

Regional Pediatric Asthma Program

Ring of Knowledge



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Revised_10.18.24

Pediatric Asthma Team Consult Order

Place a consult for any child with a **primary diagnosis of asthma**.

Placing the order:

Navigate to **Manage Orders**

- a. Type in **“asthma”**
- b. Select **Pediatric Asthma Team Consult**
- c. Fill in **Reason for Exam** field
- d. Click **[Accept]**
- e. **[Sign]** the order
- f. Fill in the **Order Mode = Per Protocol (No-cosign)**
- g. Fill in ordering/authorizing provider field

*It will route to the Pediatric Asthma Team's Epic InBasket.

Inpatient Consults:

EHR (Electronic Health Record)

1. Open Patient's Chart
2. Click Order's Management
3. Click Order Entry
4. Type in **“asthma”**
5. Click Accept Selection

Outpatient Consults (anyone without EPIC/EHR access):

- Call 252-847-6835 with name, MR number and reason for referral
- Email Pediatric Asthma Referral Form to PediatricAsthmaTeam@ecuhealth.org

ECUH Clinic/ECU Clinic - Use EPIC/EHR Staff Message

To: P Ip EMC Pool – Peds Asthma Team

Subject: Peds Asthma referral

Patient: include patient you are referring

Message box: Include reason for the referral

Hit Send

Asthma visit in 15 minutes

At Check-in:

- Provide families with intake forms that identify frequency of symptoms, nighttime awakenings, interference with activity, asthma ED/hospitalizations and SABA use.
- Complete ACT (TM) forms to assess control.
- Complete noninvasive testing if available and appropriate. (i.e. FeNO and/or Spirometry)

5 Minutes

Review Check-In Materials & Complete Assessment

- Control: ACT (TM), noninvasive tests, impairment
- Risk: number of ED visits, hospitalizations, steroid use in the past 12 months
- How often are maintenance & rescue medications being utilized
- Barriers to self-management eczema

2 Minutes

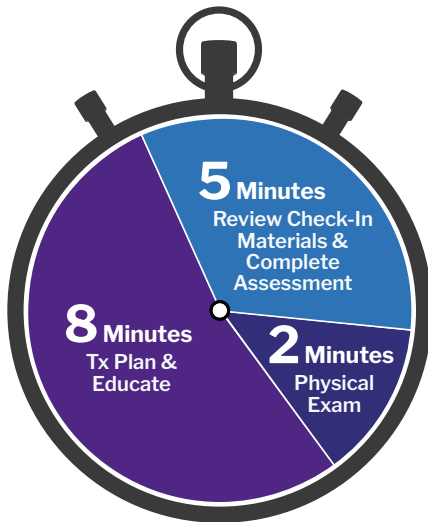
Physical Exam

- Could be normal
- Assess for signs of allergies and eczema

8 Minutes

Tx Plan & Educate

- Choose/Adjust medications based on stepwise approach guidelines
- Review maintenance vs. rescue medications
 - 11 refills for maintenance medications
 - 1 refill for rescue medication
- **Utilize teach-back method to ensure proper medication administration technique** (Prescribe and ensure utilization of spacer with all MDI's)



- Provide education on trigger avoidance strategies
- Update flu vaccine
- Discuss self-management barriers
- **Create and review AAP-involve patient and family to ensure understanding**
- **Complete School Medication administration authorization form**
- Discuss goals and schedule asthma follow-up visit at appropriate time (i.e. 1 month, 3 months, 6 months) based on control status

Childhood Asthma Control Test for children 4 to 11 years.

This test will provide a score that may help the doctor determine if your child's asthma treatment plan is working or if it might be time for a change.

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. Bring this test to the doctor to talk about the results.

Have your child complete these questions.

1. How is your asthma today?





 0 Very bad	 1 Bad	 2 Good	 3 Very good
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SCORE





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

 0 It's a big problem. I can't do what I want to do.	 1 It's a problem and I don't like it.	 2 It's a little problem but it's okay.	 3 It's not a problem.
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3. Do you cough because of your asthma?

 0 Yes, all of the time.	 1 Yes, most of the time.	 2 Yes, some of the time.	 3 No, none of the time.
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4. Do you wake up during the night because of your asthma?

 0 Yes, all of the time.	 1 Yes, most of the time.	 2 Yes, some of the time.	 3 No, none of the time.
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Please complete the following questions on your own.

5. During the last 4 weeks, how many days did your child have any daytime asthma symptoms?

5 Not at all	4 1-3 days	3 4-10 days	2 11-18 days	1 19-24 days	0 Everyday
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6. During the last 4 weeks, how many days did your child wheeze during the day because of asthma?

