



CLINICAL CARE GUIDELINE

Guideline Number: DHMP_DHMC_CG1007

Effective Date: 11/2022

Guideline Subject: Management of Asthma in Adults and Children

Revision Date: 11/2023

Pages: 1 of 16

Christine Seals Messersmith MD

11/1/22

Quality Management Committee Chair

Date

I. PURPOSE:

To define the expected standards of care for management of Asthma in Adults and Children. The overarching goal of asthma care is to achieve asthma control, enabling a patient to live without functional limitations, impairment in quality of life, or risk of adverse events.

II. POPULATION:

All currently enrolled DHMP and DHMC members with a diagnosis of asthma. This guideline will focus primarily on the management of asthma for those members who have already been diagnosed. For further information regarding the diagnosis of asthma, please refer to national guidelines or the Denver Health CHS Adult Asthma Care Guideline PolicyStat ID 2033380

III. GUIDELINE:

DHMC supports the National Heart, Lung, and Blood Institute (NHLBI) Education and Prevention Program. Program guidelines stress the assessment of asthma severity and control as a means of selecting and titrating treatment. NHLBI: Summary of Recommendations can be accessed at: <https://www.nhlbi.nih.gov/health-pro/guidelines/current/asthma-guidelines/full-report>. Specifically this guideline provides a framework to incorporate the Expert Panel Report 3 (EPR-3) into standard work for members with asthma.

A. Asthma Diagnosis:

1. Detailed medical history:
 - a. History of the Present Illness (HPI) – Assess for:
 - i. Episodic symptoms of airflow obstruction or airway responsiveness (e.g., episodic wheezing, cough, shortness of breath).
 - ii. Duration of symptoms
 - iii. Associated symptoms
 - iv. Triggers or alleviating factors
 - v. Medication trials and outcomes
 - b. Past Medical History (PMH):
 - i. Allergies (seasonal, food, perennial)
 - ii. Eczema
 - iii. Other diagnoses that can masquerade as asthma (see Section B, item 3b of this guideline).
 - c. Social History (SH):
 - i. Current or former tobacco use, marijuana use, etc.
 - ii. Exposure to second hand smoke
 - iii. Animals in home
 - iv. Molds
 - v. Pests
 - d. Family History
 - i. Asthma
 - ii. Allergy
 - iii. Atopy
2. Physical Exam

NOTE:

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- a. Presence of wheeze or decreased aeration
- b. Improvement in wheeze and aeration in response to bronchodilators
3. Spirometry
 - a. Spirometry should be performed when feasible in all patients 8 year of age or older when the diagnosis is not clear based on history and physical exam findings
 - b. Any pediatric patients who have difficulties performing spirometry in the medical home and there is a question about the diagnosis, should be referred to a Pediatric Pulmonologist
 - i. Reversibility in children is determined by an increase in FEV₁ increases from baseline by > 12 percent of the predicted value.
 - c. Spirometry should meet American Thoracic Society (ATS) standards. ^c
 - d. Spirometry measures should include:
 - i. FEV₁
 - ii. FVC
 - iii. FEV₁/FVC
4. Classification of asthma severity and disease risk:
 - a. All asthma patients should have their asthma severity assessed before any therapy is begun. Refer to Classifying Asthma Severity and Initiating Therapy table from EPR-3's Asthma Care Quick Reference (<https://www.nhlbi.nih.gov/sites/default/files/media/docs/12-5075.pdf>.)

B. Management:

1. There are four components to asthma management as outlined by EPR-3:
 - a. Measures of assessment and monitoring
 - b. Education for partnership in asthma care
 - c. Control of environmental factors and comorbid conditions that affect asthma
 - d. Medications
2. Measures of assessment and monitoring to diagnose and assess characteristics of asthma and to monitor whether asthma control is achieved and maintained. Refer to Assessing Asthma Control and Adjusting Therapy from EPR-3's Asthma Care Quick Reference (<https://www.nhlbi.nih.gov/sites/default/files/media/docs/12-5075.pdf>).
 - a. All asthma patients should be monitored for symptom control at every visit and at least once a year
 - b. Symptoms
 - i. Nighttime awakenings
 - ii. Need for SABA for quick relief of symptoms
 - iii. Work or school days missed
 - iv. Ability to engage in normal activity
 - v. Quality of life assessments
 - c. Spirometry may be performed annually or more often as determined by the provider.
 - d. Delineate persistent from intermittent disease. Persistent baseline/untreated asthma is suggested by any of the following:

