

Missouri School Asthma Manual

Resources for Improving School Asthma Services



Created through a partnership with
Missouri Department of Health & Senior Services
Missouri Association of School Nurses
Missouri School Boards Association
University of Missouri Women's and Children's Hospital

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DEDICATION AND CREDITS

The Missouri School Asthma Manual is the result of the work of many individuals and organizations. We are greatly indebted to these people. The manual is a collection of resources designed to assist school nurses and others who seek to improve school asthma services. The index has been constructed to make it easy to locate materials in the context of day-to-day needs to which school nurses respond. Every effort has been made to credit original sources. If we have failed to acknowledge anyone's contribution, please contact us. **The Missouri School Asthma Manual remains a work in progress.** We hope it will continue to evolve to meet the changing needs of Missouri children and schools. Please, share your ideas so we can keep improving this tool.
<http://health.mo.gov/living/healthcondiseases/chronic/asthma/index.php>

We are particularly indebted to the Centers for Disease Control and Prevention for financial support and expert guidance in this project. The Missouri working group who launched this project and saw it to completion also deserves credit for managing a painstaking, but rewarding task. A very special thanks is needed to the following persons for their help with the 2011 version: Dianne Herndon, retired School Nurse, Parkway Schools in St. Louis; Deb Cook, School Nurse, Kennett Public Schools; Marjorie Cole, State School Nurse Consultant, Missouri Department of Health and Senior Services; Kelli Alley, AE-C, Public Health Planner, Grundy County Health Department, former School Nurse; Holly Neske, School Nurse, Montgomery County R-II; Carol Massie, School Nurse, Southern Reynolds County R-II School; Beth Stieffermann, Missouri Department of Health and Senior Services; and Stefanie Birk, RN, BSN.

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Tammy Rood, CPNP, AE-C has shouldered the primary responsibility for bringing the 2011 version to press. This has taken countless, sometimes painful hours of editing and research. Julie Patterson, Program Coordinator, Asthma Ready® Communities was been a big help formatting documents for the 2011 Missouri School Asthma Manual. Bonnie Clarkson and John Leach, System Support Analysts at University of Missouri-Columbia provided technical assistance for creation of one unified document.

We are very excited that so many opportunities are currently available to school nurses in Missouri to improve school asthma services. Please visit www.asthmaready.org and www.astmahere.org for further resources and information on current events happening with asthma in Missouri.

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A

Section A
REPORTED
ASTHMA

OVERVIEW OF ASTHMA CARE AT SCHOOL

1. Use **health forms, emergency cards, sports physical forms, and medications brought to school** to identify children with a history of asthma who will be attending school.
2. **Complete *School Asthma Worksheet (A-2)*** to evaluate the likelihood that students with asthma in your school(s) have been identified and are receiving appropriate services.
3. **Complete *Asthma Care at School form (A-6, A-7)*** for students identified with asthma.
4. **Identify students who require *Needs Assessment (B-1) & School Asthma Action Plan (B-2, B-3)*:**
 - a. Students who have been hospitalized for asthma-related problems in the last three years
 - b. Students who have required urgent or emergency care due to asthma in last three years
 - c. Students who will be using asthma medications at school
 - d. Students who take medication daily to control asthma (Examples include Singulair®, Flovent®, QVar®, Pulmicort®, Asmanex®, Alvesco®, Advair®, Dulera®, Symbicort®, theophylline, Tilade®)
 - e. Students who have used asthma medications in the past year
5. **Arrange a meeting with the student and parents/legal guardian or caregiver to complete the *Needs Assessment Form (B-1)* and the *School Asthma Action Plan (B-2, B-3)* (may be a telephone interview):**
 - a. Identify student's current health status and asthma management activities at home
 - b. Evaluate parental need for education & concerns about child's health & safety
 - c. Identify expectations for asthma care at school (classroom, PE, & field trips)
 - d. Determine specific services student will require at school
 - e. Identify equipment and supplies the child will require during the school day.
 - f. Evaluate student need for education, training, and support
 - g. Obtain written consent from parent/legal guardian to provide asthma services at school
 - h. Obtain consent from parent/legal guardian to communicate with healthcare providers
6. **Inform appropriate staff about child's *School Asthma Action Plan (B-2, B-3)*:**
 - a. Document asthma training activities for staff providing asthma services
 - b. Monitor & supervise health staff in performance of asthma care
 - c. Identify & prepare school personnel involved in care of child at school
 - d. Provide asthma care in-service for teachers and school staff
 - e. Update staff who need to know if students' asthma care plans change
 - f. Determine if staff CPR dates are current. If necessary, arrange training
7. **Assess need & provide asthma education to children with asthma and their parents**
8. **Include the *School Asthma Action Plan (B-2, B-3)* if the student has an *IEP* or *504 Plan***
9. **Participate in community-wide efforts to increase asthma awareness & improve care**
10. **Evaluate school asthma services and develop an annual plan to improve care**
11. **Use a coordinated school health approach for addressing asthma**, such as "Strategies for Addressing Asthma", available at <http://www.cdc.gov/HealthyYouth/Asthma/strategies.htm> or (K-4).

SCHOOL ASTHMA WORKSHEET

How many children in my school have asthma??

The purpose of this worksheet is to help you assess that students with asthma in your school(s) have been identified and are receiving appropriate services to reduce impairment and lower risk of exacerbations by improving control of asthma.

There are about 1,200,000 children in Missouri. About 10% (9.7%) or one in 10 Missouri children (111,000) has asthma (Missouri Department of Health & Senior Services, 2006). School asthma screenings and surveys reported in the literature have consistently reported under-diagnosis of asthma among students. The following questions will help to determine if most students with asthma have been recognized in your school.

1) The expected number of children with asthma in my school building is [b] ____.

(Calculation - total number of children in my school building [a] ____ times 0.1 (10%) = [b] ____)

2) The actual number of children reported to have asthma in my school is [c] ____ .

3) Out of 10 children with asthma: 2 (20%) have intermittent asthma, 3 (30%) have mild persistent asthma, 3 (30%) have moderate persistent asthma and 2 (20%) have severe persistent asthma. Approximately 80% of children with asthma have persistent asthma (mild plus moderate plus severe) and 20% have intermittent asthma. (See D-3 of Missouri School Asthma Manual: "Checklist for Identifying Persistent Asthma").

Persistent asthma requires a daily control medicine to reduce impairment and lower risk of asthma exacerbations, and quick-relief medicine (albuterol) should be available at school.

The preferred medicine for all levels of persistent asthma includes inhaled corticosteroids (ICS).

4) The number of children in my school that are expected to have persistent asthma is the total number of children (a) times 0.08 = [d] ____ .

5) The actual number of students that have been identified as having persistent asthma in my school is [e] ____ .

6) The number of students known to be taking control medications (see box below right) at my school is ____ .

The number taking inhaled corticosteroid (ICS) medicines is ____.

[a] = total number of students in your school building
[b] = expected number of children with asthma
[c] = actual number of children reported to have asthma
[d] = expected number of children with persistent asthma
[e] = actual number of children identified with persistent asthma

ICS Control Medicines for Asthma:

Flovent®, QVar®, Pulmicort® or budesonide, Asmanex®, Alvesco®, Advair®, Dulera®, Symbicort®

Other Control Medicines for Asthma:

Singular® , theophylline, Tilade®

Use of objective measures of airflow (peak flow and forced expiratory volume in one second [FEV1]) makes it possible to identify students with uncontrolled asthma who would otherwise miss detection due to the absence of overt symptoms, such as wheezing and shortness of breath and those who have not experienced easily recognizable episodes of asthma during school activities. Assessment of asthma control is inadequate when symptom-reports and observed exacerbations alone are used to evaluate the adequacy of treatments and self-management. For more information on this key asthma assessment tool- see D-8 "A Vital Sign for Asthma - Measure Airflow!"

ASSESSING ASTHMA CONTROL IN STUDENTS

EPR-3 Recommendation: Every patient with asthma should be taught to recognize symptom patterns and monitor airflow to identify poor asthma control and the need for additional therapy. Control should be routinely monitored to assess whether impairment and risk are reduced.

Message for Schools

School nurses should routinely assess control. Monitor and report: 1) frequency of need for quick relief medications, 2) impairment related to breathing problems, 3) missed school days, and 4) diminished air-flow measures (FEV1 or PEF). Communicate regularly with parents and asthma care clinicians, especially when asthma is not well controlled.

Source: *Creating Asthma-Friendly Schools: EPR-3 Recommendations and Priority Messages.* (2010), National Asthma Control Initiative and American School Health Association.

When asthma is well controlled, students with asthma should have MINIMAL OR NO asthma symptoms and can safely participate in all school activities. However, uncontrolled asthma can affect a student's school attendance, participation, and progress in school.

A student's asthma is **WELL CONTROLLED** if **ALL OF THE FOLLOWING ARE TRUE:**

- Daytime symptoms **no more than 2 days a week** (AND symptoms not more than once on the same day for a student 5-11 yrs old)
- **(5-11 yrs)** Nighttime awakenings occur due to asthma symptoms **no more than ONCE A MONTH**
(12 to Adult) Nighttime awakenings occur due to asthma symptoms **no more than 2 NIGHTS A MONTH**
- Symptoms **no more than 2 days a week** that require quick-relief medicine (SABA –short acting beta agonists, i.e. albuterol)
- The student can participate fully in regular school activities, including play, sports, and exercise **(NO interference with normal activity due to asthma symptoms)**
- **Normal FEV1 or peak flow (>80% of personal best or predicted value)**
- The student has had **ZERO or only ONE exacerbation** in the past 12 months that required oral steroids

A student's asthma is **NOT WELL CONTROLLED** if **ONE OR MORE** of the following are true:

- Daytime symptoms occur **more than 2 days a week but NOT EVERYDAY**, and for 5-11 years, if symptoms occur many times on ≤ 2 days a week
- **(5-11 yrs)** Nighttime awakenings occur due to symptoms **more than 1 night a month but < 2 nights a week**
(12 - Adult) Nighttime awakenings occur due to symptoms **1-3 nights a week**
- Symptoms occur **MORE THAN 2 DAYS A WEEK** but **NOT several times daily** that require quick-relief medicine (SABA –short acting beta agonists, i.e. albuterol)
- There is **SOME** interference with normal activity due to asthma symptoms
- **FEV1 or peak flow values are 60% to 80%**
- The student has had **TWO or more** exacerbations in the past 12 months which required oral steroids

Asthma Ready® Communities (2010)

ASSESSING ASTHMA CONTROL IN STUDENTS

A student's asthma is **VERY POORLY CONTROLLED** if **ONE OR MORE** of the following are true:

- Daytime symptoms occur **THROUGHOUT THE DAY**
- (5-11 yrs) Nighttime awakenings occur due to symptoms **2 or more nights a week**
(12 – Adult) Nighttime awakenings occur due to symptoms **4 or more nights a week**
- Symptoms occur **SEVERAL TIMES DAILY** that require quick-relief medicine (SABA –short acting beta agonists, i.e. albuterol)
- NORMAL ACTIVITY is **EXTREMELY LIMITED** due to asthma symptoms
- **FEV1 or peak flow values are below 60%**
- The student has had **TWO or more** exacerbations in the past 12 months which required oral steroids

The above information is from Expert Panel Report 3 (EPR3): Guidelines for the Diagnosis and Management of Asthma (2007). See MSAM page G-13 (5-11 yrs) and MSAM page G-17 (Youths 12 – Adult) for EPR3 charts on assessing asthma control.

Other signs of Uncontrolled Asthma

- Lingering cough after a cold.
- Persistent cough during the day.
- Coughing during the night or early in the morning.
- Coughing or wheezing, chest tightness, or shortness of breath after vigorous physical activity or activity in cold or windy weather.
- Low level of stamina during physical activity or reluctance to participate.
- Coughing, wheezing, chest tightness, or shortness of breath even though the child is taking medicine for asthma.
- Increased use of asthma medicine to relieve coughing, wheezing, chest tightness, or shortness of breath.

Remember: The level of control is based on the most severe impairment or risk category (EPR3). If your student has one assessment which falls in the VERY POORLY CONTROLLED category, then your student has VERY POORLY CONTROLLED asthma. **If you suspect not well controlled or undiagnosed asthma in a student, document your findings and share these in writing with the parent(s) or guardian(s). Suggest referral to their healthcare provider.**

See MSAM page D-5 “Is Asthma under Control?” to complete with the student and parent/guardian(s). Other helpful tools: The Asthma Control Test - see MSAM pages D-6 (for children 4-11 years old) and D-7 (for teens 12 years and older) and Asthma Symptom Diary (E-4).

Asthma Ready® Communities (2010)

ASTHMA CARE AT SCHOOL

(date sent)

(home address)

Dear _____:

According to school health information, your child _____ has been identified as having a history of asthma. To better meet your child's needs at school, please complete and return the enclosed form by _____. This form enables school health personnel to administer needed medication to your child at school, as determined by your child's health care provider. It also enables the appropriate treatment of your child's asthma during an emergency situation. Please be certain to answer the six questions indicated with an asterisk (*), as this will help us to determine the seriousness of your child's asthma.

Please sign and return the form to school with your child. If medications are needed at school and/or if you have answered yes to any of the questions preceded by an asterisk, please call me at _____ to discuss your child's asthma care further. I look forward to working with you and your child.

Sincerely,

school nurse

school nurse e-mail address

school nurse contact number

school nurse fax number

ASTHMA CARE AT SCHOOL

Student Name: _____ Teacher: _____

*Medications that have been prescribed for use at school and at home may be administered by a school nurse or authorized staff member if: 1) the medication has been appropriately labeled by a pharmacist under the direction of a licensed health care provider 2) the parent or legal guardian has granted permission below for the specific medication to be administered at school (Please note that medications that have been duly prescribed for **self-administration** by a school-age minor child require completion of an "**Asthma Medication Self-Administration Form**" as set forth by the Missouri Safe Schools Act of 1996).*

Medication Name _____ **Dose** _____ **Time/Interval** _____

Route/inhalation device _____ Instructions _____

Medication Name _____ **Dose** _____ **Time/Interval** _____

Route/inhalation device _____ Instructions _____

Allergies: list known allergies to medications, food, or air-borne substances _____

* How many times in the last 3 years has your child required urgent or emergency care due to asthma? _____ When? _____

* How many times in the last 3 years has your child been hospitalized due to asthma-related problems? _____ When? _____

* Has your child been instructed to take a medication daily to control asthma? _____ If so, when? _____

* Has your child recently been waking up at night coughing? _____ If so, how many nights a month? _____

* Has your child recently been coughing and draining a lot of daytime mucous? _____ If so, how often? _____

* Has your child had asthma symptoms that are worse in certain seasons? _____ If so, what seasons? _____

If the answer to any of these questions is yes, please call _____ to schedule a time to meet with the school nurse. A history and needs assessment form should be completed. An asthma action plan should also be on record with the school.

I, the parent or legal guardian of the student listed above, give permission for administration of the above listed medications. I also grant permission for exchange of information with the health care provider to facilitate my child's asthma and allergy care.

Parent/Guardian:

Name: _____ Home Phone: _____

Address: _____ Work Phone: _____

Cell Phone: _____ E-mail Address: _____

Name: _____ Home Phone: _____

Address: _____ Work Phone: _____

Cell Phone: _____ E-mail Address: _____

Emergency Contacts:

Name: _____ Phone: _____

Student's Health Care Provider:

Name: _____ Phone: _____

Address: _____ Fax: _____

Signature of parent/legal guardian _____ Date _____

B

Section B

**ARE MEDICATIONS
TO BE USED AT
SCHOOL?**

SCHOOL ASTHMA HISTORY AND NEEDS ASSESSMENT

Student Name: _____ **Teacher/Team:** _____ **School Year** _____

1. How long has your child had asthma? _____
2. What signs and symptoms signal a flare up of your child's asthma? _____

3. Describe any special care your child requires at school. _____

4. Any dietary restrictions to follow at school? _____

5. Describe the plan of care in the event of field trips, after-school activities and exercise. _____

6. How many days of school did your child miss last school year?
 0 days 1-2 days 3-5 days 6-9 days 10-14 days 15 or more days
7. During the past year has your child's asthma ever stopped him/her from taking part in sports, recess, physical education or other school activities?
 None Some of the time All of the time
8. In the past month, during the day, how often has your child had a hard time with coughing, wheezing or breathing?
 2 times a week or less More than 2 times a week All the time - throughout the day - every day
9. In the past month, during the night, how often does your child wake up or have a hard time with coughing, wheezing or breathing?
 2 nights a month or less More than 2 nights a month More than 2 nights a week More than 4 nights a week

Equipment and Supplies Provided by Parents

_____ Daily Asthma Medications _____ Emergency Asthma Medications
 _____ Peak Flow Meter Supplies (with mouthpiece) _____ Spacer for Metered Dose Inhaler Use
 _____ Nebulizer Tubing/Mask

Please list asthma and allergy medications that your child takes at home: _____

I rate my child's need for additional knowledge about asthma as:
 0-None 1-Very Low 2-Low 3-Moderate 4-High 5-Very High (please circle one)

I rate my child's need to improve skills for self-management of asthma (use of inhalers, peak flow meters, symptom reporting) as:
 0-None 1-Very Low 2-Low 3-Moderate 4-High 5-Very High (please circle one)

I rate my child's health problems related to asthma currently as (Optional: See Asthma Control Test: D-6, D-7 of Missouri School Asthma Manual)
 0-None 1-Very Low 2-Low 3-Moderate 4-High 5-Very High (please circle one)

I rate my level of concern about asthma posing a safety risk for my child at school:
 0-None 1-Very Low 2-Low 3-Moderate 4-High 5-Very High (please circle one)

I rate MY need for additional asthma information as:
 0-None 1-Very Low 2-Low 3-Moderate 4-High 5-Very High (please circle one)

Asthma Needs Score: _____ *(sum of item scores)*

Child's personal best peak flow number is _____
 Green Zone (80-100% Personal Best) _____ Yellow Zone (50-80% Personal Best) _____
 Red Zone (Below 50% Personal Best) _____

Person Interviewed _____ Date _____
 Signature of School Nurse _____ Date _____

SCHOOL ASTHMA ACTION PLAN

Student Name _____ Teacher/Team _____ School Year _____

1. Triggers that might start an asthma episode for this student:

- Exercise Animal Dander Cigarette smoke, strong odors Respiratory Infections
 Pollens Temperature Changes Foods _____ Emotions (e.g. when upset)
 Molds Irritants (e.g. chalk dust) Other _____

2. Control of the School Environment:

_____ Environmental measures to control triggers at school _____
 _____ Pre-Medications (prior to exercise, choir, band, etc.) _____
 _____ Dietary Restrictions _____

3. Peak Flow Monitoring:

How often does your child check peak flows? _____ Never Sometimes Always
 Personal Best Peak Flow _____ Monitoring Times _____

4. Routine Asthma, Allergy, and Anaphylaxis Medication Schedule

Medication Name	Dose/Frequency	When to Administer	
		At Home	At School

5. Field Trips: Asthma Medications and supplies must accompany student on all field trips. Staff member must be instructed on correct use of the asthma medications and bring a copy of the Asthma Action Plan and Contact Phone Numbers.

1. Parent to Contact _____
 Phone Number(s) _____
2. Other Person to Contact in Emergency _____
 Phone Number(s) _____

Parent Consent for Management of Asthma at School

I, the parent or guardian of the above named student, request that this School Asthma Action Plan be used to guide asthma care for my child. I agree to:

1. Provide necessary supplies and equipment.
2. Notify the school nurse of any changes in the student's health status.
3. Notify the school nurse and complete new consent for changes in orders from the student's health care provider.
4. Authorize the school nurse to communicate with the primary care provider/specialist about asthma/allergy as needed.
5. School staff interacting directly with my child may be informed about his/her special needs while at school.

Parent/Legal Guardian Signature _____ Date _____

Reviewed by the School Nurse _____ Date _____

(SEE NEXT PAGE - FLIP OVER)

SCHOOL ASTHMA ACTION PLAN

Immediate action is required when the student exhibits ANY of the following signs of respiratory distress. Always treat symptoms even if a peak flow meter or electronic flow meter is not available. If a peak flow meter or electronic flow meter is available, check for airflow obstruction (FEV1 preferred or peak flow if FEV1 is not available) prior to giving quick relief medicine and every 20 minutes to assess need for additional doses.

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> Severe cough | <input type="checkbox"/> Shortness of Breath | <input type="checkbox"/> Sucking in of the chest wall | <input type="checkbox"/> Difficulty breathing when walking |
| <input type="checkbox"/> Chest tightness | <input type="checkbox"/> Turning blue | <input type="checkbox"/> Shallow, rapid breathing | <input type="checkbox"/> Difficulty breathing while talking |
| <input type="checkbox"/> Wheezing | <input type="checkbox"/> Rapid, labored breathing | <input type="checkbox"/> Blueness of fingernails & lips | <input type="checkbox"/> Decreased or loss of consciousness |

Steps to Take During an Asthma Episode:

1. Give Emergency Asthma Medications As Listed Below:

Quick Relief Medications	Dose/Frequency	When to Administer

2. Contact Parents if _____

3. Call 911 to activate EMS if the student has ANY of the following:

- Lips or fingernails are blue or gray
 - Student is too short of breath to walk, talk, or eat normally
 - Chest and neck pulling in with breathing
 - Child is hunching over
 - Child is struggling to breathe
- OR**
- The quick-relief medicine is not helping (breathing should improve within 15 minutes after quick-relief medicine is given)

Note: For a severe, life-threatening asthma episode, activate EMS. The Guidelines for the Diagnosis and Treatment of Asthma – Expert Panel Report 3 (2007) recommend a short-acting beta-agonist (i.e. Albuterol), 2-6 puffs with a spacer/spacer with mask. If the child is not receiving emergency care in 20 minutes, guidelines recommend repeating this dose.

Parent/Legal Guardian Signature _____ Date _____

Reviewed by School Nurse _____ Date _____

Telephone Contact

Date _____

Person _____

Additional Examples of Asthma Action Plans

1. <http://www.rampasthma.org/info-resources/asthma-action-plans/>
2. http://www.nhlbi.nih.gov/health/public/lung/asthma/asthma_actplan.htm



Is the Asthma Action Plan Working?

A Tool for School Nurse Assessment

Assessment for: _____ Completed by: _____ Date: _____
(Student) (Nurse or Parent)

This tool assists the school nurse in assessing if students are achieving good control of their asthma. Its use is particularly indicated for students receiving intensive case management services at school.

With good asthma management, students should:

- Be free from asthma symptoms or have only minor symptoms:
 - no coughing or wheezing
 - no difficulty breathing or chest-tightness
 - no waking up at night due to asthma symptoms
- Be able to go to school every day, unhampered by asthma.
- Be able to participate fully in regular school and daycare activities, including play, sports, and exercise.
- Have no bothersome side effects from medications.
- Have no emergency room or hospital visits.
- Have no missed class time for asthma-related interventions or missed class time is minimized.

Signs that a student's asthma is not well controlled:

Indicate by checking the appropriate box whether any of the signs or symptoms listed below have been observed or reported by parents or children within the past 2-4 weeks (6 months for history). If any boxes are marked, this suggests difficulty with following the treatment plan or need for a change in treatment or intervention (e.g., different or additional medications, better identification or avoidance of triggers).

- Asthma symptoms more than two days a week or multiple times in one day that require quick-relief medicine (short-acting beta2-agonists, e.g., albuterol).
- Symptoms get worse even with quick-relief meds.
- Waking up at night because of coughing or wheezing. Frequent or irregular heartbeat, headache, upset stomach, irritability, feeling shaky or dizzy.
- Missing school or classroom time because of asthma symptoms.
- Having to stop and rest at PE, recess, or during activities at home because of symptoms.
- Exacerbations requiring oral systemic corticosteroids more than once a year.
- Symptoms require unscheduled visit to doctor, emergency room, or hospitalization.
- 911 call required.

If you checked any of the above, use the following questions to more specifically ascertain areas where intervention may be needed.

