

Highlights of the Major Changes in the New Asthma Treatment Guidelines

*Christina Victor, Pharm.D.
Pharmacy Practice Resident, LSUHSC-S*

*Stephen Hill, Pharm.D. Candidate
ULM College of Pharmacy*

*S. Sean Needham, Pharm.D. Candidate
ULM College of Pharmacy*

*Jeffery D. Evans, Pharm.D.
Assistant Professor of Pharmacy Practice, ULM College of Pharmacy*

According to the current asthma guidelines published in 2007, more than 22 million Americans have asthma. It is one of the most common chronic diseases of childhood, affecting more than 6 million children. Some of the effects of asthma include burden to the patients, families, and society in terms of loss of work and school, lessened quality of life, and emergency department visits, hospitalizations, and death.

This review highlights some of the major changes in the most recent version of the NHLBI Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma as they relate to the previously issued guidelines. More information can be found in the full report available at <http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm>. This review focuses on changes made in many sections including: asthma control and severity, impairment and risk, patient education and control of environmental factors, stepwise approach management, and the treatment of asthma exacerbations.

Asthma Control and Severity

Asthma control is now recommended as the goal of asthma therapy. It is also important to distinguish between classifying asthma severity and monitoring asthma control. Asthma severity is defined as the intrinsic intensity of the disease process, and classification of the severity of asthma is needed for initiating therapy. Asthma control is the degree to which the manifestations of asthma are minimized by therapeutic interventions. Control should be assessed and monitored so that therapy can be adjusted accordingly.

Impairment and Risk

Another focus of the current guidelines is on impairment and risk as the two most important domains of severity and control. Impairment is defined by the guidelines as the frequency and intensity of symptoms and functional limitations the patient is experiencing, while risk is the likelihood of an asthma exacerbation, decline in lung function, or risk for adverse effect from medication. These two domains are different manifestations of asthma and could respond differently to treatment.

Patient Education and Control of Environmental Factors

Patient education is an important and fundamental aspect of asthma treatment, and should occur at every point of care including clinics, emergency departments, hospitals, pharmacies, schools, community settings, and the patient's home. Environmental control measures must include several approaches to reduce exposure because single interventions are not as effective. Also, subcutaneous immunotherapy should be considered for anyone with asthma defined as step 2-4, if there is a clear relationship between asthma symptoms and a particular allergen. Finally, any comorbid conditions that could worsen asthma should be optimally treated.

Stepwise Approach

The stepwise approach to the management of asthma has been increased from 4 to 6 steps of care. Although medications have been repositioned within the six steps, inhaled corticosteroids (ICS) continue as the preferred long-term control therapy for all ages. Due to the variable course of the disease and age-related medication effects, treatment recommendations are now presented for three age groups (0 - 4 years of age, 5-11 years of age, and 12 years of age and older).

Treatment of Asthma Exacerbations

The classification of an asthma exacerbation that requires emergency care is now defined as a forced expiratory volume in one second (FEV1) or peak expiratory flow (PEF) of <40 percent. Also, a FEV1 or PEF >70 percent is a goal for discharge from an emergency care department. The new guidelines encourage the development of prehospital asthma treatment protocols for emergency medical services. Finally, there are new recommendations for the medical treatment of asthma exacerbations which include:

- Addition of levalbuterol to the list of options for short acting beta 2 agonists
- Addition of magnesium sulfate or heliox for unresponsive patients
- Emphasis on the use of oral corticosteroids rather than doubling the ICS dose for home management
- Emphasis on the fact that anticholinergics are used in emergency care, not hospital care
- Consideration for initiation of ICS at discharge if patient is not currently on this treatment

This review addressed some of the major changes in the recently released Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma. For a quick reference summarizing the complete guidelines, refer to the following Figures 1-9.

Louisiana Drug Utilization Review Education (Cont.)

FIGURE 1 - 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 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 decision-making 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.

Reference:

Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma - Summary Report 2007
<http://www.nhlbi.nih.gov/guidelines/asthma>

Louisiana Drug Utilization Review Education (Cont.)

