Asthma Update

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Asthma Burden in the U.S.

- Prevalence: 22.5 million (6.5 million children) in 2005
- 500,000 hospitalizations
- 1.8 million ER visits
- 3800 deaths (decreasing since 1996)
- Responsible for 12.8 million lost school days and 14.5 million lost work days
- $19.7 billion in health care costs

Diagnosis of Asthma

- Episodic symptoms of variable airflow obstruction
- Airflow obstruction that is partially or completley reversible
- Alternate diagnoses excluded
- Detailed medical history, PE and spirometry

Four Components of Management

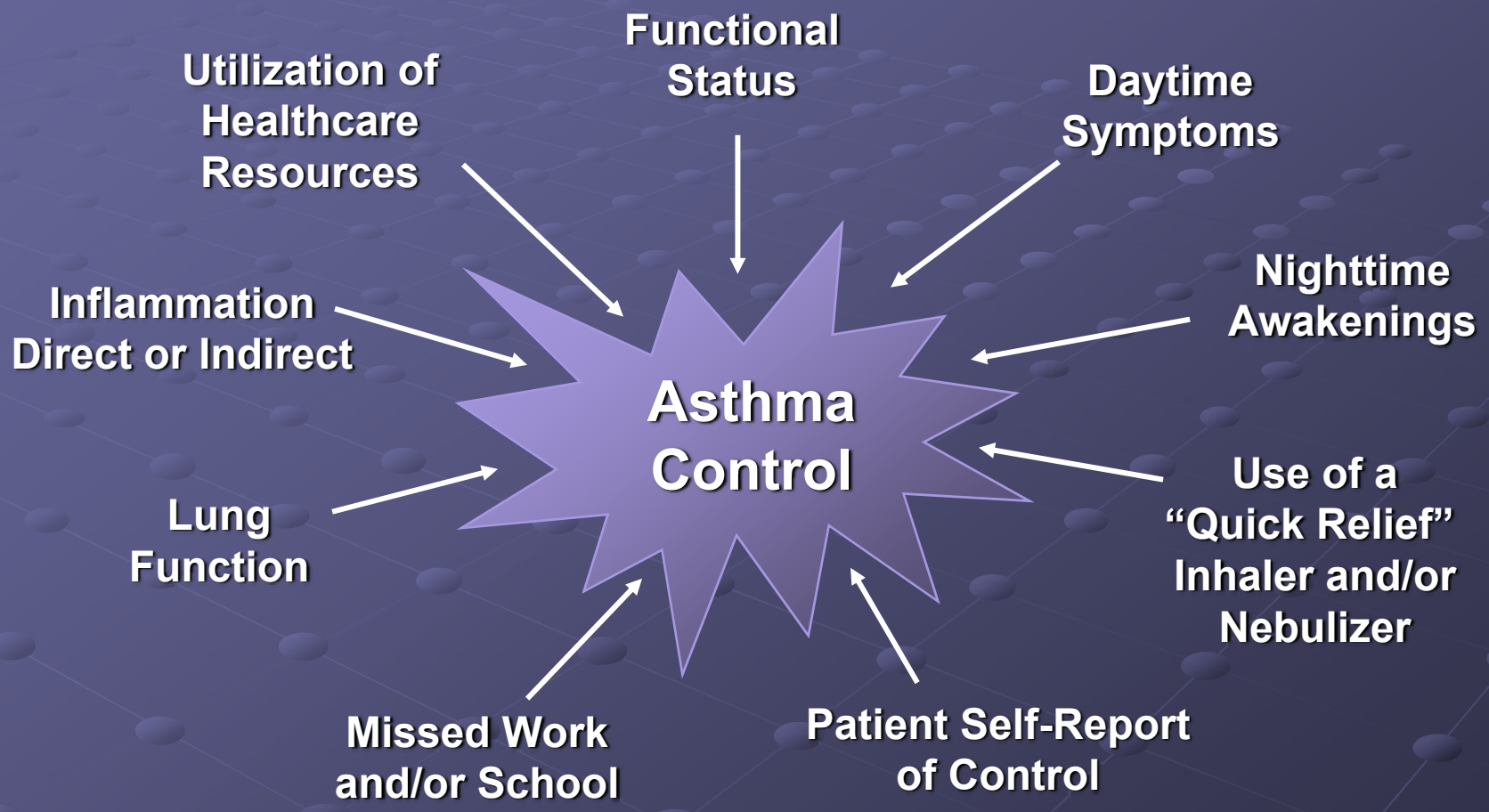
- Assessing and Monitoring Asthma Severity and Control
- Education for a Partnership in Care
- Control of Environmental Factors and Comorbid Conditions
- Pharmacologic Therapy