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- i. Symptoms > 2 days/week OR
 - ii. Night awakenings from asthma \geq 2 times/month OR
 - iii. Limitation of activities, despite pre-treatment for exercise induced asthma OR
 - iv. Short-acting beta agonist use > 2 times/week (not for exercise induced bronchospasm).
 - v. More than two steroid bursts in one year OR
 - vi. FEV₁ < 80% predicted, or lower than expected for age
 - e. Risk: Determine the patient's overall risk:
 - i. Exacerbation frequency
 - ii. ED visits or other unannounced care
 - iii. Decline in lung function greater than expected as a result of normal aging
 - iv. Side effects of medications
 - f. In general, patients who have intermittent or mild persistent asthma that has been under control for at least three months should be seen by a clinician approximately every six months and patient who have uncontrolled and/or severe persistent asthma and those who need additional supervision to help them follow their treatment plan need to be seen more often.
3. Education for a partnership in asthma care
 - a. Providers of asthmatic patients should discuss asthma and asthma triggers with patients when first diagnosed and on an ongoing basis. Providers include physicians, NPs, PAs, RNs and pharmacists. Educational handouts are available in EHR.
 - i. What is asthma?
 - ii. Asthma triggers?
 - b. Patients, in partnership with providers, should develop a self-management goal regarding their asthma
4. Control of environmental factors and comorbid conditions that affect asthma
 - a. Advise patients to eliminate or reduce exposure to the following allergens/irritants
 - i. Tobacco (cigarettes or vaping)
 - ii. Marijuana
 - iii. Indoor
 1. Pests (house dust mites, cockroaches)
 2. Animal dander
 3. Mold
 4. Wood burning
 5. Unvented gas stove
 6. Volatile organic compounds (e.g. paint, cleaning, fluids)
 7. Perfumes
 8. Incense or diffusers

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9. NSAIDs and aspirin in some adults
 - iv. Outdoor
 1. Pollens
5. When patient's asthma cannot be well controlled, evaluation for a complicating, comorbid condition, for example:
 - a. Allergic bronchopulmonary aspergillosis
 - b. Gastroesophageal reflux disease (GERD)
 - c. Obesity
 - d. Obstructive sleep apnea (OSA)
 - e. Rhinitis/sinusitis
 - f. Stress/depression
 - g. Vocal cord dysfunction (VCD)
 - h. Upper airway cough syndrome
6. Pharmacologic therapy:
 - a. A stepwise approach to pharmacologic therapy is recommended to gain and maintain control of asthma in both the impairment and risk domains. Refer to the Stepwise Approach for Managing Asthma Long Term table from EPR-3's Asthma Care Quick Reference (<https://www.nhlbi.nih.gov/sites/default/files/media/docs/12-5075.pdf>.) When initiating therapy, the type, amount, and scheduling of medication is dictated by asthma severity. The level of control is considered when adjusting therapy. Step down therapy is essential to identify the minimum medication necessary to maintain control.
 - i. Patients with persistent asthma should be on long-term controller medication to be taken daily. Inhaled corticosteroids (ICS) are the most potent and consistently effective long-term single control medication for asthma
 - ii. Regularly scheduled daily chronic use of SABA is not recommended and generally indicates inadequate control of asthma and the need for initiating or intensifying anti-inflammatory therapy (e.g., ICS).
 - iii. Step up therapy if needed to gain control patient medication use and technique should first be reviewed, as well as environmental control.
 - iv. Spacers should be used with MDIs to optimize appropriate drug delivery. Videos demonstrating how to use inhalers with a spacer and mask and how to prime an asthma inhaler in English and Spanish can be found at DenverHealth.org/Asthma. In addition there are Denver Health created handouts on spacer with mask technique and spacer technique (without mask) in English and Spanish in HER
 - b. Long term controller medication
 - i. ICS
 - ii. ICS long-acting beta agonist (LABA) combination
 - iii. LABA

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- iv. LAMA
- v. Leukotriene modifier
- vi. Methylxanthines
- vii. Monoclonal antibody therapy

- c. Quick relief Medication
 - i. SABA
 - ii. Anticholinergics (for exacerbations only)

7. Referrals

- a. Pediatric patients have the option to see allergy if underlying inhalant and/or food allergies are a concern.
- b. Pediatric patients have the options to see Pulmonology if they have difficult to control asthma, frequent exacerbations or comorbid conditions

