MOLINA HEALTHCARE OF CALIFORNIA

ASTHMA GUIDELINE

The child guideline was reviewed and adopted by the Molina Healthcare of California Clinical Quality Management Committee (CQMC) April 18, 2001. The adult guideline was adopted by the CQMC August 15, 2001. The adult and child guidelines were adopted by the CQMC June 12, 2002. The 2002 NAEPP Expert Panel Report executive summary was adopted by the CQMC August 14, 2002, August 6, 2003, August 4, 2004, April 6, 2005, April 5, 2006 and April 4, 2007. The NAEPP 2007 Expert Panel Report summary, sponsored by PRIME®, was adopted by the CQMC December 5, 2007, December 10, 2008, November 4, 2009 and December 8, 2010.

Important Points from Asthma Clinical Guidelines

The following are extracted from the NHLBI_NAEPP 2007 Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. (www.nhlbi.nih.gov/guidelines/asthma/index.htm)

MONITORING CONTROL DETERMINES ONGOING THERAPY

Asthma control is achieved by:

1) **Reducing impairment, which includes:**
   a) Prevention of chronic and troublesome symptoms
   b) Reducing need for inhaled short-acting bronchodilator to relieve symptoms
   c) Maintenance of near normal lung function
   d) Maintenance of normal activity levels
   e) Patient and family satisfaction
2) **Reducing risk, which includes:**
   a) Prevention of recurrent exacerbations
   b) Prevention of progressive loss of lung function
   c) Avoidance of adverse effects of pharmacotherapy for asthma

Components of Control (≥ 12 years of Age and Adults)			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	
		Consider severity and interval since last exacerbation		
	Progressive loss of lung function	Evaluation requires long-term follow-up 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		• Maintain current step • Regular follow-ups every 1-6 months to maintain control. • Consider step down if well controlled for at least 3 months.	• Step up 1 step • Reevaluate in 2-6 weeks • For side effects, consider alternative treatment options	• Consider short course of oral systemic corticosteroids • Step up 1 – 2 steps • Reevaluate in 2 weeks • For side effects, consider alternative treatment options

Important Points from Asthma Clinical Guidelines

The following are extracted from the NHLBI_NAEPP 2007 Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. (www.nhlbi.nih.gov/guidelines/asthma/index.htm)

MONITORING CONTROL DETERMINES ONGOING THERAPY

Components of Control (Children 5–11 Years of Age)		Classification of Asthma Control (Children 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 • FEV1 or peak flow • FEV1/FVC	• >80% predicted/ personal best • >80% predicted	• 60- 80% predicted/ personal best • 75-80% predicted	• < 60% predicted/ personal best • < 75% predicted
Risk	Exacerbations requiring oral systemic corticosteroids	0 – 1 /year	≥2 / year	
		Consider severity and interval since last exacerbation		
	Reduction in lung growth	Evaluation requires long-term follow-up 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		• Maintain current step • Regular follow-ups every 1-6 months • Consider step down if well controlled for at least 3 months.	• Step up at least 1 step • Reevaluate in 2-6 weeks • For side effects, consider alternative treatment options	• Consider short course of oral systemic corticosteroids • Step up 1- 2 steps • Reevaluate in 2 weeks • For side effects, consider alternative treatment options

Important Points from Asthma Clinical Guidelines

The following are extracted from the NHLBI_NAEPP 2007 Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. (www.nhlbi.nih.gov/guidelines/asthma/index.htm)

MONITORING CONTROL DETERMINES ONGOING THERAPY

Components of Control Children 0-4 Years of Age)			Classification of Asthma Control (Children 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		• Maintain current treatment • Regular follow-ups every 1-6 months. • Consider step down if well controlled for at least 3 months.	• Step up 1 step • 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	• Consider short course of oral systemic corticosteroids • Step up 1- 2 steps • 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

A Pocket Guide for the busy Managed Care professional

GUIDELINES IN ASTHMA MANAGEMENT FOR MANAGED CARE

- Based upon the updated 2007 NAEPP/NHLBI Asthma Guidelines
- Intended to assist the care coordination team in improving the care of patients with asthma
- Developed through expert consensus

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POSITION STATEMENT:

Despite advances in therapy, asthma remains a disease which, in many patients, is suboptimally controlled. Research indicates that there is a disparity between patient and provider perceptions of asthma control, leading to many patients not achieving an adequate level of symptom control on a regular basis. The National Heart, Lung, and Blood Institute, through the National Asthma Education and Prevention Program, was convened to update existing asthma guidelines beginning in 2004, which resulted in the release of the updated 2007 NAEPP/NHLBI asthma guidelines.