Asthma Assessment and Monitoring: Key Differences From 1997 and 2002

- Key elements of assessment and monitoring
  - Severity
  - Control
  - Responsiveness to treatment
- Severity emphasized for initiating therapy
- Control emphasized for monitoring and adjusting therapy
- Severity and control defined in terms of 2 domains
  - Impairment
  - Risk

National Asthma Education and Prevention Program. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma* (EPR-3 2007). U.S. Department of Health and Human Services. Available at: http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf. Accessed August 29, 2007.

How Should Control Be Measured in Asthma?



Adapted with permission from Chipps BE, Spahn JD. *J Asthma*. 2006;43:567-572.

Assessing Asthma Severity: Impairment Domain

Impairment = Frequency and Intensity of Symptoms and Functional Limitations

Symptoms

- Nighttime awakenings
- Need for SABAs for quick relief of symptoms
- Work/school days missed
- Ability to engage in normal daily activities or desired activities
- QOL assessments

Lung Function

- Spirometry
- Peak flow

SABAs = short-acting β_2-agonists; QOL = quality of life.

National Asthma Education and Prevention Program. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma* (EPR-3 2007). U.S. Department of Health and Human Services. Available at: http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf. Accessed August 29, 2007.

Assessing Asthma Severity: Risk Domain

- Likelihood of asthma exacerbations, progressive decline in lung function, or risk of adverse effects from medications
- Assessment
  - Frequency and severity of exacerbations
  - Oral corticosteroid use
  - Urgent-care visits
  - Lung function
  - Noninvasive biomarkers may play an increased role in future

Goal of Asthma Therapy: Achieve Control

Reduce Impairment

- Prevent chronic and troublesome symptoms
- Require infrequent use of inhaled SABA (≤2 days/week)
- Maintain (near) "normal" pulmonary function
- Maintain normal activity levels
- Meet patients' expectations of, and satisfaction with, asthma care

Reduce Risk

- Prevent recurrent exacerbations
- Minimize need for emergency department visits or hospitalizations
- Prevent progressive loss of lung function
- Provide optimal pharmacotherapy, with minimal or no adverse effects

National Asthma Education and Prevention Program. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma* (EPR-3 2007). U.S. Department of Health and Human Services. Available at: http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf. Accessed August 29, 2007.

Periodic Assessment of Asthma Control Recommended (1- to 6-month intervals)

- Are goals of therapy being met?
- Are adjustments in treatment necessary?
- Measure
  - Signs and symptoms
  - Pulmonary function
  - QOL/functional status
  - History of exacerbations
  - Pharmacotherapy
  - Patient-provider communication and patient satisfaction

National Asthma Education and Prevention Program. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma* (EPR-3 2007). U.S. Department of Health and Human Services. Available at: http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf. Accessed August 29, 2007.

