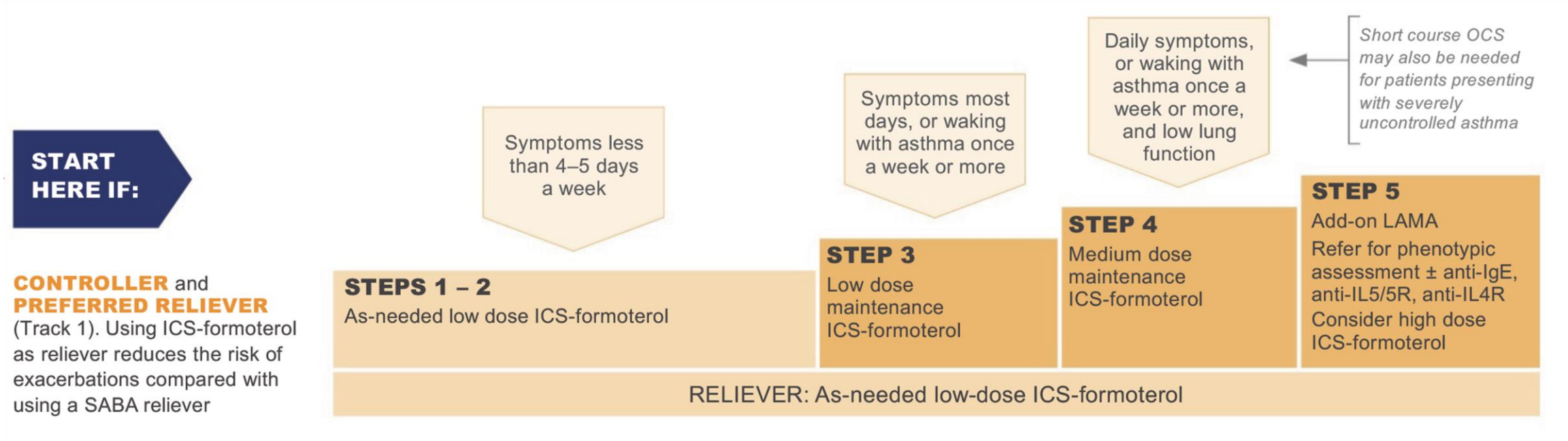
Learning assessment question 3

- You and the student see Joey, a 45 yo new patient with PFT diagnosed asthma who was without insurance for the past 2 years (and thus has no prescriptions other than an albuterol MDI from an ED visit 3 months ago). They now have insurance with reasonable drug coverage after 90 days at a new job.
- How will you decide where to start treatment and what treatment to recommend?

Step wise therapy:
Starting Treatment Ages 12 & Up



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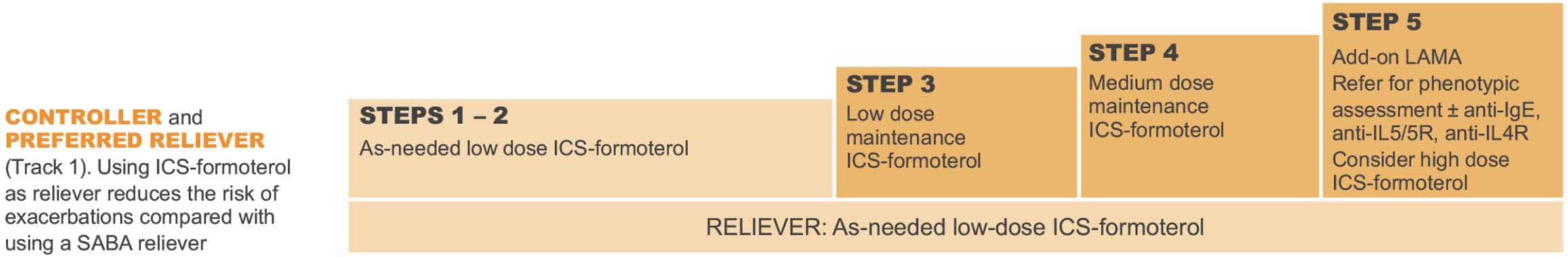
Step wise therapy: Ages 12 & Up
Continuing Treatment-step up if ongoing sxs* step down if stable for 3 mos



*see take home message #2-ICS can take up to 8 weeks for full effect

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Learning assessment question 4

- The student independently sees Joey's 9 yo son with asthma diagnosed by spirometry. His previous provider prescribed albuterol inhaler for as needed use and he reports symptoms 1-2 times per week.
- The student presents to you and, having read the outline of the most recent GINA guidelines, the suggests this treatment plan: _____