Probes	Responsible Person/Site	Yes	No	N/A
Medications				
• Are appropriate forms completed and on file for permitting medication administration at school?	By school staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Self-carry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Has a daily long-term-control medication(s)* been prescribed?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is long-term-control medication available to use as ordered?	Home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is the student taking the long-term-control medication(s) as ordered?	Home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Has a quick-relief (short-acting B2-agonist) medication been prescribed?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Is quick-relief medication easily accessible?	Home	<input type="checkbox"/>	<input type="checkbox"/>	
	Personal inhaler(s) at school health office	<input type="checkbox"/>	<input type="checkbox"/>	
	Self-carry	<input type="checkbox"/>	<input type="checkbox"/>	
• Is the student using quick-relief medication(s) as ordered... ◦ Before exercise?	Home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◦ Immediately when symptoms occur?	Home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Responsible Person/Site		No	N/A
Medical Administration				
• Does the student use correct technique when taking medication?	Home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Does the person administering the medication use correct technique?	Home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring				
• Can the student identify his/her early warning signs and symptoms that indicate the onset of an asthma episode and need for quick-relief medicine?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Can the student identify his/her asthma signs and symptoms that indicate the need for help or medical attention?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Can the student correctly use a peak flow meter or asthma diary for tracking symptoms?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Are the student's asthma signs and symptoms monitored using a Peak Flow, verbal report, or diary? ◦ Daily?	Home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◦ For response to quick-relief medication?	Home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◦ During physical activity?	Home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trigger Awareness				
• Have triggers been identified?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Can student name his/her triggers?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Can parents/caregivers list their child's asthma triggers?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Are teachers, including physical educators, aware of this student's asthma triggers?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trigger Avoidance				
• Are triggers removed or adequately managed?	Home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	School	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

School nurses provide appropriate asthma education and health behavior intervention to students, parents, and school personnel when signs and symptoms of uncontrolled asthma and other areas of concern are identified. If there is an indication for a change in asthma medications or treatment regimen, refer the student and family to their primary care provider or asthma care specialist or help families to find such services as soon as possible.

*Long-term-control medications (controllers) include inhaled corticosteroids (ICS), leukotriene receptor antagonists (LTRA), or combination medicine (long-acting B2-agonists and ICS), cromolyn, or theophylline.

C

Section C

**ARE MEDICATIONS
TO BE
SELF-ADMINISTERED
BY THE STUDENT?**

SAFE SCHOOLS ACT SUMMARY

Under the Safe Schools Act of 1996 (revised August 28, 2009), children with asthma or anaphylaxis are able to self-administer life-saving medications.

In 1996 Governor Mel Carnahan signed into law the "Safe Schools Act." Because asthma is the number one reason for missed school days, many schools are challenged to assure children with asthma are able to participate fully in the learning process.

**To self-administer asthma or anaphylaxis medication,
children MUST have on file with the school:**

- **Medical history of the student's asthma or anaphylaxis**
- **Written authorization from the prescribing health care provider that the child has asthma or is at risk for having anaphylaxis, has been trained in the correct and responsible use of the medication, and is capable of self-administering the medication while in school, at a school-sponsored activity, and in transit to or from school or school-sponsored activity**
- **Written authorization by the parent/guardian - the parent/guardian has completed and submitted to the school any written documentation required by the school, including the treatment plan**
- **A written treatment plan for managing asthma or anaphylaxis episodes approved and signed by the prescribing health care provider to address emergencies and the care of asthma and anaphylaxis while in school. The treatment plan should have a statement that the student is capable of self-administering the medication, and be kept in an easily accessible place.**
- **A signed statement by the parent/guardian acknowledging that the school district and its employees or agents shall incur no liability as a result of any injury arising from the self-administration of medication by the child or the administration of such medication by school staff**
- **Permission for self-medication is effective for the same school and school year for which it is granted, and must be renewed every school year.**
- **Any current duplicate prescription medication, if provided by parent/guardian or by the school, shall be kept at a location which the student or school staff has immediate access in the event of an asthma or anaphylaxis emergency.**

If the above steps are followed, the school incurs no liability as a result of the child self-administering life-saving medication.

Adapted from:

<http://www.moga.missouri.gov/statutes/C100-199/1670000627.htm>

When Should Students With Asthma or Allergies Carry and Self-Administer Emergency Medications at School?

Guidance for Health Care Providers Who Prescribe Emergency Medications

Physicians and others authorized to prescribe medications, working together with parents and school nurses, should consider the list of factors below in determining when to entrust and encourage a student with diagnosed asthma and/or anaphylaxis to carry and self-administer prescribed emergency medications at school.

Most students can better manage their asthma or allergies and can more safely respond to symptoms if they carry and self-administer their life saving medications at school. **Each student should have a personal asthma/allergy management plan on file at school that addresses carrying and self-administering emergency medications.** If carrying medications is not initially deemed appropriate for a student, then his/her asthma/allergy management plan should include action steps for developing the necessary skills or behaviors that would lead to this goal. All schools need to abide by state laws and policies related to permitting students to carry and self-administer asthma inhalers and epinephrine auto-injectors.

Health care providers should assess student, family, school, and community factors in determining when a student should carry and self-administer life saving medications. **Health care providers should communicate their recommendation to the parent/guardian and the school,** and maintain communication with the school, especially the school nurse. Assessment of the factors below should help to establish a profile that guides the decision; however, responses will not generate a "score" that clearly differentiates students who would be successful.

Student factors:

- Desire to carry and self-administer
- Appropriate age, maturity, or developmental level
- Ability to identify signs and symptoms of asthma and/or anaphylaxis
- Knowledge of proper medication use in response to signs/symptoms
- Ability to use correct technique in administering medication
- Knowledge about medication side effects and what to report
- Willingness to comply with school's rules about use of medicine at school, for example:
 - Keeping one's bronchodilator inhaler and/or auto-injectable epinephrine with him/her at all times;
 - Notifying a responsible adult (e.g., teacher, nurse, coach, playground assistant) during the day when a bronchodilator inhaler is used and *immediately* when auto-injectable epinephrine is used;
 - Not sharing medication with other students or leaving it unattended;
 - Not using bronchodilator inhaler or auto-injectable epinephrine for any other use than what is intended;
- Responsible carrying and self-administering medicine at school in the past (e.g. while attending a previous school or during an after-school program).

NOTE: Although past asthma history is not a sure predictor of future asthma episodes, those children with a history of asthma symptoms and episodes might benefit the most from carrying and self-administering emergency medications at school. It may be useful to consider the following.

- Frequency and location of past sudden onsets
- Presence of triggers at school
- Frequency of past hospitalizations or emergency department visits due to asthma

ASTHMA STUDENT SKILLS CHECKLIST

Student _____ Age _____ Grade _____

School Nurse Signature _____ Date _____

Metered Dose Inhaler (MDI) Skills Checklist:

Requires Supervision **Performs Independently**

1. Remove the cap to expose the mouth piece. Make sure the mouthpiece and the opening where the medicine comes out is clean and free of debris and build-up
2. If applicable, shake the inhaler gently back and forth and prime if needed.
3. Gently exhale fully and completely to empty the air from your lungs
4. Place the inhaler up to your mouth and seal your lips around the mouth piece, making sure teeth are not blocking the opening of the mouthpiece.
5. Lift the chin and start to breathe in and then immediately spray ONE puff of medicine as you continue breathing in for 3-5 seconds.

If the student's FEV1 is known, use a target time to coach the time in seconds the student should breathe in. (This will help the student breathe in at the right speed for the inhaler they are using).

Target time for MDIs is [FEV1 value] X 2 = seconds.

Example: student's FEV1 = 2.0 Liters: MDI target time would be [2.0] X 2 = 4 seconds.

6. Fill your lungs with the medication and hold your breath for 5-10 seconds. Then slowly breathe out.
7. Repeat steps 1-5 for each prescribed puff. Wait one minute between puffs.
8. Avoid exposing the MDI to extreme temperatures. Follow manufacturer's guidelines for care of the device.
9. Recommend "rinse and spit, then brush your teeth" after inhaled corticosteroids (ICS). If unable, eating or drinking will help remove drug from throat.

Spacer/Chamber Skills Checklist: Type of Device _____

Requires Supervision **Performs Independently**

1. Remove the cap and look for foreign objects.
2. Attach inhaler to device. If applicable, shake the inhaler gently back and forth and prime if needed.
3. Gently exhale fully and completely to empty the air from your lungs.
4. Continue with steps 4-6 of the "Metered Dose Inhaler Skills Checklist" above.
5. Avoid exposing the MDI to extreme temperatures. Follow manufacturer's guidelines for care of the device.

Spacer/Chamber WITH MASK Skills Checklist: Type of Device _____

Requires Supervision **Performs Independently**

1. Look inside the mask and chamber to be sure it is clean and free from debris or foreign objects.
2. If applicable, shake the inhaler gently back and forth and prime if needed.
3. Covering both the mouth and nose, place the mask on the child's face to make a good seal. Lift the chin to open the airway.
4. Have the child gently blow out all the old air from their lungs. Say "Blow out ALL your air like you are blowing out candles on a cake."
5. Now, press down on the inhaler to actuate the medicine.
6. Then say, "Breathe in, breathe in, breathe in. Hold it. Hold it. Hold it. Good work!"
7. If the effort is not great, just keep the mask in place and repeat this sequence four or five more times to clear the medicine from the chamber.
8. Avoid exposing the MDI to extreme temperatures. Follow manufacturer's guidelines for care of the device.

Dry Powder Inhaler (DPI) Skills Checklist:

Requires Supervision **Performs Independently**

Note: Using a dry powder inhaler is very different than an MDI. Dry powder inhalers are available in various delivery devices. A lever may need to be pressed, a button squeezed, a cap removed or a dial twisted before inhalation. Dry powder inhalers need a stronger, faster inhalation and are not used with spacers. It takes greater effort to breathe in a dry powder than using an MDI, especially when a person is sick and having trouble with their asthma. Most asthma medicines are available in both DPI and MDI. The following instructions are for general information only.

1. Remove the cap to expose the mouth piece. Make sure the mouthpiece and the opening where the medicine comes out is clean and free of debris and build-up
2. Load a dose into the device as directed. Hold the device as directed.
3. Gently exhale fully away from the device and completely to empty the air from your lungs.
4. Place the inhaler up to your mouth and seal your lips around the mouth piece, making sure teeth are not blocking the opening of the mouthpiece.
5. Lift the chin and start to breathe in quickly and deeply as you continue breathing in for 2-3 seconds.

If the student's FEV1 is known, use a target time to coach the time in seconds the student should breathe in. (This will help the student breathe in at the right speed for the inhaler they are using).

Target time for DPIs is $[\text{FEV1 value}] \times 1 = \text{seconds}$.

Example: student's FEV1 = 2.0 Liters: MDI target time would be $[2.0] \times 1 = 2 \text{ seconds}$.

6. Fill your lungs with the medication and hold your breath for 5-10 seconds. Then slowly breathe out.
7. Repeat steps 1-5 for each prescribed puff. Wait one minute between puffs.
8. Avoid exposing the MDI to extreme temperatures. Follow manufacturer's guidelines for care of the device.
9. Recommend "rinse and spit, then brush your teeth" after inhaled corticosteroids (ICS). If unable, eating or drinking will help remove drug from throat.

Nebulizer Skills Checklist:

Requires Supervision **Performs Independently**

1. Place the medication in the nebulizer cup.
2. Place the air compressor on a hard surface and turn it on. Look to see that mist is coming out.
3. If you use a mask, place the mask on your face covering both your nose and mouth. If you use a mouthpiece, put your lips around the end of it to form a seal. It should never be outside the mouth.
4. Take slow deep breaths until no mist comes from the mouthpiece.
5. Tap the cup to produce a little more mist.
6. Follow manufacturer's guidelines for care of the device.
7. Recommend "rinse and spit, then brush your teeth" after inhaled corticosteroids (ICS). If unable, eating or drinking will help remove drug from throat.

Peak Flow Meter Skills Checklist:

Requires Supervision **Performs Independently**

1. Return the marker to the bottom of the numbered scale.
2. Stand or sit up straight.
3. Take as deep a breath as you can.
4. Hold your breath while you place the peak flow meter up to your mouth and seal your lips tightly around the mouth piece, making sure teeth are not blocking the opening of the mouthpiece.
5. Keep your tongue away from the mouthpiece as you blow out your air as hard and fast as possible. The marker will move up the numbered scale indicating the air speed. Write down this number.
6. Repeat steps 1-5 two more times.
7. Record the highest of the 3 numbers.
8. Follow manufacturer's guidelines for care of the device.

EpiPen® Trainer Skills Checklist:

Requires Supervision Performs Independently

Epinephrine dosage is based on body weight.

The EpiPen® autoinjector (0.3 mg) is for persons who weigh 30 kg (about 66 pounds) or more.

The EpiPen® Jr. autoinjector (0.15 mg) is for persons who weigh 15 to 30 kg (33-60 pounds).

<http://www.epipen.com/page/epipen--epipen-jr--prescribing-information--patient-instructions>

1. CONFIRM THAT LABEL STATES TRAINING DEVICE.
2. Remove the gray or blue safety cap.
3. Hold the barrel of the device with your fist.
4. Place black or orange tip on outer thigh. **DO NOT PLACE YOUR THUMB OVER THE END OF THE DEVICE.**
5. Push firmly against outer thigh at a right angle or perpendicular to the leg.
6. Hold the EpiPen® against the thigh for 10 seconds to deliver the medicine.
7. Remove tip from leg and massage injection site for 10 seconds.
8. If actual EpiPen® were used, **call 911.**
9. Replace the gray or blue cap on the EpiPen® trainer.
10. You may practice again.

Twinject® Trainer Skills Checklist:

Requires Supervision Performs Independently

Epinephrine dosage is based on body weight.

The Twinject® autoinjector (0.3 mg) is for persons who weigh 30 kg (about 66 pounds) or more.

The Twinject® Jr. autoinjector (0.15 mg) is for persons who weigh 15 to 30 kg (33-60 pounds).

<http://www.twinject.com/allergy-treatment-resources/PI.html>

1. CONFIRM THAT LABEL STATES TRAINING DEVICE.
2. Hold the barrel of the device with your fist.
3. Remove cap 1 and 2 in stated order.
4. Hold red tip near outer thigh. **DO NOT PLACE YOUR THUMB OVER THE END OF THE DEVICE.**
5. Push firmly against outer thigh at a right angle or perpendicular to the leg.
6. Hold the Twinject® against the thigh for 10 seconds to deliver the medicine.
7. Remove tip from leg and massage injection site for 10 seconds.
8. If actual Twinject® were used, **call 911.**

ASTHMA/ANAPHYLAXIS MEDICATION SELF-ADMINISTRATION FORM

Student Name: _____ Teacher: _____

The Missouri Safe Schools Act of 1996 (Pupils and Special Services Section 167.627, revised August 28, 2009) provides for students to carry and self-administer life-saving medications when the following criteria are met:

- 1) *Written authorization by the parent/guardian*
- 2) *Medical history of students' asthma or anaphylaxis on file at the school*
- 3) *Written asthma action plan/individual health care plan on file at school*
- 4) *Written authorization from the prescribing health care provider that child has asthma or is at risk of having anaphylaxis, has been trained in the use of the medication and is capable of self-administration of the medication.*

THIS MEDICATION AUTHORIZATION IS ONLY VALID FOR THE CURRENT SCHOOL YEAR

MEDICATION NAME _____ **Dose** _____ **Time or Interval** _____
Route/Inhalation device _____ **Instructions** _____

IMPORTANT NOTE: May repeat use of short-acting bronchodilator dose 2-6 puffs (i.e. Albuterol) with a spacer/spacer with mask every 20 minutes for 2 treatments if asthma symptoms are not improving (Expert Panel Report-EPR3, 2007 National Asthma Guidelines). Notify school staff if one dose fails to relieve symptoms.

MEDICATION NAME _____ **Dose** _____ **Time or Interval** _____
Route/Inhalation device _____ **Instructions** _____

If Epinephrine, notify staff immediately when used. May repeat dose of epinephrine in 10-15 minutes if symptoms are not resolving.
ALLERGIES: list known allergies to medications, foods, insects, latex or air-borne substances :

I, the parent or legal guardian of the student listed above, give permission for this child to carry and self-administer the above listed medications. I have instructed my child to notify the school staff if one dose fails to relieve asthma symptoms in 20 minutes or does not sustain my child for at least 3 hours. My child understands to notify school staff immediately if epinephrine is used so 911 can be called. I acknowledge that the school district and its employees or agents shall incur no liability as a result of any injury arising from the self-administration of medication by my child or the administration of such medication by school staff.

Signature of parent or legal guardian _____ **Date** _____

Parent/Guardian: _____

Name: _____ Home phone: _____ Cell phone: _____

Address: _____ Work phone: _____

Name: _____ Home phone: _____ Cell phone: _____

Address: _____ Work phone: _____

Emergency Contact:

Name: _____ Phone: _____

I, a licensed health care provider, certify that this child has a medical history of asthma and/or anaphylaxis, has been trained in the use of the listed medicine, and is judged to be capable of carrying and self-administering the listed medication(s). The child should notify school staff if one dose of the medication fails to relieve asthma symptoms in 20 minutes or sustain the child for at least 3 hours. This child understands the hazards of sharing medications with others and has agreed to refrain from this practice.

Signature of Health Care Provider _____ **Date** _____

Health care Provider:

Name: _____

Fax: _____ Phone: _____

Address: _____ City: _____ Zip: _____

D

Section D
PERSISTENT OR
HIGH-RISK
ASTHMA

WHAT IS PERSISTENT ASTHMA?

(Children aged 5-11 yrs, and youths 12 yrs to adults)

BACKGROUND INFORMATION:

Asthma severity is the intrinsic intensity of disease. Initial clinical assessment of children who have asthma begins with determining the level of severity. A therapy step (there are six) is then chosen based on the child's level of asthma severity. Assessment of asthma severity is made before the child is taking long-term control medication. The preferred treatment for ALL levels of persistent asthma is an inhaled corticosteroid (ICS). Assessment is made on the basis of current spirometry (measurement of airflow) and the child's (or caregiver's) recall of symptoms over the previous 2–4 weeks. If the child is being treated for an acute exacerbation during the initial assessment, then asking the child (or caregiver) to recall symptoms in the period before the onset of the current exacerbation will be adequate. At regular follow-up visits medications are then adjusted as needed (step up in therapy if asthma control is inadequate or step down if asthma control is maximized).

See Section G for steps of therapy (steps 1-6 and severity charts for each age group).

Asthma Severity – Assess Impairment & Risk: The latest guidelines from “The Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma” (National Heart, Lung, and Blood Institute, 2007) recommends that clinicians classify asthma severity by assessing current impairment and future risk. The distinction between impairment and risk emphasizes the need to consider separately asthma's effects on current quality of life and functional capacity while also considering the risks asthma presents for adverse events in the future, such as exacerbations and progressive loss of pulmonary function. Asthma impairment and risk of asthma might respond differently to treatment.

ASSESSMENT OF CURRENT IMPAIRMENT

Assessment of severity requires assessing the following areas:

- 1) Symptoms: if the child is experiencing cough, wheeze, shortness of breath, chest tightness more than 2 days a week, (past month) they have persistent asthma.
- 2) Nighttime awakenings: if the child is awakening at night more than 2 times a month due to asthma symptoms, they have persistent asthma. This is a key marker of uncontrolled asthma.
- 3) Need for SABA (short-acting beta-agonist, i.e. albuterol) for quick relief of symptoms: if the child is requiring the use of a SABA more than 2 days a week (past month) for asthma symptoms, they have persistent asthma. (This count does not include scheduled use of SABA for the PREVENTION of exercise induced bronchospasm)
- 4) Interference with normal activity (including exercise): if the child is experiencing ANY limitation in their normal activity (even a minor limitation) due to having asthma symptoms, they have persistent asthma.
- 5) Lung function, measured by spirometry: A new emphasis on using FEV1/FVC has been added to the updated guidelines to classify severity in children because it is more sensitive measure of airflow obstruction than FEV1. FEV1 can be > 80% of predicted and the FEV1/FVC ratio normal or > 80% and the child can still be classified as having persistent asthma. If FEV1 is between 60 to 80% of predicted, or the FEV1/FVC is 75-80%, the child has moderate persistent asthma. If the FEV1 is <60% of predicted, or the FEV1/FVC is <75%, the child has severe persistent asthma.

ASSESSMENT OF RISK:

Risk is the likelihood of future asthma exacerbations, progressive decline in lung function (or, for children, lung growth), or adverse effects from medication. 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, **children who have more than one asthma exacerbation requiring systemic corticosteroids in the past year have persistent asthma**, even in the absence of impairment levels consistent with persistent asthma. [Ask the child or caregiver if the child has had to take any special medicines after asthma flare-ups such as any of the following: Cortef, Decadron, Dexamethasone, Hydrocortisone, Medrol, Methylprednisolone, Orapred, Pediapred, Prednisolone, Prednisone, Prelone, Solumedrol, Triamcinolone.] (If available review claims databases to confirm.)

Asthma exacerbation defined: Exacerbations of asthma are acute or subacute episodes of progressively worsening shortness of breath, cough, wheezing, and chest tightness—or some combination of these symptoms. Exacerbations are characterized by decreases in expiratory airflow that can be documented and quantified by full spirometry, FEV1 or PEF.

The severity and interval since the last asthma exacerbation is always considered. The frequency and severity of asthma exacerbations can fluctuate over time for children in any severity category. The relative annual risk of exacerbations may be related to FEV1. Declining FEV1 is a predictor of future asthma attacks. Regular monitoring of FEV1 at school provides an opportunity to detect and treat worsening asthma. Twice daily inhalation of an ICS medication improves air flow and reduces asthma impairment and risk, including the risk of fatal attacks (Suissa et al. N Engl J Med. 2000;343:332-336).

Information adapted from: Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. (2007). Retrieved from the National Heart, Lung, and Blood Institute of the National Institutes of Health at <http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm>.

Asthma Ready® Communities (2010)

The most important medicine for all levels of persistent asthma is inhaled corticosteroids (ICS).

ICS is the only type of asthma medicine proven to lower the risk of death due to asthma.

The logo consists of the letters 'ICS' in a large, bold, sans-serif font, with the word 'ASTHMA' in a smaller, bold, sans-serif font directly below it. The letters are black and have a slight shadow effect.

IMPORTANT: Acute exacerbations can be mild, moderate, or severe in ANY category of persistent asthma. Patients at any level of severity, even intermittent asthma, can have severe exacerbations.

CHECK LIST FOR IDENTIFYING PERSISTENT ASTHMA

If **ANY** of the following items is true the student has persistent asthma;

- The student has a current prescription for regular use of any of the following medications or any other daily control medication for asthma:
 - Singulair® Flovent® QVar® Pulmicort® (budesonide)
 - Asmanex® Alvesco® Advair® Symbicort®
 - Dulera® theophylline Intal® Tilade®

- The student has taken a systemic steroid after a severe asthma flare-up more than once in the last year, such as any of the following:
 - Decadron Dexamethasone Hydrocortisone Medrol
 - Methylprednisolone Orapred Pediapred Prednisolone
 - Prednisone Prelone Solumedrol Triamcinolone.

- The student is experiencing daytime asthma symptoms (cough, wheeze, shortness of breath, OR chest tightness) more than 2 days a week (past month).

- The student is awakening at night more than 2 times a month due to asthma symptoms (breathing problems or persistent coughing). This is a key indicator of uncontrolled asthma.

- The student is using quick relief medicine (ProAir®, Ventolin®, Proventil® or Xopenex®) more than 2 days a week (past month) for relief of asthma symptoms. This does NOT include students who use SABA for prevention of EIB – exercise induced bronchospasm, UNLESS student has poor endurance, prolonged recovery time after exercise, or asthma symptoms during usual activities.

- The student experiences ANY limitation in their normal activity (even a minor limitation) due to having asthma symptoms (breathing problems or persistent coughing). This includes exercise. With good asthma control, students with asthma should be able to keep up with other children their same age and size.

- The student's FEV1 or peak flow is less than 80% of predicted and has a history of asthma.

- A student with breathing problems or persistent cough at school who has an FEV1 <80% but has not been diagnosed with asthma should be referred to the caregiver with documentation of events at school that suggest asthma for an appointment with a health care provider for a full evaluation.

- Objective measures of airflow (peak flow and FEV1) improve assessment of asthma severity, asthma control, and response to therapy. Many children and adults with asthma do not recognize the degree of airway obstruction which they are experiencing until the airway obstruction is very severe.

If one or more of these items are checked, the student has persistent asthma and should be on a daily control medicine. The preferred treatment for all levels of persistent asthma is ICS!

KNOW YOUR CHILD'S RIGHTS

Students with asthma are covered under Title II of the American Disabilities Act of 1990, Section 504 of the Rehabilitation Act of 1973, and the Individuals with Disabilities Education Act (IDEA). Title II and Section 504 ensure access to federally funded services for any handicapped person. IDEA provides funds to help schools serve these students, when schools follow specific requirements.

Title II, Section 202 of the Americans With Disabilities Act of 1990 reads:

"...no qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any such entity."