8. Goals of therapy

- a. Patients should
 - i. Have no chronic symptoms day or night
 - ii. Have minimal or no exacerbations (i.e., PUCC/AUCC visits, ED visits, hospitalizations).
 - iii. Experience no activity limitations (i.e., no missed school or work).
 - iv. Have minimal use of quick relief agents (SABA use <2x/week-except for exercise-induced bronchospasm, one canister of SABA should last longer than one month).
 - v. Experience minimal or no adverse effects from medications

D. Care and Management:

Initial Visit:



Follow-up Visits:

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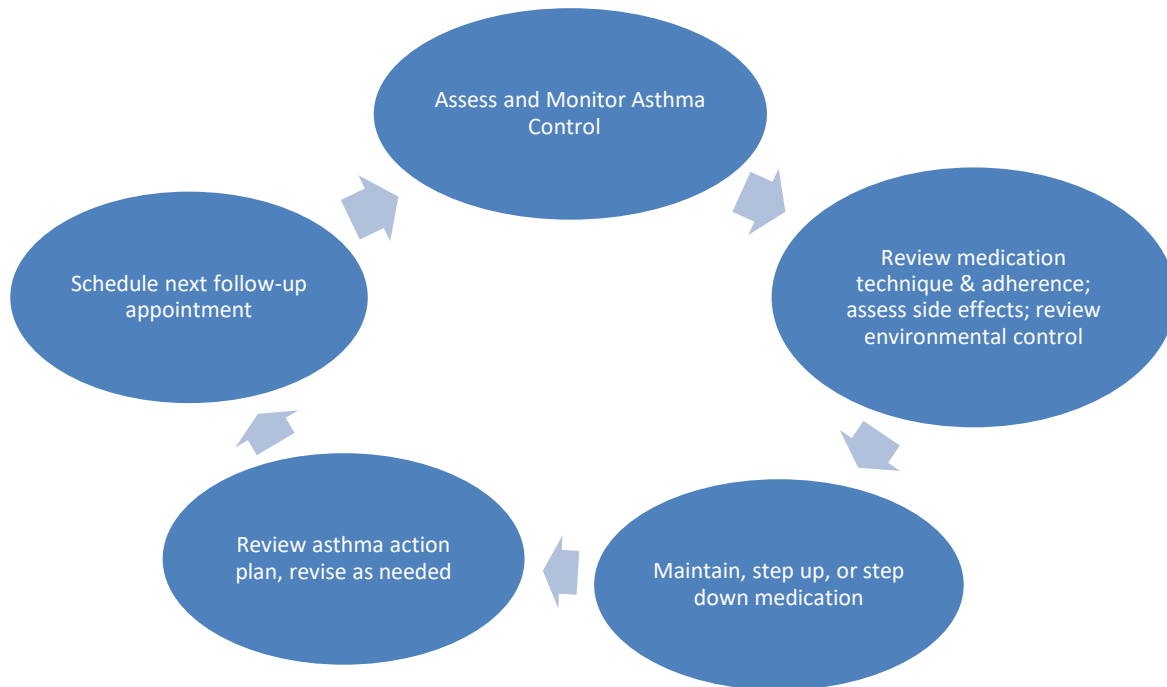
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D. Four Components of Care and Management:

1. Assessment and monitoring:

- a. Assess asthma severity to initiate therapy.
- b. Assess asthma control to monitor and adjust therapy.
- c. Schedule follow-up care.
- d. Consider specialty consult/referral with asthma symptoms that are difficult to control or requires frequent hospitalization and/or ED visits.

2. Education for a partnership in asthma care:

- a. Provide self-management education.
- b. Develop a written asthma action plan in partnership with the patient.
- c. Integrate education into all points of care where health professionals interact with patients.

3. Control environmental factors and comorbid conditions:

- a. Recommend measures to control exposures to allergens and pollutants or irritants that make asthma worse.
- b. Treat comorbid conditions.

4. Medications:

- a. Select medication and delivery devices to meet patient’s need and circumstances.

