Achieving and Maintaining Asthma Control

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Although asthma occurs in persons of all ages, the highest prevalence of active asthma occurs in children and youth. In Los Angeles County, the prevalence of active childhood asthma is 9.0% while the lifetime prevalence of asthma in children younger than 18 years is 13.8%.[1] Asthma impacts the quality of life of patients, their families, and society, including the cost of routine and urgent medical care, missed school or work days, missed opportunities for participating in activities that may trigger asthma, the expense and adverse effects of medications, and the mortality associated with the disease.

The National Asthma Education and Prevention Program (NAEPP) has developed "Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma—Full Report 2007" (EPR-3). To reduce the burden of asthma, this resource provides detailed asthma recommendations for three age groups: 0-4 years, 5-11 years, and 12 years and older.[2] It also provides evidence-based asthma guidelines for clinicians who care for patients with asthma.

Definition and Diagnosis

Asthma is characterized by airway inflammation, airway hyper-responsiveness, and episodic reversible airway obstruction. To establish the diagnosis of asthma, the recommended methods include a detailed medical history, physical examination, spirometry for all patients 5 years of age and older, and exclusion of alternative diagnoses.[3]

Asthma Severity and Assessment of Asthma Control

Once the diagnosis of asthma is established, the next step is to assess asthma *severity* (which is defined by the intrinsic intensity of the disease process) to guide the initiation of asthma therapy.[2] After the initial visit, the EPR-3 focuses on monitoring asthma *control*, defined by the degree to which the manifestations of asthma are minimized by therapeutic interventions, and the goals of asthma therapy are met.[2]

When assessing asthma severity or control, the EPR-3 defines the two key domains of impairment and risk.[2] *Impairment* is defined by the frequency and intensity of asthma symptoms that the patient is experiencing, and functional limitations, if any.[2] *Risk* is the likelihood of asthma exacerbations, decline in lung function or poor lung growth, or risk of adverse effects from the medication.[2]

At the baseline visit, the EPR-3 provides clear stepwise guidelines for the different age groups for the initiation of therapy.[3] (See Table 1 for youth ≥12 years.) For the 0-4 age group, consider daily long-term controller therapy in children who have a positive Asthma Predictive Index (API), a clinical index based on the presence of wheezing before 3 years of age.[4] The presence of one major risk factor (personal history of atopic dermatitis, or parent history of asthma) or two minor risk factors (allergic rhinitis, eosinophilia >4%, or wheezing apart from colds) is predictive of the presence of asthma after the age of 6 years.[5,6]

For the age groups 5-11 and 12 years and above, involve the patient in developing a written asthma action plan, promote physical activity, and provide education at the appropriate literacy level about asthma triggers and environmental avoidance measures.

At the follow-up visit and all subsequent visits, monitor asthma control by assessing impairment and risk and adjusting asthma therapy by using the stepwise approach[2] (Table 2).

Goals of Asthma Therapy

The goals of asthma therapy are to achieve and maintain asthma control by reducing both impairment and risk.[2] By reducing impairment, the goal is to prevent chronic and troublesome symptoms, require infrequent use (2 days per week or less) of inhaled short-acting beta$_2$-agonists, maintain normal (or near normal) lung function, maintain normal activity levels (including exercise), and meet the patient and their family's expectations of and satisfaction with asthma care.[2] By reducing risk, the goal is to prevent recurrent exacerbations of asthma (including reducing the need for urgent or emergent asthma care), prevent the loss of lung function, and provide optimal pharmacotherapy with minimal or no adverse effects.[2]

To achieve asthma control, there are four identified components of care: assessing and monitoring asthma (Table 3); patient education, including self-monitoring and a written asthma action plan; control of environmental factors and comorbid conditions; and a tailored medication treatment plan.[2]

The general principles for all age groups are to incorporate the four components of care, initiate appropriate asthma therapy based on the asthma severity at the initial visit, and then step up or step down asthma therapy based on asthma control at all subsequent visits.[2] The guidelines have also included information on usual doses for long-term controller therapy and estimated comparative daily dosages for inhaled steroids.

Conclusion

A systematic guidelines-based approach to the treatment of asthma, especially in an inner-city setting, has been shown to improve asthma control significantly.[7,8] The entire EPR-3 document is available at www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf.

Consider referral to an asthma specialist if signs and symptoms are atypical, if there is no improvement on therapy, if there are problems with a differential diagnosis, or if additional testing is indicated. Los Angeles County resources can be accessed through the following website, www.asthmacoalitionla.org.

Table 1. Components and Classification of Asthma Severity in Children 12 Years of Age and Older – Not Currently Taking Controllers

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 exercise-induced bronchoconstriction [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	• 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	≥ 0-2/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			
Recommended Step for Initiating Treatment *See Table 3 for steps*		**Step 1**	**Step 2**	**Step 3**	**Step 4 or 5**
				And consider short course of oral systemic corticosteroids	
		In 2-6 weeks, evaluate level of asthma control that is achieved and adjust therapy accordingly			

Source: Adapted from NAEPP EPR-3. Public domain document.