Section 504 of the Rehabilitation Act of 1973 reads:

"No qualified handicapped person shall, on the basis of handicap, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity which receives Federal financial assistance ..."

"Handicapped persons means any person who ... has a physical or mental impairment which substantially limits one or more major life activities ... [such as] ... breathing ..."

Section 504 regulations require that schools follow procedures to safeguard the rights of parents, students, and school employees and ensure that decisions and their implementation regarding a child's needs are fair and appropriate. These regulations also require that schools and parents act as partners in the planning and decision making involved in the child's welfare.

State and local Boards of Education have resource staff that can provide specific guidelines. For more information, contact the U.S. Department of Education Office for Civil Rights, 800-421-3481; www.ed.gov/about/offices/list/ocr/

Source: Allergy & Asthma Network Mothers of Asthmatics (2010). Available online at:
<http://www.aanma.org/?s=american+disabilities+act>

IS ASTHMA UNDER CONTROL?

Student: _____ **Date:** _____

If you have been told you have asthma, this simple test from the American College of Allergy, Asthma & Immunology will help you decide if your asthma is well controlled. Check items that describe your experience of asthma. (Ask your parents to help.) If you checked several items it is likely that your asthma is NOT well controlled. Discuss these concerns with your health care provider. Adjustments in your medications and action plan should eliminate these problems.

Activities

- When I walk or do simple chores, I have trouble breathing or I cough.
- When I perform heavier work, such as walking up hills or stairs or doing chores that involve lifting, I have trouble breathing or I cough.
- Sometimes I avoid exercising or taking part in sports like jogging, swimming, tennis or aerobic activities because I have trouble breathing or I cough.
- Sometimes I am unable to sleep through the night due to coughing or breathing problems.

Symptoms

- Sometimes I can't catch a good, deep breath.
- Sometimes I make wheezing sounds in my chest
- Sometimes my chest feels full or tight.
- Sometimes I cough a lot.

Triggers

- Dust, pollen, and pets make my asthma, cough, or breathing worse.
- My asthma gets worse in cold weather.
- My asthma gets worse when I'm around tobacco smoke, fumes, or strong odors.
- When I catch a cold it often goes to my chest.

Hospital Visits

- I made one or more emergency visits due to asthma or breathing problems in the last year.
- I stayed overnight in a hospital due to asthma or breathing problems in the last year.

Medication Problems

- I use my reliever inhaler to stop asthma symptoms more than 2 days a week in the past month.
- Sometimes I don't take my medication because I dislike it or it makes me feel bad.
- My asthma medicine doesn't really control my asthma.
- This new HFA inhaler is different and hard to get used to.

Anxieties

- My asthma or breathing problems control my life more than I would like.
- I feel tension or stress because of my breathing problem or asthma.
- I worry that my breathing problem or asthma affects my health or may even shorten my life.
- I smoke sometimes to alleviate stress and need help to stop smoking.

Completed by: _____

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.

1. How is your asthma today?

 0 Very bad	 1 Bad	 2 Good	 3 Very good
---	--	--	--

SCORE

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

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

3. Do you cough because of your asthma?

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

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

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

Please complete the following questions on your own.

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

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

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

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

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

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

TOTAL

Please turn this page over to see what your child's total score means.

Asthma Control Test™ for teens 12 years and older. Know the score.

If your teen is 12 years or older have him take the test now and discuss the results with your doctor

Step 1 Write the number of each answer in the score box provided.

Step 2 Add up each score box for the total.

Step 3 Take the test to the doctor to talk about your child's 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	1	Most of the time	2	Some of the time	3	A little of the time	4	None of the time	5
-----------------	---	------------------	---	------------------	---	----------------------	---	------------------	---

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

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

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

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



The American Lung Association supports the Asthma Control Test and wants everyone 12 years of age and older with asthma to take it.

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Asthma Control Test is a trademark of QualityMetric Incorporated.

Total

What does it mean if my child scores 19 or less?

- If your child's score is 19 or less, it may be a sign that your child's asthma is not under control.
- Make an appointment to discuss your child's asthma score with their doctor. Ask if you should change your child's asthma treatment plan.
- Ask your child's doctor about daily long-term medications that can help control airway inflammation and constriction, the two main causes of asthma symptoms. Many children may need to treat both of these on a daily basis for the best asthma control.



GlaxoSmithKline

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A VITAL SIGN FOR ASTHMA- MEASURE AIRFLOW!!

Measuring airflow is an important part of controlling asthma--it can often tell if a student's breathing is limited, even before symptoms occur.

It is important to measure airflow in students with asthma to improve assessment of asthma severity, asthma control, and response to therapy. **Many children and adults with asthma do not recognize the degree of airway obstruction which they are experiencing until the airway obstruction is very severe.** It is useful to measure airflow when the student is having asthma problems, just like it is important to check a student's temperature when they have an illness. Objective measures of airflow can help you recognize serious problems at home or school, much like a thermometer can measure fever. It is helpful to measure airflow when the student seems to have asthma under control, similar to how you would check a blood sugar for a diabetic or check a blood pressure for a hypertensive student. These measures will provide you with important data to guide assessment and care of the student with asthma.

Peak expiratory flow (PEF) versus "forced expiratory volume in one second" (FEV1)

Good asthma control means it should be easy for the student to get air in and out of their lungs. Asthma episodes or exacerbations are characterized by decreases in expiratory airflow. This decrease in airflow – airflow obstruction - can be measured by assessing a simple measurement of lung function: 1) peak flow or 2) forced expiratory volume in one second [FEV1]. **These objective measures of airflow provide "vital signs" for asthma. The severity of an exacerbation and response to treatment is best assessed by tracking airflow as well as symptoms.** A peak flow meter monitors **peak expiratory flow rate [PEF]** – the **speed** at which air emerges from the lungs. Peak flow measurement does not detect airway flow from small airways. PEF might be normal even when asthma is poorly controlled. Most people with asthma become aware of breathing problems long before PEF falls, however some do not. Peak flow meters are available to many students with asthma to monitor their asthma at home. Digital flow meters allow measurement of both peak flow and a more sensitive measure of airflow obstruction - the **forced expiratory volume in one second [FEV1]**. FEV1 is the **volume** of air a person can forcibly exhale out of their lungs in the first second after a maximal inhalation. FEV1 falls before peak flow, sometimes before the person becomes aware of asthma symptoms. Helping students and families recognize early signs of worsening asthma allows them to make changes according to their asthma action plan to prevent or reduce the severity of an asthma episode. These measures of airflow tell how well the student's lungs are working and can help the child's health care team know what medications will best help.

"FEV1 or PEF values provide important information about the level of airflow obstruction.... FEV1 measurements are preferable if they are available". Expert Panel Report 3 (2007, p. 389).

It's helpful to always measure airflow at the same time every day. The student should measure airflow every morning and evening before taking medications when they are having asthma symptoms, trouble breathing or changing medications. Morning checks are more likely to detect airflow obstruction. Remind the student to record peak flow measurements on their peak flow diary. Peak flow and FEV1 can be predicted from the height of the child. Some never reach this number. Some score much higher. It is best to compare airflow with a person's **personal best** FEV1 or PEF. This is the highest value attained on 3 or more days. FEV1 or PEF should be measured before and 15 minutes after using quick relief medications when asthma is flared. If FEV1 or PEF does not improve after quick relief medicines, airway swelling is likely. Increased doses of the ICS or a short course of oral steroids might be needed.

STUDENT ASTHMA STATUS REPORT

As observed by school nurse and other staff

Date _____

Student _____ Grade /Teacher _____

The following asthma symptoms, findings or episodes were observed by the school nurse and/or other staff:

Signs and Symptoms	<p>This student:</p> <p><input type="checkbox"/> appears to be requiring more quick relief medications (Albuterol, Xopenex, or Atrovent [ipratropium]): _____ more than once a week _____ more than 3 times a week</p> <p><input type="checkbox"/> does not appear to be responding to quick relief medication at usual doses</p> <p><input type="checkbox"/> requests a visit to the school nurse more than once a week</p> <p><input type="checkbox"/> has been absent from school more than ___ time(s) in the last month</p> <p><input type="checkbox"/> has exhibited or reported the following symptoms in the past (2) weeks: _____ coughing spells _____ wheezing _____ chest tightness _____ shortness of breath _____ being unusually tired or sleepy _____ sleep disturbance due to asthma</p>
---------------------------	--

Objective Assessment	<p>FEV1 OR PEF READINGS LESS THAN 80% SUGGEST ASTHMA IS FLARING UP OR IS POORLY CONTROLLED. <i>"FEV1 [Forced Expiratory Volume in One Second] or PEF [peak expiratory flow] values provide important information about the level of airflow obstruction.... FEV1 measurements are preferable if they are available". Expert Panel Report 3 (2007, p. 389).</i></p> <p><input type="checkbox"/> peak flow or FEV1 reading in the yellow zone (50% - 79%)</p> <p><input type="checkbox"/> peak flow or FEV1 reading in the red zone (<50%)</p> <p>The following care was given:</p> <p><input type="checkbox"/> quick relief medicine given (drug name) _____ at time _____ _____ by MDI with spacer _____ by MDI - no spacer available _____ by nebulizer</p> <p>Number of puffs given: <input type="checkbox"/> 2 puffs <input type="checkbox"/> 4 puffs <input type="checkbox"/> 6 puffs</p> <p><input type="checkbox"/> rest <input type="checkbox"/> other _____</p> <p><i>Note: For a severe, life threatening asthma episode, activate EMS. Expert Panel Report 3 (2007, p. 382) recommends 6 puffs of a short acting beta-agonist (i.e. Albuterol) with a spacer/spacer with mask for a life threatening asthma attack. If child is not receiving emergency care in 20 minutes, EPR3 recommends repeat this dose.</i></p> <p>The student:</p> <p><input type="checkbox"/> had a peak flow or FEV1 reading that: <input type="checkbox"/> stayed in the _____ zone after treatment.</p> <p><input type="checkbox"/> returned to the _____ zone after treatment. <input type="checkbox"/> returned to class</p> <p><input type="checkbox"/> remained in the office</p> <p>Student unable to perform adequate inhalation technique for MDI (30 LPM for expected time in seconds) - observed inhalation efforts were: _____ to _____ LPM for _____ seconds.</p>
-----------------------------	---

<p>Other data/comments: _____</p> <p>_____</p> <p>_____</p>

(SEE NEXT PAGE - FLIP OVER)

Because an asthma episode may happen again, please observe your child closely.

We encourage you to contact your child's health care provider because your child's condition appears to be uncontrolled at this time.

- Ask your health care provider for a new or updated Asthma Action Plan (fax to _____).
- Ask your health care provider about the need for:
___Medication ___Spacer ___Control medicine or adjustment of control medicine
- Ask your health care provider about the need for a 2-Tone MDI Trainer
- Other _____

When your child sees a health care provider for asthma, please tell the school office. Please let us know the plan of care for your child's asthma care and give us a copy of the Asthma Action Plan so we can better care for your child at school. Ask you provider to fax a copy of the plan to me at: _____

Children with asthma should get a flu shot every fall and have at least 2 "well" check-ups for asthma every year to review your child's asthma pattern and medication needs.

Please contact me if you have any questions or concerns. Please sign this note and return it to school with your child, so we will know that you have received this important report on your child's health.

Sincerely,

_____ school nurse _____ phone _____ email

Parent Response _____

Parent Signature _____

I give consent to share this information with my child's health care provider: Yes _____ No _____

(Parent signature) _____ **Date:** _____

Provider's phone number: _____ Provider Fax: _____

<p>"Student Asthma Status Report" provided to family or guardian by:</p> <p><input type="checkbox"/> Student <input type="checkbox"/> US Mail <input type="checkbox"/> Telephone</p> <p>Date form returned:</p> <p>_____</p>
--

ASTHMA CASE MANAGEMENT FORM

Student Name _____ School Year _____ Grade _____

Annual intensive case management summary for nurse case manager

School year _____ School _____ School Nurse _____

Student Name _____ ID # _____

Gender _____ Date of Birth ____/____/____ Primary Health Care Provider _____

Allergist/Pulmonologist _____ Date of Asthma Action Plan _____

Severity

Severity established by:

Doctor School Nurse Not Established

Asthma Severity:

Intermittent Mild Persistent
 Moderate Persistent Severe Persistent
 Exercise Induced

Known Allergies:

Known Triggers (circle): Dust mites, molds, pollens, hair, animal dander, cockroaches, cold, exercise, colds, chemicals, sinus infections, cigarette smoke, exhaust, foods, yelling, crying, laughing, other _____

Current Treatments:

Takes control medication at home or school: Yes No

Quick relief medication (e.g. Albuterol):

At home At school None

Self-carry: At home At school None

Peak flow: At home At school None

Spacer: At home At school None

Nebulizer: At home At school None

Flu/Pneumonia Vaccine: Yes No Don't know

Receiving Allergy Shots: Yes No Don't know

School Related Asthma Events

(see worksheet, next page)

Date form completed _____

Visits to school health office for preventative care _____

ED visits for asthma (if known) _____

Visits to health office for asthma symptoms _____

911 calls for asthma _____

Days sent home due to asthma _____

Hospitalizations for asthma (if known) _____

Total days absent _____

Days absent known to be due to asthma _____

School Nurse _____

School Based Interventions

Permission to interact with doctor: Yes No

Sent letter to doctor: Yes No

Date _____

Teach inhaler/spacer technique: Yes No

Teach Peak Flow Technique: Yes No

Parent Counseling: Yes No

Date _____

Student Health Counseling: Yes No

Peak flow Log: Yes No

Asthma Education for Classmates: Yes No

Open Airways for Schools: Yes No

Teaming Up for Asthma Control: Yes No

Other formal asthma education program: Yes No

Parent or student support group participation: Yes No

Emergency Protocol on file: Yes No

Emergency Protocol shared with staff: Yes No

P.E. Teacher Education: Yes No

Staff Education/Counseling: Yes No

If yes, number of staff _____

Trigger identification at school: Yes No

Trigger modification at school: Yes No

Trigger identification at home: Yes No

Trigger modification at home: Yes No Don't know

Home visit related to asthma: Yes No

Date _____

Enrolled in extracurricular asthma program:

Yes No Don't know

ASTHMA CASE MANAGEMENT WORKSHEET

Student _____

School year _____

Health Appraisal	Date	July/ Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June
Communication with Health Care Provider												
Open airways for schools received												
Other classroom asthma programs												
Home visits by school for asthma												
Total days absent												
Days absent due to asthma												
911 calls for asthma												
ED visits for asthma												
Hospitalizations for asthma												

Individual Education	Date	Return Demo by Student	Personal Best Peak Flow
Peak flow instruction/review			
Inhaler instruction/review			
Spacer instruction review			

Individual Education	Date	Comments/Additional Information
Trigger Identification		
Personal trigger modifications		
Preferred for Influenza/ Pneumococcal Vaccine		

Adapted from original at http://www.aaaai.org/members/allied_health/tool_kit/handouts/school_nurse_case_worksheet.pdf

E

Section E

**IS THIS POSSIBLY A
STUDENT WITH
UNDIAGNOSED
ASTHMA?**

A MULTIMEDIA ASTHMA ASSESSMENT PROGRAM - CHILDREN 7-12

The 2005 Missouri School Asthma Manual provided a CD tutorial. On the CD you will find a folder entitled "Multimedia Evaluation". Open this folder and double click on "Start Assessment". If you do not have the CD, you can access this Asthma Screening Program at <http://impactasthma.missouri.edu/screening/index.html>. The ideal use of this program is with a child and parent. Enter the firstname only of the child. This preserves confidentiality in the event that the report is later misplaced. No record of the answers is saved on the computer. Next, click "GO". Eight brief movies will play. After each movie the child will respond by selecting "Never", "Sometimes", or "Often" to the question "Does this ever happen to you?" After selecting an answer it is possible to change that answer before going to the next movie. After all questions are answered a report will appear on screen with a print button. After printing the report you can "CLICK HERE" at the bottom of the page to open a page for the parent to complete. This form can be printed blank for completion at home or answered on screen by a parent and then printed. The form below illustrates the contents of the report generated after a child completes the multimedia assessment form.

Title	Never	Sometimes	Often
I wheeze & cough while sitting quietly			
I wheeze, cough, or feel short of breath after running			
I wake up at night wheezing and struggling to breathe			
I wake up at night due to coughing			
People smoke around me			
<i>Tobacco smoke exposure greatly increases the likelihood that children will be troubled by respiratory problems. Children who have asthma & are exposed to smoke are at much greater risk for serious symptoms requiring urgent care. Tobacco smoke also causes many other health problems including ear and sinus infections, allergies, and an increased number of colds & respiratory infections.</i>			
Other things make me cough, wheeze, or feel short of breath			
<i>Many things can make asthma worse. Airborne particles such as pollen, animal dander, & dust mites can trigger asthma or allergy symptoms. Very cold air & heavy breathing can also trigger asthma symptoms. Allergy tests can help identify triggers. Learning to avoid triggers can help with asthma control. Allergy medications such as nose sprays and antihistamines might be helpful too, especially during peak pollen seasons in the spring and fall.</i>			
When I run or play hard coughing, wheezing, or difficulty breathing make it hard for me to keep up with other kids.			
<i>Running or playing hard might cause someone who has asthma to feel unable to breathe well enough to keep up. Pay attention to the concerns of children who shy away from physical activity because of breathing problems. Being overweight or out of shape might also cause shortness of breath, but it is important to always consider asthma as a possible explanation too. Exercise is important for everyone. Let's identify & control asthma so kids can keep fit.</i>			

If you have concerns about your child's breathing after these activities make an appointment with your health care provider. Keep a daily symptom diary (see E-4) until your appointment. Share these results and your child's symptom diary at this appointment.

DOES MY CHILD HAVE ASTHMA?

Student: _____ Date: _____

The purpose of this form is to help parents answer the question “is there a possibility that my child has asthma?” No paper and pencil test can completely answer this question. However, if you check no boxes below, the possibility of asthma is very unlikely. If possible, include your child to help answer these questions.

Does your child experience any of the following?:

- Frequent cough, worse particularly at night
- Wheezing or noisy breathing (especially when breathing out)
- Difficulty in breathing
- Complaints of chest tightness

Do these symptoms occur or worsen in the presence of:

- Exercise
- Viral Infection
- Animals with fur or hair
- House-dust mites (in mattresses, pillows, upholstered furniture, carpets)
- Mold
- Smoke (tobacco, wood)
- Pollen
- Changes in weather
- Strong emotional expression (laughing or crying hard)
- Airborne chemicals or dusts
- Menses

Do these symptoms occur or worsen at night, awakening you/your child?

- Yes No

Do these symptoms make it difficult for you/your child to run, play, or work?

- Yes No

If you checked one or more items, it is important that you share this information with your health care provider. A complete asthma evaluation may be helpful, including a medical history, physical examination, lung tests, spirometry, and additional studies (i.e. radiology tests and allergy testing). Asthma is a common lung condition in childhood. We hope you will evaluate your child’s health and seek special care if this seems wise. Together we can fight asthma.

ASTHMA SYMPTOM DIARY -- VERBAL

Name:	Medical Record Number:	Date of Birth:
Month/Year:		
Has a fever (mark date with *)		
Date:		
Coughing		
None.....0		
Occasional.....1		
Frequent.....2		
Character of cough		
Dry.....1		
Productive or wet.....2		
Croupy (barking seal).....3		
Nasal symptoms		
None.....0		
Stuffy.....1		
Clear Drainage.....2		
Yellow or green discharge.....3		
Wheezing or forcing air out		
None.....0		
Little.....1		
Moderately bad.....2		
Severe.....3		
Activity level		
Quite normal.....0		
Some difficulty.....1		
Moderate difficulty.....2		
Severe difficulty.....3		
Short of breath or chest tight		
None.....0		
Occasional.....1		
Part of day.....2		
Most of day.....3		
Sleep disturbance due to cough, wheeze, or breathing problems		
None.....0		
Heard, does not wake.....1		
Awake.....2		
Unable to sleep.....3		
Peak flow		
Morning		
After school		
Drugs (No. of doses/24 hours)	Week 1	Week 2
1.		
2.		
3.		
4.		
5.		
6.		

Hankinson Predicted Spirometric Reference Values –FEMALE

Age	Parameters	42" 107cm		46" 117 cm		50" 127 cm		54" 137 cm		58" 147 cm		62" 157 cm		66" 168 cm		68" 173 cm		70" 178 cm		72" 183 cm		74" 188 cm		76" 193 cm		
		Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	
8	FEV1	C	0.96	0.77	1.22	0.98	1.51	1.21	1.81	1.45	2.15	1.72	2.5	2.00												
	A	0.84	0.68	1.07	0.86	1.33	1.06	1.59	1.27	1.89	1.51	2.2	1.76													
	H	0.86	0.69	1.10	0.88	1.36	1.09	1.63	1.30	1.94	1.55	2.25	1.80													
10	PEF	C	136	109	162	130	190	152	220	176	252	202	286	229												
	A	120	96	143	114	167	134	194	155	222	177	252	201													
	H	122	98	146	117	171	137	198	158	227	181	257	206													
12	FEV1	C	1.09	0.87	1.35	1.08	1.64	1.31	1.95	1.56	2.28	1.82	2.63	2.10	3.01	2.41										
	A	0.96	0.77	1.19	0.95	1.44	1.15	1.72	1.37	2.01	1.61	2.31	1.85	2.65	2.12											
	H	0.98	0.78	1.22	0.97	1.48	1.18	1.76	1.40	2.05	1.64	2.37	1.89	2.71	2.17											
14	PEF	C	173	138	198	158	226	181	256	205	288	230	323	258	360	288										
	A	152	122	174	139	199	159	225	180	253	203	284	227	317	253											
	H	156	125	178	143	203	163	230	184	259	207	291	233	324	259											
16	FEV1	C			1.48	1.18	1.77	1.42	2.08	1.66	2.41	1.93	2.76	2.21	3.14	2.51	3.34	2.67								
	A			1.30	1.04	1.56	1.25	1.83	1.46	2.12	1.70	2.43	1.94	2.76	2.21	3.04	2.35									
	H			1.33	1.07	1.59	1.27	1.87	1.50	2.17	1.74	2.48	1.99	2.83	2.26	3.01	2.40									
18	PEF	C			227	182	254	203	284	227	317	254	351	281	388	310	407	326								
	A			200	160	224	179	250	200	279	223	309	247	341	273	358	287									
	H			204	163	229	183	256	204	285	228	316	253	349	279	366	293									
14	FEV1	C					1.9	1.52	2.21	1.77	2.54	2.03	2.9	2.32	3.27	2.62	3.47	2.78	3.68	2.94	3.98	3.18				
	A					1.67	1.34	1.94	1.56	2.24	1.79	2.55	2.04	2.88	2.30	3.05	2.44	3.24	2.59	3.50	2.80					
	H					1.71	1.37	1.99	1.59	2.29	1.83	2.61	2.09	2.94	2.35	3.12	2.50	3.31	2.65	3.58	2.87					
16	PEF	C					274	219	304	243	337	270	371	297	408	326	428	342	448	358	468	374				
	A					241	193	268	214	297	237	326	261	359	287	377	301	394	315	412	329					
	H					247	222	274	246	303	273	334	301	367	330	385	347	403	363	421	379					
18	FEV1	C					2.03	1.62	2.34	1.87	2.67	2.14	3.03	2.42	3.41	2.73	3.6	2.88	3.81	3.05	4.02	3.22	4.24	3.39		
	A					1.79	1.43	2.06	1.65	2.35	1.88	2.67	2.13	3.00	2.40	3.17	2.53	3.35	2.68	3.54	2.83	3.73	2.98			
	H					1.83	1.46	2.11	1.68	2.40	1.92	2.73	2.18	3.07	2.46	3.24	2.59	3.43	2.74	3.62	2.89	3.82	3.05			
18	PEF	C					286	229	317	254	349	279	383	306	421	337	440	352	460	368	480	384	501	401		
	A					252	201	279	223	307	246	337	270	370	296	387	310	405	324	422	338	441	353			
	H					257	206	285	228	314	251	345	276	379	303	396	317	414	331	432	346	451	361			
18	FEV1	C									2.8	2.24	3.16	2.53	3.54	2.83	3.73	2.98	3.95	3.16	4.16	3.33	4.37	3.50	4.59	3.67
	A										2.46	1.97	2.78	2.22	3.12	2.49	3.28	2.63	3.48	2.78	3.66	2.93	3.85	3.08	4.04	3.23
	H										2.52	2.02	2.84	2.28	3.19	2.55	3.36	2.69	3.56	2.84	3.74	3.00	3.93	3.15	4.13	3.30
18	PEF	C									353	282	388	310	424	339	444	355	464	371	485	388	505	404	527	422
	A										311	249	341	273	373	298	391	313	408	327	427	341	444	356	464	371
	H										318	286	349	314	382	343	400	360	418	376	437	393	455	409	474	427

Table adapted from Hankinson, J.L., Odencrantz, J.R. & Fedan, K.B. (1999). Spirometric reference values from a sample of the general U.S. population. *American Journal of Respiratory and Critical Care Medicine*, 159, p. 179-187.