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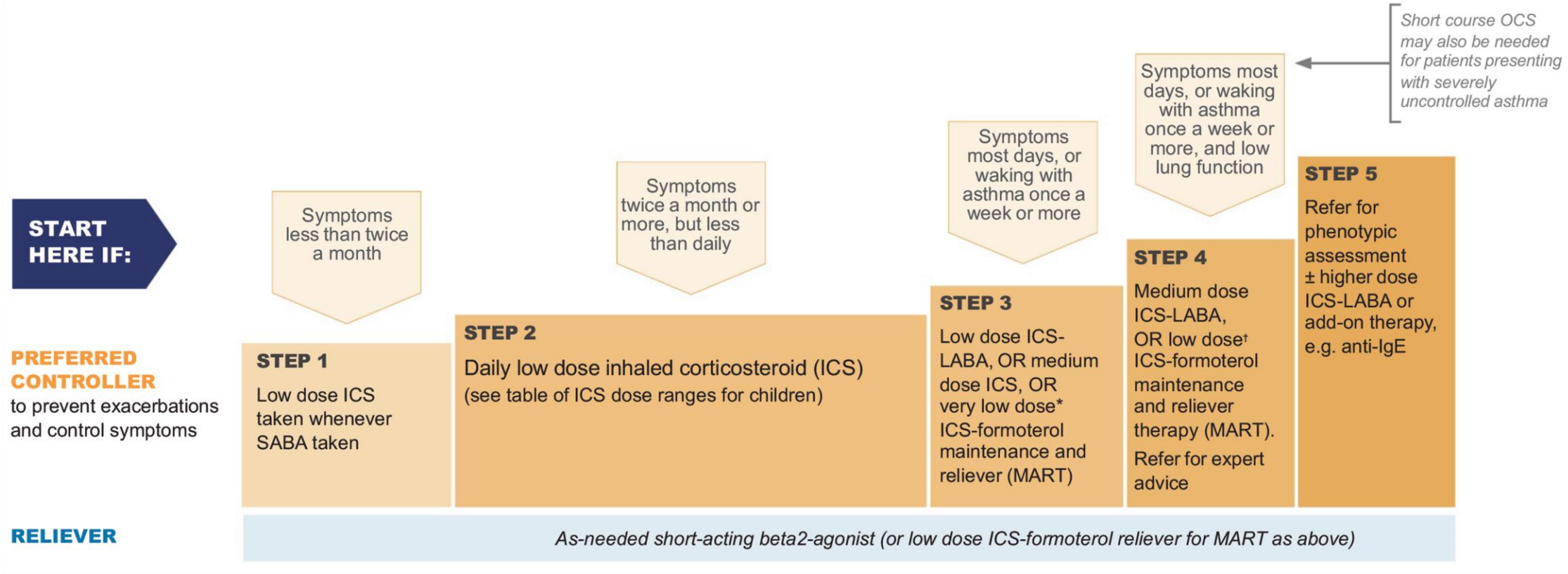
Step wise therapy:
Starting Treatment Ages 6-11



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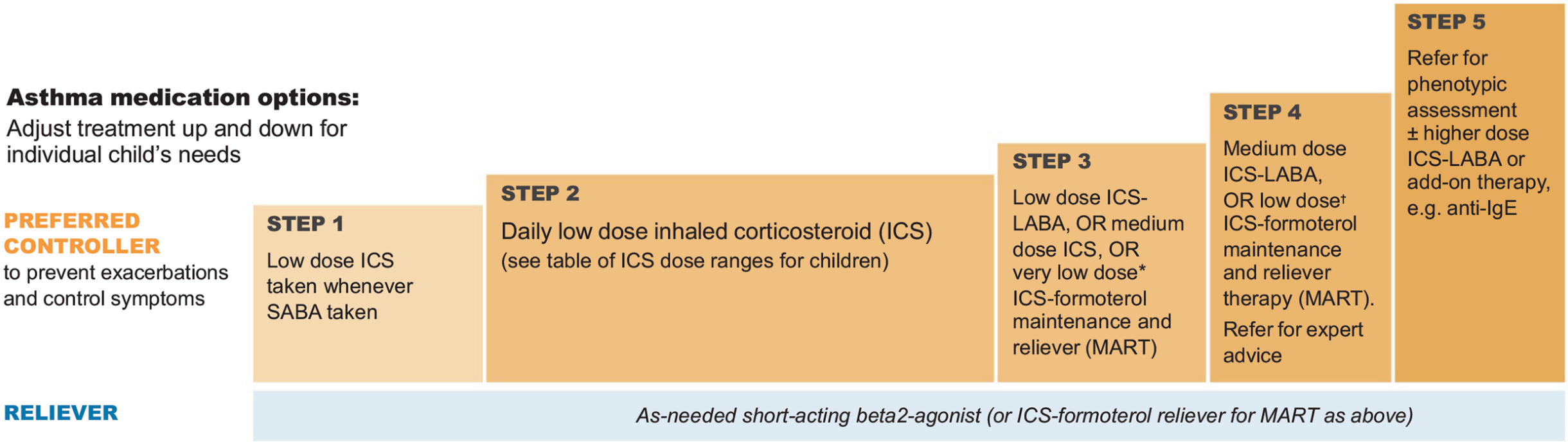
Step wise therapy: Ages 6-11
Continuing Treatment-step up if ongoing sxs*
step down if stable for 3 mos