To view Asthma Classification tables for children aged 0-4 and 5-11, visit the National Heart Lung and Blood Institute website at http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm.

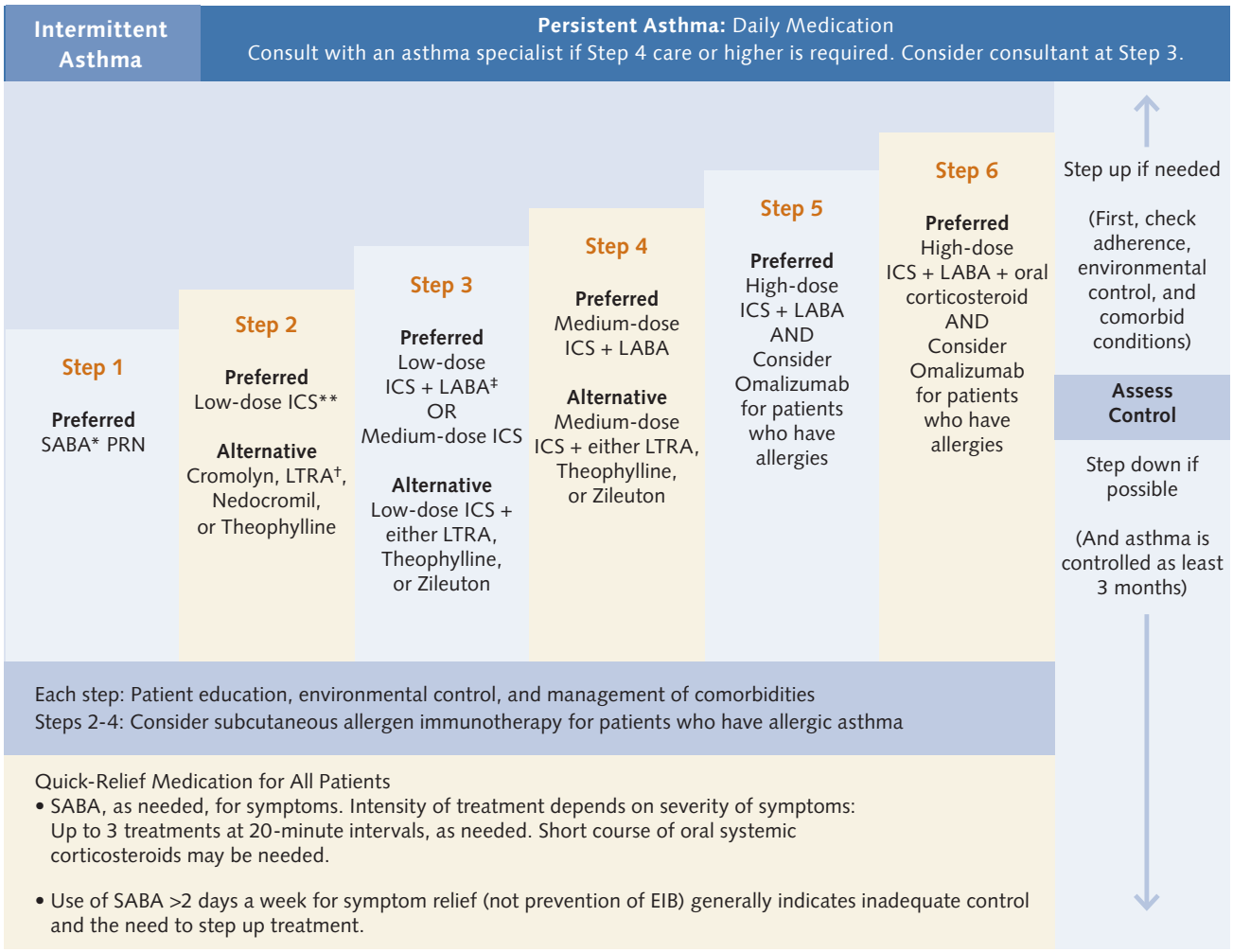
Table 2. Assessing Asthma Control in Youth ≥12 Years of Age and Adults

Components of Control		Classification of Asthma Control (Youth ≥12 Years of Age and Adults)		
		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
	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	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.		

Source: Adapted from NAEPP EPR-3. Public domain document.

To view the Asthma Assessment tables for children ages 0-4 and 5-11, visit the National Heart Lung and Blood Institute website at http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm.

Table 3. Stepwise Approach for Managing Asthma in Youths 12 Years and Older and Adults



KEY * SABA = Short-acting beta$_2$-agonist
** ICS = Inhaled corticosteroid
† LTRA = Leukotriene receptor antagonist
‡ LABA = Long-acting beta$_2$-agonist

Source: Adapted from NAEPP EPR-3. Public domain document.

To view the stepwise approach for Managing Asthma tables for children ages 0-4 and 5-11, visit the National Heart Lung and Blood Institute website at http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm

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