* PEF (peak expiratory flow) is expressed in LPM (Liters per Minute) * C = Caucasian; A = African-American; and H = Hispanic American
 * All values based on equations for Caucasian subjects. Ethnic reduction for FEV1 was calculated using a 12% reduction for African-American and a 10% reduction for Hispanic American. For Asian American, an 8% reduction should be used.

* Classification of Asthma Severity: An FEV1 > 80% predicted is consistent with intermittent OR mild persistent; if FEV1 is 60-80% predicted = moderate persistent; and FEV1 < 60% predicted = severe persistent.

* To calculate % predicted: Take actual value/predicted value X 100.

Hankinson Predicted Spirometric Reference Values –MALE

Age	Parameters	42" 107cm		46" 117 cm		50" 127 cm		54" 137 cm		58" 147 cm		62" 157 cm		66" 168 cm		68" 173 cm		70" 178 cm		72" 183 cm		74" 188 cm		76" 193 cm		
		Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	Pred	80%	
8	FEV1	C	0.82	0.66	1.14	0.91	1.49	1.19	1.86	1.49	2.27	1.82	2.71	2.17												
	A	0.72	0.58	1.00	0.80	1.31	1.05	1.64	1.31	2.00	1.60	2.38	1.91													
	H	0.74	0.59	1.03	0.82	1.34	1.07	1.67	1.34	2.04	1.63	2.44	1.95													
10	PEF	C	126	101	160	128	197	158	237	190	280	224	327	262												
	A	111	89	141	113	173	139	209	167	246	197	288	230													
	H	113	91	144	115	177	142	213	171	252	202	294	235													
12	FEV1	C	0.9	0.72	1.22	0.98	1.57	1.26	1.94	1.55	2.35	1.88	2.79	2.23	3.25	2.60										
	A	0.79	0.63	1.07	0.86	1.38	1.11	1.71	1.37	2.07	1.65	2.46	1.96	2.86	2.29											
	H	0.81	0.65	1.10	0.88	1.41	1.13	1.75	1.40	2.12	1.69	2.51	2.01	2.93	2.34											
14	PEF	C	139	111	173	138	211	169	251	201	294	235	340	272	390	312										
	A	122	98	152	122	186	149	221	177	259	207	299	239	343	275											
	H	125	100	156	125	190	152	226	181	265	212	306	245	351	281											
16	FEV1	C	1.33	1.06	1.68	1.34	2.06	1.65	2.47	1.98	2.9	2.32	3.37	2.70	3.61	2.89										
	A	1.17	0.94	1.48	1.18	1.81	1.45	2.17	1.74	2.55	2.04	2.97	2.37	3.18	2.54											
	H	1.20	0.96	1.51	1.21	1.85	1.48	2.22	1.78	2.61	2.09	3.03	2.43	3.25	2.60											
18	PEF	C	193	154	230	184	271	217	314	251	360	288	410	328	436	349										
	A	170	136	202	162	238	191	276	221	317	253	361	289	384	307											
	H	174	139	207	166	244	195	283	226	324	259	369	295	392	314											
14	FEV1	C			1.83	1.46	2.21	1.77	2.62	2.10	3.05	2.44	3.52	2.82	3.76	3.01										
	A			1.61	1.29	1.94	1.56	2.31	1.84	2.68	2.15	3.10	2.48	3.31	2.65											
	H			1.65	1.32	1.99	1.59	2.36	1.89	2.75	2.20	3.17	2.53	3.38	2.71											
16	PEF	C			256	205	296	237	340	272	386	309	436	349	461	369										
	A			225	180	260	208	299	239	340	272	384	307	406	325	429										
	H			230	184	266	213	306	245	347	278	392	314	415	332	439										
18	FEV1	C			2.02	1.62	2.4	1.92	2.8	2.24	3.24	2.59	3.71	2.97	3.95	3.16										
	A			1.78	1.42	2.11	1.69	2.46	1.97	2.85	2.28	3.26	2.61	3.48	2.78											
	H			1.82	1.45	2.16	1.73	2.52	2.02	2.92	2.33	3.34	2.67	3.56	2.84											
18	PEF	C			289	231	329	263	373	298	419	335	468	374	494	395										
	A			254	203	290	232	328	263	369	295	412	329	435	348											
	H			260	208	296	237	336	269	377	302	421	337	445	356	469										
18	FEV1	C							3.03	2.42	3.46	2.77	3.93	3.14	4.17	3.34										
	A								2.67	2.13	3.04	2.44	3.46	2.77	3.67	2.94										
	H								2.73	2.18	3.11	2.49	3.54	2.83	3.75	3.00										
18	PEF	C							411	329	458	366	507	406	533	426										
	A								362	289	403	322	446	357	469	375										
	H								370	296	412	330	456	365	480	384										

Table adapted from Hankinson, J.L., Odencrantz, J.R. & Fedan, K.B. (1999). Spirometric reference values from a sample of the general U.S. population. *American Journal of Respiratory and Critical Care Medicine*. 159, p. 179-187.

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Asthma Ready® Communities (2010)

F

Section F
CHILD AND
FAMILY ASTHMA
SELF-MANAGEMENT
EDUCATION

EXPECTATIONS FOR STANDARDS OF CARE FOR STUDENTS WITH ASTHMA

General Goals of Asthma Therapy:

- Prevent asthma symptoms during the day and night:
 - No sleep disruption by asthma
 - No missed school or work days due to asthma
 - No or minimal visits to the Emergency Room
 - No or minimal hospitalizations
- Maintain normal or nearly normal activity levels including exercise & other physical activities
- Have normal or nearly normal lung function
- Be satisfied with your asthma care and comfortable asking your healthcare provider to explain things you don't quite understand
- Have no or minimal side effects while receiving optimal medications
- Significantly reduce or eliminate attacks
- Enhance long-term health by taking anti-inflammatory medications regularly



Asthma Patients Should Expect Their Doctor to:

- Take a medical history
- A thorough physical exam
- Check lung function
- Exclude a diagnosis, including severity level and whether the asthma is controlled or uncontrolled
- Discuss benefits of flu shots and administer them as appropriate
- Develop and agree on a shared set of goals for asthma therapy
- Create an individualized treatment plan to include:
 - controlling triggers for asthma
 - a medication plan
- Gradually “step down” or reduce long-term control medications when the goals of the therapy are reached
- “Step up” or increase long term control medications if asthma is poorly controlled
- Monitor and manage your asthma over time
- Establish a health care team between the patient, physician and other caregivers
- Provide education for prevention and self-care
- Listen to and answer your questions
- Refer you to a specialist (allergist or Lung doctor) if asthma goals are not being met

*Source: Arizona Asthma Coalition © (1999)
reviewed by Asthma Ready® Communities Staff
(2010).*

MANAGING ASTHMA AT SCHOOL

Parents need to take the first step

Keeping your child safe at school is a team effort.

Follow the steps below to help school nurses, teachers and other school personnel deal with your child's asthma or allergies. Taking just a few simple steps can ensure your child stays healthy throughout the school year.

- ◆ Schedule a meeting with teachers and the school nurse to discuss your child's condition.
- ◆ Encourage your children to take their maintenance medications as prescribed.
- ◆ Review your child's triggers with them and encourage them to ask their teacher for help when symptoms worsen.
- ◆ If your child is allergic to certain foods, inform school cafeteria staff and teachers. Tell them how to avoid the trigger and suggest safe alternatives for celebrations and class projects involving food. If possible, have your child bring a bag lunch to school or suggest an allergy-free lunch table.
- ◆ If your child is at risk for anaphylaxis, the child, teacher or school nurse should have at least one autoinjectable epinephrine, preferably two, on hand and know how to use it.
- ◆ Make sure physical education teachers, coaches, and bus drivers know about your child's asthma. Let them know the warning signs of an asthma attack.
- ◆ Work with your child's school system to address their concerns about your child's medical needs. Provide a written Asthma Action Plan or Anaphylaxis Action Plan to better control your child's health. Make this plan available to your school personnel.
- ◆ Encourage your child's health care provider to be an informational resource for the school.
- ◆ See a physician if your child is having trouble with learning, endurance, or alertness. These symptoms may be due to side effects of the child's condition or medications.
- ◆ Make sure your child has their medications (especially a quick relief inhaler or autoinjectable epinephrine), valved holding chamber or spacer and peak flow meter with them at school. Talk to school personnel about letting your child carry these medications with them throughout the day.
- ◆ Talk to your child's health care provider about the type of asthma controller medication your child is currently using. According to the most recent NAEPP guidelines (EPR-3, 2007), **an inhaled corticosteroid remains the best control medicine for persistent asthma.**

Source: American Academy of Allergy, Asthma & Immunology (2010). Available online at http://www.aaaai.org/patients/just4kids/classroom_corner/steps.stm

WARNING SIGNS OF AN ASTHMA EPISODE

Asthma episodes rarely occur without warning. Most people have warning signs (physical changes) that occur hours before symptoms appear. Warning signs are not the same for everyone. You may have different signs at different times. By knowing your warning signs and acting on them, you may be able to avoid a serious episode of asthma.

- ◆ Think back on your last asthma episode. Did you have any of the signs below?
- ◆ Check your warning sign(s). Show them to your health care provider and family.
- ◆ Remember to follow your asthma control plan as soon as these signs appear.

(Check here)

- | | |
|--|--|
| <input type="checkbox"/> Drop in FEV1 or peak flow reading | <input type="checkbox"/> Stroking chin or throat |
| <input type="checkbox"/> Chronic cough, especially at night | <input type="checkbox"/> Sneezing, head stopped up |
| <input type="checkbox"/> Difficulty Breathing | <input type="checkbox"/> Headache, fever |
| <input type="checkbox"/> Chest starts to get tight, or hurts | <input type="checkbox"/> Restlessness |
| <input type="checkbox"/> Breathing faster than normal | <input type="checkbox"/> Runny Nose |
| <input type="checkbox"/> Getting out of breath easily | <input type="checkbox"/> Change in face color |
| <input type="checkbox"/> Tired, itchy, watery eyes | <input type="checkbox"/> Dark circles under eyes |
| <input type="checkbox"/> Itchy, scratchy, or sore throat | <input type="checkbox"/> Other: _____ |



Source: National Asthma Education Program. National Heart, Lung, & Blood Institute (1992), reviewed by Asthma Ready® Communities Staff (2010).

STAY HOME OR GO TO SCHOOL?

Clues for Deciding

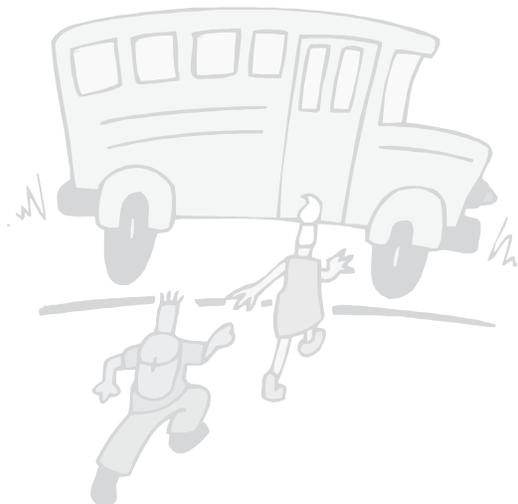
It is probably ok to go to school or work with any of these symptoms:

- ◆ Stuffy nose, but no wheezing
 - ◆ A little wheezing that goes away with medicine
 - ◆ Able to do your usual daily activities
 - ◆ No extra effort needed to breathe
 - ◆ Peak flow number is in the “Green Zone”
-

You should probably stay home *and* consult your health care provider if you have any of these symptoms:

- ◆ Infection, sore throat, or swollen, painful glands
- ◆ Fever over 100 degrees F orally, or 101 degrees F rectally; face hot and flushed.
- ◆ Have had a sleepless night due to asthma symptoms
- ◆ Wheezing, coughing, shortness of breath or chest tightness that still bothers you 1 hour after taking quick-relief medicine
- ◆ Weakness or tiredness that makes it hard to take part in usual daily activities
- ◆ Breathing with difficulty or breathing very fast; cannot speak a full sentence
- ◆ Peak flow score below 80% of personal best, even after taking your quick relief medicine. Parents should watch for good effort with peak flows.

IF YOU ARE IN THE RED ZONE, FOLLOW YOUR EMERGENCY PLAN.



Source: National Asthma Education Program. National Heart, Lung, & Blood Institute (1992), reviewed by Asthma Ready® Communities Staff (2010).

SUMMARY OF STEPS

Managing an asthma episode

- ◆ **Know your warning signs** and peak flow zones so you can begin treatment early.
 - ◆ **Take the correct amount of medicine** at times the doctor has prescribed. If your asthma control plan includes increased dosage or a second medicine to be used during episodes, take it as prescribed. **Always call your doctor before taking more medicine than the doctor ordered.**
 - ◆ **Remove yourself or the child from the trigger** if you know what it is. Treatment does not work as effectively if the person affected stays around the trigger.
 - ◆ **Keep calm and relaxed.** Family members must stay calm and relaxed, too.
 - ◆ **Rest and sip some warm water while waiting for medications to work.**
 - ◆ **Observe yourself or the affected person** by noting changes in body signs such as wheezing, coughing, trouble breathing, and posture. If you have a peak flow meter, measure peak flow number before at treatment of quick-relief medicine and 20-30 minutes after each treatment to see if peak flow measurement is improving.
 - ◆ **Review the list below for signs to seek emergency medical care for asthma.** They include:
 1. **Your wheeze, cough, or shortness of breath gets worse, even after the medicine has been given and had time to work.** Most inhaled bronchodilator medicines produce an effect within 5 to 10 minutes. Discuss the time your medicines take to work with your doctor.
 2. **Peak Flow readings going down, or unimproved after treatment with bronchodilators,** or anytime the personal best peak flow readings drop to 60 percent or lower. Discuss this personal best peak flow level with your doctor.
 3. **Your breathing or the affected person's breathing gets difficult.** Signs of breathing difficulty include:
 - Chest and neck muscles that are pulled or sucked in with each breath, flaring nostrils
 - The affected person is hunching over.
 - The affected person is struggling to breathe.
 - **The affected person has trouble walking or talking.**
 - **The affected person stops moving/playing and cannot start again.**
 - **The affected person's lips or fingernails are grey or blue.**
- If the any of the last three signs are observed, get help NOW!***
- ◆ **Keep your important information** for getting emergency help handy.
 - ◆ **Call your parent,** or other nearby adult to help you when signs of an uncontrolled asthma begin. Do not do the following:
 - Do not drink a lot of water, just drink normal amounts.
 - Do not breathe warm moist air from a shower.
 - Do not re-breathe into a paper bag held over the nose.
 - Do not use over-the-counter cold remedies without first calling your provider.
 - ◆ **See “Management of Asthma Exacerbations: Home Treatment”,** G-19 of Missouri School Asthma Manual.

Source: National Asthma Education Program.

National Heart, Lung, & Blood Institute (1992), reviewed by Asthma Ready® Communities Staff (2010).

MAINTAINING AN ASTHMA-FRIENDLY HOME

Tips for Parents

House Dust Mites:

- ◆ Encase mattresses and box springs in an airtight cover.
- ◆ Either encase pillows or wash them in hot water once every week.
- ◆ Wash bed covers, clothes, and stuffed toys once a week in hot water (130 degrees F).

Other Actions to Reduce Dust Mites:

- ◆ Reduce indoor humidity to less than 60%, ideally 30-50%. Use a dehumidifier as needed.
- ◆ Remove carpets from the bedrooms of those with asthma.
- ◆ Do not allow asthmatic children to sleep or lie on upholstered furniture. Replace with vinyl, leather, or wood furniture.
- ◆ Remove carpets that are laid on concrete.
- ◆ Use exhaust-port HEPA (high-efficiency particulate air) filters on vacuums, or central vacuum.

Animals:

- ◆ If your child is allergic to animals, avoid having animals in your home.
- ◆ Choose a pet without fur or hair (such as a fish or snake).
- ◆ If you must have a warm-blooded pet, keep the pet outside of your child's bedroom at all times. Outside the home is even better.
- ◆ If your home has forced-air heat, close air ducts in your bedroom.
- ◆ Avoid visiting homes with pets. If you must go to such a home, take your **quick relief** (albuterol bronchodilator) and prevention medications before going.

Cockroaches:

- ◆ Use insect sprays; have ALL persons, especially those with asthma out of the home while you are spraying. **Wear a mask**

yourself while spraying. Roach traps may also help.

- ◆ All units in a multiple-family dwelling (apartment buildings, etc.) must be treated to eliminate roaches.

Tobacco Smoke:

- ◆ Do not smoke.
- ◆ Do not allow smoking in your home.
- ◆ Have household members smoke outside.
- ◆ If you smoke, wear a smoking jacket, and leave it outside when you come in.
- ◆ Do not smoke in your car, or other confined areas where your children will be.
- ◆ Choose no-smoking areas in restaurants, hotels, and other public buildings.

Wood Smoke:

- ◆ Do not use a wood-burning stove to heat your home.
- ◆ Do not use kerosene heaters.
- ◆ If cooking outside, keep the child with asthma away from the smoke.

Colds and Infections:

- ◆ Talk to your doctor about flu shots.
- ◆ Keep your child away from people with colds or the flu, whenever possible.
- ◆ Wash hands frequently. Cover mouth and nose when coughing and sneezing.

Strong Odors and airborne droplet or dry Particle irritants:

- ◆ Avoid strong odors associated with paint, perfume, talcum powder, cleaning products, or strong cooking odors.
- ◆ Use exhaust fans and open windows when cleaning, cooking, or spraying chemicals. keep volatile chemical fumes dispersed by having good ventilation in the room.

Adapted from: Partners in Asthma Care, National Heart, Lung, and Blood Institute (1995), reviewed by Asthma Ready® Communities Staff (2010).

SETTING ACTIVITY GUIDELINES

Suggestions for parents

Parents often attempt to prevent asthma episodes by limiting what activities their children can participate in. **The goal is to allow your child to participate in all school activities and after school activities to whatever degree they are able to participate, even if it means that a modified program is developed allowing for gradual increases as tolerated.** Studies have proven that exercise is beneficial physically in strengthening lung development, weight stabilization and improving overall fitness; emotionally as a strong reducer; and as part improving social connectedness.

Help your child stay active and healthy with the following steps:

- ◆ **Before setting any limits, look at what your child can already do. Ask the school nurse and school coaches for assistance in developing individual activity goals for your child, and for help in monitoring the progress. Get your child involved in setting realistic incremental goals and tracking their progress. Celebrate your child's successes, and encourage your child to set new goals as accomplishments are reached. When occasional illness slows progress, remind your child of past successes, that the setback is only temporary and they can resume working on their goals when they are feeling better.**
- ◆ Set individual *personal best goals* for self-improvement WITH input from your child, allowing them to take more responsibility for their own health. No child with asthma is the same. Each child has different levels of physical fitness and maturity.
- ◆ Discuss the goals you think are right with your child. Agree on a reasonable timeline to reassess progress. As progress is achieved and new goals are set, consider gradually introducing formerly restricted activities.
- ◆ Discuss disagreements or doubts about physical activities with your provider so that he or she can help decide if the proposed activity goals are reasonable for your child.
- ◆ Practice and review with your child the written Asthma Action Plan steps to take if an uncontrolled asthma episode occurs at home or in school. Your child's school nurse can help reinforce this learning.
- ◆ To help your child participate in more school or social activities, practice, role-play, and discuss specific ways to protect him or her from asthma triggers. For example, if your child is allergic to animal dander and wants to visit a friend who has a dog, have your child take asthma medicine before the visit. Make sure they know what to do in case asthma symptoms flare up. An alternative plan could be to invite the friend to come to your house. Your child should be told *not* to touch or pet the animal, and should change clothes, wash hair, and shower when he/she comes home.

Source: National Asthma Education Program. National Heart, Lung & Blood Institute (1992), reviewed by Asthma Ready® Communities Staff (2010).



ASTHMA SELF-MAINTENANCE

Peak flow monitoring info for parents

Importance:

Peak Expiratory Flow (PEF) provides a simple way of measuring breathing ability. It is reproducible, demonstrating the severity of air flow obstruction (severity of asthma attack). PEF can be measured with **hand-held devices** called *peak flow meters*. A peak flow meter helps a person tell if the insides of their lung passages are getting more swollen and constricted, and that a severe asthma episode may be coming. Peak flow meters are designed to monitor, NOT diagnose asthma. Children need to be instructed on how to appropriately use a peak flow meter. It should be demonstrated to the child, with frequent review of proper technique.

Personal Best:

A child's *personal best* reading is the most appropriate reference value by which to compare repeated readings. It can be a useful reading for long-term daily monitoring, as well as short-term monitoring and evaluating exacerbations. The personal best measure gives you a starting level to see if your breathing is better or worse (with medicine or activity) compared to where you started from when you were not ill. A personal best peak flow reading is the highest peak flow number achieved over a two to three week period (when asthma is under good control). Good control means the child feels good, and does not have any asthma symptoms. Each child's personal best peak flow reading is different, and may be higher or lower than the peak flow of someone the same height, weight, and gender. Personal best should be reestablished with a new meter and every 6 months to allow for lung growth.

How to Measure:

To find a personal best peak flow number, take peak flow readings at least once a day for two to three weeks. Measure peak flow at these times:

- ◆ In the morning and evening for two to three weeks. If this is not possible, then the same time every day, preferably in the morning.
- ◆ Each time the patient takes quick-relief medicine, to relieve asthma symptoms
- ◆ Any other time the child or provider feels is necessary

Outlying Values:

If a PEF reading is recorded that is considerably higher than other values, this reading should not be considered a personal best reading. It may merely be the result of the tongue partly over the opening, "spitting" into the flow meter, or coughing. Caution should be used in establishing a personal best when an outlying value is observed. **If a person is in respiratory distress, and having trouble taking in deep breaths—rather than having them keep trying to get a more accurate reading, check the peak flow reading AFTER they have had a chance to use their quick relief medication.**

Flow Variability:

When the morning PEF is below 80% of the patient's personal best, PEF should be measured more than once daily (again before taking quick-relief medication). The additional measurements of PEF will enable the child to determine if their asthma is continuing to worsen or is improving after taking medication. If their asthma is in fact worsening, they will be able to more quickly respond. Periodically, children should assess their PEF in the morning and in the afternoon, for one to two weeks. This is a way to assess variability, which is an indicator of the current level of the patient's asthma severity.



National Asthma Education and
Prevention Program

NATIONAL HEART, LUNG AND BLOOD INSTITUTE
National Asthma Education and Prevention Program
NAEPP School Asthma Education Subcommittee

How Asthma-Friendly Is Your School?

Students with asthma need proper support at school to keep their asthma under control and be fully active. Use this checklist to find out how well your school serves students with asthma:

- Are the school buildings and grounds **free of tobacco smoke** at all times? Are all school buses, vans, and trucks free of tobacco smoke? Are all school events, like field trips and team games (both “at-home” and “away”), free from tobacco smoke?
- Does your school have a policy or rule that allows **students to carry and use their own asthma medicines**? If some students do not carry their asthma medicines, do they have quick and easy access to their medicines?
- Does your school have a **written emergency plan for teachers** and staff to follow to take care of a student who has an asthma attack? In an emergency, such as a fire, weather, or lockdown, or if a student forgets his/her medicine, does your school have standing orders and quick-relief medicines for students to use?
- Do all students with asthma have updated **asthma action plans** on file at the school? An asthma action plan is a written plan from the student’s doctor to help manage asthma and prevent asthma attacks.
- Is there a **school nurse in your school building during all school hours**? Does a nurse identify, assess, and monitor students with asthma at your school? Does he/she help students with their medicines, and help them be active in physical education, sports, recess, and field trips? If a school nurse is not full-time in your school, is a nurse regularly available to write plans and give the school guidance on these issues?
- Does the school nurse or other asthma education expert **teach school staff about asthma**, asthma action plans, and asthma medicines? Does someone teach all students about asthma and how to help a classmate who has asthma?
- Can students with asthma fully and safely join in **physical education, sports, recess, and field trips**? Are students’ medicines nearby, before and after they exercise? Can students with asthma choose a physical activity that is different from others in the class when it is medically necessary? Can they choose another activity without fear of being ridiculed or receiving reduced grades?
- Does the school have **good indoor air quality**? Does the school help to reduce or prevent students’ contact with allergens or irritants, indoors and outdoors, that can make their asthma worse? Allergens and irritants include tobacco smoke, pollens, animal dander, mold, dust mites, cockroaches, and strong odors or fumes from things like bug spray, paint, perfumes, and cleaners. Does the school exclude animals with fur?