Because of the overall scope and length of the updated asthma guidelines, their utility for decision makers in managed care may be limited. As a result, PRIME®, through an educational grant from Genentech and Novartis, convened an expert panel of leaders in the field of asthma to discuss the guidelines and create a condensed document which features key points contained herein. The purpose of this pocket guide is to assist the care coordination team in improving the treatment of patients with asthma.

DISCLAIMER: These treatment practice guidelines are not a substitute for any formal guidelines, nor are they an endorsement of any particular approach to asthma care.

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ESTABLISHING AN ACCURATE DIAGNOSIS IS ESSENTIAL

Visit the Following Organizations' Websites for Information About Diagnosis of Asthma

- American Academy of Allergy Asthma and Immunology
  www.aaaai.org
- American College of Allergy Asthma and Immunology
  www.acaai.org
- American Lung Association
  www.lungusa.org
- Asthma and Allergy Foundation of America
  www.aafa.org
- Food Allergy and Anaphylaxis Network
  www.foodallergy.org
- Allergy and Asthma Network, Mothers of Asthmatics
  www.breatherville.org
- Centers for Disease Control and Prevention
  Potentially Effective Interventions for Asthma, Web page
  www.cdc.gov/asthma/interventions/default.htm
- The National Asthma Education Program Information Center
  National Heart, Lung and Blood Institute
  www.nhlbi.nih.gov
- National Jewish Center for Immunology and Respiratory Medicine
  www.njc.org

To establish a diagnosis of asthma, clinicians should determine that:

1. Episodic symptoms of airflow obstruction are present
2. Airflow obstruction is at least partially reversible
3. Alternative diagnoses have been excluded

Recommended methods to establish the diagnosis of asthma include:

1. Medical history
2. Physical examination focusing on upper respiratory tract, chest, and skin
3. Spirometry to demonstrate obstruction and assess reversibility
4. Additional diagnostic testing as necessary to exclude alternative diagnoses

Key indicators which suggest a diagnosis of asthma include:

1. Wheezing
2. History of cough (particularly nocturnal), recurrent wheeze, recurrent dyspnea, recurrent chest tightness
3. Worsening of symptoms in the presence of exercise, viral infection, animals with fur, house-dust mites, mold, smoke, pollen, changes in weather, strong emotional expression, airborne chemicals or dusts, or menses
4. Worsening of symptoms at night, awakening the patient

Differential Diagnosis of Asthma

Upper airway disease (such as allergic rhinitis or sinusitis)
Airway obstruction (large or small)
Chronic obstructive pulmonary disease
Congestive heart failure
Pulmonary embolism
Laryngeal and/or vocal cord dysfunction
Cough related to drugs

SUCCESSFUL MANAGEMENT DEPENDS ON A COMPREHENSIVE APPROACH

EDUCATION

Document that patients have been provided with information on:

1. Basic facts about asthma
2. Roles of different medications in the treatment of asthma, including the difference between long-term controller medications and short-acting medications for quick-relief
3. Skills necessary to properly manage their asthma, including use of devices and symptom monitoring tools, as well as understanding specific precipitants to their asthma
4. Methods to control environmental triggers for asthma
5. When and how to adjust asthma treatment
6. When to seek medical care
7. Optimization of community resources and not-for-profit organizations (eg American Lung Association)

ENVIRONMENTAL CONTROL

1. Reduce or eliminate exposure to allergens, including:
   - **a.** Animal dander
   - **b.** House-dust mites
   - **c.** Cockroaches
   - **d.** Pollens
   - **e.** Indoor mold/mildew
2. Smoke only outside the home
3. Discuss ways to reduce exposure to indoor/outdoor pollutants, including:
   - **a.** Wood-burning stoves and fireplaces
   - **b.** Unvented stoves or heaters
   - **c.** Irritants, such as perfumes, cleaning agents, sprays
   - **d.** Volatile organic compounds, such as from home renovations
   - **e.** Limitation of exposure to outdoor precipitants: pollen count, grass mowing, affected clothing
   - **f.** Proper maintenance and cleaning of equipment used to reduce allergens (eg vacuum cleaners and air conditioning system filters)