FIGURE 2 - 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	- Normal FEV1 between exacerbations - FEV1 >80% predicted - FEV1/FVC >85%	- FEV1 = >80% predicted - FEV1/FVC >80%	- FEV1 = 60-80% predicted - FEV1/FVC =75-80%	- 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 FEV1.			
Recommended Step for Initiating Therapy (See Figure 5 for treatment steps.)	Step 1	Step 2	Step 3, medium-dose ICS option	Step 3, medium-dose ICS option, or Step 4	
	and consider short course of oral systemic corticosteroids				
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 decision-making 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 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.

Reference:

Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma - Summary Report 2007
<http://www.nhlbi.nih.gov/guidelines/asthma>

Louisiana Drug Utilization Review Education (Cont.)

FIGURE 3 - CLASSIFYING ASTHMA SEVERITY AND INITIATING TREATMENT IN YOUTHS ≥12 YEARS OF AGE AND ADULTS

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

Components of Severity		Classification of Asthma Severity ≥12 years of age			
		Intermittent	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	>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	- Normal FEV1 between exacerbations -FEV1 >80% predicted -FEV1/FVC normal	-FEV1 >80% predicted -FEV1/FVC normal	-FEV1 >60% but <80% predicted -FEV1/FVC reduced 5%	-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 FEV1.			
Recommended Step for Initiating Therapy (See Figure 6 for treatment 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.				

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

Notes

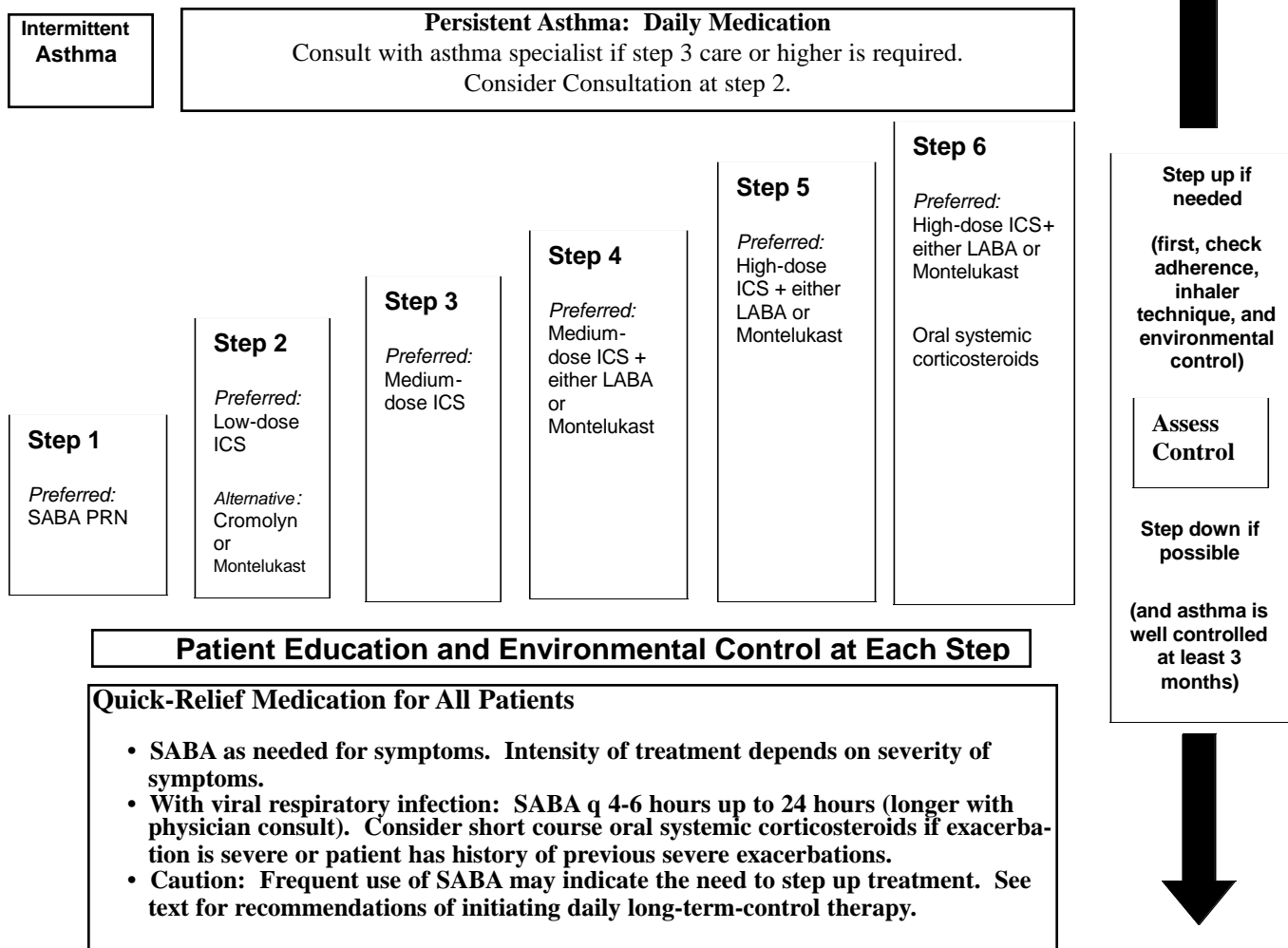
- The stepwise approach is meant to assist, not replace, the clinical decision-making required to meet individual patient needs.
- Level of severity is determined by assessment of both impairment and risk. Assess impairment domain by patient's/caregiver's recall of previous 2 - 4 weeks and spirometry. 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.