If the answer to any question is “no,” then it may be harder for students to have good control of their asthma. Uncontrolled asthma can hinder a student’s attendance, participation and progress in school. School staff, healthcare providers, and families should work together to make schools more asthma-friendly to promote student health and education.

For more information on keeping students with asthma safe at school, see the list of resources on the next page. National and state laws can help children with asthma.

**Asthma cannot be cured but it can be controlled.
Students with asthma should be able to live healthy, active lives with few symptoms.**

October 2008

Resources for Families and School Staff

National Asthma Education and Prevention Program

National Heart, Lung and Blood Institute
Information Center
(301) 251-1222
<http://www.nhlbi.nih.gov>

NAEPP School Materials

<http://www.nhlbi.nih.gov/health/prof/lung/>

Allergy & Asthma Network Mothers of Asthmatics

(800) 878-4403 or (703) 641-9595
www.breatherville.org

American Academy of Allergy, Asthma & Immunology

(800) 822-ASMA or (414) 272-6071
www.aaaai.org

American Academy of Pediatrics

(800) 433-9016 or (847) 228-5005
www.aap.org

American Association for Respiratory Care

(972) 243-2272
www.aarc.org

American Association of School Administrators

703-841-0700
www.aasa.org

American College of Allergy, Asthma & Immunology

(800) 842-7777 or (847) 427-1200
<http://www.acaai.org>

American Lung Association

For the affiliate nearest you, call
(800) LUNG USA
www.lungusa.org

American School Health Association

(330) 678-1601
www.ashaweb.org

Asthma and Allergy Foundation of America

(800) 7-ASTHMA or (202) 466-7643
www.aafa.org

Centers for Disease Control and Prevention

National Center for Chronic Disease Prevention and Health Promotion
Division of Adolescent and School Health
(800) CDC-INFO
www.cdc.gov/HealthyYouth/asthma

Centers for Disease Control and Prevention

National Center for Environmental Health
Division of Environmental Hazards and Health Effects
(800) CDC-INFO
www.cdc.gov/asthma

National Association of School Boards

(703) 838-6722
www.nsba.org/SchoolHealth

National Association of School Nurses

(866) 627-6767
www.nasn.org

National Association of State Boards of Education

(703) 684.4000
www.nasbe.org

U.S. Department of Education

Office for Civil Rights, Customer Service Team
(800) 421-3481 or (202) 205-5413
www.ed.gov/offices/OCR

U.S. Environmental Protection Agency

Indoor Environments Division
(202) 233-9370
www.epa.gov/iaq/schools

Indoor Air Quality Information Clearinghouse
(800) 438-4318
www.epa.gov/iaq

G

Section G
HEALTH STAFF
TRAINING

SCHOOL HEALTH STAFF TRAINING

School nurses, teachers, administrators, and school staff play important roles in the safe and effective management of asthma at school.

Over the last two decades the worldwide prevalence of asthma has increased dramatically, particularly among school-age children. Large numbers of students are experiencing poorly controlled, disabling asthma. Yet, this problem is growing worse at a time when very effective asthma medications have become available. Today, with appropriate education, clinical care, and support, children with asthma can lead normal lives.

This section of the manual will focus on changes that occur in the airway due to asthma, signs and symptoms of an asthma flare-up (exacerbation), medications used in the treatment of asthma, and skills needed by health care staff to assist children who have asthma.

**You can make a
difference!
Help control
asthma in your
school!**



STAFF PROCEDURE PERFORMANCE CHECKLIST

For Managing Asthma in School

Instructor signature signifies that the staff member successfully demonstrated competency in the management of the designated skill.

	Date	Staff member performing procedure	Instructor signature
MDI using Spacer/ Aerochamber with mask	_____ _____ _____	_____ _____ _____	_____ _____ _____
MDI using Spacer/ Aerochamber	_____ _____ _____	_____ _____ _____	_____ _____ _____
DPI	_____ _____ _____	_____ _____ _____	_____ _____ _____
Nebulizer	_____ _____ _____	_____ _____ _____	_____ _____ _____
Peak Flow Meter	_____ _____ _____	_____ _____ _____	_____ _____ _____
Electronic flow meter	_____ _____ _____	_____ _____ _____	_____ _____ _____
In-Check Dial®	_____ _____ _____	_____ _____ _____	_____ _____ _____
EpiPen® Autoinjector	_____ _____ _____	_____ _____ _____	_____ _____ _____
TwinJect® Autoinjector	_____ _____ _____	_____ _____ _____	_____ _____ _____

PATHOGENESIS OF ASTHMA IN CHILDREN

Components of Airway Limitations

- Acute Bronchoconstriction
- Airway Edema
- Mucus Plug Formation
- Airway Injury and Repair



Implications of Asthma Inflammation

- Airway Hyper-responsiveness
- Airflow limitation
- Respiratory symptoms:
 - coughing
 - wheezing
 - shortness of breath
 - chest tightness
- Persistent symptoms
- Pathologic damage
(even when symptoms are not present)

Characteristic Features of Asthma Inflammation

- Mast cell activation
- Inflammatory cell infiltration
- Edema of the airway
- Denudation and disruption of bronchial epithelial smooth muscle
- Collagen deposition beneath the basement membrane
- Goblet cell hyperplasia with mucus hypersecretion
- Smooth muscle thickening

Adapted from: Pediatric Asthma: Promoting Best Practice, a Guide for Managing Asthma in Children. American Academy of Allergy, Asthma & Immunology (1999); reviewed by Asthma Ready® Communities Staff (2010).

DEFINITION OF ASTHMA

National Heart Lung and Blood Institute Expert Panel Report 3, (2007) defines asthma as:

.. a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role, in particular, mast cells, eosinophils, T lymphocytes, neutrophils, and epithelial cells. In susceptible individuals, this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, particularly at night and in the early morning. These episodes are usually associated with wide spread but variable airflow obstruction that is often reversible either spontaneously or with treatment. The inflammation also causes an associated increase in the existing bronchial hyperresponsiveness to a variety of stimuli. Reversibility of airflow limitation may be incomplete in some patients with asthma (NHBLI, 2007, p. 14).

Pathogenesis of Asthma

Inflammation

- Found in patients with mild, moderate and severe asthma
- Common airway infiltration by inflammatory mediators
- Mast cell degranulation common with mild and moderate persistent asthma
- Epithelial denudation and deposition of collagen to the basement membrane can occur in severe (and often fatal asthma) mucus may occlude the bronchial lumen; bronchial smooth muscle may become hypertrophied; goblet cell hyperplasia may occur.
- IgE antibodies involved with severity of asthma, especially in early airway response to allergens
- Existing allergic illness is a major risk factor for the pathogenesis of asthma.
- IgE antibodies bind to mast cells and basophils, signaling the release of histamine and various leukotrienes, resulting in rapid constriction of airway smooth muscle.
- Mast cells produce various cytokines, contributing to both acute and chronic inflammation.
- Asthma treatment is focused on controlling underlying airway inflammation.

Immune Factor Involvement

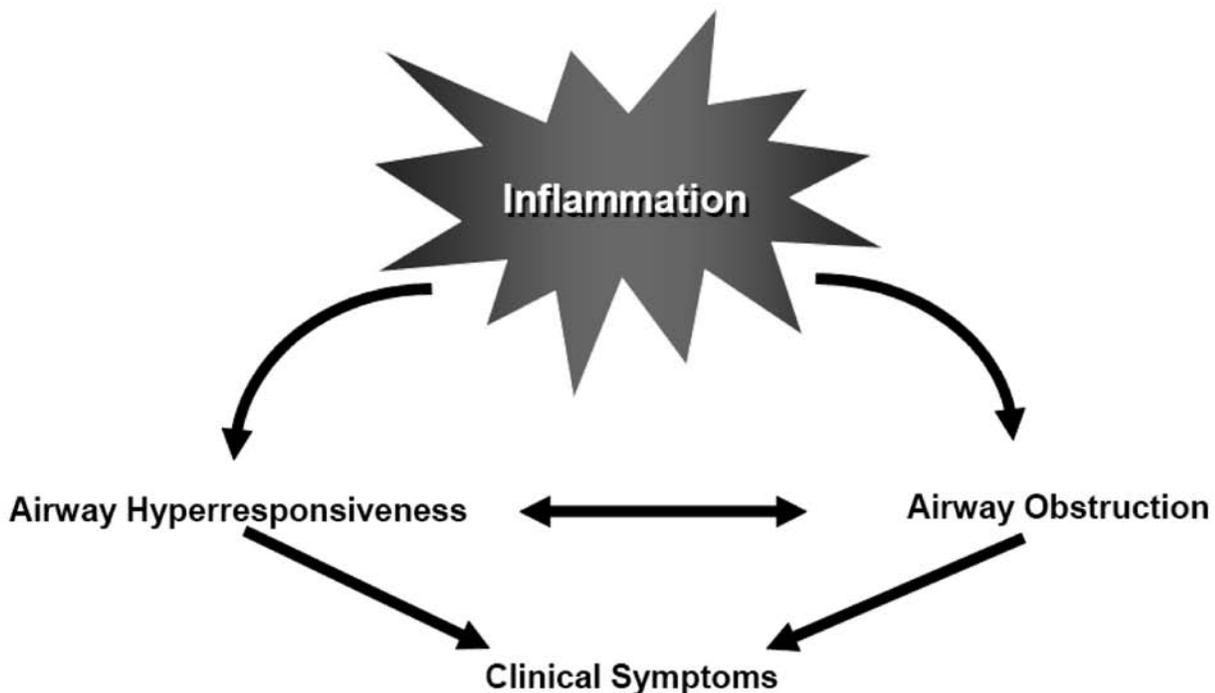
- An imbalance occurs between T-helper cells Th1 and Th2.
- Airway inflammation may represent loss of balance between opposing types of T-helper cells.
- Environmental exposure to certain antigens by children genetically capable of generating IgE antibodies may contribute to the development of asthma.
- New treatments being generated to treat leukotriene activity in allergic asthma.
- Interrelationship between immune factor development and airway inflammation

*Source: National Asthma Education and Prevention Program
Expert Panel Report (2007), National Heart Lung and Blood Institute, as printed in the
Journal of Allergy and Clinical Immunology, November 2002. Reviewed by Asthma Ready® Communities Staff (2010).*

KEY DIFFERENCES FROM 1997 AND 2002 EXPERT PANEL REPORTS

- The critical role of inflammation has been further substantiated, but evidence is emerging for considerable variability in the pattern of inflammation, thus indicating phenotypic differences that may influence treatment responses.
- Gene-by-environmental interactions are important to the development and expression of asthma. Of the environmental factors, allergic reactions remain important. Evidence also suggests a key and expanding role for viral respiratory infections in these processes.
- The onset of asthma for most patients begins early in life with the pattern of disease persistence determined by early, recognizable risk factors including atopic disease, recurrent wheezing, and a parental history of asthma.
- Current asthma treatment with anti-inflammatory therapy does not appear to prevent progression of the underlying disease severity.

FIGURE 2-1. THE INTERPLAY AND INTERACTION BETWEEN AIRWAY INFLAMMATION AND THE CLINICAL SYMPTOMS AND PATHOPHYSIOLOGY OF ASTHMA



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

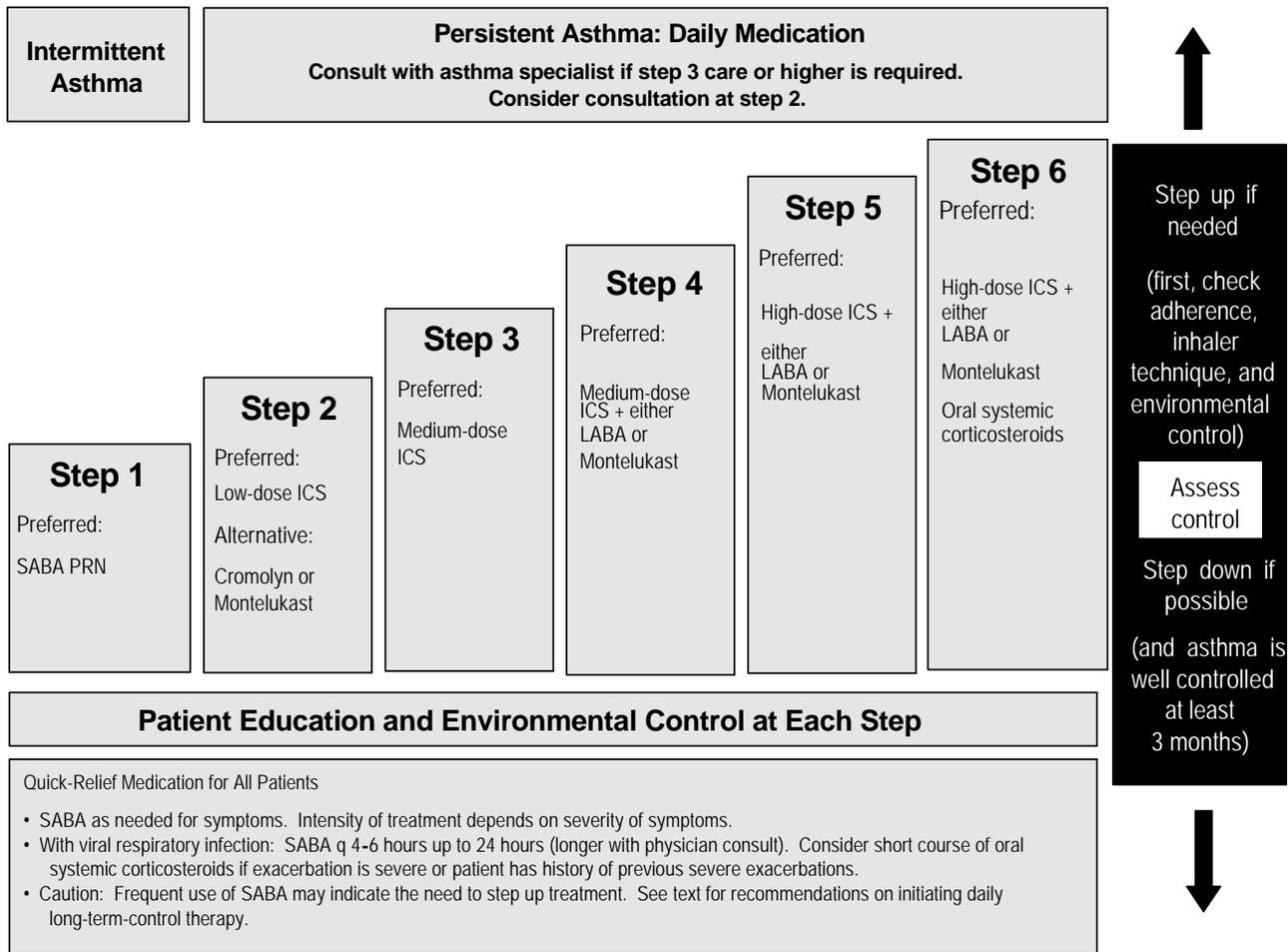
EXPERT PANEL REPORT 3 (EPR3)
Highlights of the 2007 Asthma Guidelines

- 1) **Poorly controlled asthma has a very negative impact on the lives of children.** 9.7 % of Missouri children, ~111,000 have asthma (2004, MO DHSS); more than 55,000 Missouri children take asthma medications at school (2006, MO DESE); approximately 25,000 Missouri children experience disability due to asthma (2005, Francisco & Konig)
- 2) **EPR3 is the result of a rigorous, systematic review of the scientific literature.** Ten committees composed of dozens of national experts spent 3 years screening 15,444 abstracts. They reviewed the full-text of 2,122 articles and judged 1,654 to contribute evidence relating to asthma best practices. Twenty evidence tables were constructed to integrate findings from 316 articles on critical topics. EPR3 recommendations are weighted by evidence level (Categories A, B, C, & D).
- 3) **A four component approach is effective for achieving control of asthma.**
 - i) Measures of Asthma Assessment & Monitoring,
 - ii) Education for a Partnership in Asthma Care,
 - iii) Control of Environmental Factors & Comorbid Conditions that Affect Asthma and
 - iv) Medications
- 4) **Assessment of severity, evaluation of control and stepwise treatment of asthma differ for three age groups - 0-4 years, 5-11 and those 12 and above.** Initiation of therapy requires assessment of asthma severity. Continuation of therapy should be based on assessment of asthma control. Use of medications should be based on evidence of effectiveness among the target age group.
- 5) **Inhaled corticosteroids (ICS) are the foundation of asthma pharmacotherapy.** Whereas, the treatment of Intermittent Asthma requires only SABA, preferred treatment for all levels of persistent asthma includes ICS. Comparative dose tables are available to aid in the determination of low, medium, or high dose therapy for the various age groups.
- 6) **Inhalation technique is critical and requires correct use of assistive devices and objective assessment of inspiratory flow rate & time for MDIs and DPIs.**
- 7) **Spirometric parameters improve assessment of severity, control, exacerbations and response to therapy (FEV1, FEV1/FVC ratio and PEF). Symptom reports are also useful, but under-estimate the degree of airway obstruction in many individuals.**
- 8) **Effective initial management of exacerbations is based on aggressive use of SABA and ipratropium, guided by reassessment & evaluation of response to therapy.**
- 9) **Evaluation of contributing factors (comorbidities & inhalant triggers) is essential for achieving optimal control with the lowest possible doses of medications.**
- 10) **Regular office visits are required to develop a partnership that enhances adherence by reassessment, mutual goal-setting, written plans and education for self-care.**

Abbreviations: MO DHSS=Missouri Department of Health & Senior Services, MO DESE=Missouri Department of Elementary & Secondary Education, MDI=metered dose inhaler, DPI=dry powder inhaler, FEV1=forced expiratory volume in 1 second, FEV1/FVC ratio=fraction of forced vital capacity exhaled in the first second, PEF=peak inspiratory flow rate, SABA=short-acting beta agonists.

Asthma Ready® Communities (2010)

FIGURE 4-1a. 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 shortacting beta₂-agonist

Notes:

The stepwise approach is meant to assist, not replace, the clinical decisionmaking 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.

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

FIGURE 4-2a. 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		Step 1	Step 2	Step 3 and consider short course of oral systemic corticosteroids	
(See figure 4-1a for treatment steps.)		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 decisionmaking 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.

FIGURE 4-3a. 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 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 (See figure 4–1a 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 diagnoses 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 decisionmaking 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.

FIGURE 4-4b. ESTIMATED COMPARATIVE DAILY DOSAGES FOR INHALED CORTICOSTEROIDS IN CHILDREN

Drug	Low Daily Dose		Medium Daily Dose		High Daily Dose	
	Child 0-4	Child 5-11	Child 0-4	Child 5-11	Child 0-4	Child 5-11
Beclomethasone HFA 40 or 80 mcg/puff	NA	80-160 mcg	NA	>160-320 mcg	NA	>320 mcg
Budesonide DPI 90, 180, or 200 mcg/inhalation	NA	180-400 mcg	NA	>400-800 mcg	NA	>800 mcg
Budesonide inhaled Inhalation suspension for nebulization (child dose)	0.25-0.5 mg	0.5 mg	>0.5-1.0 mg	1.0 mg	>1.0 mg	2.0 mg
Flunisolide 250 mcg/puff	NA	500-750 mcg	NA	1,000-1,250 mcg	NA	>1,250 mcg
Flunisolide HFA 80 mcg/puff	NA	160 mcg	NA	320 mcg	NA	≥640 mcg
Fluticasone HFA/MDI: 44, 110, or 220 mcg/puff	176 mcg	88-176 mcg	>176-352 mcg	>176-352 mcg	>352 mcg	>352 mcg
DPI: 50, 100, or 250 mcg/inhalation	NA	100-200 mcg	NA	>200-400 mcg	NA	>400 mcg
Mometasone DPI 200 mcg/inhalation	NA	NA	NA	NA	NA	NA
Triamcinolone acetonide 75 mcg/puff	NA	300-600 mcg	NA	>600-900 mcg	NA	>900 mcg

Key: HFA, hydrofluoroalkane; NA, not approved and no data available for this age group

Notes:

The most important determinant of appropriate dosing is the clinician's judgment of the patient's response to therapy. The clinician must monitor the patient's response on several clinical parameters and adjust the dose accordingly. The stepwise approach to therapy emphasizes that once control of asthma is achieved, the dose of medication should be carefully titrated to the minimum dose required to maintain control, thus reducing the potential for adverse effect.

Some doses may be outside package labeling, especially in the high-dose range. Budesonide nebulizer suspension is the only ICS with FDA approved labeling for children <4 years of age.

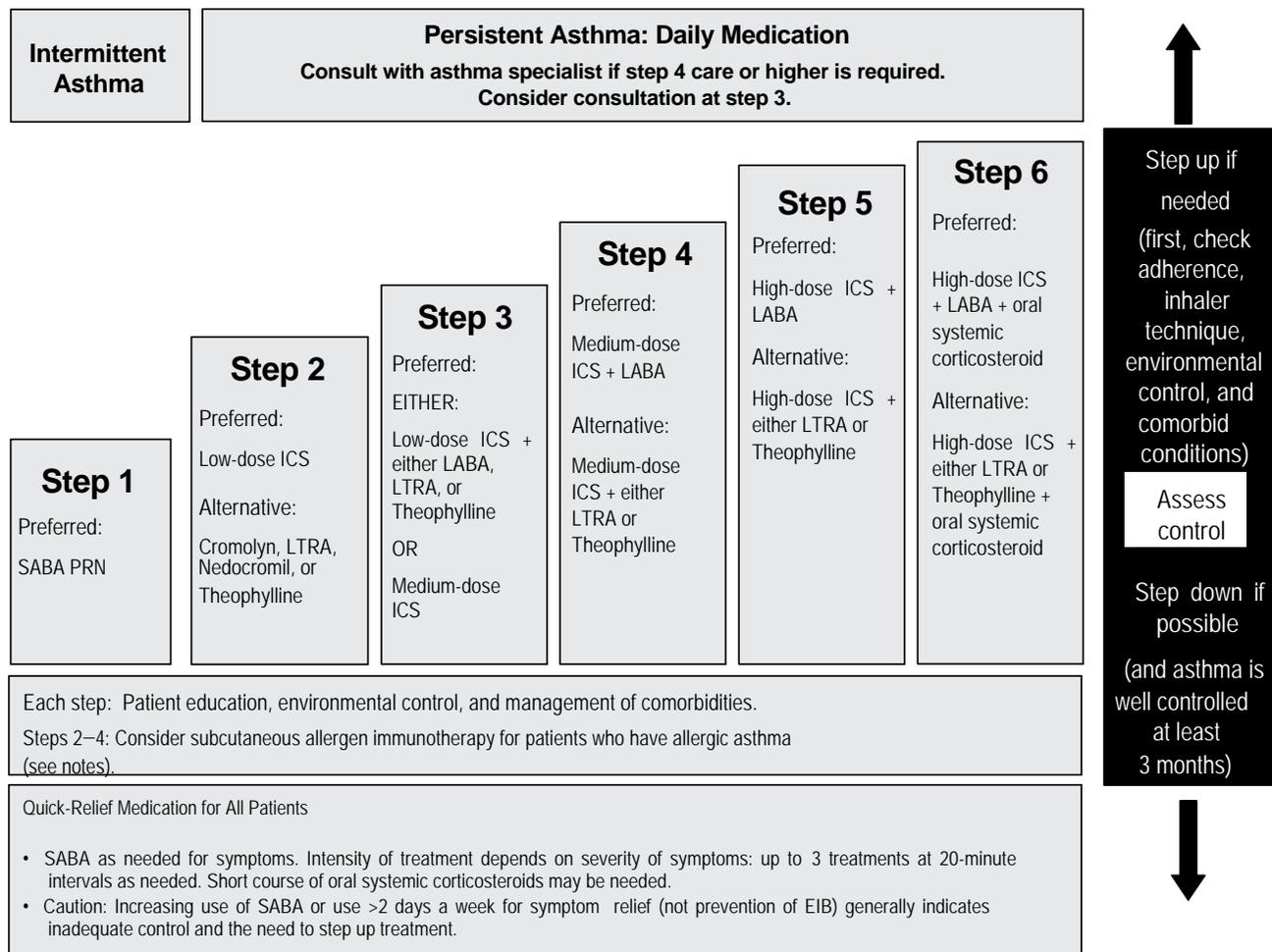
Metered-dose inhaler (MDI) dosages are expressed as the actuator dose (the amount of the drug leaving the actuator and delivered to the patient), which is the labeling required in the United States. This is different from the dosage expressed as the valve dose (the amount of drug leaving the valve, not all of which is available to the patient), which is used in many European countries and in some scientific literature. Dry powder inhaler (DPI) doses are expressed as the amount of drug in the inhaler following activation.