Classifying Asthma Severity and Assessing Asthma Control

- In patients not on long-term controller medications
  - Severity based upon domains of impairment and risk
  - Level of severity based upon most severe category in which any feature appears
- In patients on long-term controller medications
  - Severity based upon lowest step required to maintain clinical control
  - Control of asthma based upon domains of impairment and risk
    - Level of control based upon most severe impairment or risk category
    - Validated questionnaires may be used in patients aged ≥12 years

National Asthma Education and Prevention Program. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma* (EPR-3 2007). U.S. Department of Health and Human Services. Available at: http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf. Accessed August 29, 2007.

ASTHMA ACTION PLAN

ASTHMA ACTION PLAN

Date_____ Patient name_____ DOB _____

MD _____ MRN_____ ☐ Reviewed with: guardian/patient Verbalized understanding ☐ yes ☐ no

GO — *maintain therapy*

- Breathing is easy
- No coughing
- No wheezing
- No shortness of breath
- Can work, play, and sleep easily
- Using quick-relief medication less than twice a week
- **PEAK FLOW** *80% – 100% of personal best*

_____ – _____

Avoid these asthma triggers: _____

_____

Take **CONTROLLER** medication: _____

_____

Take **QUICK-RELIEF** medication:

☐ Before exercise: _____

☐ Before exposure to a trigger: _____

Keep ORAL STEROIDS on hand in case you fall into STEP 3 of the yellow zone or into the red zone.

CAUTION — *step up therapy*

- Using quick-relief medication more than twice a week*
- Coughing
- Wheezing
- Shortness of breath
- Difficulty with physical activity
- Waking at night
- Tightness in chest
- **PEAK FLOW** *50% – 80% of personal best*

_____ – _____

** You might need a change in your treatment plan*

STEP 1: Add **QUICK-RELIEF** medication:

_____

_____

STEP 2: Monitor your symptoms:

- If symptoms GO AWAY quickly, return to the green zone.
- If symptoms CONTINUE or return within a few hours:

☐ Add _____

STEP 3: Continue monitoring your symptoms:

- If symptoms **CONTINUE** after step 2 treatment:

☐ Add _____
oral steroid medication

☐ Call your healthcare provider: _____

STOP — *get help now*

- Medication is not helping
- Breathing is very difficult
- Cannot walk or play
- Cannot talk easily
- **PEAK FLOW** *Less than 50% of personal best*

_____

☐ Call your healthcare provider: _____
If you can't reach your healthcare provider quickly, go to the nearest hospital emergency room or call 911 immediately.

☐ Go to the hospital emergency room or call 911 immediately.

- If you have an oral steroid at home, take _____mg of _____ as you leave for the hospital.
- Continue to use your quick-relief medication _____ as you go to the emergency room.

Asthma symptoms can get worse quickly. When in doubt, seek medical help.

ACT – ASTHMA CONTROL TEST

selecthealth.

Take the Asthma Control Test™ now to help you better control your asthma

The American Lung Association recommends everyone 12 years of age or older with asthma take the Asthma Control Test, no matter how well controlled you think your asthma is.

Your answers to this 5-question quiz will provide you a score that may help you and your doctor discuss your treatment plan.

How to take the Asthma Control Test

Step 1. Write the number of each answer in the score box provided.
Step 2. Add up each score box for your total.
Step 3. Take the test to your doctor to talk about your total score.

1. In the past 4 weeks, how much of the time did your asthma keep you from getting as much done at work, school or at home?

All of the time	Most of the time	Some of the time	A little of the time	None of the time	SCORE
1	2	3	4	5	

2. During the past 4 weeks, how often have you had shortness of breath?

More than once a day	Once a day	3 to 6 times a week	Once or twice a week	Not at all	
1	2	3	4	5	

3. During the past 4 weeks, how often did your asthma symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?

4 or more nights a week	2 or 3 nights a week	Once a week	Once or twice	Not at all	
1	2	3	4	5	

4. During the past 4 weeks, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?

3 or more times per day	1 or 2 times per day	2 or 3 times per week	Once a week or less	Not at all	
1	2	3	4	5	

5. How would you rate your asthma control during the past 4 weeks?

Not controlled at all	Poorly controlled	Somewhat controlled	Well controlled	Completely controlled	
1	2	3	4	5	

TOTAL

AMERICAN LUNG ASSOCIATION.