5 Not at all	4 1-3 days	3 4-10 days	2 11-18 days	1 19-24 days	0 Everyday
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7. During the last 4 weeks, how many days did your child wake up during the night because of asthma?

5 Not at all	4 1-3 days	3 4-10 days	2 11-18 days	1 19-24 days	0 Everyday
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TOTAL

FOR PATIENTS:

Take the Asthma Control Test™ (ACT) for people 12 yrs and older. Know your score. Share your results with your doctor.

Step 1 Write the number of each answer in the score box provided.

Step 2 Add the score boxes for your total.

Step 3 Take the test to the doctor to talk about your score.

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?

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

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

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

4 or more nights a week	1	2 or 3 nights a week	2	Once a week	3	Once or twice	4	Not at all	5
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4. During the past 4 weeks, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?

3 or more times per day	1	1 or 2 times per day	2	2 or 3 times per week	3	Once a week or less	4	Not at all	5
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5. How would you rate your asthma control during the past 4 weeks?

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

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Asthma Control Test is a trademark of QualityMetric, Incorporated.

**If your score is 19 or less, your asthma may not be controlled as well as it could be.
Talk to your doctor.**

FOR PHYSICIANS:

The ACT is:

- A simple, 5-question tool that is self-administered by the patient
- Clinically validated by specialist assessment and spirometry¹
- Recognized by the National Institutes of Health

Reference: 1. Nathan RA et al. *J Allergy Clin Immunol.* 2004;113:59-65.

PITT COUNTY SCHOOLS
AUTHORIZATION FOR MEDICATION

Example

TO BE COMPLETED BY PHYSICIAN/MEDICAL PROVIDER

Date: 9/30/24

Name of Student Jane Doe

DOB: 5/15/16 School: Pitt Elementary

It is necessary that medication be given during school hours in order to keep this student in optimum health and to help maintain school performance.

Medication Albuterol Inhaler Dosage/mg 4 puffs Route Inhaled with spacer

Time(s) medication is to be given at SCHOOL AS needed for symptoms - child's AAP

*Providers please note that "lunch time" can vary from 10:30 am to 1:30 pm

*If medication is ordered as needed, please indicate specific circumstances when medication should be given (School staff, not licensed medical or nursing personnel, will be administering medication):

FOLLOW Asthma Action Plan

For K-12 students authorized to carry and administer rescue medications such as asthma inhalers, epi-pens or insulin or high school students authorized to carry and administer medication, with the exception of Class 2 controlled substances such as Ritalin, Oxycontin, Percocet, Adderall, Concerta, please check the appropriate box.

May self-medicate (student has demonstrated proficient use of medication).

May not self-medicate.

Doctor Asthma
Medical Provider's Signature

333-333-3333
Telephone Number

TO BE COMPLETED BY PARENT

I hereby give permission for my child, Jane Doe to receive medication during school hours. This medication has been prescribed by a licensed physician. I hereby release the Pitt County Board of Education and their agents and employees from any and all liability that may result from my child taking the medication.

Janice Doe
Signature of Parent/Guardian

919-999-9999
Telephone Number

9/30/24
Date

TO BE COMPLETED BY STUDENT AUTHORIZED TO SELF-MEDICATE

I understand that it is a privilege for students to be allowed to self-medicate during school hours. Abuse of this privilege shall result in its revocation.

Signature of Student

Date

Asthma Action Plan for Joe Wheeler DOB: 6/26/13
 Emergency Contact: May Wheeler Phone Number: 999-999-9999 Date: 9/30/24
 Doctor's Name: Dr. Ragweed Phone Number: 333-333-3333 Pharmacy: Writers

GREEN means GO!
 Use CONTROL medicines daily
YELLOW means CAUTION!
 Add RESCUE medicine
RED means DANGER!
 Get help from a doctor NOW

Asthma Severity:
 Intermittent
 OR
 Persistent
 Mild
 Moderate
 Severe

Asthma Triggers:
 Animals (furry or feathered) Change in temperature Exercise
 Colds/Respiratory infections Tobacco Smoke Cockroaches
 Strong odors or cologne Mold Pollen
 Other _____ Dust
Peak flow: Height (inches): _____ **Predicted Best** _____ **Personal Best** _____

HELPFUL HINTS: Always use a spacer device when using metered dose inhalers and Always rinse your mouth after using controller medicine

CONTROLLED- Green

- Breathing is good
- No cough or wheeze
- Can play and work
- Sleeping well at night

Peak Flow > _____ (80-100% of best)

Use **CONTROL** medicines **EVERY DAY**. Don't stop taking without talking to your doctor.

2 puffs of Symbicort 2 times a day, every day.