Reference:

Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma - Summary Report 2007
<http://www.nhlbi.nih.gov/guidelines/asthma>

Louisiana Drug Utilization Review Education (Cont.)

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



Key: Alphabetical order is used when more than one treatment option is listed within either preferred or alternative therapy. ICS, inhaled corticosteroid; LABA, inhaled long-acting beta2-agonist; SABA, inhaled short-acting beta2-agonist

Notes:

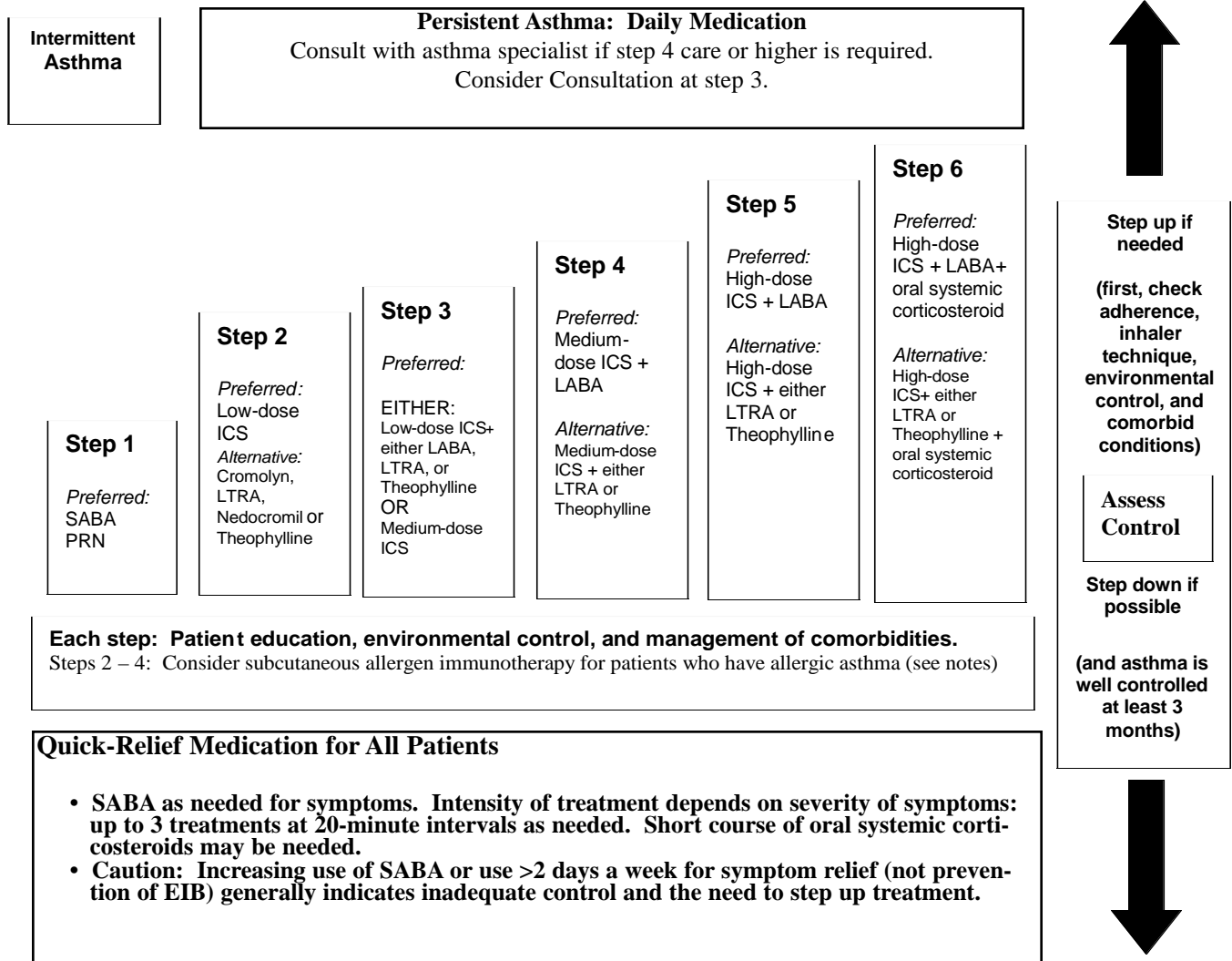
- The stepwise approach is meant to assist, not replace, the clinical decision-making required to meet individual patient needs.
- If alternative treatment is used and response is inadequate, discontinue it and use the preferred treatment before stepping up.
- If clear benefit is not observed within 4 - 6 weeks and patient/family medication technique and adherence are satisfactory, consider adjusting therapy or alternative diagnosis.
- Studies on children 0 - 4 years of age are limited. Step 2 preferred therapy is based on Evidence A. All other recommendations are based on expert opinion and extrapolation from studies in older children.

Reference:

Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma - Summary Report 2007
<http://www.nhlbi.nih.gov/guidelines/asthma>

Louisiana Drug Utilization Review Education (Cont.)

**FIGURE 5 - STEPWISE APPROACH FOR MANAGING ASTHMA IN CHILDREN
5 - 11 YEARS OF AGE**



Key: **Alphabetical order is used when more than one treatment option is listed within either preferred or alternative therapy.** ICS, inhaled corticosteroid; LABA, inhaled long-acting beta2-agonist; LTRA, leukotriene receptor antagonist; SABA, inhaled short-acting beta2-agonist

Notes:

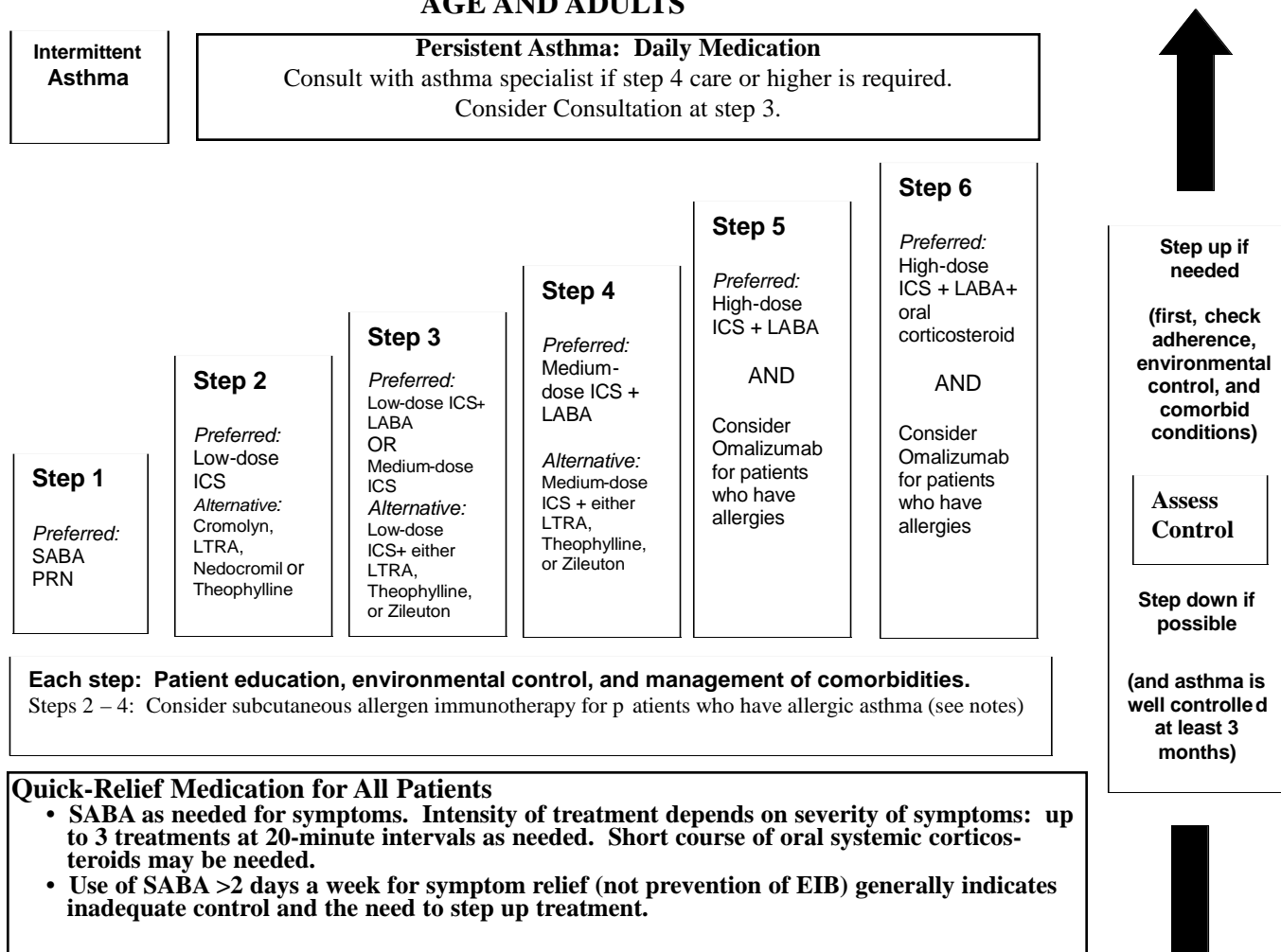
- The stepwise approach is meant to assist, not replace, the clinical decision-making required to meet individual patient needs.
- If alternative treatment is used and response is inadequate, discontinue it and use the preferred treatment before stepping up.
- Theophylline is a less desirable alternative due to the need to monitor serum concentration levels.
- Step 1 and step 2 medications are based on Evidence A. Step 3 ICS + adjunctive therapy and ICS are based on Evidence B for efficacy of each treatment and extrapolation from comparator trials in older children and adults - comparator trials are not available for this age group; steps 4-6 are based on expert opinion and extrapolation from studies in older children and adults.
- Immunotherapy for steps 2-4 is based on Evidence B for house-dust mites, animal danders, and pollens; evidence is weak or lacking for molds and cockroaches. Evidence is strongest for immunotherapy with single allergens. The role of allergy in asthma is greater in children than in adults. Clinicians who administer immunotherapy should be prepared and equipped to identify and treat anaphylaxis that may occur.