The American Lung Association supports the Asthma Control Test™ and does not endorse products.

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expect more

When your asthma is controlled, you should expect to be **MORE** active and have **LESS** symptoms

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What does my score mean?

19 or less

- If your score is 19 or less, your asthma may not be controlled as well as it could be.
- Discuss your Asthma Control Test score with your doctor.
- Ask your doctor about daily long-term medications that can help control airway constriction and inflammation, the two main components of asthma. Many people need to treat both of these components of asthma on a daily basis for the best asthma control.

20 or more

- If you scored 20 or more, your asthma may be well controlled. You should still talk to your doctor about your results.
- Asthma is unpredictable. Your asthma symptoms may seem mild or nonexistent, but they can flare up at any time.
- Take the Asthma Control Test periodically no matter how good you feel, and continue to see your doctor on a regular basis to ensure you are taking the necessary steps to keep your asthma in control.

PEDIATRIC ACT

selecthealth

Childhood Asthma Control Test for children 4 to 11 years old. Know the score.

This test will provide a score that may help your doctor determine if your child's asthma treatment plan is working or if it might be time for a change.

How to take the Childhood Asthma Control Test

Step 1 Let your child respond to **the first four questions (1 to 4)**. If your child needs help reading or understanding the question, you may help, but let your child select the response. Complete the remaining **three questions (5 to 7)** on your own and without letting your child's response influence your answers. There are no right or wrong answers.

Step 2 Write the number of each answer in the score box provided.

Step 3 Add up each score box for the total.

Step 4 Take the test to the doctor to talk about your child's total score.

19 or less If your child's score is 19 or less, it may be a sign that your child's asthma is not controlled as well as it could be. No matter what the score, bring this test to your doctor to talk about your child's results.

Have your child complete these questions.

SCORE

1. How is your asthma today?

0	1	2	3
Very bad	Bad	Good	Very good

2. How much of a problem is your asthma when you run, exercise or play sports?

0	1	2	3
It's a big problem, I can't do what I want to do.	It's a problem and I don't like it.	It's a little problem but it's okay.	It's not a problem.

3. Do you cough because of your asthma?

0	1	2	3
Yes, all of the time.	Yes, most of the time.	Yes, some of the time.	No, none of the time.

4. Do you wake up during the night because of your asthma?

0	1	2	3
Yes, all of the time.	Yes, most of the time.	Yes, some of the time.	No, none of the time.

Please complete the following questions on your own.

5. During the last 4 weeks, how many days did your child have any daytime asthma symptoms?

5	4	3	2	1	0
Not at all	1-3 days	4-10 days	11-18 days	19-24 days	Everyday

6. During the last 4 weeks, how many days did your child wheeze during the day because of asthma?

5	4	3	2	1	0
Not at all	1-3 days	4-10 days	11-18 days	19-24 days	Everyday

7. During the last 4 weeks, how many days did your child wake up during the night because of asthma?

5	4	3	2	1	0
Not at all	1-3 days	4-10 days	11-18 days	19-24 days	Everyday

TOTAL

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PEDIATRIC SEVERITY

Severity table, patients age 5 to 11

Use with patients **NOT** currently taking controller medication to determine initial step therapy.