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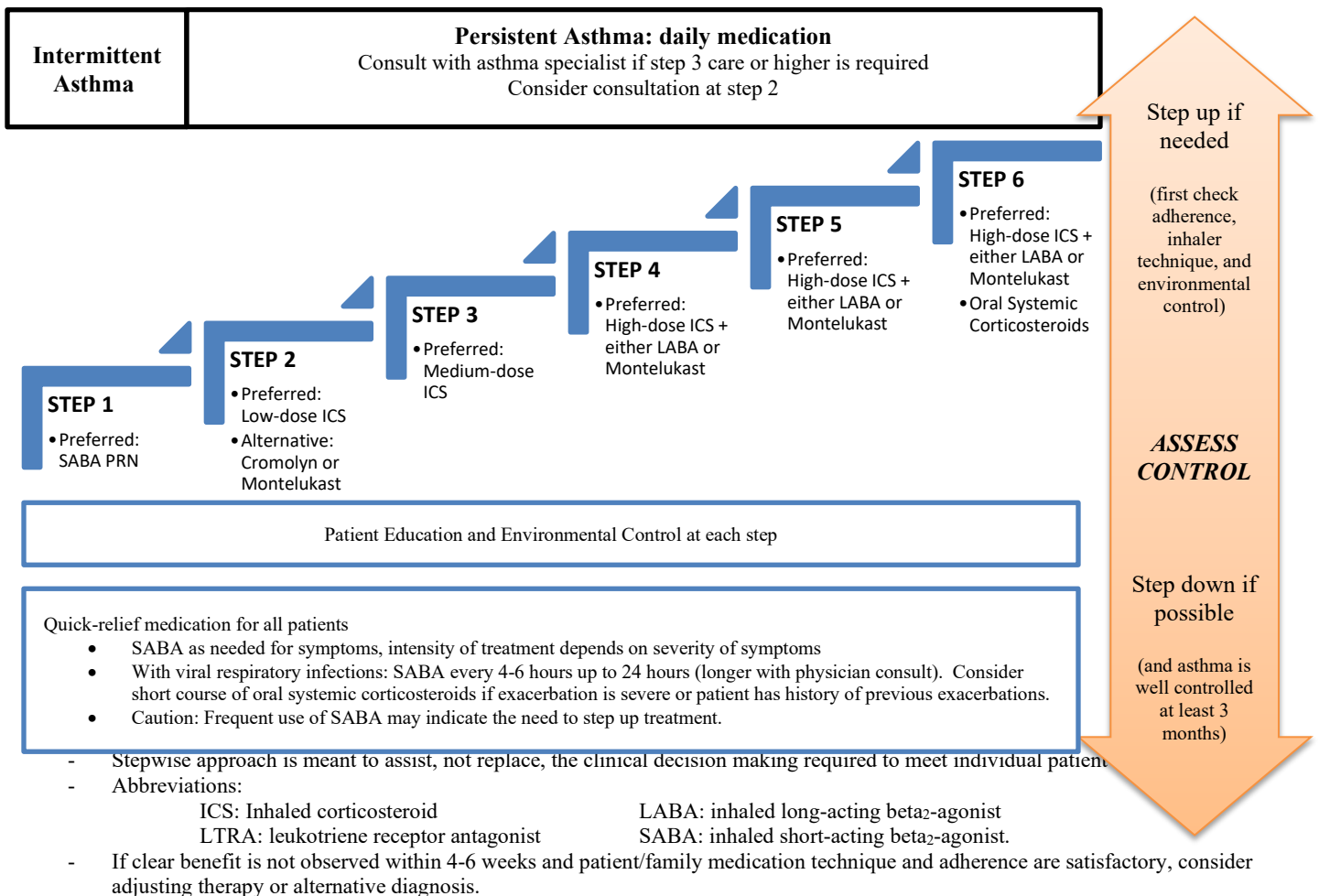
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STEPWISE APPROACH FOR MANAGING ASTHMA IN CHILDREN 0-4 YEARS OF AGE:



Classifying Asthma Severity and Initiating Treatment in Children 0-4 Years of Age

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

Table with 5 columns: Components of Severity, Intermittent, Mild, Moderate, Severe. Rows include Impairment (Symptoms, Nighttime awakenings, SABA use, Interference) and Risk (Exacerbations requiring oral systemic corticosteroids). Includes a section for Recommended step for initiating therapy.

Notes:

- Level of severity is determined by both impairment and risk. Assess impairment domain by caregiver's recall of previous 2-4 weeks. 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 with ≥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.