USE OF APPROPRIATE PHARMACOLOGIC THERAPIES

(Long-term/quick-relief listed alphabetically)

Long-term control medications should be used to achieve and maintain control of persistent asthma and include:

1. Long-acting bronchodilators with anti-inflammatories
2. Inhaled corticosteroids (ICS)
3. Cromolyn sodium and nedocromil
4. Immunomodulators, including anti-IgE therapy
5. Leukotriene modifiers, including leukotriene receptor antagonists (LTRAs) and a 5-lipoxygenase inhibitor
6. Methylxanthines

Quick-relief medications should be used to treat acute symptoms and exacerbations and include:

1. Anticholinergics
2. Short-acting bronchodilators
3. Short-course oral corticosteroid therapy
4. Systemic corticosteroids

ASSESSMENT OF SEVERITY DETERMINES INITIAL THERAPY

Initial Assessment of Asthma

Once the diagnosis of asthma has been established, information obtained from the diagnostic evaluation should be used to characterize the patient's asthma in order to guide initial therapy, including:

1. Identification of precipitating factors
2. Identification of comorbidities
3. Classification of asthma severity

Asthma severity should be classified by use of:

1. Assessment of current impairment, including presence of symptoms and status of lung function
2. Assessment of future risk of adverse events, including exacerbations and risk of death

Classifying Asthma Severity Youths ≥12 Years of Age and Adults

(who are not currently taking long-term-control medication)

Components of Severity		Intermittent	Classification of Asthma Severity (≥12 Years of Age and Adults)		
			Persistent		
			Mild	Moderate	Severe
Impairment : Normal FEV1/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	>1 x/week but not nightly	Often 7x/week
	Short-acting beta$_2$-agonist (SABA) use for symptom control (not prevention of exercise-induced bronchospasm - EIB)	≤ 2 days/week	>2 days/ week but >1x/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 > 80% predicted •FEV_1/FVC normal	•FEV_1 ≥ 80% predicted •FEV_1/FVC normal	•FEV_1 > 60% but < 80% predicted •FEV_1/FVC reduced 5%	•FEV_1 < 60% predicted •FEV_1/FVC reduced > 5%
Risk	Exacerbations requiring oral systemic corticosteroids	0 - 1/year	≥ 2 / 1year		
		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			

Classifying Asthma Severity in Children 5-11 Years of Age

(who are not currently taking long-term-control medication)

Components of Severity		Intermittent	Classification of Asthma Severity (Children 5-11 Years of Age)		
			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	>1 x/week but not nightly	Often 7x/week
	Short-acting beta$_2$-agonist (SABA) use for symptom control (not prevention of exercise-induced bronchospasm - 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	•Normal FEV_1 between exacerbations •FEV_1 > 80% predicted •FEV_1/FVC > 85%	•FEV_1 = > 80% predicted •FEV_1/FVC > 80%	•FEV_1 = 60 - 80% predicted •FEV_1/FVC =75 - 80%	•FEV_1 < 60% predicted •FEV_1/FVC < 75%
Risk	Exacerbations requiring oral systemic corticosteroids)	0 - 1/year	≥ 2 / 1 year		
		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			

Classifying Asthma Severity in Children 0-4 Years of Age

(who are not currently taking long-term-control medication)

Components of Severity		Intermittent	Classification of Asthma Severity (Children 0-4 Years of Age)		
			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 - 4 x/month	>1x/week
	Short-acting beta$_2$-agonist (SABA) use for symptom control (not prevention of exercise-induced bronchospasm - 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 steroids, 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			

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MONITORING CONTROL DETERMINES ONGOING THERAPY

Asthma control is achieved by:

1. **Reducing impairment, which includes:**
   a. Prevention of chronic and troublesome symptoms
   b. Reducing need for inhaled short-acting bronchodilator to relieve symptoms
   c. Maintenance of near normal lung function
   d. Maintenance of normal activity levels
   e. Patient and family satisfaction
2. **Reducing risk, which includes:**
   a. Prevention of recurrent exacerbations
   b. Prevention of progressive loss of lung function
   c. Avoidance of adverse effects of pharmacotherapy for asthma

Components of Control (≥12 Years of Age and Adults)			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	
		Consider severity and interval since last exacerbation		
	Progressive loss of lung function	Evaluation requires long-term follow-up 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		• Maintain current step • Regular follow-ups every 1–6 months to maintain control. • Consider step down if well controlled for at least 3 months	• Step up 1 step • Reevaluate in 2 - 6 weeks • For side effects, consider alternative treatment options	• Consider short course of oral systemic corticosteroids • Step up 1 - 2 steps • Reevaluate in 2 weeks • For side effects, consider alternative treatment options

Components of Control (Children 5-11 Years of Age)		Classification of Asthma Control (Children 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	≥2 x/month	≥2 x /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 • FEV_1/FVC	• >80% predicted/ personal best • >80% predicted	• 60 - 80% predicted/ personal best • 75 - 80% predicted	• <60% predicted/ personal best • <75% predicted
Risk	Exacerbations requiring oral systemic corticosteroids	0 - 1 /year	≥2 /year	
		Consider severity and interval since last exacerbation		
	Reduction in lung growth	Evaluation requires long-term follow-up		
	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		• Maintain current step • Regular follow-up up every 1 - 6 months • Consider step down if well controlled for at least 3 months	• Step up at least 1 step • Reevaluate in 2 - 6 weeks • For side effects, consider alternative treatment options	• Consider short course of oral systemic corticosteroids • Step up 1 - 2 steps • Reevaluate in 2 weeks • For side effects, consider alternative treatment options

Components of Control (Children 0-4 Years of Age)		Classification of Asthma Control (Children 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	≤ 1 x/month	>1 x/month	>1 x/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		• Maintain current treatment • Regular follow-up every 1 - 6 months • Consider step down if well controlled for at least 3 months	• Step up 1 step • 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	• Consider short course of oral systemic corticosteroids • Step up 1 - 2 steps • 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

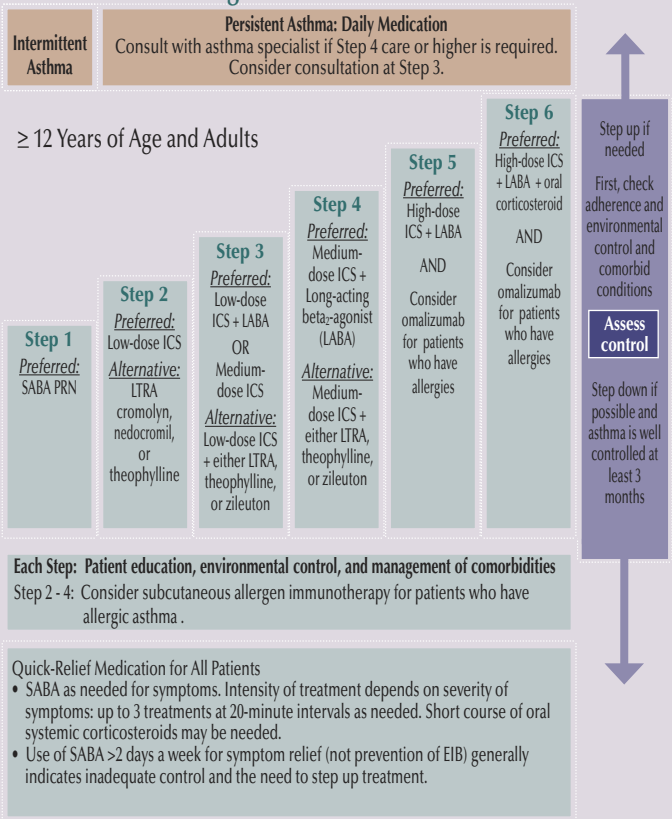
Periodic assessments and ongoing monitoring of asthma control are recommended to determine if the goals of therapy are being met and if adjustments in therapy are needed. This should include:

1. Assessment of signs and symptoms of asthma
2. Assessment of lung function
3. Estimation of quality of life and patient functional status
4. Determination of the presence of any exacerbations
5. Evaluation and (if necessary) adjustment of pharmacotherapy regimen
6. Assessment of patient satisfaction
7. Avoidance of triggers/environmental control

Tools which can be used to monitor asthma control include:

1. Clinician assessment
2. Patient self-assessment
3. Spirometry
4. Action plans

Stepwise Approach for Managing Asthma in Youths ≥12 Years of Age and Adults



Stepwise Approach for Managing Asthma in Children 5-11 Years of Age

Intermittent Asthma

Persistent Asthma: Daily Medication
Consult with asthma specialist if Step 4 care or higher is required.
Consider consultation at Step 3.

5 - 11 Years of Age

Step 1
Preferred:
SABA PRN

Step 2
Preferred:
Low-dose ICS
Alternative:
LTRA
cromolyn,
nedocromil, or
theophylline

Step 3
Preferred:
EITHER: Low-dose ICS + either LABA, LTRA, or theophylline
OR
Medium-dose ICS

Step 4
Preferred:
Medium-dose ICS + LABA
Alternative:
Medium-dose ICS + either LTRA or theophylline

Step 5
Preferred:
High-dose ICS + LABA
Alternative:
High-dose ICS + either LTRA or theophylline

Step 6
Preferred:
High-dose ICS + LABA + oral systemic corticosteroid
Alternative:
High-dose ICS + either LTRA or theophylline + oral systemic corticosteroid

Step up if needed.
First, check adherence, inhaler technique, environmental control, and comorbid conditions
Assess control
Step down if possible and asthma is well controlled at least 3 months

Each step: Patient education, environmental control, and management of comorbidities.
Step 2 - 4: Consider subcutaneous allergen immunotherapy for patients who have 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: Increasing use of SABA or use >2 days a week for symptom relief (not prevention of EIB) generally indicates inadequate control and the need to step up treatment.

Stepwise Approach for Managing Asthma in Children 0-4 Years of Age

Intermittent Asthma

Persistent Asthma: Daily Medication
Consult with asthma specialist if Step 3 care or higher is required.
Consider consultation at Step 2.

0 - 4 Years of Age

Step 1
Preferred:
SABA PRN

Step 2
Preferred:
Low-dose ICS
Alternative:
montelukast
or cromolyn

Step 3
Preferred:
Medium-dose ICS

Step 4
Preferred:
Medium-dose ICS + either:
LABA or
montelukast

Step 5
Preferred:
High-dose ICS + either:
LABA or
montelukast

Step 6
Preferred:
High-dose ICS + either:
LABA or
montelukast
systemic oral corticosteroid

Step up if needed.
First, check adherence, inhaler technique, environmental control, and comorbid conditions
Assess control
Step down if possible and asthma is well controlled at least 3 months

Patient education, environmental control at each step

Quick-Relief Medication for All Patients
- SABA as needed for symptoms. Intensity of treatment depends on severity of symptoms.
- With viral respiratory infection: SABA q 4–6 hours up to 24 hours (longer with physician consult). Consider short course of oral systemic corticosteroids if exacerbation is severe or patient has history of previous severe exacerbations.
- Caution: Frequent use of SABA may indicate the need to step up treatment. See text for recommendations on initiating daily long-term-control therapy.

SUCCESSFUL MANAGEMENT DEPENDS ON A COMPREHENSIVE APPROACH

EXERCISE-INDUCED BRONCHOSPASM

Exercise induced bronchospasm (EIB) is often a marker of inadequate asthma control. Patients with a history of cough, dyspnea, chest pain or tightness, or endurance problems during exercise should be considered as potentially having EIB. Clinicians should understand the concept that an important dimension of asthma control is a patient's ability to participate in any activity he or she chooses without experiencing asthma symptoms.