Components of severity		Classifications of severity			
			persistent		
		intermittent	mild	moderate	severe
Impairment *Assess by patient's or caregiver's recall of the previous 2 to 4 weeks.*	Symptoms	≤2 days/week	>2 days/week but not daily	daily	Throughout the day
	Nighttime awakenings	≤2 days/month	3-4 times/month	> 1 time/week but not nightly	often 7 times/week
	SABA use for Sx (NOT EIB-prevention)	≤2 days/week	>2 days/week but not daily	daily	several times/day
	Interference with normal activity	none	minor limitation	some limitation	extremely limited
	Lung function/spirometry	• normal FEV_1 btwn. exacerbations • FEV_1 > 80% predicted • FEV_1/FEVC >85%	• FEV_1 > 80% predicted • FEV_1/FEVC >80%	• FEV_1 = 60% to 80% predicted • FEV_1/FEVC = 75% to 85%	• FEV_1 <60% predicted • FEV_1/FEVC <75%
Risk *Assign severity to the most severe category in which any feature occurs.*	Exacerbations requiring oral corticosteroids	0 to 1 time/year	≥2 exacerbations/year		
		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		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 corticosteroids	

PEDIATRIC TREATMENT

Treatment summary: recommendations for children 5 to 11 years of age

Provide medication, and consult or refer as necessary

The chart below includes sample medications and dosages for this age group.

- **Initiate** therapy based on severity classification at diagnosis. (See the bottom row of the severity table below.)
- **Adjust** therapy based on asthma control. (See the table on facing page 7.)

Abbreviations:

- **ICS:** inhaled corticosteroid
- **LABA:** long-acting beta$_2$-agonist
- **LRA:** leukotriene receptor agonist
- **SABA:** short-acting beta$_2$-agonist

For more information on asthma medications—including dosing guidelines for ICS—see pages 13 and 14.

Consider consultation with asthma specialist at step 3

Consult with asthma specialist for step 4 and above

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
No daily controller medication	**Low-dose ICS** *Alternatives: cromolyn,* LRA nedocromyl,* or theophylline*	*Either...* **low-dose ICS +** *either* **LRA, LABA,** *or* **theophylline** *OR* **medium-dose ICS**	**Medium-dose ICS** **+** **LABA** *Alternative: Medium-dose ICS + either LRA or theophylline*	**High-dose ICS** **+** **LABA** *Alternative: High-dose ICS + either LRA or theophylline*	**High-dose ICS** **+** **LABA** **+** **oral systemic steroids** *Alternatives: High-dose ICS + either LRA or theophylline + oral systemic steroids*
*SABA prn for quick-relief**	*SABA prn for quick-relief**	*SABA prn for quick-relief**	*SABA prn for quick-relief**	*SABA prn for quick-relief**	*SABA prn for quick-relief**

***SABA:** albuterol (ProAir HFA, Proventil HFA) via MDI (90 mcg, use spacer: 2 puffs every 4 to 6 hours) or via nebulizer (2.5 mg/3.0 mL solution 0.63 to 2.5 mg in 3.9 cc saline every 4 to 6 hours; short course of oral systemic corticosteriods (up to 60 mg) may be needed.

****cromolyn** and **nedocromil**: these medications are rarely used, but helpful in some cases.

SEVERITY TABLE >12yrs

Severity table, patients age 12 to adult

Use with patients **NOT** currently taking controller medication to determine initial step therapy.

Components of severity		Classifications of severity			
			persistent		
		intermittent	mild	moderate	severe
Impairment *Assess by patient's or caregiver's recall of the previous 2 to 4 weeks.*	Symptoms	≤2 days/week	>2 days/week but not daily	daily	Throughout the day
	Nighttime awakenings	≤2 times/month	3-4 times/month	> 1 time/week but not nightly	often 7 times/week
	SABA use for Sx (NOT EIB-prevention)	≤2 days/week	>2 days/week but not daily and not > 1 daily	daily	several times/day
Normal FEV_1/FVC: *8-19 yrs: 85%* *20-39 yrs: 80%* *40-59 yrs: 75%* *60-80 yrs: 70%*	Interference with normal activity	none	minor limitation	some limitation	extremely limited
	Lung function/spirometry	• normal FEV_1 btwn. exacerbations • FEV_1 > 80% predicted • FEV_1/FEVC >85%	• FEV_1 > 80% predicted • FEV_1/FEVC normal	• FEV_1 >60% but < 80% predicted • FEV_1/FEVC reduced 5%	• FEV_1 <60% predicted • FEV_1/FEVC reduced 5%
Risk *Assign severity to the most severe category in which any feature occurs.*	Exacerbations requiring oral corticosteroids	0 to 1 time/year	≥2 exacerbations/year		
		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		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 corticosteroids	