For children <4 years of age: The safety and efficacy of ICSs in children <1 year has not been established. Children <4 years of age generally require delivery of ICS (budesonide and fluticasone HFA) through a face mask that should fit snugly over nose and mouth and avoid nebulizing in the eyes. Wash face after each treatment to prevent local corticosteroid side effects. For budesonide, the dose may be administered 1-3 times daily. Budesonide suspension is compatible with albuterol, ipratropium, and levalbuterol nebulizer solutions in the same nebulizer. Use only jet nebulizers, as ultrasonic nebulizers are ineffective for suspensions.

For fluticasone HFA, the dose should be divided 2 times daily; the low dose for children <4 years is higher than for children 5-11 years of age due to lower dosedelivered with face mask and data on efficacy in young children.

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

FIGURE 4-1b. 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 decisionmaking 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.

FIGURE 4-2b. 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	<ul style="list-style-type: none"> • Normal FEV₁ between exacerbations • FEV₁ >80% predicted • FEV₁/FVC >85% 	<ul style="list-style-type: none"> • FEV₁ = >80% predicted • FEV₁/FVC >80% 	<ul style="list-style-type: none"> • FEV₁ = 60–80% predicted • FEV₁/FVC = 75–80% 	<ul style="list-style-type: none"> • 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.			
Recommended Step for Initiating Therapy (See figure 4–1b for treatment steps.)		Step 1	Step 2	Step 3, medium-dose ICS option and consider short course of oral systemic corticosteroids	Step 3, medium-dose ICS option, or step 4
		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 decisionmaking 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 the 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.

FIGURE 4-3b. 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 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%	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 4–1b for treatment steps.)		<ul style="list-style-type: none"> • Maintain current step. • 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 at least 1 step and • Reevaluate in 2–6 weeks. • 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. • 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 decisionmaking 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.

FIGURE 4-4b. ESTIMATED COMPARATIVE DAILY DOSAGES FOR INHALED CORTICOSTEROIDS IN CHILDREN

Drug	Low Daily Dose		Medium Daily Dose		High Daily Dose	
	Child 0-4	Child 5-11	Child 0-4	Child 5-11	Child 0-4	Child 5-11
Beclomethasone HFA 40 or 80 mcg/puff	NA	80-160 mcg	NA	>160-320 mcg	NA	>320 mcg
Budesonide DPI 90, 180, or 200 mcg/inhalation	NA	180-400 mcg	NA	>400-800 mcg	NA	>800 mcg
Budesonide inhaled Inhalation suspension for nebulization (child dose)	0.25-0.5 mg	0.5 mg	>0.5-1.0 mg	1.0 mg	>1.0 mg	2.0 mg
Flunisolide 250 mcg/puff	NA	500-750 mcg	NA	1,000-1,250 mcg	NA	>1,250 mcg
Flunisolide HFA 80 mcg/puff	NA	160 mcg	NA	320 mcg	NA	≥640 mcg
Fluticasone HFA/MDI: 44, 110, or 220 mcg/puff	176 mcg	88-176 mcg	>176-352 mcg	>176-352 mcg	>352 mcg	>352 mcg
DPI: 50, 100, or 250 mcg/inhalation	NA	100-200 mcg	NA	>200-400 mcg	NA	>400 mcg
Mometasone DPI 200 mcg/inhalation	NA	NA	NA	NA	NA	NA
Triamcinolone acetonide 75 mcg/puff	NA	300-600 mcg	NA	>600-900 mcg	NA	>900 mcg

Key: HFA, hydrofluoroalkane; NA, not approved and no data available for this age group

Notes:

The most important determinant of appropriate dosing is the clinician's judgment of the patient's response to therapy. The clinician must monitor the patient's response on several clinical parameters and adjust the dose accordingly. The stepwise approach to therapy emphasizes that once control of asthma is achieved, the dose of medication should be carefully titrated to the minimum dose required to maintain control, thus reducing the potential for adverse effect.

Some doses may be outside package labeling, especially in the high-dose range. Budesonide nebulizer suspension is the only ICS with FDA approved labeling for children <4 years of age.

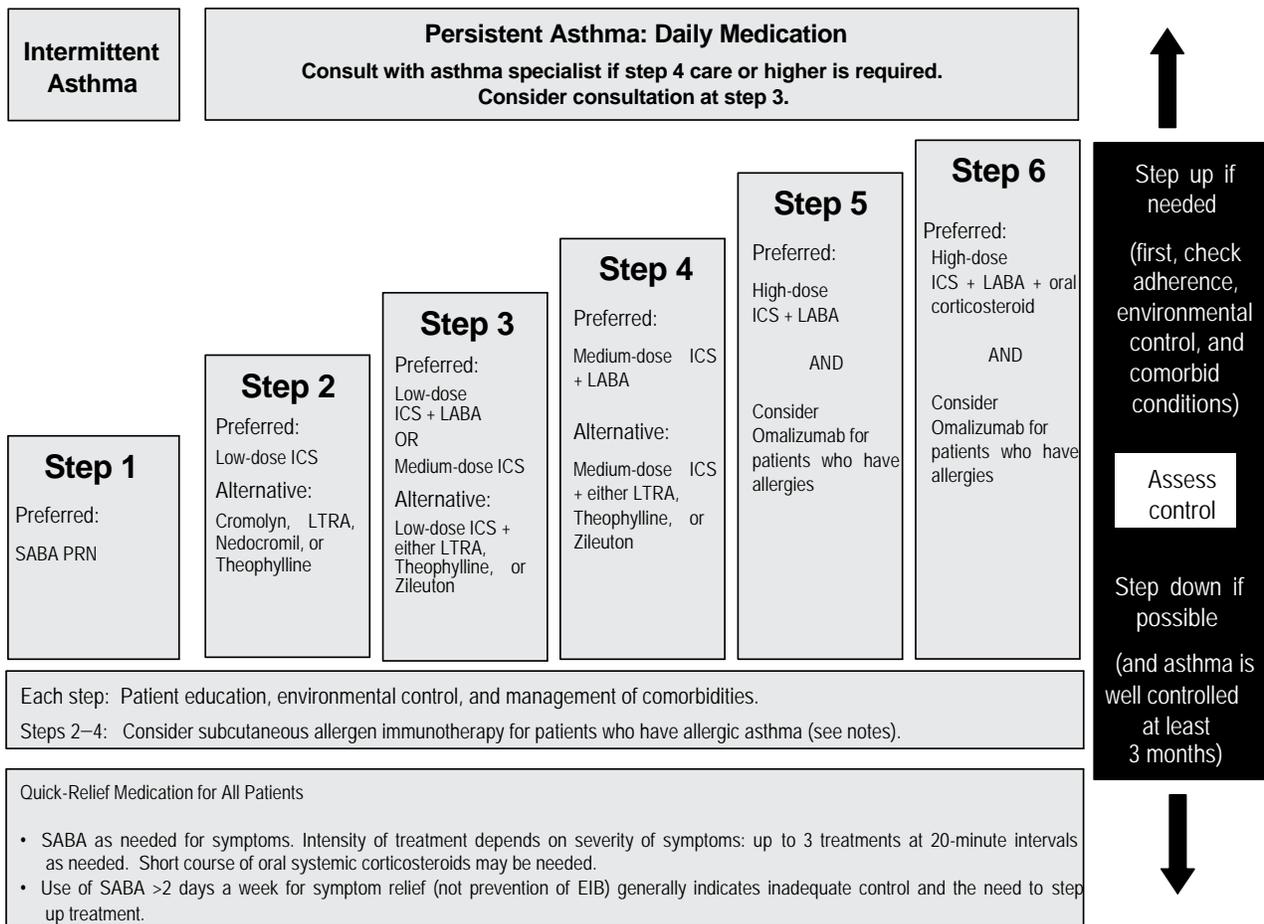
Metered-dose inhaler (MDI) dosages are expressed as the actuator dose (the amount of the drug leaving the actuator and delivered to the patient), which is the labeling required in the United States. This is different from the dosage expressed as the valve dose (the amount of drug leaving the valve, not all of which is available to the patient), which is used in many European countries and in some scientific literature. Dry powder inhaler (DPI) doses are expressed as the amount of drug in the inhaler following activation.

For children <4 years of age: The safety and efficacy of ICSs in children <1 year has not been established. Children <4 years of age generally require delivery of ICS (budesonide and fluticasone HFA) through a face mask that should fit snugly over nose and mouth and avoid nebulizing in the eyes. Wash face after each treatment to prevent local corticosteroid side effects. For budesonide, the dose may be administered 1-3 times daily. Budesonide suspension is compatible with albuterol, ipratropium, and levalbuterol nebulizer solutions in the same nebulizer. Use only jet nebulizers, as ultrasonic nebulizers are ineffective for suspensions.

For fluticasone HFA, the dose should be divided 2 times daily; the low dose for children <4 years is higher than for children 5-11 years of age due to lower dosedelivered with face mask and data on efficacy in young children.

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

FIGURE 4-5. 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, long-acting inhaled beta₂ agonist; LTRA, leukotriene receptor antagonist; SABA, inhaled shortacting beta₂-agonist

Notes:

The stepwise approach is meant to assist, not replace, the clinical decisionmaking 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.

FIGURE 4-6. CLASSIFYING ASTHMA SEVERITY AND INITIATING TREATMENT IN YOUTHS ≥12 YEARS OF AGE AND ADULTS

— Assessing severity and initiating treatment for patients who are not currently taking long-term control medications

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 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	<ul style="list-style-type: none"> • Normal FEV₁ between exacerbations • FEV₁ >80% predicted • FEV₁/FVC normal 	<ul style="list-style-type: none"> • FEV₁ >80% predicted • FEV₁/FVC normal 	<ul style="list-style-type: none"> • FEV₁ >60% but <80% predicted • FEV₁/FVC reduced 5% 	<ul style="list-style-type: none"> • 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 FEV ₁ .			
Recommended Step for Initiating Treatment		Step 1	Step 2	Step 3	Step 4 or 5
(See figure 4–5 for treatment steps.)		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 decisionmaking 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.

FIGURE 4-7. 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	≤ 2 x/month	1–3x/week	≥ 4 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
	FEV ₁ or peak flow	$> 80\%$ predicted/ personal best	60–80% predicted/ personal best	$< 60\%$ predicted/ personal best
	Validated questionnaires			
	ATAQ ACQ ACT	0 $\leq 0.75^*$ ≥ 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)	
		Consider severity and interval since last exacerbation		
	Progressive loss of lung function	Evaluation requires long-term followup 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 (see figure 4 –5 for treatment steps)		<ul style="list-style-type: none"> • Maintain current step. • Regular followups every 1–6 months to maintain control. • 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. • 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. • 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 decisionmaking 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 (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.

Validated Questionnaires for the impairment domain (the questionnaires do not assess lung function or the risk domain)

ATAQ = Asthma Therapy Assessment Questionnaire© (See sample in “Component 1: Measures of Asthma Assessment and Monitoring.”)

ACQ = Asthma Control Questionnaire© (user package may be obtained at www.qoltech.co.uk or juniper@qoltech.co.uk)

ACT = Asthma Control Test™ (See sample in “Component 1: Measures of Asthma Assessment and Monitoring.”)

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 an alternative treatment option was used in a step, discontinue and use the preferred treatment for that step.

FIGURE 4-8b. ESTIMATED COMPARATIVE DAILY DOSAGES FOR INHALED CORTICOSTEROIDS FOR YOUTHS \geq 12 YEARS OF AGE AND ADULTS

Drug	Low Daily Dose Adult	Medium Daily Dose Adult	High Daily Dose Adult
Beclomethasone HFA 40 or 80 mcg/puff	80-240 mcg	>240-480 mcg	>480 mcg
Budesonide DPI 90, 180, or 200 mcg/inhalation	180-600 mcg	>600-1,200 mcg	>1,200 mcg
Flunisolide 250 mcg/puff	500-1,000 mcg	>1,000-2,000 mcg	>2,000 mcg
Flunisolide HFA 80 mcg/puff	320 mcg	>320-640 mcg	>640 mcg
Fluticasone HFA/MDI: 44, 110, or 220 mcg/puff DPI: 50, 100, or 250 mcg/inhalation	88-264 mcg 100-300 mcg	>264-440 mcg >300-500 mcg	>440 mcg >500 mcg
Mometasone DPI 200 mcg/inhalation	200 mcg	400 mcg	>400 mcg
Triamcinolone acetonide 75 mcg/puff	300-750 mcg	>750-1,500 mcg	>1,500 mcg

Key: DPI, dry powder inhaler; HFA, hydrofluoroalkane; MDI, metered-dose inhaler

Notes:

The most important determinant of appropriate dosing is the clinician's judgment of the patient's response to therapy. The clinician must monitor the patient's response on several clinical parameters and adjust the dose accordingly. The stepwise approach to therapy emphasizes that once control of asthma is achieved, the dose of medication should be carefully titrated to the minimum dose required to maintain control, thus reducing the potential for adverse effect.

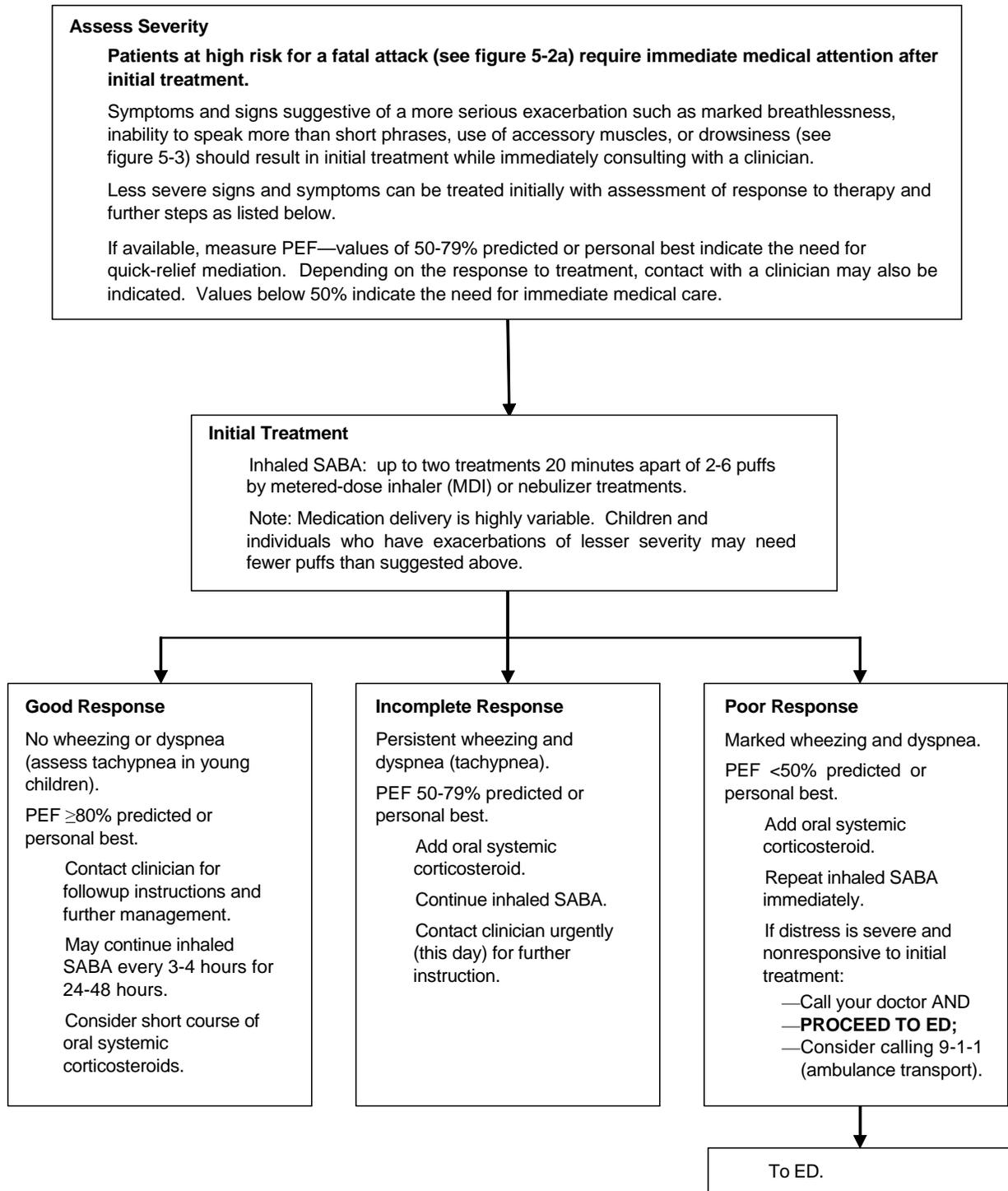
Some doses may be outside package labeling, especially in the high-dose range.

MDI dosages are expressed as the actuator dose (the amount of the drug leaving the actuator and delivered to the patient), which is the labeling required in the United States. This is different from the dosage expressed as the valve dose (the amount of drug leaving the valve, not all of which is available to the patient), which is used in many European countries and in some scientific literature. DPI doses are expressed as the amount of drug in the inhaler following activation.

Comparative dosages are based on published comparative clinical trials (Adams et al. 2005; Barnes et al. 1998; Kelly 1998; Lasserson et al. 2005; Pedersen and O'Byrne 1997). The rationale for some key comparisons is summarized as follows:

- The high dose is the dose that appears likely to be the threshold beyond which significant hypothalamic-pituitary-adrenal (HPA) axis suppression is produced, and, by extrapolation, the risk is increased for other clinically significant systemic effects if used for prolonged periods of time (Martin et al. 2002; Szeffler et al. 2002).
- The low- and medium-doses reflect findings from dose-ranging studies in which incremental efficacy within the low- to medium-dose ranges was established without increased systemic effect as measured by overnight cortisol excretion. The studies demonstrated a relatively flat dose-response curve for efficacy at the medium-dose range; that is, increasing the dose of high-dose range did not significantly increase efficacy but did increase systemic effect (Adams et al. 2001; Martin et al. 2002; Szeffler et al. 2002).
- The dose for budesonide DPI is based on recently available comparative data with other medications. These new data, including meta-analyses, show that budesonide DPI is comparable to approximately twice the microgram dose of fluticasone MDI or DPI (Adams et al. 2005; Barnes et al. 1998; Nielsen and Dahl 2000).

FIGURE 5-4. MANAGEMENT OF ASTHMA EXACERBATIONS: HOME TREATMENT



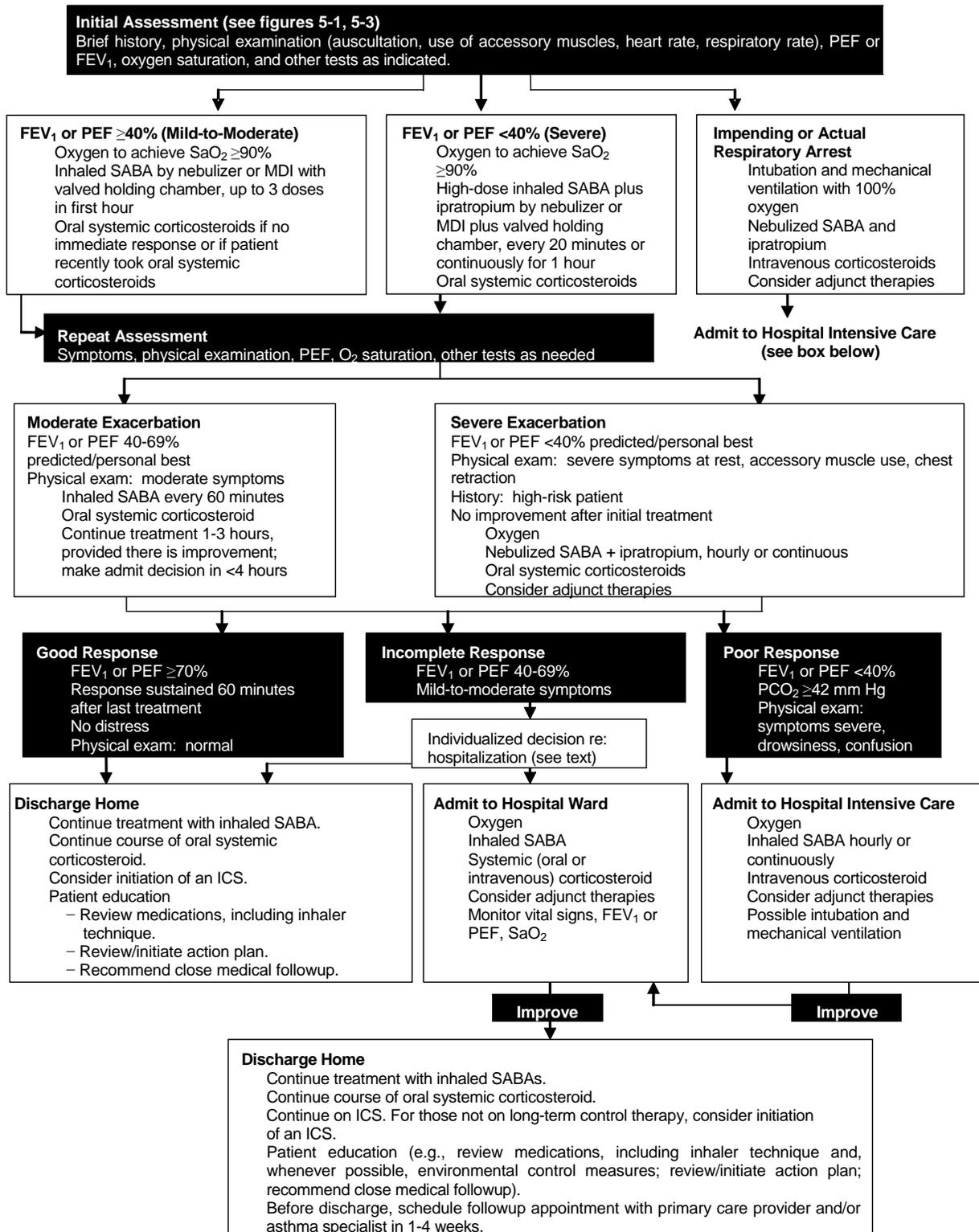
Key: ED, emergency department; MDI, metered-dose inhaler; PEF, peak expiratory flow; SABA, short-acting beta₂-agonist (quick-relief inhaler)

FIGURE 5-3. FORMAL EVALUATION OF ASTHMA EXACERBATION SEVERITY IN THE URGENT OR EMERGENCY CARE SETTING

	Mild	Moderate	Severe	Subset: Respiratory Arrest Imminent
Symptoms				
Breathlessness	While walking Can lie down	While at rest (infant—softer, shorter cry, difficulty feeding) Prefers sitting	While at rest (infant—stops feeding) Sits upright	
Talks in	Sentences	Phrases	Words	
Alertness	May be agitated	Usually agitated	Usually agitated	Drowsy or confused
Signs				
Respiratory rate	Increased	Increased Guide to rates of breathing in awake children: <i>Age</i> <2 months 2-12 months 1-5 years 6-8 years	Often >30/minute <i>Normal rate</i> <60/minute <50/minute <40/minute <30/minute	
Use of accessory muscles; suprasternal retractions	Usually not	Commonly	Usually	Paradoxical thoracoabdominal movement
Wheeze	Moderate, often only end expiratory	Loud; throughout exhalation	Usually loud; throughout inhalation and exhalation	Absence of wheeze
Pulse/minute	<100	100-120 Guide to normal pulse rates in children:: <i>Age</i> 2-12 months 1-2 years 2-8 years	>120 <i>Normal rate</i> <160/minute <120/minute <110/minute	Bradycardia
Pulsus paradoxus	Absent <10 mmHg	May be present 10-25 mmHg	Often present >25 mmHg (adult) 20-40 mmHg (child)	Absence suggests respiratory muscle fatigue
Functional Assessment				
PEF percent predicted or percent personal best	≥70 percent	Approx. 40-69 percent or response lasts <2 hours	<40 percent	<25 percent Note: PEF testing may not be needed in very severe attacks
PaO ₂ (on air)	Normal (test not usually necessary)	≥60 mmHg (test not usually necessary)	<60 mmHg: possible cyanosis	
and/or PCO ₂	<42 mmHg (test not usually necessary)	<42 mmHg (test not usually necessary)	≥42 mmHg: possible respiratory failure (See pages 393-394, 399.)	
SaO ₂ percent (on air) at sea level	>95 percent (test not usually necessary) Hypercapnia (hypoventilation) develops more readily in young children than in adults and adolescents.	90-95 percent (test not usually necessary)	<90 percent	
Key: PaO ₂ , arterial oxygen pressure; PCO ₂ , partial pressure of carbon dioxide; PEF, peak expiratory flow; SaO ₂ , oxygen saturation				
Notes:				
The presence of several parameters, but not necessarily all, indicates the general classification of the exacerbation. Many of these parameters have not been systematically studied, especially as they correlate with each other. Thus, they serve only as general guides (Cham et al. 2002; Chey et al. 1999; Gorelick et al. 2004b; Karras et al. 2000; Kelly et al. 2002b and 2004; Keogh et al. 2001; McCarren et al. 2000; Rodrigo and Rodrigo 1998b; Rodrigo et al. 2004; Smith et al. 2002).				
The emotional impact of asthma symptoms on the patient and family is variable but must be recognized and addressed and can affect approaches to treatment and followup (Ritz et al. 2000; Strunk and Mrazek 1986; von Leupoldt and Dahme 2005).				