Flonase (50) one spray each nostril daily
Zyrtec (5) one tablet by mouth at bedtime

_____ puffs of _____ 10-15 min before very active exercise.

CAUTION- Yellow

- Coughing (may be worse at night or with exercise)
- Wheezing
- Chest tightness
- Shortness of breath
- 1st sign of a cold

Peak flow _____ to _____ (50%-80% of best)

Take your **RESCUE** medicine and continue your **CONTROL** medicines.

Rescue medicine: **How much to take:** **When to take it:**

Albuterol 4 puffs by inhaler with Repeat every 4 hours until
 OR spacer, if available back in the green zone
 Symbicort/Dulera OR Repeat every 6 hours until
 OR Nebulizer back in the green zone
 Other _____

Additional therapy: _____

- Call your doctor if you need to use your rescue medicine for more than 24 hours or 2 times in a week
- Always check for improvement in symptoms and/or repeat peak flow meter 10-15 minutes after using rescue medicine. Continue to follow plan.

SMART Therapy

- If taking **Symbicort** or **Dulera** inhaler as rescue

SMART Therapy Helpful Hints

- Ages 4-11 years of age, use a maximum of 8 puffs per day
- Ages 12 years and older, use a maximum of 12 puffs per day

****Contact your doctor if you need to exceed the maximum number of puffs**

EMERGENCY- Red

- Breathing hard and fast
- Nostrils open wide (flares out)
- Sinking in of skin between ribs and neck (retracting)
- Grunting
- Can't talk or walk well
- Gray or blue lips or fingernails

Peak Flow > _____ (< 50% of best)

Take your **RESCUE** medicine immediately and get help!

Rescue medicine: **How much to take:** **When to take it:**

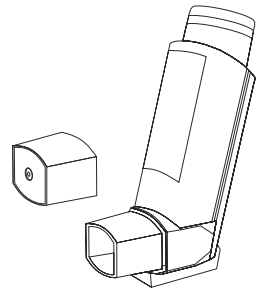
Albuterol 4 puffs by inhaler with Repeat every 20 minutes
 OR spacer, if available for a total of 3 treatments
 Nebulizer OR Other _____

- Call your doctor at _____ while giving rescue medicine.
- If you cannot contact your doctor or parent/guardian, call 911 or go directly to the Emergency Department.

Completed by: Jane Anigood, RT

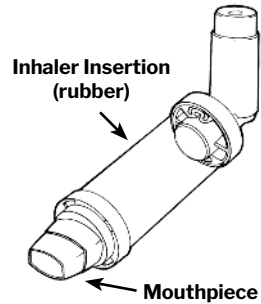
Using My Inhaler

1. Check inhaler expiration date.
2. Shake inhaler five (5) times before using.
3. Prime your controller medicine, _____, ____ puffs before using it the first time.
4. Prime your rescue (albuterol) inhaler ____ puffs before using it the first time and ____ puffs after ____ days of non-use.
5. Spacer device needs to be used *with all inhalers, with the exception of diskus, flexhaler, and twisthaler.*
6. Always rinse mouth after using inhaler.
7. Always refill inhaler before empty.
 - Dose counter inhalers need to be refilled when 10 is showing in the window.
 - Inhalers without dose counters need to record puffs used and subtract number from total number of actuations shown on the canister.
 - Floating inhalers in water is not recommended.
8. Clean the mouthpiece of the inhaler weekly with a dry cloth.



Mouthpiece Spacer

1. Remove caps from inhaler and spacer.
2. Shake inhaler and insert into back of spacer.
3. Breathe out and place mouthpiece in mouth.
4. Press inhaler once to release one puff of medication.
5. Take in a slow, deep breath. Hold breath until you count to 10 then slowly breathe out. If you hear a whistling sound, you are breathing in too quick. Stop, slow down and repeat.
6. If additional puffs are needed, wait 2 minutes and repeat steps 3, 4 and 5.
7. Always use a spacer when using an inhaler.
8. Keep spacer stored in a sealable bag to keep clean.
9. Cleaning Instructions: Pull off inhaler insertion part and rotate mouthpiece to disassemble, agitate parts in warm soapy (liquid detergent) water for 1 minute, then allow parts to soak for at least 10 minutes. Rinse using clean running water. Allow parts to AIR DRY completely before putting back together.



Facemask Spacer

1. Remove cap from inhaler.
2. Shake inhaler and insert into back of spacer.
3. Apply mask to face covering mouth and nose. Apply gentle pressure to make a good seal.
4. Press inhaler once and breathe in and out through mask for 5-6 breaths.
5. If additional puffs are needed, wait 2 minutes and repeat steps 3 and 4.
6. Always use a spacer when using an inhaler.
7. Keep spacer stored in sealable bag to keep it clean.
8. Cleaning Instructions: Pull off inhaler insertion part, mask and rotate mouthpiece to disassemble, agitate parts in warm soapy (liquid detergent) water for 1 minute, then allow parts to soak for at least 10 minutes. Rinse using clean running water. Allow parts to AIR DRY completely before putting back together.