Assessing Asthma Control in Children 0-4 Years of Age

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Assessing Asthma CONTROL in Children 0-4 Years of Age

Components of Control		CLASSIFICATION OF ASTHMA CONTROL: CHILDREN 0-4 YEARS		
		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
	SABA use for symptom control	≤2 days/week	>2 days/week	Several times per day
	Interference with normal activity	None	Some limitation	Extremely limited
Risk	Exacerbations requiring oral systemic corticosteroids	0-1/year	2-3/year	>3/year
	Treatment-related adverse events	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 The stepwise approach is meant to assist, not replace clinical decision making requires to meet individual patient needs.		<ul style="list-style-type: none"> •Maintain current step •Regular follow ups every 1-6 months •Consider step down if well controlled 3+ months 	<ul style="list-style-type: none"> •Step up 1 step and reevaluate in 2-6wks •If no clear benefit in 4-6 wks, 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 wks. •If no clear benefit in 4-6 wks, consider alternative diagnoses or adjusting therapy •Consider expert consultation with difficult-to-control asthma or for help with the diagnosis and/or adherence •For side effects, consider alternative treatments options
		Before step up in therapy: <ul style="list-style-type: none"> •Review adherence, technique, environmental control and comorbid conditions If an alternative treatment option was used in a step, discontinue and use preferred treatment for that step.		

- The level of control is based on the most severe impairment or risk category. Assess impairment domain by caregivers 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 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

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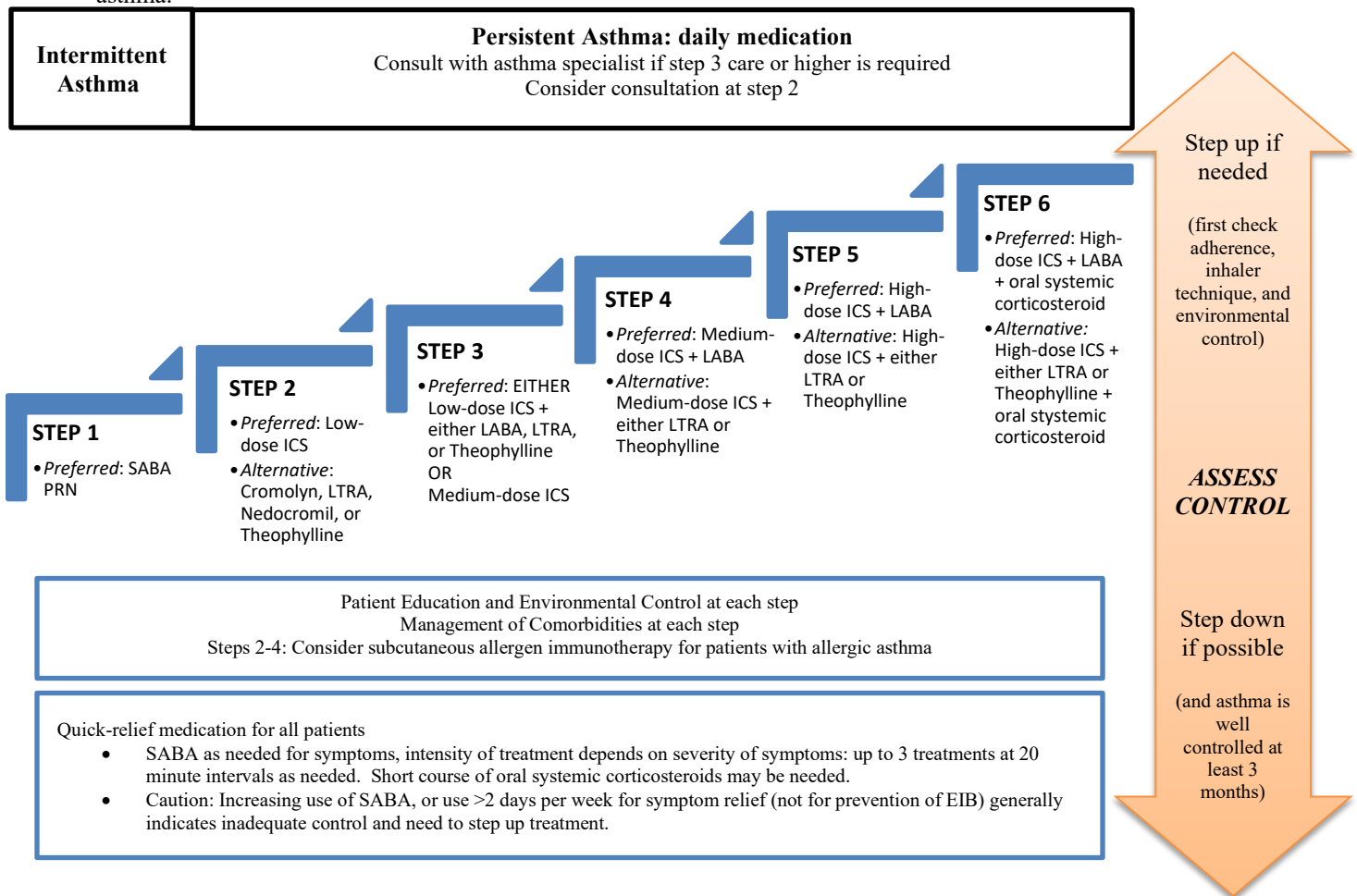
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as patients who have not-well-controlled asthma, even in the absence of impairment levels consistent with persistent asthma.