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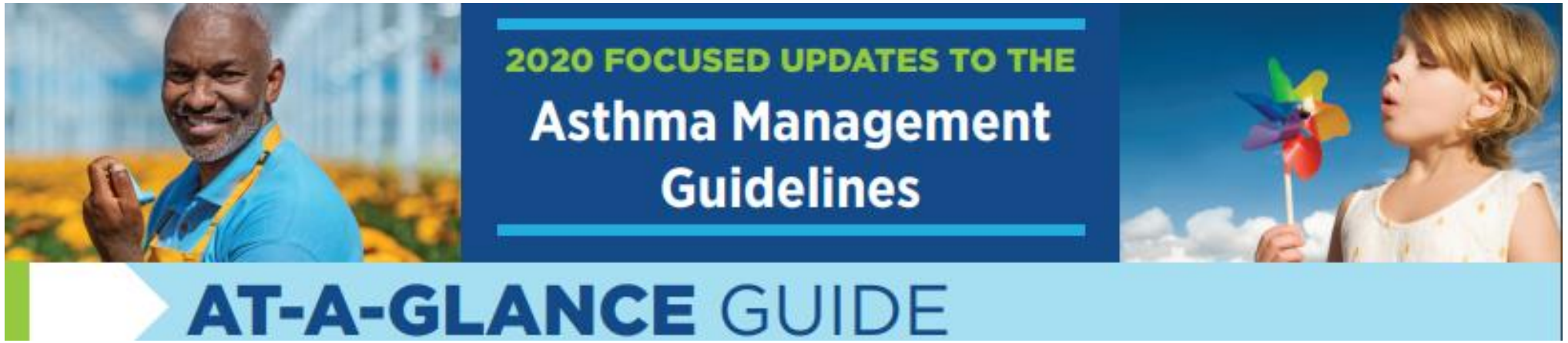
*see take home message #2-ICS can take up to 8 weeks for full effect



ADDITIONAL GUIDELINES FROM NIH-NHLBI

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AGES 0–4 YEARS: STEPWISE APPROACH FOR MANAGEMENT OF ASTHMA

	Intermittent Asthma	Management of Persistent Asthma in Individuals Ages 0–4 Years				
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▲	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

U.S. Department of Health and Human Services
National Institutes of Health
National Heart, Lung, and Blood Institute

NIH Publication No. 20-HL-8142
December 2020

Exacerbation Management

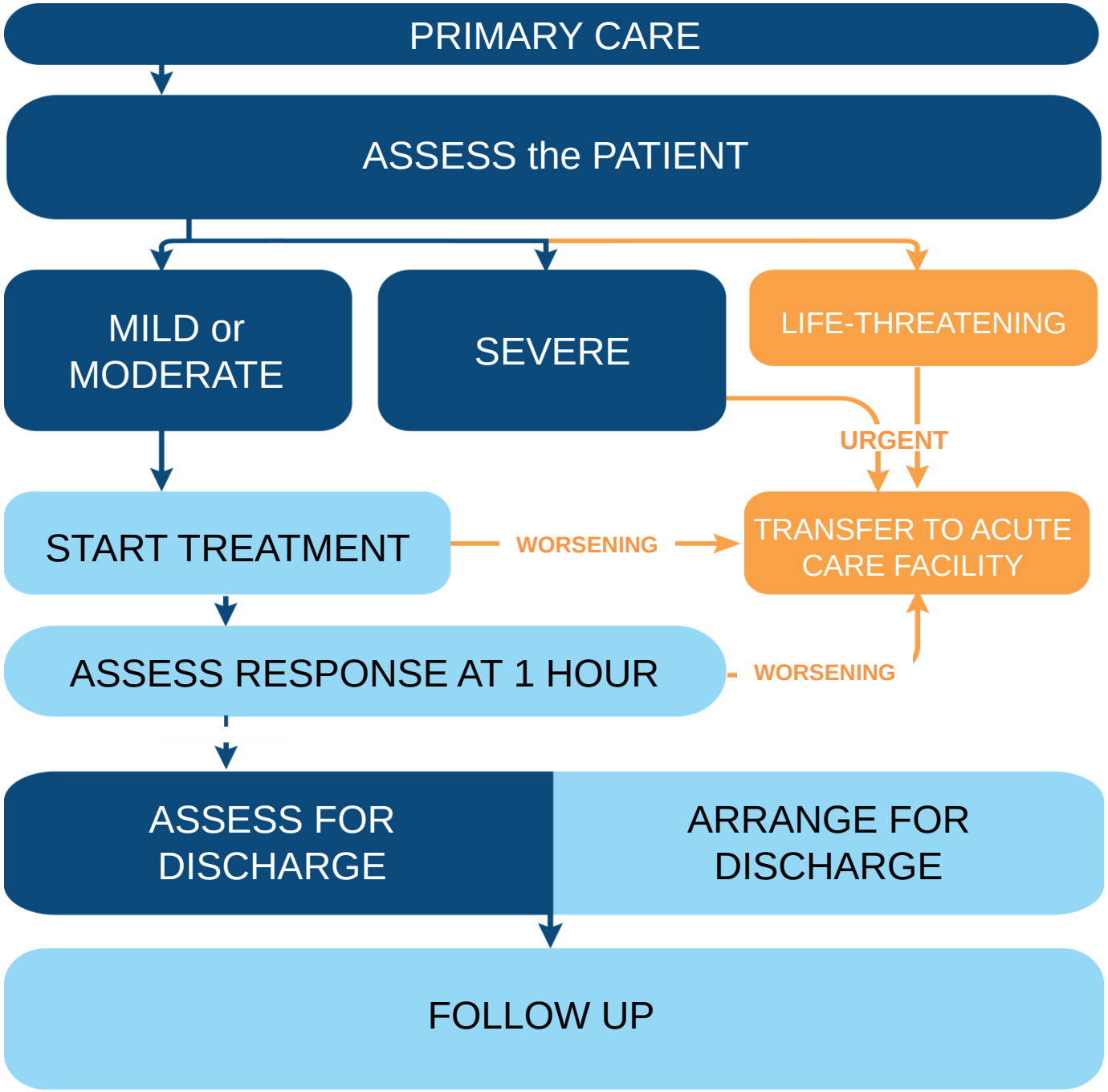
- Can be treated at home as part of a written action plan w/thresholds to act
- Consider increasing ICS-formoterol: 2 puffs q4h (>12 yo)