Brand	Drug	Low Daily Dose			Medium Daily Dose			High Daily Dose		
		Child 0-4	Child 5-11	>12 & Adult	Child 0-4	Child 5-11	>12 & Adult	Child 0-4	Child 5-11	>12 & Adult

Inhaled Corticosteroids

Flovent-HFA	Fluticasone-HFA MDI: 44, 110, or 220 mcg/puff	176 mcg	88-176 mcg	88-264 mcg	176-352 mcg	176-352 mcg	264-440 mcg	>352 mcg	>440 mcg
Flovent-DPI	Fluticasone-DPI DPI: 50, 100, or 250 mcg/inhalation	NA	100-200 mcg	100-300 mcg	NA	200-400 mcg	300-500 mcg	>400 mcg	>500 mcg
OVAR RediHaler HFA	Beclomethasone Dipropionate HFA 40-80 mcg/puff	NA	80-160 mcg	80-240 mcg	NA	>160-320 mcg	>240-320 mcg	>320 mcg	>320 mcg
Pulmicort	Budesonide DPI 90 or 180 mcg/inhalation	NA	180-400 mcg	180-600 mcg	NA	400-800 mcg	600-1200 mcg	>800 mcg	>1200 mcg
Asmanex	Inhalation suspension for nebulization (child dose) .25 & .5 mg	0.25-0.5 mg	.5 mg	NA	0.5-1.0 mg	1.0 mg	NA	>1.0 mg	NA
Asmanex	Mometasone HFA 100 or 200 mcg/inhalation	NA	NA	200 mcg	NA	NA	200 mcg	NA	400 mcg
Asmanex	Mometasone DPI 110 or 220 mcg/inhalation	NA	110 mcg	220 mcg	NA	110 mcg	440 mcg	110 mcg	440-880 mcg

Combined Medications

Advair	Fluticasone/Salmeterol DPI 100/50; 250/50; 500/50	NA	100/50 1 puff bid	100/50 1 puff bid	NA	100/50 1 puff bid	250/50 1 puff bid	100/50 1 puff bid	250/50 - 500/50 1 puff bid
Advair HFA MDI	Fluticasone/Salmeterol HFA 45 mcg/21 mcg, 115 mcg/21 mcg, 230 mcg/21 mcg	NA	NA	45/21 2 puffs bid	NA	NA	115/21 2 puffs bid	NA	230/21 2 puffs bid
Symbicort HFA	Budesonide/formoterol fumarate dihydrate 80 mcg/4.5 mcg, 160 mcg/4.5 mcg	NA	NA	80/4.5 2 puffs bid	NA	NA	160/4.5 2 puffs bid	NA	160/4.5 2 puffs bid
Dulera	Mometasone/Formoterol fumarate dihydrate 100 mcg/5 mcg, 200 mcg/5 mcg	NA	NA	100/5 2 puffs bid	NA	NA	200/5 2 puffs bid	NA	200/5 2 puffs bid

Long-Acting Muscarinic Antagonists

Spiriva Respimat-HFA	Tiotropium Bromide-HFA MDI: 1.25 mcg/puff	NA	NA	2.5 mg	NA	NA	2.5 mg	NA	2.5 mg
Spiriva HandiHaler-DPI	Tiotropium Bromide-DPI DPI: 18 mcg/inhalation	NA	NA	2.5 mg	NA	NA	2.5 mg	NA	2.5 mg