NOTES:

- The stepwise approach is meant to assist, not replace, the clinical decision making required to meet individual patient needs
- Abbreviations:
 - ICS: Inhaled corticosteroid
 - LTRA: leukotriene receptor antagonist
 - LABA: inhaled long-acting beta2-agonist
 - SABA: inhaled short-acting beta2-agonist.
- Theophylline is less desirable due to the need to monitor serum concentration levels.
- The role of allergy in asthma is greater in children than in adults.

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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: CHILDREN 5-11 YEARS			
		Intermittent	Persistent		
			Mild	Moderate	Severe
Impairment	Symptoms	≤2 days/week	>2days/week but not daily	Daily	Throughout the day
	Nighttime awakenings	≤2x/month	3-4x/month	>1x/week but not nightly	Often 7x/week
	SABA use for symptom control	≤2 days/week	>2 days/week but not daily and not more than once/day	Daily	Several times per day
	Interference with normal activity	None	Minor limitation	Some limitation	Extremely limited
	Lung Function	Normal FEV ₁ between exacerbations			
	FEV ₁ (% predicted)	>80%	>80%	60-80%	<60%
	FEV ₁ /FVC	>85%	>80%	75-80%	<75%
Risk	Exacerbations requiring oral systemic corticosteroids	0-1/year	≥2 exacerbations/year		
		Generally, more frequent and intense events indicate greater severity			
		Consider severity and interval since last exacerbation. Frequency and severity may fluctuate over time for patients in any severity category. Exacerbations of any severity may occur in 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 inhaled corticosteroid option	STEP 3 Medium-dose inhaled corticosteroid option, or STEP 4	
	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 diagnosis					

Notes:

-Level of severity is determined by both impairment and risk. Assess impairment by caregiver's recall of previous 2-4 weeks. Assess risk over the last year. 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. It is suggested that patients with ≥2 exacerbations, requiring oral systemic corticosteroids in the past 6 months, or ≥4 wheezing episodes in the past year, with risk factors for persistent asthma be considered the same as those with persistent asthma, even in the absence of impairment levels consistent with persistent asthma.

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Assessing Asthma Control in Children 5-11 Years of Age

Assessing Asthma CONTROL in Children 5-11 Years of Age				
Components of Control		CLASSIFICATION OF ASTHMA CONTROL: CHILDREN 0-4 YEARS		
		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
	SABA use for symptom control	≤2 days/week	>2 days/week	Several times per day
	Interference with normal activity	None	Some limitation	Extremely limited
	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	2-3/year	>3/year
		Consider severity and interval since last exacerbation		
	Reduction in Lung Growth	Evaluation requires long-term follow-up.		
	Treatment-related adverse events	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 The stepwise approach is meant to assist, not replace clinical decision making requires to meet individual patient needs.		<ul style="list-style-type: none"> Maintain current step Regular follow ups every 1-6 months Consider step down if well controlled 3+ months 	<ul style="list-style-type: none"> Step up 1 step and reevaluate in 2-6wks 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 2wks Consider expert consultation with difficult-to-control asthma or for help with the diagnosis and/or adherence For side effects, consider alternative treatment options
		Before step up in therapy: <ul style="list-style-type: none"> Review adherence, technique, environmental control and comorbid conditions If an alternative treatment option was used in a step, discontinue and use preferred treatment for that step.		