Management of EIB may be accomplished with:

1. Long-term controller medications
2. Pre-treatment before exercise with inhaled ß$_2$-agonists, LTRAs, or cromolyn
3. Warm up period prior to exercise
4. Use of masks over the mouth (may attenuate cold-induced EIB)

SURGERY AND ASTHMA

Patients with asthma are at specific risk for complications during and after surgery. To reduce complications, the following should be done:

1. Review of medication regimen and lung function prior to surgery, including out-patient and office-based procedures requiring anesthesia
2. Attempts at optimization of lung function preoperatively
3. The use of stress dose steroids in patients who have been on systemic corticosteroids during the past 6 months and for selected patients on a chronic high dose of an inhaled corticosteroid (ICS)

PREGNANCY AND ASTHMA

Maintaining adequate control of asthma during pregnancy is important for the health of both mother and baby. Recommendations to achieve adequate asthma control include:

1. Monitoring of asthma status during prenatal visits
2. Use of albuterol as the preferred short-acting bronchodilator
3. Use of inhaled corticosteroids, and specifically budesonide, as the preferred long-term control medication
4. Treatment of co-morbid allergic conditions with intranasal corticosteroids, LTRAs, and second generation antihistamines, loratadine and cetirizine

RACIAL AND ETHNIC DISPARITY IN ASTHMA

Several factors may affect asthma control in racial and ethnic minority populations. These include:

1. Lack of adherence to prescribed therapy
2. Lesser use of preventive medications
3. Increased exposure to potential environmental asthma triggers
4. Potential biological differences in response to asthma therapy by racial and ethnic minorities
5. Optimize external educational opportunities (see Education above)

Because of this, a heightened awareness of cultural barriers between the clinician and the patient should influence asthma management, and modification of educational and communication strategies should be considered to address these barriers.

EARLY MANAGEMENT OF EXACERBATIONS REDUCES MORBIDITY

Early treatment of asthma exacerbations in the best strategy for management, and this most often will occur at home. Important elements include:

1. Patient education, including home self-management instructions
2. Recognition of early signs of worsening
3. Appropriate intensification of therapy when warranted
4. Removal or withdrawal from contributing environmental factors
5. Prompt communication between patient and clinician

CLASSIFYING THE SEVERITY OF ASTHMA EXACERBATIONS IN THE URGENT OR EMERGENCY CARE SETTING

	Signs & Symptoms	Initial PEF (or FEV_1)	Clinical Course
Mild	Dyspnea only with activity (assess tachypnea in young children)	PEF ≥70% predicted or personal best	• Usually cared for at home • Prompt relief with inhaled SABA • Possible short course of oral systemic corticosteroids
Moderate	Dyspnea interferes with or limits usual activity	PEF 40 - 69% predicted or personal best	• Usually requires office or ED visit • Relief from frequent inhaled SABA • Oral systemic corticosteroids; some symptoms last for 1–2 days after treatment is begun
Severe	Dyspnea at rest; interferes with conversation	PEF <40% predicted or personal best	• Usually requires ED visit and likely hospitalization • Partial relief from frequent inhaled SABA • Oral systemic corticosteroids; some symptoms last for >3 days after treatment is begun • Adjunctive therapies are helpful
Subset: Life Threatening	Too dyspneic to speak; diaphoretic	PEF <25% predicted or personal best	• Requires ED/hospitalization; possible ICU • Minimal or no relief from frequent inhaled SABA • Intravenous corticosteroids • Adjunctive therapies are helpful

When treatment in the Emergency Department is required, it includes:

1. Oxygen to relieve hypoxemia
2. Short-acting bronchodilators to relieve airflow obstruction
3. Systemic corticosteroids to decrease airway inflammation
4. Adjunctive therapy (as indicated) with magnesium sulfate or heliox
5. Ongoing monitoring of response to therapy with serial measurements of lung function
6. Preventing relapse of the exacerbation or recurrence of symptoms by providing appropriate follow-up and education

When the patient requires hospitalization, if discharge is anticipated, the following should be prescribed:

1. Continued treatment with short-acting bronchodilators
2. A course of tapering systemic oral corticosteroids
3. Continued treatment with or consideration for adding an inhaled corticosteroid (ICS)
4. Patient education
5. A scheduled follow-up appointment with the primary care provider and/or asthma specialist within 1 to 4 weeks

Preventing relapse of the exacerbation or recurrence of symptoms by providing appropriate follow-up and education.