Key: HFA= hydrofluoroalkane NA = not approved

Revised_7.7.21

Brand	Drug	Daily Dose
Short Acting Bronchodilators		
ProAir HFA Proventil HFA Ventolin HFA	Albuterol Sulfate	2-4 puffs q 4-6 hr PRN (90 mcg/puff)
Xopenex HFA	Levalbuterol Tartrate	2-4 puffs q 4-6 hr PRN (45 mcg/puff)
ProAir Digihaler	Albuterol Sulfate	Ages > 4 years 2 puffs q 4-6 hrs 117 mcg/puff
ProAir Respiclick DPI	Albuterol Sulfate	Ages > 12 years 2 puffs q 4-6 hrs 90 mcg/puff
Leukotriene Modifiers		
Singulair	Montelukast Sodium 4, 5, 10, mg tabs & 4 mg sprinkles at bed time	12 mos-23 mos: 4 mg sprinkles with 1 spoonful of CAIR: Carrots, Applesauce, Ice Cream or Rice. 12 mos-5 years: 4 mg chewable tablet 6 yrs - 14 yrs: 5 mg chewable tablet > 15 years 10 mg tablet
Antihistamines		
Zyrtec	Cetirizine (OTC) syrup: 5 mg/5 ml tablet: 5 & 10 mg	6 mos-2 years: 2.5 mg daily 2-5 years: 2.5 mg daily; may increase to 5 mg daily > 6 years: 5-10 mg daily
Claritin Tablets: Regular; Rapid - disinte- grating; Orally disintegrating	Loratadine (OTC) syrup: 1 mg/1 ml tablets: 10 mg	2-5 years: 5 mg daily > 6 years: 10 mg daily
Allegra	Fexofenadine (OTC) syrup: 15 mg/2.5 ml or 30 mg/5 ml tablets: 30, 60, 180 mg	6 mos-2 yrs: 15 mg BID 2-11 yrs: 30 mg BID > 12 yrs: 60 mg BID or 180 mg daily 6-11 tablets
Oral Steroids		
	Prednisone/Prednisolone 0.25-2 mg/kg daily in single dose in am or every other day as needed for control	Inpatient: Child - 1 mg/kg in 2 divided doses (maximum = 60 mg/day) until PEF 70% of predicted or personal best >12 yrs - 7.5 - 60 mg/day in 1 or 2 divided doses until PEF reaches 70% of predicted or personal best Outpatient Burst: Child - 1-2 mg/kg/day maximum 60 mg/day for 3-10 days Adult - 40-60 mg in single or 2 divided doses for total of 3-10 days
Dexamethasone	Dexamethasone	Outpatient: po 0.6 mg/kg maximum 16 mg/day; 2 total doses over 2 days

FIGURE 4–2a. CLASSIFYING ASTHMA SEVERITY AND INITIATING TREATMENT IN CHILDREN 0–4 YEARS OF AGE

Assessing severity and initiating therapy in children who are not currently taking long-term control medication

Components of Severity		Classification of Asthma Severity (0–4 years of age)			
		Intermittent	Persistent		
			Mild	Moderate	Severe
Impairment	Symptoms	≤2 days/week	>2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	0	1–2x/month	3–4x/month	>1x/week
	Short-acting beta ₂ -agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week but not daily	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
Risk	Exacerbations requiring oral systemic corticosteroids	0–1/year	≥2 exacerbations in 6 months requiring oral systemic corticosteroids, or ≥4 wheezing episodes/1 year lasting >1 day AND risk factors for persistent asthma		
		← Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time. →			
		Exacerbations of any severity may occur in patients in any severity category.			
Recommended Step for Initiating Therapy (See figure 4–1a for treatment steps.)		Step 1	Step 2	Step 3 and consider short course of oral systemic corticosteroids	
		In 2–6 weeks, depending on severity, evaluate level of asthma control that is achieved. If no clear benefit is observed in 4–6 weeks, consider adjusting therapy or alternative diagnoses.			

Key: EIB, exercise-induced bronchospasm

Notes

- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- Level of severity is determined by both impairment and risk. Assess impairment domain by patient's/caregiver's recall of previous 2–4 weeks. Symptom assessment for longer periods should reflect a global assessment such as inquiring whether the patient's asthma is better or worse since the last visit. Assign severity to the most severe category in which any feature occurs.
- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma severity. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past 6 months, or ≥4 wheezing episodes in the past year, and who have risk factors for persistent asthma may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.

FIGURE 4–3a. ASSESSING ASTHMA CONTROL AND ADJUSTING THERAPY IN CHILDREN 0–4 YEARS OF AGE

Components of Control		Classification of Asthma Control (0–4 years of age)		
		Well Controlled	Not Well Controlled	Very Poorly Controlled
Impairment	Symptoms	≤2 days/week	>2 days/week	Throughout the day
	Nighttime awakenings	≤1x/month	>1x/month	>1x/week
	Interference with normal activity	None	Some limitation	Extremely limited
	Short-acting beta ₂ -agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week	Several times per day
Risk	Exacerbations requiring oral systemic corticosteroids	0–1/year	2–3/year	>3/year
	Treatment-related adverse effects	Medication side effects can vary in intensity from none to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk.		
Recommended Action for Treatment (See figure 4–1a for treatment steps.)		<ul style="list-style-type: none"> Maintain current treatment. Regular followup every 1–6 months. Consider step down if well controlled for at least 3 months. 	<ul style="list-style-type: none"> Step up (1 step) and Reevaluate in 2–6 weeks. If no clear benefit in 4–6 weeks, consider alternative diagnoses or adjusting therapy. For side effects, consider alternative treatment options. 	<ul style="list-style-type: none"> Consider short course of oral systemic corticosteroids, Step up (1–2 steps), and Reevaluate in 2 weeks. If no clear benefit in 4–6 weeks, consider alternative diagnoses or adjusting therapy. For side effects, consider alternative treatment options.

