

**Clinical practice guideline
for the
management of asthma
in children and adults**

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Limitations

This document is a guideline. The synthesis of the enclosed recommendation is not meant to replace any practices based on personal training, clinical judgment, experience or specific aspects of individual patient situations.

Goals

The goal of asthma therapy is asthma control:

- Reduce impairment (prevent chronic symptoms, require infrequent use of short-acting beta-agonist (SABA), maintain (near) normal lung function and normal activity levels
- Reduce risk (prevent exacerbations, minimize need for emergency care for hospitalization, prevent loss of lung function, or for children, prevent reduced lung growth, have minimal or no adverse effects of therapy).

Timetable

CPGC proposed guideline endorsement:	December 2006
Original guideline disseminated:	January 2007
First revision:	January 2009

Management of asthma in children and adults

Consider the diagnosis of asthma if:

1. Recurrent coughing, wheezing, or shortness of breath relieved by a bronchodilator
2. Objective response by spirometry ($\geq 12\%$ increase in FEV₁ post bronchodilator)
3. Rule out conditions such as aspiration, GERD, airway anomaly, foreign body, cystic fibrosis, vocal cord dysfunction, or COPD. GERD is a common co-morbidity. (If diagnosis in doubt, consult with an asthma specialist.)

Assess asthma severity: *persistent vs. intermittent*

FEV₁/FVC:

5-19 yrs	$\geq 85\%$
20-39 yrs	$\geq 80\%$
40-59 yrs	$\geq 75\%$
60-80 yrs	$\geq 70\%$

1. Symptoms > 2 days per week **OR**
2. Awaken at night from asthma > 2 X per month **OR**
3. Limitation of activities, despite pretreatment for exercised induced asthma **OR**
4. More than 2 steroid bursts in 1 year **OR**
5. FEV₁ $< 80\%$ predicted **OR** low FEV₁/FVC ratio (see left)
6. For children < 4 years consider persistent if more than 4 episodes of wheezing in a year **AND** parental history of asthma or eczema or wheezing between illnesses.

Treatment for persistent asthma: daily inhaled corticosteroids (steps 2, 3 or higher)

Assess response within 2-6 weeks

Well-controlled asthma

1. Daytime symptoms < 2 days per week **AND**
2. Awakening at night from asthma < 2 X per month **AND**
3. No limitations of activities **AND**
4. Less than 2 steroid bursts per year **AND**
5. FEV₁ $\geq 80\%$ predicted or personal best peak flow

Follow the Stepwise Approach Guideline

and consider step *down* if well-controlled for 3 consecutive months.

Then **re-assess every 3 to 6 months.**

Follow the Stepwise Approach Guideline

and step *up* until patient is well-controlled.

Re-assess in 2 to 6 weeks.

Quick tips for patients with asthma

- **Environmental control:** Identify and avoid triggers such as tobacco smoke, pollens, molds, animal dander, cockroaches, and dust mites.
- **Flu vaccine:** Recommended annually.
- **Spirometry:** Consider at diagnosis and at least annually.
- **Asthma score:** Use tools such as ACQ[®], ACT[™] or ATAQ[®] to assess asthma control.
- **Asthma education:** Review correct inhaled medication device technique at every visit, if needed.
- **Asthma action plan:** At diagnosis; review and update at each visit.
- **Short-acting beta-agonist (e.g., albuterol):**
 1. For quick relief every 4-6 hours as needed (see step 1)
 2. Pretreat with 2 puffs for exercise-induced bronchospasm 10-60 minutes before exercise
- **Oral corticosteroids:** Consider for acute exacerbation.
- **Spacer with valve:** If spacer selected, use spacer with valve.
- **Mask:** use with spacer with valve and with nebulizer for children, 5 years and anyone unable to use correct mouthpiece technique.

Consider referral to a specialist if not well controlled within 3-6 months using stepwise approach **OR** 2 or more ED visits or hospitalizations for asthma in a year.

Asthma Stepwise Approach Guideline

NOTE: All LABAs (long-acting beta-agonists) and combination agents containing LABAs have a **black box warning**.

Intermittent asthma	Persistent asthma: Daily medication
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Step up as indicated although address possible poor adherence to medication. **Re-assess in 2 to 6 weeks.**

Step down if well controlled and re-assess in 3 months. If very stable then assess control every **3 to 6 weeks**.