  *may run up against insurance quantity limit issues
- OR Step up SABA (i.e. 8 puffs/ day)
- Consider oral steroids (tx above can avoid oral steroid use)
- For severe exacerbations: oxygen and/or ipratropium, consider adding LAMA chronically

Exacerbation Management

See 2022 GINA Pocket Guide, p. 41 for Primary /Acute care exacerbation treatment algorithm

https://ginasthma.org/pocket-guide-for-asthma-management-and-prevention/



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Exacerbation Management-Oral steroids

	Dexamethasone	Prednisone or prednisolone
Pediatric (0-11 years)	0.3-0.6 mg/kg po SINGLE DOSE (max 16 mg)	1 mg/kg po daily x 3-5 days (max 50mg)
Adult (age 12 or greater)	16 mg po daily x 2 days	40-60 mg po daily x 5 days (occ up to 14 days, no taper)

*in kids, less vomiting with dexamethasone (0% vs 6% in one study)
*in adults, side effects similar between the two medications
*no efficacy benefit of dexamethasone IM vs po, injection site reaction is a risk

Our OLD friend Theophylline

- 4th line duet to systemic toxicity/narrow therapeutic window
- Only MILD bronchodilator activity
- May be useful as add-on in pts already requiring high-dose ICS
- Bedtime dosing w/24h formulation may increase clinical effect
- NOT FOR USE in children

Reminder of Indicators of Controlled Asthma

INDICATOR	FREQUENCY/DESCRIPTOR
Daytime symptoms	<=2 days/week
Need for reliever therapy	<=2 doses/week
Nighttime symptoms	None
Physical activity tolerance	Normal
Exacerbations	Mild + infrequent
Work/school absence	None (due to asthma)
PEF or FEV1	>=90% personal best

Learning assessment question 5

- In your final discussion about asthma with the student, you are surprised to hear the student say a risk factor for asthma-related death is the lack of this non-pharmacological strategy:

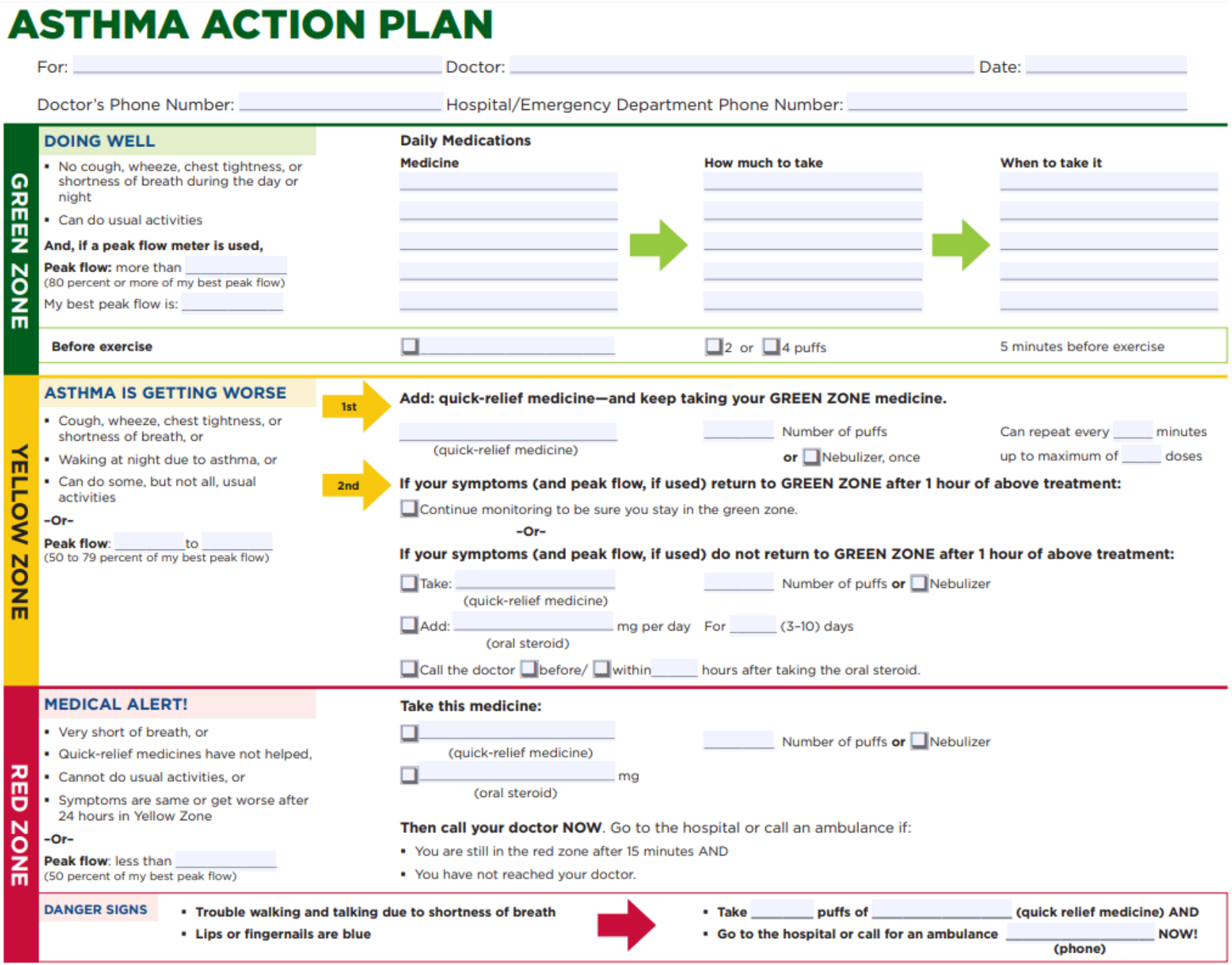
  _____

Self-management & Education

- written action plan
  - daily preventative strategies
  - when & how to adjust reliever & controller medications
  - when to seek care
- encourage physical activity
- smoking cessation
- intensive education programs significantly decrease asthma sxs & hospitalizations
- breathing exercises
- healthy diet

Action Plan

source:
https://www.nhlbi.nih.gov/health-topics/all-publications-and-resources/asthma-action-plan-2020



ASTHMA ACTION PLAN

For: _____ Doctor: _____ Date: _____

Doctor's Phone Number: _____ Hospital/Emergency Department Phone Number: _____

GREEN ZONE

DOING WELL

- No cough, wheeze, chest tightness, or shortness of breath during the day or night
- Can do usual activities

And, if a peak flow meter is used,

Peak flow: more than _____
(80 percent or more of my best peak flow)

My best peak flow is: _____

Daily Medications

Medicine	How much to take	When to take it

Before exercise	☐ _____	☐2 or ☐4 puffs	5 minutes before exercise

YELLOW ZONE

ASTHMA IS GETTING WORSE

- Cough, wheeze, chest tightness, or shortness of breath, or
- Waking at night due to asthma, or
- Can do some, but not all, usual activities

–Or–

Peak flow: _____ to _____
(50 to 79 percent of my best peak flow)

1st

Add: quick-relief medicine—and keep taking your GREEN ZONE medicine.

_____ (quick-relief medicine) _____ Number of puffs **or** ☐Nebulizer, once

Can repeat every _____ minutes up to maximum of _____ doses

2nd

If your symptoms (and peak flow, if used) return to GREEN ZONE after 1 hour of above treatment:

☐Continue monitoring to be sure you stay in the green zone.

–Or–

If your symptoms (and peak flow, if used) do not return to GREEN ZONE after 1 hour of above treatment:

☐Take: _____ (quick-relief medicine) _____ Number of puffs **or** ☐Nebulizer

☐Add: _____ (oral steroid) mg per day For _____ (3–10) days

☐Call the doctor ☐before/ ☐within_____ hours after taking the oral steroid.

RED ZONE

MEDICAL ALERT!

- Very short of breath, or
- Quick-relief medicines have not helped,
- Cannot do usual activities, or
- Symptoms are same or get worse after 24 hours in Yellow Zone

–Or–

Peak flow: less than _____
(50 percent of my best peak flow)

Take this medicine:

☐_____ (quick-relief medicine) _____ Number of puffs **or** ☐Nebulizer

☐_____ (oral steroid) mg

Then call your doctor NOW. Go to the hospital or call an ambulance if:

- You are still in the red zone after 15 minutes AND
- You have not reached your doctor.

DANGER SIGNS

- **Trouble walking and talking due to shortness of breath**
- **Lips or fingernails are blue**

- **Take _____ puffs of _____ (quick relief medicine) AND**
- **Go to the hospital or call for an ambulance _____ (phone) NOW!**

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Caveats & Take-Home Messages

- Majority of pts can be controlled on low dose ICS
- Benefits of ICS start at 1 week but can take up to 8 weeks for full clinical effect
- SABA monotherapy appropriate only in extremely mild asthma-using less than 2 inhalers per **year** (not including exercise-induced)
- Consider ICS-formoterol as needed for exacerbations

Caveats & Take-Home Messages (continued)

- NO LABA MONOTHERAPY
- Choose ICS over LTRA in most pts (increased efficacy)
- When to de-escalate step-wise therapy? (reduce ICS dose by 25-50%) if stable for 3 mos
- Consider referring kids <6 yo to subspecialist

THANK YOU FOR CONSIDERING THE WAYS YOU CAN TEACH HEALTH PROFESSIONS STUDENTS AS PART OF YOUR CLINICAL PRACTICE!