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FIGURE 5-6. MANAGEMENT OF ASTHMA EXACERBATIONS: EMERGENCY DEPARTMENT AND HOSPITAL-BASED CARE



Key: FEV₁, forced expiratory volume in 1 second; ICS, inhaled corticosteroid; MDI, metered dose inhaler; PCO₂, partial pressure carbon dioxide; PEF, peak expiratory flow; SABA, short-acting beta₂-agonist; SaO₂, oxygen saturation

FIGURE 5-5. DOSAGES OF DRUGS FOR ASTHMA EXACERBATIONS

Medication	Dosages		Comments
	Child Dose	Adult Dose*	
Inhaled Short-Acting Beta₂-Agonists (SABA)			
Albuterol			
Nebulizer solution A. (0.63 mg/3 mL, 1.25 mg/3 mL, 2.5 mg/3 mL, 5.0 mg/mL)	0.15 mg/kg (minimum dose 2.5 mg) every 20 minutes for 3 doses then 0.15-0.3 mg/kg up to 10 mg every 1-4 hours as needed, or 0.5 mg/kg/hour by continuous nebulization.	2.5-5 mg every 20 minutes for 3 doses, then 2.5-10 mg every 1-4 hours as needed, or 10-15 mg/hour continuously.	Only selective beta ₂ -agonists are recommended. For optimal delivery, dilute aerosols to minimum of 3 mL at gas flow of 6-8 L/min. Use large volume nebulizers for continuous administration. May mix with ipratropium nebulizer solution.
MDI B. (90 mcg/puff)	4-8 puffs every 20 minutes for 3 doses, then every 1-4 hours inhalation maneuver as needed. Use VHC; add mask in children <4 years.	4-8 puffs every 20 minutes up to 4 hours, then every 1-4 hours as needed.	In mild-to-moderate exacerbations, MDI plus VHC is as effective as nebulized therapy with appropriate administration technique and coaching by trained personnel.
Bitolterol			
Nebulizer solution C. (2 mg/mL)	See albuterol dose; thought to be half as potent as albuterol on mg basis.	See albuterol dose.	Has not been studied in severe asthma exacerbations. Do not mix with other drugs.
MDI D. (370 mcg/puff)	See albuterol MDI dose.	See albuterol MDI dose.	Has not been studied in severe asthma exacerbations.
Levalbuterol (R-albuterol)			
Nebulizer solution E. (0.63 mg/3 mL, 1.25 mg/0.5 mL 1.25 mg/3 mL)	0.075 mg/kg (minimum dose 1.25 mg) every 20 minutes for 3 doses, then 0.075-0.15 mg/kg up to 5 mg every 1-4 hours as needed.	1.25-2.5 mg every 20 minutes for 3 doses, then 1.25-5 mg every 1-4 hours as needed.	Levalbuterol administered in one-half the mg dose of albuterol provides comparable efficacy and safety. Has not been evaluated by continuous nebulization.
MDI F. (45 mcg/puff)	See albuterol MDI dose.	See albuterol MDI dose.	
Pirbuterol			
MDI G. (200 mcg/puff)	See albuterol MDI dose; thought to be half as potent as albuterol on a mg basis.	See albuterol MDI dose.	Has not been studied in severe asthma exacerbations.
Systemic (Injected) Beta₂-Agonists			
Epinephrine H. 1:1,000 (1 mg/mL)	0.01 mg/kg up to 0.3-0.5 mg every 20 minutes for 3 doses sq.	0.3-0.5 mg every 20 minutes for 3 doses sq.	No proven advantage of systemic therapy over aerosol.
Terbutaline I. (1 mg/mL)	0.01 mg/kg every 20 minutes for 3 doses then every 2-6 hours as needed sq.	0.25 mg every 20 minutes for 3 doses sq.	No proven advantage of systemic therapy over aerosol.

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

FIGURE 5-5. DOSAGES OF DRUGS FOR ASTHMA EXACERBATIONS (CONTINUED)

Medication	Dosages		Comments
	Child Dose*	Adult Dose	
Anticholinergics			
Ipratropium bromide			
Nebulizer solution J. (0.25 mg/mL)	0.25-5 mg every 20 minutes for 3 doses, then as needed	0.5 mg every 20 minutes for 3 doses then as needed	May mix in same nebulizer with albuterol. Should not be used as first-line therapy; should be added to SABA therapy for severe exacerbations. The addition of ipratropium has not been shown to provide further benefit once the patient is hospitalized. Should use with VHC and face mask for children <4 years. Studies have examined ipratropium bromide MDI for up to 3 hours.
MDI K. (18 mcg/puff)	4-8 puffs every 20 minutes as needed up to 3 hours	8 puffs every 20 minutes as needed up to 3 hours	
Ipratropium with albuterol			
Nebulizer solution (Each 3 mL vial contains 0.5 mg ipratropium bromide and 2.5 mg albuterol.)	1.5 mL every 20 minutes for 3 doses, then as needed	3 mL every 20 minutes for 3 doses, then as needed	May be used for up to 3 hours in the initial management of severe exacerbations. The addition of ipratropium to albuterol has not been shown to provide further benefit once the patient is hospitalized. Should use with VHC and face mask for children <4 years.
MDI (Each puff contains 18 mcg ipratropium bromide and 90 mcg of albuterol.)	4-8 puffs every 20 minutes as needed up to 3 hours	8 puffs every 20 minutes as needed up to 3 hours	
Systemic Corticosteroids			
	<i>(Applies to all three corticosteroids)</i>		
Prednisone	1 mg/kg in 2 divided doses (maximum = 60 mg/day) until PEF is 70% of predicted or personal best	40-80 mg/day in 1 or 2 divided doses until PEF reaches 70% of predicted or personal best	For outpatient "burst," use 40-60 mg in single or 2 divided doses for total of 5-10 days in adults (children: 1-2 mg/kg/day maximum 60 mg/day for 3-10 days).
Methylprednisolone			
Prednisolone			

*Children ≤ 12 years of age

Key: ED, emergency department; MDI, metered-dose inhaler; PEF, peak expiratory flow; VHC, valved holding chamber

Notes:

There is no known advantage for higher doses of corticosteroids in severe asthma exacerbations, nor is there any advantage for intravenous administration over oral therapy provided gastrointestinal transit time or absorption is not impaired.

The total course of systemic corticosteroids for an asthma exacerbation requiring an ED visit of hospitalization may last from 3 to 10 days. For corticosteroid courses of less than 1 week, there is no need to taper the dose. For slightly longer courses (e.g., up to 10 days), there probably is no need to taper, especially if patients are concurrently taking ICSs.

ICSs can be started at any point in the treatment of an asthma exacerbation.

EARLY SIGNS OF AN ASTHMA EPISODE

Early warning signs of an asthma episode are the physical changes that occur in the early stage of airway obstruction. These early warning signs usually happen before more serious symptoms occur. They alert students that it is time to measure their peak flow and take medication according to their asthma action plan. Each student's early warning signs should be documented in the student's asthma action plan available in the school health room or clinic. Teachers should be made aware of each student's early signs and symptoms and enable students with asthma to take the proper steps to prevent more serious asthma trouble.

Recognizing the early warning signs of an asthma episode can avoid a more serious medical emergency. **There should be no delay once a student has notified the teacher or other school staff of a possible problem.**

A student may exhibit one or more of these signs during the initial phase of an asthma episode.

Changes in Breathing

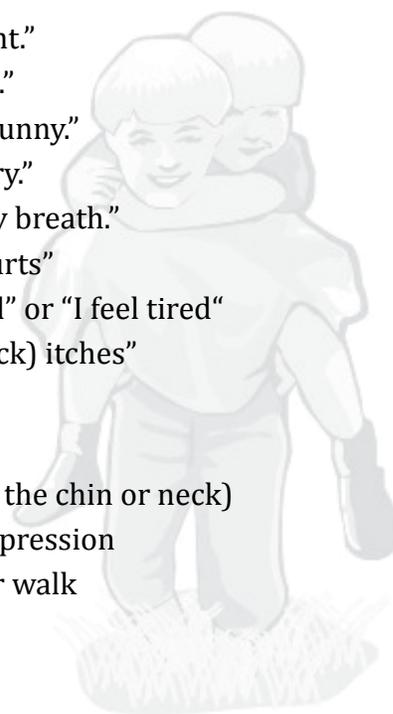
- coughing
- wheezing
- mouth breathing
- shortness of breath
- rapid breathing
- rapid pulse at rest

Verbal Complaints

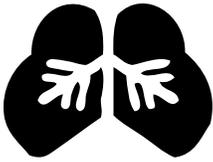
- "My chest is tight."
- "My chest hurts."
- "My neck feels funny."
- "My mouth is dry."
- "I can't catch my breath."
- "My stomach hurts"
- "I don't feel well" or "I feel tired"
- "My chin (or neck) itches"

Other Signs

- agitation
- unusually quiet
- hunching over
- "clipped" speech (may speak in short, choppy sentences)
- itchy skin (may rub at the chin or neck)
- anxious or worried expression
- refusing to eat, play or walk



Adapted from: Managing Asthma: A Guide for Schools, National Heart Lung and Blood Institute (NHLBI), National Institutes for Health, US Department of Health and Human Services and the Fund for the Improvement and Reform of Schools and Teaching, Office of Educational Research and Improvement (OERI), US Department of Education, September 1991. Revised July 2003. NIH Publication No. 91-2650. Reviewed by Asthma Ready® Communities Staff (2010).



STEPS TO FOLLOW FOR AN ASTHMA EPISODE **IN THE SCHOOL SETTING** **WHEN A NURSE IS NOT AVAILABLE**

Be prepared. Know which students have asthma and where their medicine is kept.

If a student has asthma symptoms or complaints and needs your assistance,* take these steps.

- **Quickly evaluate** the situation. **Call 911** if the student is **struggling to breathe, talk, stay awake, has blue lips, or asks for an ambulance.**
- **NEVER LEAVE A STUDENT ALONE.**
- **Stop the student's activity.**
- **Help the student locate and take his/her prescribed quick-relief inhaler medicine.**
- **Contact the parent/guardian.**
- **Repeat quick-relief inhaler medicine in 20 minutes** if student is still having trouble breathing.

Call 911 if any of the following occur:

- If the student is **struggling to breathe, talk, stay awake, has blue lips, or asks for an ambulance.**
- If the **student doesn't improve** after two administrations of quick-relief medicine, and nurse/designee or parent/guardian is not available.
- If no quick-relief medicine is available, **the student's symptoms have not improved** spontaneously, and nurse/designee or parent/guardian is not available.
- If you are unsure what to do.

Remember:

* Many students who carry their own medicine may be able to self-manage asthma episodes. They should follow the school protocol. Provide support as needed.

** Common asthma allergens and irritants include tobacco smoke, pollens, furry animals, cockroach droppings, dust mites, chalk dust, or strong odors (for example, from cleaning products, paints, or perfume).

SEPTEMBER 2008

From: National Heart Lung and Blood Institute, U.S. Department of Health & Human Services; National Institutes for Health at http://www.nhlbi.nih.gov/health/prof/lung/asthma/no-nurse_p.htm .

AVOIDING ASTHMA TRIGGERS IN THE SCHOOL ENVIRONMENT

Tobacco Smoke

Tobacco smoke can result in the onset of an asthma episode. This may result from both first-hand and second-hand smoke inhalation. Evidence has also found that young children in their first year of life are at increased risk for developing asthma. Furthermore, studies have shown a link between impaired lung development, increased incidences in ear infections, sinus infections, bronchitis and pneumonia and even reduced cognitive abilities in children chronically exposed to smoke and air pollutants. To reduce the chance of an asthma episode as the result of tobacco smoke, the following steps could be implemented in the school setting:



- Encourage smoking cessation programs for students and parents.
- Enforce a no-smoking policy on school grounds and at all school functions.
- Encourage parents to avoid smoking indoors, in cars, or around children.
- Encourage no bus idling or cars sitting with engines running where children are waiting to be transported and may be exposed to exhaust fumes.

Dust Mites

Dust mites are found in all locations, but are too small to be seen with the naked eye. They often live in mattresses, pillows, carpets, fabric-covered furniture, bed covers, stuffed toys, and clothes. Efforts to limit student exposure to dust mites (thereby minimizing the risk of asthma episodes as a result of dust mite presence) include:

- Avoiding curtains, throw rugs, and fabric-covered furniture in the school setting
- Following strict district policies regarding the maintenance of fabric-covered furnishings and rugs, as needed
- Avoiding the presence of stuffed toys in the school setting
- Avoiding pillows and loose cushions in the school setting



Pets

Skin flakes, dander, urine, and saliva from pets can trigger asthma episodes for some people. While animals are not terribly common in the school setting, they are occasionally employed as classroom pets and teaching aids, as well as for assistive use for disabled students and staff.

Efforts to reduce asthmatic episodes under such circumstances may be difficult. Some considerations include:



- Avoiding classroom pets when they are known to trigger allergic asthma response by students or staff
- Encourage schools to thoroughly clean vents and areas where pets were kept.
- Encourage schools to review the latest Environmental Protection Agency guidelines on animals in schools.

Pests

Cockroaches and rodents, as well as their waste products, can be asthma triggers for some people. Reduce exposure to these pests by implementing the following safeguards in your school setting:

- Do not leave food or garbage out.
- Store food in airtight containers.
- Clean all food crumbs or spilled liquids right away.
- Use pesticides according to your school district policy.
- Limit pesticide spray to infested area.
- Use same measures for school busses.



Molds

Damp conditions may produce an asthmatic episode for some people. Damp conditions also contribute to mold growth. To control mold in the school setting, excess water must be reduced. Reduction of mold growth at school involves the following:



- Fixing all leaky plumbing and other sources of water entry into the school
- Washing mold from surfaces with vinegar and water or water and soap, allow to dry completely
- Replacing carpeting and other surfaces that are unable to completely dry after being wet
- Keeping drip pans in air conditioning units, refrigerators, and dehumidifiers dry and clean; may add a tablespoon of vinegar
- Using exhaust fans or open windows in showering areas, as well as in the kitchen.

Weather Changes

Some children and staff may find that weather changes precipitate asthmatic symptoms. For some people, cold, dry air is the trigger. Others may find moist, hot air to be more troublesome. Other problematic situations may include sudden fluctuations in weather conditions, wind, or change in seasons. To help prevent such attacks:

- Encourage children to cover their nose and mouth with a scarf on cold or windy days. Play indoors during inclement weather.
- Use air conditioners when at all possible during humid, windy, or high air-allergy conditions.
- Be aware of forecasted weather conditions. Encourage susceptible children to avoid too much activity during extreme weather.
- Start medication/inhaled corticosteroid inhaler prior to season for prevention.



Allergies

Some people are allergic to specific things such as pollen, trees, fresh cut grass and foods. To prevent an asthma attack:



- Stay indoors and keep windows closed if possible during times when pollen levels are high.
- Highly allergic foods should be avoided in school menus. Action plans should be in place for those students known to have food allergies. High allergy foods include shell fish, tree nuts, and peanut products.
- Students known to have latex or insect sting allergies should have action plans in place, with appropriate environmental actions enforced.

Strong Odors and Sprays

The presence of strong smells can be a trigger for an asthma attack. Special attention should be given to students known to have such odors as a trigger for asthmatic symptoms. Steps to take in the school setting include:

- Encourage school faculty and staff to avoid wearing strong perfumes/cologne/lotions, talcum powder, and hair sprays. Avoid the use of strong smelling cleaning agents within the school setting.



Exercise

Asthma can be triggered by exercise or vigorous activity. To avoid this:

- Have students warm up for 6-10 minutes before exercising.
- Limit outdoor activity when air pollen/pollution levels are forecasted as high.
- Encourage students to be proactive in addressing their asthma symptoms. Allow exercise pre-medication as prescribed by a health care provider, and emergency-relief medications as needed for symptoms of asthma.
- Have action plans in place for students with known exercise-induced asthma.



Stress/Excitement

Some students may be susceptible to the onset of an asthma attack as the result of strong emotions. Emotions such as crying, laughing too hard, frustration, or anger may trigger asthma symptoms. To deal with such symptoms:

- Encourage the student to calm down quickly, and remove source of emotion, if possible from the situation.
- Encourage slow, steady breathing.
- Have quick-relief medicines readily available, and action plans in place for children susceptible to such circumstances.



Respiratory Infections

Many students experience respiratory symptoms as the result of infection with colds, flu, or bronchitis. These may also trigger an asthmatic episode. Encourage such students to:

- Have annual flu shot
- Avoid close contact with other people who have respiratory infection
- Wash hands with soap and water regularly, especially during the cold and flu season
- Follow-up with a health care provider at the first signs of a respiratory infection.



GUIDELINES FOR TEACHING INHALATION TECHNIQUE TO CHILDREN

In-Check Dial™

- Set the resistance for the appropriate device
- Install the one-way filter (arrow pointing toward the patient) [Clement-Clarke is blue]
- Set up the simulation; “Imagine that you are at home getting ready to breathe your medication into your lungs. Show me exactly what you do when you breathe your [medicine name] into your lungs.
- Hand the In-Check Dial™ to the student saying “Seal your lips around the end of the mouthpiece. Lift your chin to open your airway, aiming the In Check Dial up towards the top of the facing wall. Suck air through it in the same way you would breathe in to suck medicine out of your [name of medicine device]. (**Reminder** – You might need to say. “This is NOT your peak flow meter. Don’t blow into this tube. Think of this like a big straw. You are going to suck air through this tube in the same way that you would breathe your medicine into your lungs at home.)
- Watch for the following patient behaviors:
 - 1) exhales fully to empty the lungs (increases the volume of air that can be inhaled, this increases the amount of drug deposited into peripheral airways)
 - 2) inhales at a steady inspiratory flow rate (IFR) at or near the recommended rate of 30 LPM for MDIs and 60 LPM for DPIs (EPR3); the **red** marker marks only the peak inspiratory flow rate, so observe the **white** marker for variability in IFR; the white disks marks instantaneous IFR and allows an estimation of the inspiratory time (IFT)
 - 3) holds breath for 5-10 seconds (time is limited by patient comfort and capacity)
- Coach the patient to improve their effort for each step above (1-3)
- **Provide a “target time” to guide the person’s effort at breathing in at the correct speed. Target time for MDIs is 2 times the FEV1. Target time for DPIs in seconds equals FEV1 in liters. (If FEV1=2 L and the person is using an MDI, say “it should take you 4 seconds to fill your lungs with your medication”).**
- Repeat until the IFR and IFT are optimal and reproducible
- Document initial effort (eg. 120 LPM for one second) and final attained flow and time (30-35 LPM for 4 seconds), document that this effort was or was not reproducible
- Recheck at each opportunity (work toward the EPR3 recommendation of 30 LPM for MDIs (p. 250) and 60 LPM for DPIs (p. 249).

MDI [metered dose inhaler]

- Use a spacer (good idea for bronchodilators, essential for inhaled corticosteroids)
- Insert MDI into the VHC and shake the medication gently several times if indicated [see package instructions]
- Common error is excessive IFR with very brief inspiratory time (results in oropharyngeal deposition with minimal lung deposition)

Valved holding chamber [VHC]

- Might require coating in diluted dish detergent once a month to block static build-up
- Might have a flow signal that sounds off if IFR exceeds 60 LPM – twice the recommended IFR (**Reminder** – ask the patient “If you hear a whistle, what does that mean?” Answer is “slow down. Keep breathing, but slow down.”) Remind the person of their target time and encourage to watch a clock with a second hand or count “One 1000, two 1000...”

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- An In-Check Dial™ looks a little like a spacer, so this is a natural simulation for most patients. Say “Imagine that you are at home getting ready to take your [medicine name]. You hook up your MDI to your spacer. Now show me how you breathe your medication into your lungs.”
- Promotes slower, deeper inhalation with improved drug delivery to small airways
- When more than one type of inhaler is used, start with quick relief medicines.

VHC with Mask

- Infants are going to be passive participants. The goal is to have the parent observe the exhalation valve (nose valve), if this is a device feature, to be sure that the infant takes six breaths after each actuation of the MDI. Otherwise the rise and fall of the chest/abdomen will be the indicator for breaths. Toddlers are more likely to tolerate the mask if the parent counts out loud for the required 6 breaths (One, Two, Three, Four, Five, Six – clap and applaud NOW). This works! Really!
- Preschool children will usually respond to the following instructions after the mask is in place. “OK. Blow out ALL your air, like you blow out the candles on a cake [or similar instructions].” Next, actuate the MDI and say, “Breathe in, breathe in, breathe in... Now hold it, hold it, hold it. Good work!” If the effort is not great just keep the mask in place and repeat this sequence one or more times to clear the drug from the chamber. By three or four years of age most young children can learn to intentionally empty their lungs, take a slow breath to fill their lungs with medication and then hold their breath a few seconds.
- Recommend “rinse and spit, then brush your teeth” after inhaled corticosteroids (ICS). For infants, toddlers and others unable to perform good oral care, wipe face with moist cloth and provide food or beverage after ICS doses to remove drug from face and throat.

DPI [Dry Powder Inhaler]

- Common errors – either insufficient IFR (leading to settling of the drug in the mouth and upper airway) or excessive IFR with short IFT leading to over-acceleration of drug, keeping it from making the many turns required to arrive in the lower airways)
- DPIs need a stronger, faster inhalation and are not used with spacers. It takes greater effort to breathe in a DPI than an MDI, especially when someone is having trouble with asthma. Most asthma medicines are available in both DPI and MDI.
- Coach for 60 LPM using a target inspiratory time equal to their FEV1 (or 2-3 seconds), **use correct resistance setting on the In-Check Dial.** (For Twisthaler™ and Flexhaler™ resistance is very close to the Turbuhaler™ setting.)
- Some patients don’t like the feel of the lactose that ends up on the back of their throat. Recommend that they take a sip of water first to moisten the throat.
- Recommend “rinse and spit, then brush your teeth” after inhaled corticosteroids (ICS). If unable, eating or drinking will help remove drug from throat.

Nebulizer with Mask for Infants, Toddlers and Preschoolers

- Without a mask most of the intended dose will be lost; blow-by technique not effective for infants and young children; USE A MASK!!! (EPR3, p. 251)
- **Reminder** – Ask the parent – “Will your child leave the mask in place for the treatments?” Also ask – “Is the time and effort required for these treatments doable for your household?” “Can you afford this medication?” If not consider MDI by VHC with mask. This approach cuts drug administration time from 10 minutes several times a day to one minute and eliminates the need for a machine. This might make the family more portable and adherent to the ICS dosing plan.