ASSESSING CONTROL

Assess control and adjust therapy as needed

Depending on severity, assess asthma control in 2 to 6 weeks after medication is initiated or stepped up. If no clear benefit is observed in 4 to 6 weeks, consider adjusting therapy or alternative diagnoses.

Note that the two domains of severity—impairment and risk—may respond differently to treatment. **The level of control is based on the most severe impairment or risk category.**

Patients 12 years to adult		**Classifications of asthma control**		
Components of control		**Well controlled**	**Not well controlled**	**Very poorly controlled**
Impairment	Symptoms	≤2 days/week	> 2 days/week	Throughout the day
	Nighttime awakenings	≤2 times/month	1 to 3 times/week	≥4 times/week
	Interference with normal activity	None	Some limitation	Extremely limited
	SABA use for Sx (NOT EIB-prevention)	≤2 days/week	>2 days/week	Several times per day
	Lung function/spirometry	FEV_1 or peak flow ≥ 80% predicted/personal best	FEV_1 or peak flow 60% to 80% predicted/personal best	FEV_1 or peak flow <60% predicted/personal best
	Questionnaire (ACT: Asthma Control Test)	ACT score = ≥20	ACT score = 16 to 19	ACT score = ≤15
Risk	Exacerbations	0 to 1 time/year	≥2 times/year	
		Consider severity and interval since last exacerbation.		
	Progressive loss of lung function	Evaluation requires long-term follow-up.		
	Possible treatment-related adverse effects	Possible 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 actions based on level of control		• **Maintain** current medication. • Reinforce education and trigger management. • Follow up every 1 to 6 months. • **Consider stepping down** medication therapy if well controlled for at least 3 months.	• **Step up** current medication (one step)* and re-assess control in 2 to 6 weeks. • For side effects, consider alternative treatment options. • Reinforce education and trigger management.	• **Consider** a short course of oral systemic corticosteroids • **Step up** current medication (one or two steps)* and re-assess control in 2 weeks. • For side effects, consider alternative treatment options. • Reinforce education and trigger management
			* Before stepping up therapy, check **ICE:** • Check **I**nhaler or nebulizer technique • Check **C**ompliance • Check **E**nvironmental history and trigger management In addition, **If alternative medication** therapy is used and response is inadequate, **switch to preferred treatment** before stepping up.	

TREATMENT - >12 YRS

Treatment summary: recommendations for patients 12 years to adult

Provide medication, and consult or refer as necessary

The chart below includes sample medications and dosages for this age group.

- **Initiate** therapy based on severity classification at diagnosis. (See the severity table below.)
- **Adjust** therapy based on asthma control. (See the table on facing page 9.)

Abbreviations:

- **ICS:** inhaled corticosteroid
- **LABA:** long-acting beta$_2$-agonist
- **LRA:** leukotriene receptor agonist
- **SABA:** short-acting beta$_2$-agonist

For more information on asthma medications—including dosing guidelines for ICS—see pages 13 and 14.