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Additional Resources

Free asthma education program for pts:
https://www.maine.gov/dhhs/mecdc/population-health/mat/learn-to-control-your-asthma.shtml

Free asthma education program for providers/staff:
http://newsmanager.commpartners.com/mainemed/issues/2023-09-13/2.html

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How to get CME for today

micismaine.org

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Individualized private one-on-one MICIS CME sessions available

- *Asthma Level 2*
- *Hepatitis C Levels 1 + 2*
- *Four different opioid topics*

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Reference Slides

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Baylor College of Medicine's Rules of Two™

- ✓ **Do you have asthma symptoms or use your quick-relief inhaler more than two times per week?**
- ✓ **Do you awaken at night with symptoms more than two times per month?**
- ✓ **Do you refill your quick-relief inhaler more than two times per year?**
- ✓ If yes to any, step up care (does not apply to exercise-induced)

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ICS Daily Dose

Adults and Adolescents over 12 years

	Low	Medium	High
beclomethasone (Qvar Redihaler) 40 or 80 mcg	40 BID	80-160 BID	320 BID
budesonide (Pulmicort Flexhaler) 90 or 180 mcg	90 BID	360 BID	720 BID
fluticasone prop (Flovent HFA/Advair HFA) 44/45 mcg, 110/115 mcg or 220/230 mcg	110/115 BID	220/230 BID	440/460 BID
fluticasone prop (Flovent Diskus/Advair Diskus) 50 mcg or 100 mcg 0r 250 mcg 0r 500 mcg	100 BID	250 BID	500 BID
mometasone (Dulera) 50 or 100 or 200 mcg	100 BID	200.D	200.D

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ICS Daily Dose

Ages 5-11

	Low	Medium
beclomethasone (Qvar Redihaler) 40 or 80 mcg	40 BID	80 BID
budesonide (Pulmicort Flexhaler) 90 or 180 mcg	90 BID	180 BID
fluticasone prop (Flovent HFA/Advair HFA) 44/45 mcg, 110/115 mcg or 220/230 mcg	44/45 BID	110/115 BID
fluticasone prop (Flovent Diskus/Advair Diskus) 50 mcg or 100 mcg 0r 250 mcg 0r 500 mcg	50 BID	100 BID
mometasone (Dulera) 50 mcg or 100 mcg or 200 mcg	50 BID	100.BID

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Comparison of asthma biologics

Biologic	Mechanism	Age	Administration	Note
benralizumab (Fasenra)	Anti-IL-5 receptor	>=12 yo	Subq q4w x3 then q8w	
dupilumab (Dupixent)		>=6 yo w/high eosinophils/po steroid dependent	Subq q2w	
mepolizumab (Nucala)	Anti-IL-5	>=18 yo	Subq q4w	
omalizumab (Xolair)	Anti-IgE	>=6 yo	Subq q2-4w	Anaphylaxis can occur up to 4d post-injection; ? inc CV events
reslizumab (Cinquiar)	Anti-IL-5	>=18 yo	IV q4w	Inc CPK
tezepelumab-ekko (Tezspire)	Thymic stromal lymphopoetin (TSLP-a cytokine) blocker	>=12 yo	Subq q4w	Anaphylaxis can occur "days" after injection

*side effects of all: anaphylaxis, injection site reaction, rash, headache, fatigue, ? zoster

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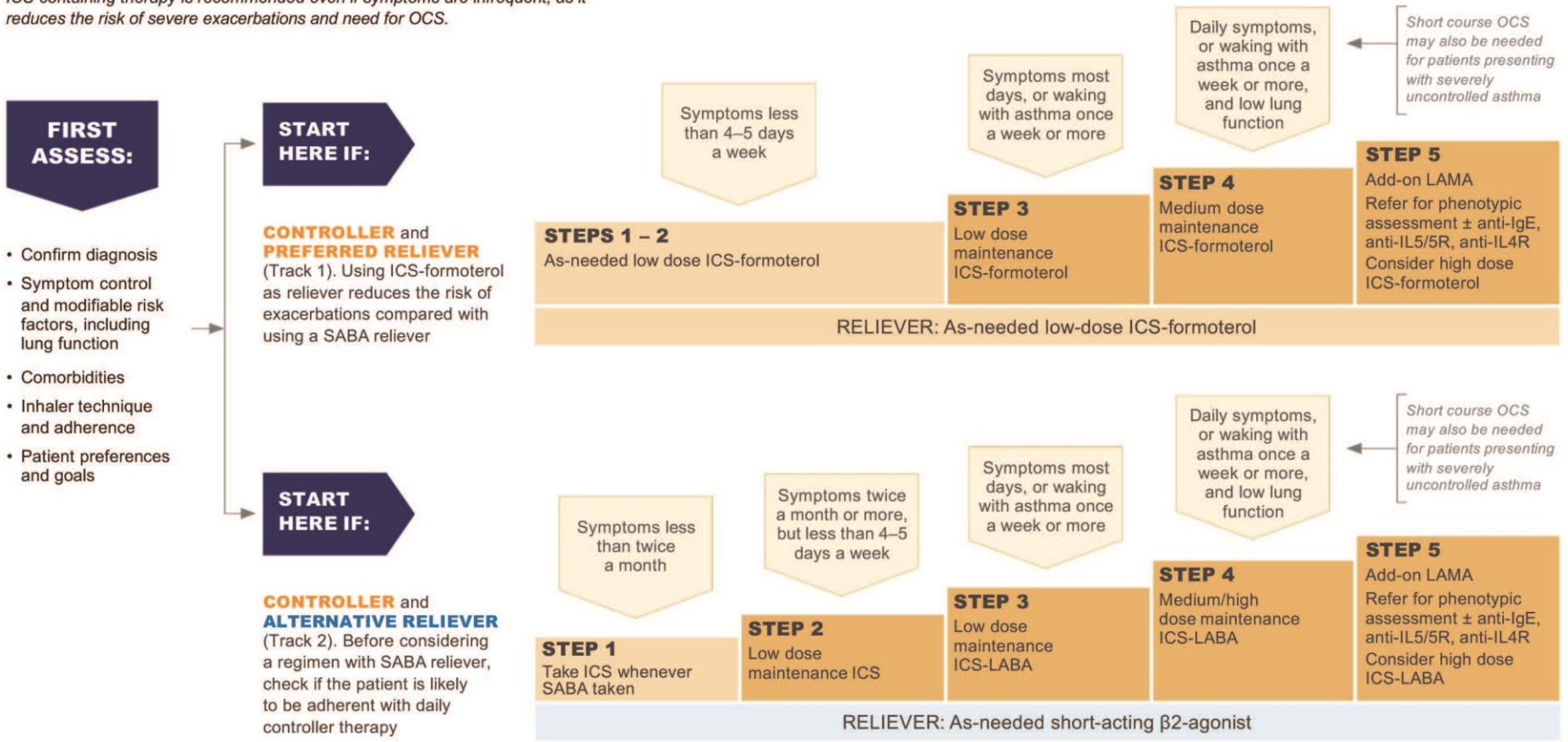
STARTING TREATMENT