Key: EIB, exercise-induced bronchospasm

Notes:

- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- The level of control is based on the most severe impairment or risk category. Assess impairment domain by caregiver’s recall of previous 2–4 weeks. Symptom assessment for longer periods should reflect a global assessment such as inquiring whether the patient’s asthma is better or worse since the last visit.
- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma control. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate poorer disease control. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have not-well-controlled asthma, even in the absence of impairment levels consistent with not-well-controlled asthma.
- Before step up in therapy:
 - Review adherence to medications, inhaler technique, and environmental control.
 - If alternative treatment option was used in a step, discontinue it and use preferred treatment for that step.

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
			For children age 4 years only, see Step 3 and Step 4 on Management of Persistent Asthma in Individuals Ages 5–11 Years diagram.			

Assess Control

- First check adherence, inhaler technique, environmental factors,[▲] and comorbid conditions.
- **Step up** if needed; reassess in 4–6 weeks
- **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.

FIGURE 4–2b. CLASSIFYING ASTHMA SEVERITY AND INITIATING TREATMENT IN CHILDREN 5–11 YEARS OF AGE

Assessing severity and initiating therapy in children who are not currently taking long-term control medication

Components of Severity		Classification of Asthma Severity (5–11 years of age)			
		Intermittent	Persistent		
			Mild	Moderate	Severe
Impairment	Symptoms	≤2 days/week	>2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	≤2x/month	3–4x/month	>1x/week but not nightly	Often 7x/week
	Short-acting beta ₂ -agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week but not daily	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung function	<ul style="list-style-type: none"> • Normal FEV₁ between exacerbations • FEV₁ >80% predicted • FEV₁/FVC >85% 	<ul style="list-style-type: none"> • FEV₁ = >80% predicted • FEV₁/FVC >80% 	<ul style="list-style-type: none"> • FEV₁ = 60–80% predicted • FEV₁/FVC = 75–80% 	<ul style="list-style-type: none"> • FEV₁ <60% predicted • FEV₁/FVC <75%
Risk	Exacerbations requiring oral systemic corticosteroids	0–1/year (see note) ≥2/year (see note)			
		← Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time for patients in any severity category. → Relative annual risk of exacerbations may be related to FEV ₁ .			
Recommended Step for Initiating Therapy		Step 1	Step 2	Step 3, medium-dose ICS option	Step 3, medium-dose ICS option, or step 4
(See figure 4–1b for treatment steps.)		In 2–6 weeks, evaluate level of asthma control that is achieved, and adjust therapy accordingly.			

Key: EIB, exercise-induced bronchospasm; FEV₁, forced expiratory volume in 1 second; FVC, forced vital capacity; ICS, inhaled corticosteroids

Notes

- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- Level of severity is determined by both impairment and risk. Assess impairment domain by patient's/caregiver's recall of the previous 2–4 weeks and spirometry. Assign severity to the most severe category in which any feature occurs.
- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma severity. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate greater underlying disease severity. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.

FIGURE 4–3b. ASSESSING ASTHMA CONTROL AND ADJUSTING THERAPY IN CHILDREN 5–11 YEARS OF AGE

Components of Control		Classification of Asthma Control (5–11 years of age)		
		Well Controlled	Not Well Controlled	Very Poorly Controlled
Impairment	Symptoms	≤2 days/week but not more than once on each day	>2 days/week or multiple times on ≤2 days/week	Throughout the day
	Nighttime awakenings	≤1x/month	≥2x/month	≥2x/week
	Interference with normal activity	None	Some limitation	Extremely limited
	Short-acting beta ₂ -agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week	Several times per day
	Lung function			
	• FEV ₁ or peak flow	>80% predicted/ personal best	60–80% predicted/ personal best	<60% predicted/ personal best
	• FEV ₁ /FVC	>80%	75–80%	<75%
Risk	Exacerbations requiring oral systemic corticosteroids	0–1/year	≥2/year (see note)	
		Consider severity and interval since last exacerbation		
	Reduction in lung growth	Evaluation requires long-term followup.		
	Treatment-related adverse effects	Medication side effects can vary in intensity from none to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk.		
Recommended Action for Treatment (See figure 4–1b for treatment steps.)		<ul style="list-style-type: none"> • Maintain current step. • Regular followup every 1–6 months. • Consider step down if well controlled for at least 3 months. 	<ul style="list-style-type: none"> • Step up at least 1 step and • Reevaluate in 2–6 weeks. • For side effects: consider alternative treatment options. 	<ul style="list-style-type: none"> • Consider short course of oral systemic corticosteroids, • Step up 1–2 steps, and • Reevaluate in 2 weeks. • For side effects, consider alternative treatment options.