Consider consultation with asthma specialist at step 3

Consult with asthma specialist for step 4 and above

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
No daily controller medication	**Low-dose ICS** *Alternatives: cromolyn,** LRA nedocromyl,** or theophylline*	*Either...* **medium-dose ICS** *OR* **low-dose ICS + LABA** *Alternatives: low-dose ICS + either LRA, theophylline, or zileuton*	**Medium-dose ICS** **+** **LABA** *Alternative: Medium-dose ICS + either LRA, theophylline, or zileuton*	**High-dose ICS** **+** **LABA** **+** *Consider omalizumab for patients with allergies*	**High-dose ICS** **+** **LABA** **+** **oral systemic steroids** **+** *Consider omalizumab for patients with allergies*
*SABA prn for quick-relief**	*SABA prn for quick-relief**	*SABA prn for quick-relief**	*SABA prn for quick-relief**	*SABA prn for quick-relief**	*SABA prn for quick-relief**

* **SABA:** albuterol (ProAir HFA, Proventil HFA) via MDI (90 mcg, use spacer: 2 puffs every 4 to 6 hours) or via nebulizer (2.5 mg/3.0 mL solution 0.63 to 2.5 mg in 3.9 cc saline every 4 to 6 hours; short course of oral systemic corticosteriods (up to 60 mg) may be needed.

** **cromolyn** and **nedocromil**: these medications are rarely used, but helpful in some cases.

Controlling Asthma Triggers

Allergens	Environmental Control
Tobacco Smoke	Avoidance
Rhinitis	Nasal steroids
Sinusitis	Antibiotics, drainage
GERD	Avoid meals before bed, HOB elevated, H2 blockers, PPI
Sulfite sensitivity	Avoid shrimp, dried fruit
Medications	No beta blockers, ASA or NSAIDs
URI's	Flu vaccine
Obesity	Weight Loss

FIRST LINE THERAPY

Inhaled Corticosteroids (ICS) for the treatment of asthma

generic (Brand), delivery mode amount per respule/ puff/inhalation	Daily doses by age		
	0 to 4 years		
	low dose	**medium dose**	**high dose**
fluticasone (Flovent), MDI 44, 110, or 220 mcg	1 to 2 puffs (44 mcg) twice a day	2 to 4 puffs (44 mcg) twice a day or 1 puff (110 mcg) twice a day	>1 puff (110 mcg) twice a day
budesonide (Pulmicort), respules for nebulizer* 0.25 mg/2.0 mL, 0.5 mg/2.0 mL, or 1.0 mg/2.0 mL	1 respule (0.25) twice a day	2 respules (0.25) twice a day or 1 respule (0.5) twice a day	1 respule (1.0) twice a day
	5 to 11 years		
	low dose	**medium dose**	**high dose**
fluticasone (Flovent), MDI 44, 110, or 220 mcg	1 to 2 puffs (44 mcg) twice a day	2 to 4 puffs (44 mcg) twice a day or 1 puff (110 mcg) twice a day	>1 puff (110 mcg) twice a day
fluticasone (Flovent), DPI 50 mcg	1 to 2 inhalations (50 mcg) twice a day	3 to 4 inhalations (50 mcg) twice a day	>4 inhalations (50 mcg) twice a day
budesonide (Pulmicort), DPI 180 mcg	1 inhalation (180 mcg) twice a day	2 inhalations (180 mcg) twice a day	>2 inhalations (180 mcg) twice a day
budesonide (Pulmicort), respules for nebulizer* 0.25 mg/2.0 mL, 0.5 mg/2.0 mL, or 1.0 mg/2.0 mL	1 respule (0.25) twice a day	2 respules (0.25) twice a day or 1 respule (0.5) twice a day	2 respules (0.5) twice a day or 1 respule (1.0) twice a day
beclomethasone (Qvar), MDI 40 mcg or 80 mcg	1 to 2 puffs (40 mcg) twice a day or 1 puff (80 mcg) twice a day	3 to 4 puffs (40 mcg) twice a day or 2 puffs (80 mcg) twice a day	>2 puffs (80 mcg) twice a day
	12 years to adult		
	low dose	**medium dose**	**high dose**
fluticasone (Flovent), MDI 44, 110, or 220 mcg	1 to 3 puffs (44 mcg) twice a day or 1 puff (110 mcg) twice a day	2 puffs (110 mcg) twice a day or 1 puffs (220 mcg) twice a day	>2 puffs (110 mcg) twice a day or >1 puff (220 mcg) twice a day
fluticasone (Flovent), DPI 50 mcg	1 to 3 inhalations (50 mcg) twice a day	3 to 5 inhalations (50 mcg) twice a day	>5 inhalations (50 mcg) twice a day
budesonide (Pulmicort), DPI 180 mcg	1 inhalation (180 mcg) twice a day	2 to 3 inhalations (180 mcg) twice a day	>3 inhalations (180 mcg) twice a day
beclomethasone (Qvar), MDI 40 mcg or 80 mcg	1 to 3 puffs (40 mcg) twice a day or 1 puff (80 mcg) twice a day	4 to 6 puffs (40 mcg) twice a day or 2 to 3 puffs (80 mcg) twice a day	>3 puffs (80 mcg) twice a day
mometasone (Asmanex), DPI 220 mcg	1 inhalation (220 mcg) once a day	2 inhalations (220 mcg) once a day	>2 inhalations (220 mcg) once a day