in adults and adolescents with a diagnosis of asthma

Track 1 is preferred if the patient is likely to be poorly adherent with daily controller ICS-containing therapy is recommended even if symptoms are infrequent, as it reduces the risk of severe exacerbations and need for OCS.



GINA 2021, Box 3-4Bi

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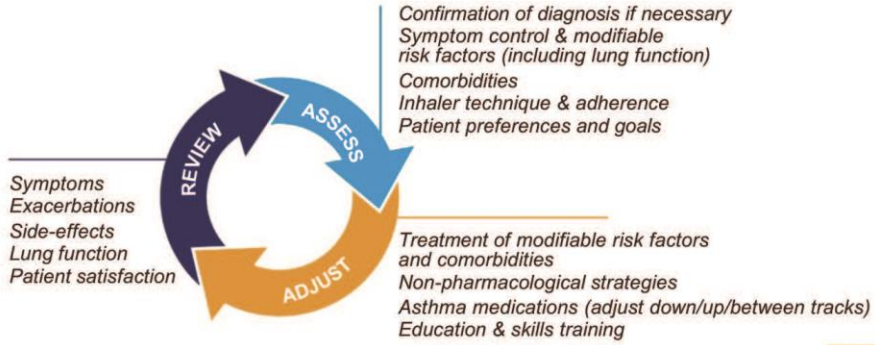
Adults & adolescents 12+ years

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



CONTROLLER and **PREFERRED RELIEVER** (Track 1). Using ICS-formoterol as reliever reduces the risk of exacerbations compared with using a SABA reliever	**STEPS 1 – 2** As-needed 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 phenotypic assessment ± anti-IgE, anti-IL5/5R, anti-IL4R Consider high dose ICS-formoterol	
	RELIEVER: As-needed low-dose ICS-formoterol				
CONTROLLER and **ALTERNATIVE RELIEVER** (Track 2). Before considering a regimen with SABA reliever, check if the patient is likely to be adherent with daily controller	**STEP 1** Take ICS whenever SABA taken	**STEP 2** Low dose maintenance ICS	**STEP 3** Low dose maintenance ICS-LABA	**STEP 4** Medium/high dose maintenance ICS-LABA	**STEP 5** Add-on LAMA Refer for phenotypic assessment ± anti-IgE, anti-IL5/5R, anti-IL4R Consider high dose ICS-LABA
	RELIEVER: As-needed short-acting β2-agonist				
Other controller options for either track		*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 LTRA or HDM SLIT, or switch to high dose ICS*	*Add azithromycin (adults) or LTRA; add low dose OCS but consider side-effects*

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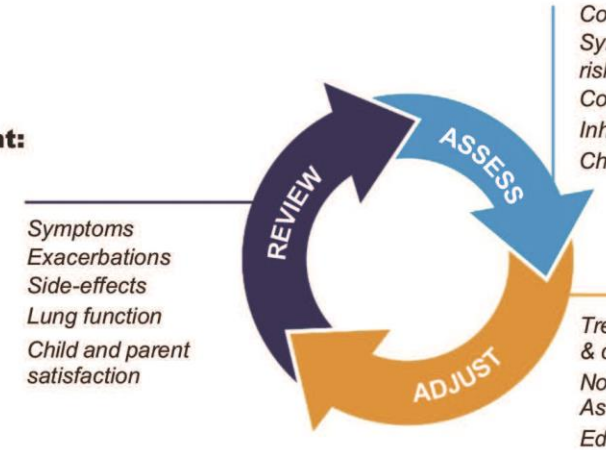
Children 6-11 years

Personalized asthma management:
Assess, Adjust, Review



Confirmation of diagnosis if necessary
Symptom control & modifiable risk factors (including lung function)
Comorbidities
Inhaler technique & adherence
Child and parent preferences and goals