Key: EIB, exercise-induced bronchospasm; FEV₁, forced expiratory volume in 1 second; FVC, forced vital capacity

Notes:

- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- The level of control is based on the most severe impairment or risk category. Assess impairment domain by patient's/caregiver's recall of previous 2–4 weeks and by spirometry/or peak flow measures. Symptom assessment for longer periods should reflect a global assessment such as inquiring whether the patient's asthma is better or worse since the last visit.
- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma control. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate poorer disease control. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.
- Before step up in therapy:
 - Review adherence to medications, inhaler technique, environmental control, and comorbid conditions.
 - If alternative treatment option was used in a step, discontinue it and use preferred treatment for that step.

AGES 5-11 YEARS: STEPWISE APPROACH FOR MANAGEMENT OF ASTHMA

		Management of Persistent Asthma in Individuals Ages 5-11 Years				
		Intermittent Asthma				
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 [▲]	Daily and PRN combination medium-dose ICS-formoterol [▲]	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 low-dose ICS-LABA, or daily low-dose ICS + LTRA,* or daily low-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, and PRN SABA
		Steps 2-4: Conditionally recommend the use of subcutaneous immunotherapy as an adjunct treatment to standard pharmacotherapy in individuals ≥ 5 years of age whose asthma is controlled at the initiation, build up, and maintenance phases of immunotherapy [▲]			Consider Omalizumab ^{**}	

Assess Control

- First check adherence, inhaler technique, environmental factors,[▲] and comorbid conditions.
- **Step up** if needed; reassess in 2-6 weeks
- **Step down** if possible (if asthma is well controlled for at least 3 consecutive months)

Consult with asthma specialist if Step 4 or higher is required. Consider consultation at Step 3.

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; LTRA, leukotriene receptor antagonist;

SABA, inhaled short-acting beta₂-agonist

[▲] Updated based on the 2020 guidelines.

* 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.

FIGURE 4-6. CLASSIFYING ASTHMA SEVERITY AND INITIATING TREATMENT IN YOUTHS ≥12 YEARS OF AGE AND ADULTS

— Assessing severity and initiating treatment for patients who are not currently taking long-term control medications

Components of Severity		Classification of Asthma Severity ≥12 years of age			
		Intermittent	Persistent		
			Mild	Moderate	Severe
Impairment Normal FEV ₁ /FVC: 8-19 yr 85% 20-39 yr 80% 40-59 yr 75% 60-80 yr 70%	Symptoms	≤2 days/week	>2 days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	≤2x/month	3-4x/month	>1x/week but not nightly	Often 7x/week
	Short-acting beta ₂ -agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week but not daily, and not more than 1x on any day	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung function	<ul style="list-style-type: none"> • Normal FEV₁ between exacerbations • FEV₁ >80% predicted • FEV₁/FVC normal 	<ul style="list-style-type: none"> • FEV₁ >80% predicted • FEV₁/FVC normal 	<ul style="list-style-type: none"> • FEV₁ >60% but <80% predicted • FEV₁/FVC reduced 5% 	<ul style="list-style-type: none"> • FEV₁ <60% predicted • FEV₁/FVC reduced >5%
Risk Exacerbations requiring oral systemic corticosteroids		0-1/year (see note)	≥2/year (see note)		
		Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time for patients in any severity category. Relative annual risk of exacerbations may be related to FEV ₁ .			
Recommended Step for Initiating Treatment (See figure 4-5 for treatment steps.)		Step 1 In 2-6 weeks, evaluate level of asthma control that is achieved and adjust therapy accordingly.	Step 2	Step 3 and consider short course of oral systemic corticosteroids	Step 4 or 5

Key: FEV₁, forced expiratory volume in 1 second; FVC, forced vital capacity; ICU, intensive care unit

Notes:

- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- Level of severity is determined by assessment of both impairment and risk. Assess impairment domain by patient's/caregiver's recall of previous 2-4 weeks and spirometry. Assign severity to the most severe category in which any feature occurs.
- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma severity. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate greater underlying disease severity. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have persistent asthma, even in the absence of impairment levels consistent with persistent asthma.