	Step 2	Step 3	Step 4	Step 5	Step 6
<p style="text-align: center;">Step 1 (all ages)</p> <p>Short-acting beta-agonist (e.g., albuterol prn)</p> <p>If used more than 2 days per week (other than for exercise), consider inadequate control and the need to step up treatment.</p>	<p style="text-align: center;">Age 12+ yrs</p> <p>Preferred: Low-dose inhaled steroid</p> <p>Alternative: Leukotriene blocker or cromolyn</p>	<p style="text-align: center;">Age 12+ yrs</p> <p>Preferred: Low-dose inhaled steroid + long-acting beta-agonist or medium-dose inhaled steroid</p> <p>Alternative: Low-dose inhaled steroid + leukotriene blocker</p>	<p style="text-align: center;">Age 12+ yrs</p> <p>Preferred: Medium-dose inhaled steroid + long-acting beta-agonist</p> <p>Alternative: Medium-dose inhaled steroid + leukotriene blocker</p>	<p style="text-align: center;">Age 12+ yrs</p> <p>High-dose inhaled steroid + long-acting beta-agonist AND consider omalizumab if allergies</p>	<p style="text-align: center;">Age 12+ yrs</p> <p>High-dose inhaled steroid + long-acting beta-agonist + oral steroid AND consider omalizumab if allergies</p>
	<p style="text-align: center;">Age 5-11 yrs</p> <p>Preferred: Low-dose inhaled steroid</p> <p>Alternative: Leukotriene blocker or cromolyn</p>	<p style="text-align: center;">Age 5-11 yrs</p> <p>Low-dose inhaled steroid + long-acting beta-agonist or leukotriene blocker or Medium-dose inhaled steroid</p>	<p style="text-align: center;">Age 5-11 yrs</p> <p>Same as 12+ yrs</p>	<p style="text-align: center;">Age 5-11 yrs</p> <p>Preferred: High-dose inhaled steroid + long-acting beta-agonist</p> <p>Alternative: High-dose inhaled steroid + leukotriene blocker</p>	<p style="text-align: center;">Age 5-11 yrs</p> <p>Preferred: High-dose inhaled steroid + long-acting beta-agonist</p> <p>Alternative: High-dose inhaled steroid + leukotriene blocker + oral steroid</p>
	<p style="text-align: center;">Age 0-4 yrs</p> <p>Consider referral (especially if diagnosis is in doubt)</p>	<p style="text-align: center;">Age 0-4 yrs</p> <p>Medium-dose inhaled steroid + referral</p>	<p style="text-align: center;">Age 0-4 yrs</p> <p>Medium-dose inhaled steroid + Either long-acting beta-agonist or leukotriene blocker</p>	<p style="text-align: center;">Age 0-4 yrs</p> <p>High-dose inhaled steroid + Either long-acting beta-agonist or leukotriene blocker</p>	<p style="text-align: center;">Age 0-4 yrs</p> <p>High-dose inhaled steroid + Either long-acting beta-agonist or leukotriene blocker + oral steroid</p>
	<p>All ages steps 2 through 4: Consider immunotherapy if allergic asthma</p>			<p>All ages steps 4 through 6: Consult with asthma specialist</p>	

Adapted from the NAEPP 3: <http://www.nhlbi.nih.gov/guidelines/asthma/>.

Asthma medications

Inhaled corticosteroid controller medications	FDA-approved age (yrs)	Adult doses* (total daily inhalations)			FCHP tier
		Low	Medium	High	
Aerobid (flunisolide) 80 mcg MDI	6+	4	4-8	> 8	3
Asmanex® (mometasone) 220 mcg DPI	12+	1	2	> 2	3
Asmanex® (mometasone) 110 mcg DPI	4+	2	4	> 4	3
Azmacort® HFA (triamcinolone) 75 mcg MDI	6+	4-10	10-20	> 20	3
Flovent® HFA (fluticasone) 44 MDI	4+	2-6	7-10	> 10	2
Flovent® HFA (fluticasone) 110 MDI	4+	1-3	4	> 4	2
Flovent® HFA (fluticasone) 220 MDI	4+	1	2	> 2	2
Flovent® Diskus® (fluticasone) 50 DPI	4+	2-6	7-10	> 10	2
Pulmicort Flexhaler™ (budesonide) DPI 90 mcg	6+	2-6	7-13	> 13	2
Pulmicort Flexhaler™ (budesonide) DPI 180 mcg	6+	1-3	4-6	> 6	2
Pulmicort Respules® (budesonide) 0.25, 0.5, or 1 mg	1+	0.5 mg	1 mg	2 mg	3
QVAR® 40 HFA (beclomethasone) MDI	5+	1-3	4-6	> 6	2
QVAR® 80 HFA (beclomethasone) MDI	5+	1-3	4-6	> 6	2
Combination agents					
Advair® HFA (fluticasone/salmeterol) MDI	12+	(45/21) 4	(115/21) 4	(230/21) 4	3
Advair® Diskus® (fluticasone/salmeterol) DPI	4+	(100/50) 2	(250/50) 2	(500/50) 2	3
Symbicort® 80/4.5 (budesonide/formoterol) MDI	12+	4	4	N/A	3
Symbicort® 160/4.5 (budesonide/formoterol) MDI	12+	N/A	4	4	3

Key: HFA = Hydrofluoroalkane (new propellant); MDI = metered dose inhaler; DPI = dry powder inhaler

***Adult doses listed.** Children under 12 years use 60% to 80 % of the listed dosages.

NOTE: All LABAs and combination agents containing LABAs **have a black box warning.**

Check product information for dosing frequency.

Leukotriene blocker controller medications	FDA-approved age	Dosage	FCHP tier
Accolate® (zafirlukast) 10 mg tablets	5-11 yrs	One tab twice daily	3
Accolate® (zafirlukast) 20 mg tablets	12+ yrs	One tab twice daily	3
Singulair® (montelukast) 4 mg granule packet	12-23 months	One packet once daily (evening)	2
Singulair® (montelukast) 4 mg chewable tablet	2-5 yrs	One tab once daily (evening)	2
Singulair® (montelukast) 5 mg chewable tablet	6-14 yrs	One tab once daily (evening)	2
Singulair® (montelukast) 10 mg tablet	15+ yrs	One tab once daily (evening)	2
Zyflo CR™ (zileutin) 600 mg tablet	12+ yrs	Two tabs two times daily	3

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