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CHEST Physician

THE NEWSPAPER OF THE AMERICAN COLLEGE OF CHEST PHYSICIANS

JOHN MCCALLEY/UNIVERSITY OF PITTSBURGH MEDICAL CENTER

Hospital blood management programs are a growing phenomenon, said Dr. Jonathan Waters of the University of Pittsburgh.

Blood Costs, Benefits Are a Delicate Balance

BY MICHELE G. SULLIVAN
Elsevier Global Medical News

Faced with skyrocketing costs, a dwindling supply, and ever-increasing demand, hospitals are finding ways to optimally manage one of their most precious resources—blood.

"The supply of blood in this country is decreasing as the need continues to rise," said Dr. Ajay Kumar, medical director of blood management at the Cleve- is a projected deficit of blood by 2030—and it looks like it will be quite an imbalance, with a shortage of up to 4 million units per year."

But the looming shortfall is just one prod for hospitals to reexamine their blood use policies.

Although most blood comes from free donation, it's not cheap to store it, keep track of it, or use it. And there's no denying that blood transfusion exposes patients to a unique set of health risks, said Deborah Tolich, R.N., regional director for blood

FDA Panels: 'No' to LABA Monotherapy, 'Yes' to Combo Tx

Use of LABAs for asthma debated.

BY ELIZABETH MECHCATIE
Elsevier Global Medical News

ROCKVILLE, MD. — The benefits of the single-ingredient, long-acting β-agonist products salmeterol (Serevent) and formoterol (Foradil) do not outweigh their risks when used for treating asthma in adults, adolescents, and children, according to a majority of the three Food and Drug Administration advisory panels who reviewed the safety of the drugs.

However, most of the panelists at the joint meeting Dec. 10-11 of the FDA's Pulmonary-Allergy Drugs Advisory Committee, Drug Safety and Risk Management Advisory Committee, and Pediatric Advisory Committee agreed that the benefits of Advair, which combines salmeterol with the inhaled corticosteroid (ICS) fluticasone, and Symbicort, which combines formoterol with the ICS budesonide, outweighed the risks when used to treat asthma in adults and adolescents.

The panel members recommended that safety be further studied in randomized, controlled trials; that health care practitioners and patients be educated about the importance of an ICS as a first-line treatment for asthma; and that a long-acting β-agonist (LABA) always be combined with an ICS. The FDA usually follows the recommendations of its advisory panels, which are not binding.

The three committees met to review the risks and benefits of the four inhaled LABAs marketed in the United States for adults and children with asthma. The committees also discussed whether the drugs

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FDA Pulmonary-Allergy Drugs Advisory Committee

Summary

- NAEPP has published new comprehensive guidelines for the diagnosis and management of asthma (2007)
- Assessment, education, control of environment and medications
- Anti-inflammatory medications remain the mainstay of therapy

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