Reference:

Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma - Summary Report 2007
<http://www.nhlbi.nih.gov/guidelines/asthma>

Louisiana Drug Utilization Review Education (Cont.)

FIGURE 6 - STEPWISE APPROACH FOR MANAGING ASTHMA IN YOUTHS ≥ 12 YEARS OF AGE AND ADULTS



Key: Alphabetical order is used when more than one treatment option is listed within either preferred or alternative therapy. EIB, exercise-induced bronchospasm; ICS, inhaled corticosteroid; LABA, inhaled long-acting beta2-agonist; LTRA, leukotriene receptor antagonist; SABA, inhaled short-acting beta2-agonist

Notes:

- The stepwise approach is meant to assist, not replace, the clinical decision-making required to meet individual patient needs.
- If alternative treatment is used and response is inadequate, discontinue it and use the preferred treatment before stepping up.
- Zileuton is a less desirable alternative due to limited studies as adjunctive therapy and the need to monitor liver function. Theophylline requires monitoring of serum concentration levels.
- In step 6, before oral systemic corticosteroids are introduced, a trial of high-dose ICS + LABA + either LTRA, theophylline, or zileuton may be considered, although this approach has not been studied in clinical trials.
- Step 1, 2, and 3 preferred therapies are based on Evidence A; step 3 alternative therapy is based on Evidence A for LTRA, Evidence B for theophylline, and Evidence D for zileuton. Step 4 preferred therapy is based on Evidence B, and alternative therapy is based on Evidence B for LTRA and theophylline, and Evidence D for zileuton. Step 5 preferred therapy is based on Evidence B. Step 6 preferred therapy is based on (EPR - 2 1997) and Evidence B for omalizumab.
- Immunotherapy for steps 2 - 4 is based on Evidence B for house-dust mites, animal danders, and pollens; evidence is weak or lacking for molds and cockroaches. Evidence is strongest for immunotherapy with single allergens. The role of allergy in asthma is greater in children than in adults.
- Clinicians who administer immunotherapy or omalizumab should be prepared and equipped to identify and treat anaphylaxis that may occur.

Reference:

Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma - Summary Report 2007
<http://www.nhlbi.nih.gov/guidelines/asthma>

Louisiana Drug Utilization Review Education (Cont.)

FIGURE 7 - 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 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 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 diagnosis 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 decision-making 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.

Reference:

Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma - Summary Report 2007
<http://www.nhlbi.nih.gov/guidelines/asthma>

Louisiana Drug Utilization Review Education (Cont.)

FIGURE 8 - 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 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%	60-80% predicted/personal best 75-80%	<60% predicted/personal best <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 5 for treatment steps.)		- Maintain current step. - Regular followup every 1 - 6 months. - Consider step down if well controlled for at least 3 months.	- Step up at least 1 step and - Reevaluate in 2 - 6 weeks - For side effects: consider alternative treatment options.	- 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 decision-making 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.

Reference:

Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma - Summary Report 2007
<http://www.nhlbi.nih.gov/guidelines/asthma>

Louisiana Drug Utilization Review Education (Cont.)

FIGURE 9 - 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 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
	FEV1 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)	
	Progressive loss of lung function	Consider severity and interval since last exacerbation		
	Treatment-related adverse effects	Evaluation requires long-term followup.		
Recommended Action for Treatment (See Figure 6 for treatment steps.)	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.			
	- Maintain current step. - Regular followup every 1-6 months to maintain control. - Consider step down if well controlled for at least 3 months.	- Step up 1 step and - Reevaluate in 2-6 weeks - For side effects, consider alternative treatment options.	- 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 decision-making 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 (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©
ACQ = Asthma Control Questionnaire©
ACT = Asthma Control Test™
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 alternative treatment option was used in a step, discontinue it and use preferred treatment for that step.

Reference:

Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma - Summary Report 2007

<http://www.nhlbi.nih.gov/guidelines/asthma>