- The level of control is based on the most severe impairment or risk category. Assess impairment domain by patient/caregiver's recall of previous 2-4 weeks and by spirometry/or peak flow measures. Symptom assessment for

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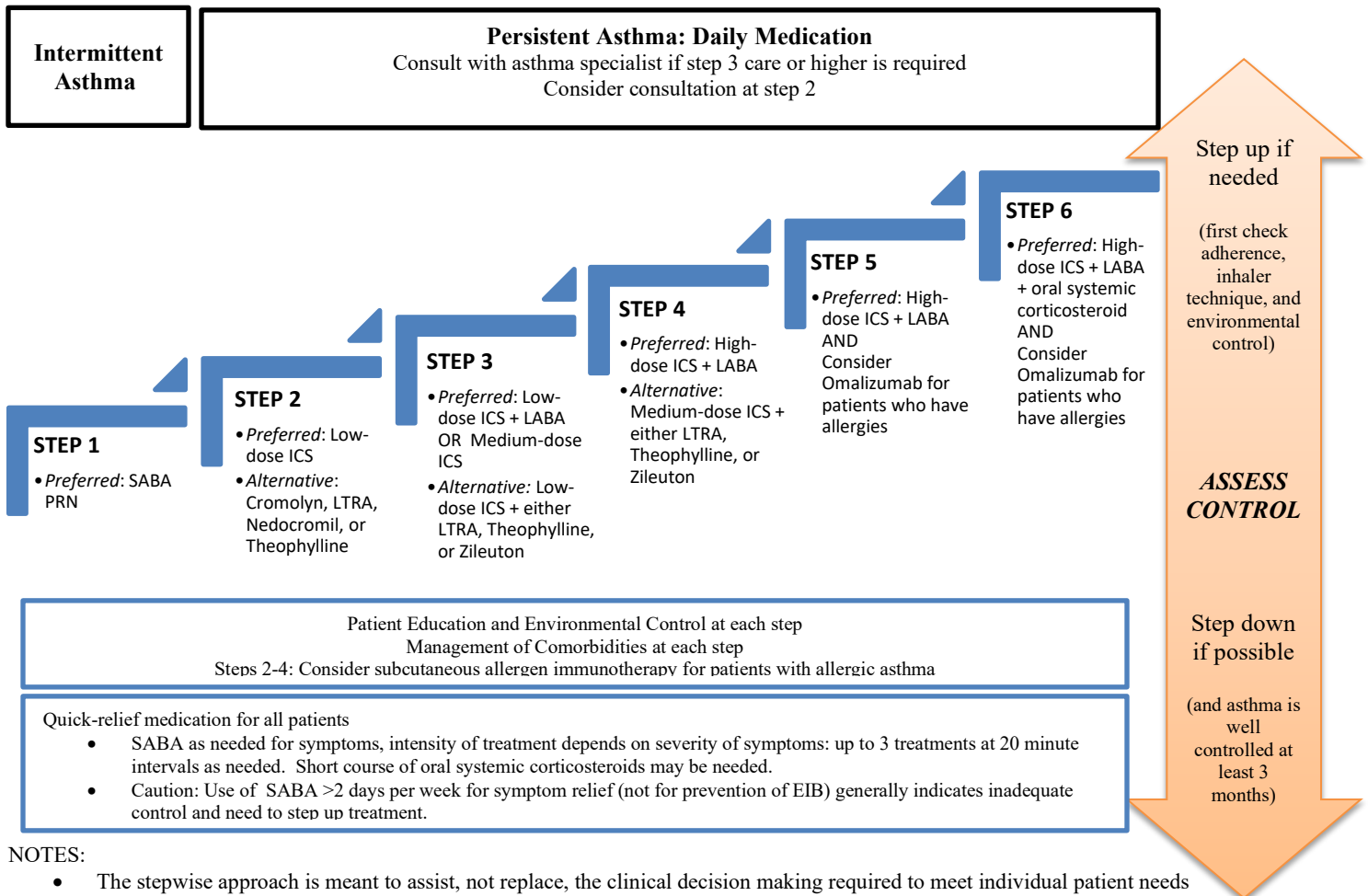
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longer periods should reflect a global assessment, such as inquiring whether the patient’s asthma is better or worse since the last visit.

- At present, there are inadequate data to correspond frequencies of exacerbations with different levels of asthma control. In general, more frequent and intense exacerbations indicate poorer disease control. For treatment purposes, those with ≥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 persistent asthma.