Symptoms
Exacerbations
Side-effects
Lung function
Child and parent satisfaction

Treatment of modifiable risk factors & comorbidities
Non-pharmacological strategies
Asthma medications (adjust down or up)
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 (MART)	Medium dose ICS-LABA, OR low dose† ICS-formoterol maintenance and reliever therapy (MART). Refer for expert advice	Refer for phenotypic assessment ± higher dose ICS-LABA or add-on therapy, e.g. anti-IgE
Other controller options	*Consider daily low dose ICS*	*Daily leukotriene receptor antagonist (LTRA), or low dose ICS taken whenever SABA taken*	*Low dose ICS + LTRA*	*Add tiotropium or add LTRA*	*Add-on anti-IL5, or add-on low dose OCS, but consider side-effects*
RELIEVER	*As-needed short-acting beta2-agonist (or ICS-formoterol reliever for MART as above)*				

*Very low dose: BUD-FORM 100/6 mcg
†Low dose: BUD-FORM 200/6 mcg (metered doses).

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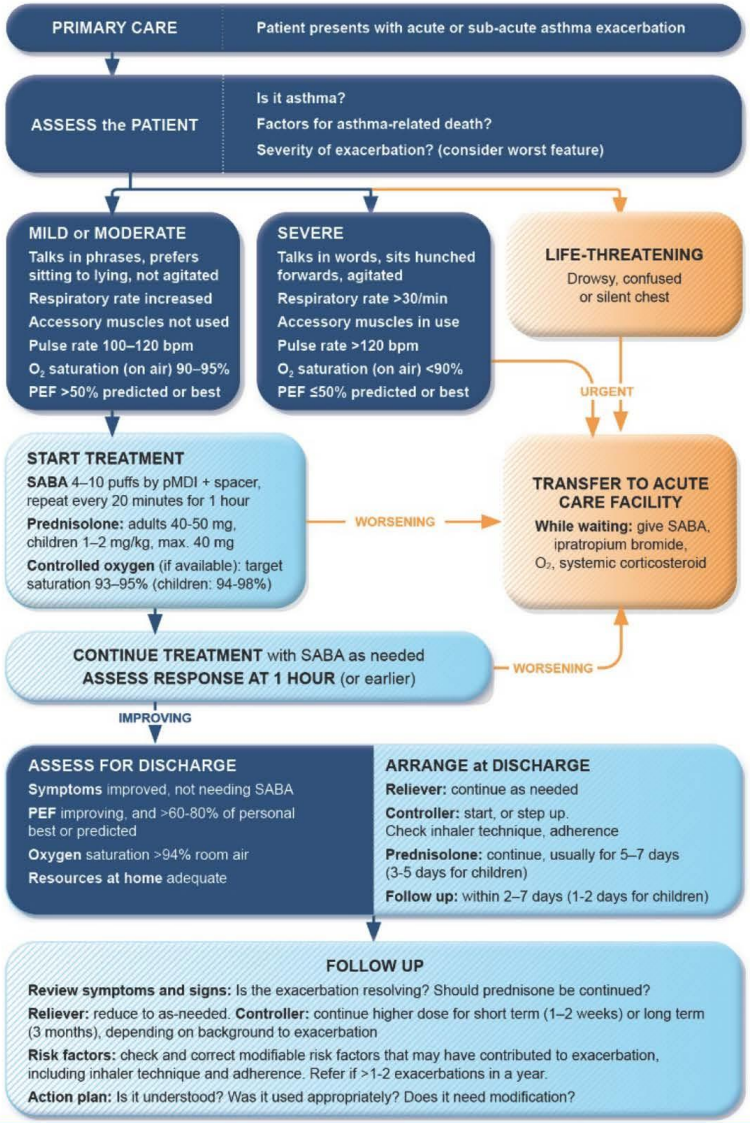
Primary care management of asthma exacerbation

(adults, adolescents, children 6–11 years)



GINA 2021, Box 4-3. Primary care management of worsening asthma

Next steps if you treat asthma

- Go over the GINA and NIHLBI guidelines to familiarize yourself with the recommendations and options (see reference slide for links)
- Better yet, schedule an ‘Academic Detailing’ session with a MICIS Educator and get CME to go over the guidelines with a peer!

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Resources

- **2022 GINA Pocket Guide for Asthma** https://ginasthma.org/pocket-guide-for-asthma-management-and-prevention/
- **Inhaler poster** https://allergyasthmanetwork.org/news/inhalers-at-a-glance-posters-resources/
- **Asthma action plan** https://www.nhlbi.nih.gov/health-topics/all-publications-and-resources/asthma-action-plan-2020
- **NIH Step Wise therapy summary, 2020 (6 pp)** https://www.nhlbi.nih.gov/health-topics/all-publications-and-resources/at-glance-2020-focused-updates-asthma-management-guidelines

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References

- https://ginasthma.org/pocket-guide-for-asthma-management-and-prevention/ and https://ginasthma.org/gina-reports/
- https://www.nhlbi.nih.gov/health-topics/asthma-management-guidelines-2020-updates/digital-toolkit
- Asthma Overview and Drug Comparison Chart, updated March 2022, RxFiles Academic Detailing, University of Saskatchewan (available by subscription), https://www.rxfiles.ca/rxfiles/