FIGURE 4–7. ASSESSING ASTHMA CONTROL AND ADJUSTING THERAPY IN YOUTHS ≥12 YEARS OF AGE AND ADULTS

Components of Control		Classification of Asthma Control (≥12 years of age)		
		Well Controlled	Not Well Controlled	Very Poorly Controlled
Impairment	Symptoms	≤2 days/week	>2 days/week	Throughout the day
	Nighttime awakenings	≤2x/month	1–3x/week	≥4x/week
	Interference with normal activity	None	Some limitation	Extremely limited
	Short-acting beta ₂ -agonist use for symptom control (not prevention of EIB)	≤2 days/week	>2 days/week	Several times per day
	FEV ₁ or peak flow	>80% predicted/ personal best	60–80% predicted/ personal best	<60% predicted/ personal best
	Validated questionnaires			
	ATAQ ACQ ACT	0 ≤0.75* ≥20	1–2 ≥1.5 16–19	3–4 N/A ≤15
Risk	Exacerbations requiring oral systemic corticosteroids	0–1/year	≥2/year (see note)	
		Consider severity and interval since last exacerbation		
	Progressive loss of lung function	Evaluation requires long-term followup care		
	Treatment-related adverse effects	Medication side effects can vary in intensity from none to very troublesome and worrisome. The level of intensity does not correlate to specific levels of control but should be considered in the overall assessment of risk.		
Recommended Action for Treatment (see figure 4–5 for treatment steps)		<ul style="list-style-type: none"> • Maintain current step. • Regular followups every 1–6 months to maintain control. • Consider step down if well controlled for at least 3 months. 	<ul style="list-style-type: none"> • Step up 1 step and Reevaluate in 2–6 weeks. • For side effects, consider alternative treatment options. 	<ul style="list-style-type: none"> • Consider short course of oral systemic corticosteroids, • Step up 1–2 steps, and • Reevaluate in 2 weeks. • For side effects, consider alternative treatment options.

*ACQ values of 0.76–1.4 are indeterminate regarding well-controlled asthma.

Key: EIB, exercise-induced bronchospasm; ICU, intensive care unit

Notes:

- The stepwise approach is meant to assist, not replace, the clinical decisionmaking required to meet individual patient needs.
- The level of control is based on the most severe impairment or risk category. Assess impairment domain by patient's recall of previous 2–4 weeks and by spirometry/or peak flow measures. Symptom assessment for longer periods should reflect a global assessment, such as inquiring whether the patient's asthma is better or worse since the last visit.
- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma control. In general, more frequent and intense exacerbations (e.g., requiring urgent, unscheduled care, hospitalization, or ICU admission) indicate poorer disease control. For treatment purposes, patients who had ≥2 exacerbations requiring oral systemic corticosteroids in the past year may be considered the same as patients who have not-well-controlled asthma, even in the absence of impairment levels consistent with not-well-controlled asthma.
- Validated Questionnaires for the impairment domain (the questionnaires do not assess lung function or the risk domain)
 - ATAQ = Asthma Therapy Assessment Questionnaire® (See sample in "Component 1: Measures of Asthma Assessment and Monitoring.")
 - ACQ = Asthma Control Questionnaire® (user package may be obtained at www.qoltech.co.uk or juniper@qoltech.co.uk)
 - ACT = Asthma Control Test™ (See sample in "Component 1: Measures of Asthma Assessment and Monitoring.")
 - Minimal Important Difference: 1.0 for the ATAQ; 0.5 for the ACQ; not determined for the ACT.
- Before step up in therapy:
 - Review adherence to medication, inhaler technique, environmental control, and comorbid conditions.
 - If an alternative treatment option was used in a step, discontinue and use the preferred treatment for that step.

AGES 12+ YEARS: STEPWISE APPROACH FOR MANAGEMENT OF ASTHMA

Intermittent Asthma		Management of Persistent Asthma in Individuals Ages 12+ Years				
Treatment	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6 [■]
Preferred	PRN SABA	Daily low-dose ICS and PRN SABA or PRN concomitant ICS and SABA [▲]	Daily and PRN combination low-dose ICS-formoterol [▲]	Daily and PRN combination medium-dose ICS-formoterol [▲]	Daily medium-high dose ICS-LABA + LAMA and PRN SABA [▲]	Daily high-dose ICS-LABA + oral systemic corticosteroids + PRN SABA
Alternative		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 + 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: Conditionally recommend the use of subcutaneous immunotherapy as an adjunct treatment to standard pharmacotherapy in individuals ≥ 5 years of age whose asthma is controlled at the initiation, build up, and maintenance phases of immunotherapy [▲]			Consider adding Asthma Biologics (e.g., anti-IgE, anti-IL5, anti-IL5R, anti-IL4/IL13) ^{**}	

Assess Control

- First check adherence, inhaler technique, environmental factors, [▲] and comorbid conditions.
- **Step up** if needed; reassess in 2-6 weeks
- **Step down** if possible (if asthma is well controlled for at least 3 consecutive months)

Consult with asthma specialist if Step 4 or higher is required. Consider consultation at Step 3.

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; LAMA, long-acting muscarinic antagonist; LTRA, leukotriene receptor antagonist; SABA, inhaled short-acting beta₂-agonist

[▲] Updated based on the 2020 guidelines.

^{*} 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.

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