STEPWISE APPROACH FOR MANAGING ASTHMA FOR MEMBERS ≥12 YEARS OF AGE:



Patient Education and Environmental Control at each step
Management of Comorbidities at each step
Steps 2-4: Consider subcutaneous allergen immunotherapy for patients with allergic asthma

Quick-relief medication for all patients

- SABA as needed for symptoms, intensity of treatment depends on severity of symptoms: up to 3 treatments at 20 minute intervals as needed. Short course of oral systemic corticosteroids may be needed.
- Caution: Use of SABA >2 days per week for symptom relief (not for prevention of EIB) generally indicates inadequate control and need to step up treatment.

NOTES:

- The stepwise approach is meant to assist, not replace, the clinical decision making required to meet individual patient needs
- Abbreviations:
ICS: Inhaled corticosteroid LABA: inhaled long-acting beta2-agonist LTRA: leukotriene receptor antagonist

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SABA: inhaled short-acting beta2-agonist.

- Zileuton is a less desirable alternative due to limited studies as adjunctive therapy and the need to monitor liver function. Theophylline requires monitoring concentration levels.
• The role of allergy in asthma is greater in children than in adults.

Classifying Asthma Severity and Initiating Treatment in Members ≥12 Year of Age

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

Table with 5 main columns: Components of Severity, Intermittent, Persistent (Mild, Moderate, Severe), and Recommended step for initiating therapy. Includes sub-headers for Impairment and Risk, and detailed criteria for symptoms, SABA use, lung function, and exacerbations.

Notes:

-Level of severity is determined by both impairment and risk. Assess impairment by caregiver's recall of previous 2-4 weeks. Assess risk over the last year. 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. It is suggested that patients with ≥2 exacerbations, requiring oral systemic corticosteroids in the past 6 months, or ≥4 wheezing episodes in the past year, with risk factors for persistent asthma be considered the same as those with persistent asthma, even in the absence of impairment levels consistent with persistent asthma.

*normal FEV1/FVC by age:8-19 years, 85%; 20-39 years, 80%; 40-59 years, 75%; 60-80years, 70%

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Assessing Asthma CONTROL in youth and adults ≥12 Years of Age

Components of Control		CLASSIFICATION OF ASTHMA CONTROL: ≥12 YEARS		
		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
	SABA use for symptom control	≤2 days/week	>2 days/week	Several times per day
	Interference with normal activity	None	Some limitation	Extremely limited
	Lung Function: FEV ₁ or Peak/Flow	>80% predicted/personal best	60-80% predicted/personal best	<60% predicted/personal best
	Validated Questionnaires	ATAQ: 0 ACQ: ≤0.75 ACT: ≥20	ATAQ: 1-2 ACQ: ≥1.5 ACT: 16-19	ATAQ: 3-4 ACQ: N/A ACT: ≤15
Risk	Exacerbations requiring oral systemic corticosteroids	0-1/year	≥2/year Consider severity and interval since last exacerbation	
	Progressive loss of lung function	Evaluation requires long-term follow-up care.		
	Treatment-related adverse events	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 The stepwise approach is meant to assist, not replace clinical decision making requires to meet individual patient needs.		<ul style="list-style-type: none"> Maintain current step Regular follow ups every 1-6 months Consider step down if well controlled 3+ months 	<ul style="list-style-type: none"> Step up 1 step and reevaluate in 2-6wks 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 2wks Consider expert consultation with difficult-to-control asthma or for help with the diagnosis and/or adherence For side effects, consider alternative treatment options
		Before step up in therapy: <ul style="list-style-type: none"> Review adherence, technique, environmental control and comorbid conditions If an alternative treatment option was used in a step, discontinue and use preferred treatment for that step. 		

Assessing Asthma Control in Members ≥12 Years of Age

NOTE:

This guideline is designed to assist providers by providing an analytical framework for the evaluation and treatment of patients, and is not intended either to replace a clinicians judgment or to establish a protocol for all patients with a particular condition.



CLINICAL CARE GUIDELINE

Guideline Number: DHMP_DHMC_CG1007

Effective Date: 11/2022

Guideline Subject: Management of Asthma in Adults and Children

Revision Date: 11/2023

Pages: 16 of 16

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11/1/22

Quality Management Committee Chair

Date

- 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 indicate poorer disease control. For treatment purposes, those with ≥ 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.

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DHHA RELATED DOCUMENTS

None

ATTACHMENTS

None

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NOTE:

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Asthma Guideline_2022 - Needs signature

Final Audit Report

2022-11-10

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