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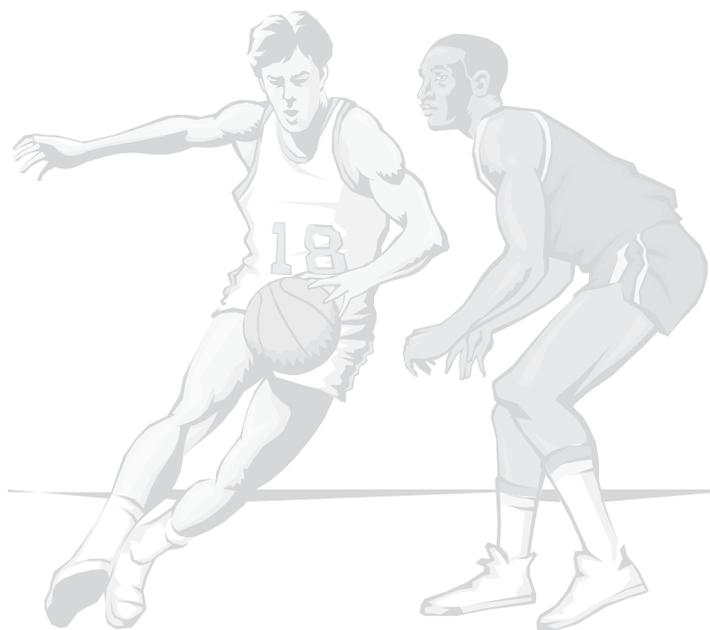
Section H
MEDICATIONS FOR
ASTHMA

MEDICATIONS FOR ASTHMA

Asthma management is usually accomplished by a combination of long-term control medication (taken every day for maintenance) and quick relief medications (fast-acting bronchodilators) to reduce the troublesome symptoms of acute exacerbations. It is important to establish effective use of maintenance medications. Quick relief medications do not change airway pathology and or improve the long-term course of asthma. **Excessive use of quick relief medications is associated with life-threatening asthma attacks.**

This section includes general information on drug classes used in the treatment of asthma, as well as information specific to the individual medications commonly used within each class.

Historically, asthma has been treated as a condition involving waxing and waning of symptoms, rather than a chronic illness. However, current clinical thinking recognizes underlying inflammatory mediators as causative mechanisms in the pathogenesis of asthma. Asthma is a serious chronic condition, but it can be managed with appropriate pharmacological intervention and avoidance of triggers.



PHARMACOLOGY OVERVIEW

The greatest advances in the pharmacological control of asthma have come over the last decade with the development of increasingly safe and effective anti-inflammatory agents in the inhaled corticosteroid family of medications. Daily use of inhaled corticosteroids changes the underlying pathology of asthma by reducing airway sensitivity and restoring the normal function of the epithelial lining. No other class of medications currently offers a similar degree of protection from serious asthma exacerbations with such a wide margin of safety and affordability. **Inhaled corticosteroids are the preferred treatment for all levels of persistent asthma.** There are numerous barriers to the use of this most important class of medications. Minority students are less likely to use anti-inflammatory medications and might require special support and encouragement. School health staff can play a crucial role in educating families about the safety and effectiveness of these medications.

Quick relief medications are readily appreciated for their immediate effect on asthma symptoms. However, it must be emphasized that quick relievers, such as albuterol, do not change the course of asthma. Inhaled corticosteroids are only valued when families understand that the long-term outcome of persistent asthma can only be altered by treating underlying airway inflammation. Fears about side effects are largely unfounded. Families need to know that uncontrolled asthma poses far greater risks to a child's health and growth than do inhaled corticosteroids. The following information will help to establish realistic and balanced understanding of the benefits and modest risks of asthma medications.

It is also important to acknowledge that medications alone cannot control asthma. The National Heart, Lung, and Blood Institute advocates a four component approach. Each component must be addressed if the best possible outcomes are to be achieved. School personnel have an important role in each component: 1) measures of assessment and monitoring, 2) education for a partnership in asthma care, 3) control of environmental factors & comorbid conditions that affect asthma, and 4) medications.

*To reference the four components approach:
<http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm>*

*For more detailed medication info see AAAAI Allergy and Asthma Drug Guide below:
http://www.aaaai.org/patients/resources/medication_guide.asp*

TYPES OF INHALATION DEVICES FOR ASTHMA MEDICATIONS

Device/Medications	Age	Comments
Metered-Dose Inhaler (MDI) <ul style="list-style-type: none"> ■ Beta2-agonists (SABA) ■ Inhaled corticosteroids ■ Cromolyn Sodium ■ Nedocromil Sodium ■ Anticholinergics ■ Combination medications 	6 months to adult	Use with a spacer/holding chamber with or without mask is recommended to help deliver the medicine to the airways of the lungs instead of the mouth. Older propellant – CFC. CFC inhalers are being phased out by the Food and Drug Administration and many are no longer available. HFA – smaller droplets so less visible and forceful, more effective.
Breath-Actuated MDI <ul style="list-style-type: none"> ■ Beta2-agonists (SABA) 	>5 years	The child may not be able to generate the necessary inspiratory flow. Device does not require the use of spacer/holding chamber.
Dry-Powder Inhaler (DPI) <ul style="list-style-type: none"> ■ Beta2-agonists (LABA) ■ Inhaled corticosteroids ■ Anticholinergics 	>5 years	More rapid inspiration is needed to carry the heavy powder deep into the lungs. DPIs are not used with spacers. It takes greater effort to breathe in a dry powder than using an MDI, especially when a person is sick and having trouble with their asthma.
Nebulizer <ul style="list-style-type: none"> ■ Beta2-agonists (SABA) ■ Anticholinergics ■ Cromolyn Sodium ■ Budesonide 	Children of any age who cannot use an MDI with spacer/holding chamber with or without face mask.	Useful in infants and very young children, and any child with a moderate to severe asthma episode. Blow-by treatment is never acceptable – the medicine will be lost in the surrounding air and never reach the child’s airways. A face mask should be used if the child is unable or unlikely to breathe only through the mouth during the treatment. A mouthpiece can be used for all other people (usually >5 years).

SABA = short acting beta agonist

LABA = long acting beta agonist

INHALED CORTICOSTEROIDS (ICS)

ICS are the preferred treatment for all levels of persistent asthma. ICS work by binding to receptor sites on target cells in the epithelium. ICS decrease the amount of inflammation and mucus in the airway. ICS are very unlikely to cause the systemic side effects that are associated with frequent use of oral corticosteroids, such as weight gain, risk of infection, and stunting. ICS are very different from the illegal anabolic steroids taken by some athletes. This is a highly effective class of medications that are capable of changing the underlying airway pathology of asthma leading to dramatically reduced morbidity and greatly improved quality of life. Relieving inflammation and swelling helps prevent the chain reaction that causes asthma symptoms. **These Drugs should not be stopped without consulting a health care provider.**

Generic Name	Brand Name	Dosage Form	Shaking and Priming Instructions	Cleaning Instructions	Sprays/ Inhalations per inhaler
Beclomethasone HFA	QVAR®	MDI: 40 or 80 mcg/ spray	Do not shake. Spray 2 times before first use or after 10 days of non-use.	Once a week wipe mouthpiece with dry cloth, do not use water.	100 sprays
Budesonide DPI	Pulmicort Flexhaler®	DPI: 90 or 180 mcg/ spray	Do not shake. Twist and click 2 times before first use.	Once a week, wipe mouthpiece with dry cloth. Do not use water.	60 or 120 inhalations
Budesonide HFN	Pulmicort Respules®	0.25 mg; 0.50 mg; or 1.0 mg in 2ml			
Ciclesonide HFA	Alvesco®	MDI: 80 or 160 mcg/spray	Do not shake. Spray 3 times before first use or after 10 days of non-use.	Once a week, wipe mouthpiece with dry cloth; do not use water.	60 sprays
Flunisolide CFC	AeroBid® and AeroBid-M®	MDI: 250 mcg/ spray	Shake before each use.	Every few days, remove canister and rinse plastic actuator with warm water, dry thoroughly.	100 sprays
Fluticasone HFA	Flovent®	MDI: 44, 110, or 220 mcg/spray	Shake 5 seconds and spray 4 times before first use-shake and spray once after dropping or after 7 days non-use.	Once a week, clean exit port with damp cotton swab; wipe mouthpiece with damp tissue, air dry overnight.	120 sprays
Fluticasone DPI	Flovent®	DPI: 50, 100, or 250 mcg/inhalation	Do not shake or prime.	Do not wash or take apart, keep dry.	60 inhalations
Mometasone	Asmanex®	110 or 220 mcg/ inhalation	Do not shake or prime.	After each use, wipe mouthpiece with dry cloth.	30, 60, or 90 inhalations
Triamcinolone	Azmacort®	75 mcg/spray	Shake and spray 2 times before first use or after 3 days of non-use.	Once a day, remove canister and rinse plastic actuator with warm water. Dry thoroughly.	240 sprays

ICS dosages are different between the various brands. To determine low, medium, or high daily dose for each medicine, refer to chart “Estimated Comparative Daily Dosages for Inhaled Corticosteroids”.

Side effects for all inhaled corticosteroids include oral candidiasis (thrush), cough, and dysphonia. Rinse mouth after each use. Be sure to wash the face if a mask is used to deliver this medicine. Use of a spacer is recommended for MDI forms of ICS.

Estimated Comparative Daily Dosages for Inhaled Corticosteroids

Drug	Low daily dose			Medium daily dose			High daily dose		
	Child 0-4 years of age	Child 5-11 years of age	≥12 years of age and adult	Child 0-4 years of age	Child 5-11 years of age	≥12 years of age and adult	Child 0-4 years of age	Child 5-11 years of age	≥12 years of age and adult
Beclomethasone HFA 40 or 80 mcg/puff	NA	80-160 mcg	80-240 mcg	NA	>160-320 mcg	>240-480 mcg	NA	>320 mcg	>480 mcg
Budesonide DPI 90, 180, or 200 mcg/ inhalation	NA	180-400 mcg	180-600 mcg	NA	>400-800 mcg	>600-1200 mcg	NA	>800 mcg	>1200 mcg
Budesonide inhaled inhalation suspension for nebulizer	0.25-0.5 mg	0.5 mg	NA	>0.5-1.0 mg	1.0 mg	NA	>1.0 mg	2.0 mg	NA
Flunisolide 250 mcg/puff	NA	500-750 mcg	500-1000 mcg	NA	1000-1250 mcg	>1000-2000 mcg	NA	>1250 mcg	>2000 mcg
Flunisolide HFA 80 mcg/puff	NA	160 mcg	320 mcg	NA	320 mcg	>320-640 mcg	NA	≥640 mcg	>640 mcg
Fluticasone HFA/MDI: 44, 110, or 220 mcg/puff DPI: 50, 100, or 250 mcg/inhalation	176 mcg NA	88-176 mcg 100-200 mcg	88-264 mcg 100-300 mcg	>176-352 mcg NA	>176-352 mcg >200-400 mcg	>264-440 mcg >300-500 mcg	>352 mcg NA	>352 mcg >400 mcg	>440 mcg >500 mcg
Mometasone DPI 200 mcg/inhalation	NA	NA	200 mg	NA	NA	400 mg	NA	NA	>400 mcg
Triamcinolone acetonide 75 mcg/puff	NA	300-600 mcg	300-750 mcg	NA	>600-900 mcg	>750-1500 mcg	NA	>900 mcg	>1500 mcg

DPI, Dry power inhaler; HFA, hydroflouroalkane; NA, not available (not approved, no date available, or safety and efficacy not established for this age group).

Reference: Used with permission. Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma. Bethesda, MD: US Department of Health and Human Services; National Institutes of Health; National Heart, Lung and Blood Institute; National Asthma Education and Prevention Program; 2007

SHORT-ACTING INHALED BETA2 AGONISTS

Generic Name	Brand Name	Dosage Forms; Dosing & Administration	Shaking and Priming Instructions	Cleaning Instructions	Sprays/ Inhalations per each unit	Potential side effects and nursing considerations
Albuterol Sulfate HFA	ProAir® HFA Proventil® HFA Ventolin® HFA	MDI: 90 mcg/ spray 1-2 inhalations every 4-6 hours or 15-30 minutes before exercise.	Shake all. ProAir® spray 3 times and Proventil® & Ventolin® spray 4 times before first use or after 2 weeks of non-use. For Ventolin®, must also be primed [4 sprays] after dropping.	Once a week remove canister and rinse plastic actuator with warm water; air dry.	ProAir® and Proventil® 200 sprays Ventolin® HFA is available in 204 sprays and 60 sprays	Use at first signs of asthma symptoms or prior to exercise. Ventolin® HFA has a dose counter on all units.
Albuterol sulfate inhalation solution	Unit dose vials of albuterol 0.083% comes as generic. Albuterol sulfate 0.5% Accuneb	One unit dose vial, every 4 to 6 hours Dose will vary. every 4 to 6 hours 0.63 mg and 1.25 mg in 3 mL unit-dose vials; every 4 to 6 hours				Vials do not require dilution. For use in a compressor or nebulizer. These are concentrated albuterol. They need to be diluted in saline before use.
Levalbuterol HCL	Xopenex® HFA Xopenex inhalation solution	MDI: 45 mcg/ spray 1-2 inhalations every 4 to 6 hrs Xopenex: 0.31 mg; 0.63 mg; 1.25 mg in 3 mL unit-dose vials; one vial every 6 to 8 hours.	MDI: Shake and spray 4 times before first use or after 3 days non-use.	Once a week remove canister and rinse plastic actuator with warm water; air dry.	80 or 200 sprays Solution: Store in the foil pouch. Once the foil pouch is opened use the vials within two weeks.	Xopenex inhalation solution also available concentrate of 1.25mg in 0.5ml (need to dilute).

For children frequently using SABAs, anti-inflammatory medication should be initiated or intensified.

Side effects of short acting beta agonists include tremor, tachycardia, headache, restlessness, apprehension, anxiety, nausea, sweating, and flushing. If a maximum dose is exceeded, sympathomimetic cardiac effects can occur. Chronic daily use may lead to worsening asthma and decreased pulmonary function. The need for more than two refills a year indicates poor asthma control and need for increased long-term medications.

ANTICHOLINERGIC MEDICATIONS

Anticholinergic medications cause bronchodilation by blocking vagally mediated reflexes and antagonizing the action of acetylcholine. These medications are used in combination with short acting bronchodilators to open large airways and reduce mucus.

Generic Name	Brand Name	Dosage Forms; Dosing & Administration	Shaking and Priming Instructions	Cleaning Instructions	Capsules/ Sprays/ Inhalations per each unit	Potential side effects and nursing considerations
Ipratropium bromide	Atrovent® HFA	MDI: 17 mcg/ spray 2 inhalations 4 times a day	Do not shake. Spray 2 times before first use or after 3 days non-use.	Once a week remove canister and rinse plastic actuator with warm water; air dry.	200 sprays	
Ipratropium bromide	Atrovent®	Nebulizer: 0.20 mg/ml (0.02% in 2.5 ml) Dose: ½ vial <12 years; 1 vial >12 years Q4 hr prn				
Tiotropium Bromide	Spiriva® HandiHaler	DPI: 18 mcg/ capsule 1 inhalation Once a day	Do not shake or prime.	Clean mouth-piece with moist tissue; once a month open device fully and rinse with warm water; air dry for 24 hours	30 or 90 capsules	This medication is <u>NOT</u> approved for the treatment of asthma.

Therapeutic Issues related to Ipratropium bromide:

- May block reflex bronchoconstriction secondary to irritants or to reflux esophagitis.
- Side effects include dry mouth, headache, dizziness, blurred vision, rash, and GI upset.
- May be an alternative for patients who do not tolerate SABA (short acting beta agonist).
- Treatment of choice for bronchospasm due to beta blocker medication.

LEUKOTRIENE MODIFIERS

These oral medications alter the effects of leukotriene, an airway inflammatory mediator. In the treatment of asthma, these medications are not as effective as inhaled corticosteroids. As an addition to a regimen of inhaled corticosteroids, leukotriene modifiers are less effective than adding a long-acting beta agonist. Montelukast is approved for the treatment of asthma and allergy, so these medications are sometimes a helpful addition to the medication regimen.

Generic Name	Brand Name	Dosage Forms	Dosing & Administration	Potential side effects and nursing considerations
Montelukast	Singulair®	4 mg granules (12-23 months) Tablet: 4 mg chewable (2-5 years old) 5 mg chewable (6-14 years old) 10 mg tablet (15 years & older)	1 packet sprinkled on soft food. 1 tablet in the evening. AM dosing optional to aid exercised induced asthma.	Dizziness, headache, rash, nausea, and vomiting (all are rare) Psychiatric disorders: agitation, anxiousness, depression, insomnia, irritability, restlessness, suicidal thinking and behavior
Zafirlukast	Accolate®	Tablet: 10 mg, 20 mg	Age 5-11: one 10 mg tablet twice daily Age 12 and older: one 20 mg tablet twice daily	Take one hour before meals or two hours after meals (administration with meals decreases bioavailability) Can inhibit the metabolism of warfarin. INRs should be monitored during coadministration. Can raise liver enzymes, measure these before first use and periodically during use.
Zileuton	Zyflo® CR tablets	Tablet: 600 mg	Age 12 and older; Two 600 mg tablets twice daily within 1 hour of meals.	Attention to drug interactions (especially warfarin and theophylline). Can raise liver enzymes, measure these before first use and periodically during use.

**DO NOT USE LEUKOTRIENE MODIFIER + LONG ACTING BETA AGONIST AS A SUBSTITUTE FOR
INHALED CORTICOSTEROID + LONG ACTING BETA AGONIST.**

LONG-ACTING BETA-2 AGONISTS

Long-acting beta agonists (LABA) bind to beta 2 receptors in the lungs. LABA blocks bronchoconstriction by interfering with endogenous adrenergic pathways in the airways.

Generic Name	Brand Name	Dosage Forms	Shaking and Priming Instructions	Cleaning Instructions	Capsules/ Inhalations per each unit	Potential side effects and nursing considerations
Salmeterol Delayed onset (30 minutes) sustained effect for 10-12 hours	Serevent®	DPI: 50 mcg/ blister	Do not shake or prime.	Do not wash or take apart; keep dry.	60 inhalations	Tachycardia, tremor, palpitations. Should not be used in place of anti-inflammatory therapy. Do not use to treat sudden episodes of asthma symptoms.
Formeterol Immediate onset, sustained effect for 10-12 hours	Foradil®	DPI: 12 mcg capsules for inhalation	Do not shake or prime.	Do not wash or take apart; keep dry.	60 capsules	Tachycardia, tremor, palpitations. Should not be used in place of anti-inflammatory therapy. Do not use to treat sudden episodes of asthma symptoms.

The U.S. Food and Drug Administration announced February 2010 that drugs in the class of long-acting beta agonists (LABAs) should never be used alone in the treatment of asthma in children or adults. These new requirements are based on FDA analyses of clinical trials showing that use of these long-acting medicines is associated with an increased risk of severe worsening of asthma symptoms, leading to hospitalization in both children and adults and death in some patients with asthma.

Product labels are required to reflect the following: 1) The use of LABAs is contraindicated without the use of an asthma controller medication such as inhaled corticosteroid. Single-agent LABAs should only be used in combination with an asthma controller medication; they should not be used alone; 2) LABAs should only be used long-term in patients whose asthma cannot be adequately controlled on asthma controller medications; 3) LABAs should be used for the shortest duration of time required to achieve control of asthma symptoms and discontinued, if possible, once asthma control is achieved. Patients should then be maintained on an asthma controller medication. 4) Pediatric and adolescent patients who require a LABA in addition to an inhaled corticosteroid should use a combination product containing both an inhaled corticosteroid and a LABA to ensure compliance with both medications.

(<http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm200931.htm>)

Long-Acting Beta Agonist (LABA) Information

<http://www.fda.gov/Drugs/DrugSafety/InformationbyDrugClass/ucm199565.htm>

COMBINATION MEDICATIONS

These medications combine a long-acting beta2-agonist with an inhaled corticosteroid.

Generic Name	Brand Name	Dosage Forms	Shaking and Priming Instructions	Cleaning Instructions	Sprays/ Inhalations per each unit	Potential side effects and nursing considerations
Fluticasone Propionate with Salmeterol	Advair® HFA	MDI: (mcg fluticasone/ mcg salmeterol) 45/21; 115/21; 230/21	Shake (5 seconds) and spray 4 times before first use; spray 2 times after dropping or after 4 weeks non-use.	Once a week, clean exit port with dry cotton swab, wipe mouthpiece with damp tissue, air dry.	120 sprays	Same as listed for long-acting beta agonists-see pages on these medications.
Fluticasone Propionate with Salmeterol	Advair® Diskus	DPI: (mcg fluticasone/ mcg salmeterol)	Do not shake or prime.	Do not wash or take apart; keep dry.	60 inhalations	Same as listed for long-acting beta agonists-see pages on these medications.
Budesonide with Formoterol	Symbicort® HFA	MDI: (mcg budesonide/ mcg formoterol) 80/4.5; 160/4.5	Shake (5 seconds) and spray 2 times before first use, after dropping and after 7 days non-use.	Once a week, wipe mouthpiece with dry cloth; do not use water.	120 sprays	Same as listed for long-acting beta agonists-see pages on these medications.
Mometasone Furoate with Formoterol	Dulera® HFA (new 2010)	MDI: (mcg mometasone/ mcg formoterol) 100/5; 200/5	Shake (5 seconds) and spray 4 times before first use, and spray 4 times after 5 days non-use.	Once a week, wipe mouthpiece with dry cloth; do not use water.	120 sprays	Same as listed for long-acting beta agonists-see pages on these medications.

**CAUTION: Persons on medicines containing long acting beta agonists must use EXACTLY as prescribed.
DO NOT try to increase the dose or frequency of these medications.**

IMMUNOMODULATORS

Immunomodulators are indicated for long term control and prevention of symptoms in children 12 years old and older who have moderate or severe persistent allergic asthma inadequately controlled with inhaled corticosteroids. Omalizumab binds to circulating IgE, preventing it from binding to the high affinity receptors on basophils and mast cells. Omalizumab decreases mast cell mediator release from allergen exposure.

Generic Name	Brand Name	Dosage Forms	Dosing & Administration	Potential side effects and nursing considerations
Omalizumab (Anti- IgE)	Xolair®	150 mg	<p>Dosing and frequency of administration are dependent upon the serum total IgE level and body weight.</p> <p>Measure total IgE level prior to beginning treatment.</p> <p>SubQ: 0.016 mg/kg/ international unit of IgE every 2-4 weeks.</p>	<p>Monitor patients following injection. Be prepared and equipped to identify and treat anaphylaxis that may occur.</p> <p>A maximum of 150 mg can be administered in one injection.</p>

ORAL CORTICOSTEROIDS

Oral corticosteroids are important during severe asthma exacerbations when inhaled medications are no longer relieving serious breathing problems. Most asthma attacks requiring oral steroids can be managed at home if treatment is started early enough. When asthma awakens a child at night and does not respond to quick relievers the need for oral steroids are likely. In the presence of airway symptoms, a peak flow rate of 50-60% of personal best that does not improve 30 minutes after quick relief medicine points to the need for an oral steroid burst. Most asthma exacerbations respond dramatically by the 3rd day of steroids and by the 5th day are resolved. The need for oral steroids longer than 7 days raises the strong possibility other factors are contributing to the exacerbation. A physical examination and thorough history should be completed by the health care provider.

Generic Name	Brand Name	Dosage Forms	Dosing & Administration
Methyl-prednisolone	Medrol	Tablet: 2, 4, 6, 8, 16, 32 mg	0.25 – 2 mg/kg daily in single dose in the morning or every other day as needed for control (max 60 mg/day) Short course (3-10 days) 1 – 2 mg/kg/day in divided doses 1-2 times/day (max 60 mg/day)
Prednisolone	Several generic forms. Orapred ODT® Pediapred	15 mg/5 ml solution 5 mg tablet Orapred Orally disintegrating tablet: 10, 15, 30 mg Pediapred: 5 mg/5 ml	1-2 mg/kg/day in divided doses 1-2 times/day
Prednisone	Several generic forms Prednisone Intensol	Tablet: 1, 2.5, 5, 10, 20, 50 mg Solution: 1 mg per ml Solution: 5 mg per ml	0.25 – 2 mg/kg daily in single dose in the morning or every other day as needed for control (max 60 mg/day) Short course (3-10 days) 1-2 mg/kg/day in divided doses 1-2 times/day (max 60 mg/day)
Cortisone Acetate	Generic	Tablet: 25 mg	2.5 – 10 mg/kg/day in divided doses every 8 hours
Dexamethasone	Generic Dexamethasone Intensol	Solution: 0.5 mg/ml Tablet: 0.5, 0.75, 1, 1.5, 2, 4, 6 mg Intensol: concentrate 1 mg/ml	0.5 – 2 mg/kg daily in divided doses every 6 hours
Hydrocortisone	Generic Cortef	Tablet: 5, 10, 20 mg	2.5 – 10 mg/kg/day divided every 6-8 hours

DID YOU KNOW?? Taking oral steroids for 5 days is equivalent to YEARS of daily inhaled corticosteroid [ICS] medications.

Side effects for all oral steroids include adrenal suppression, headache, increased appetite, weight gain, immunosuppression, and impaired wound healing. Other potential serious side effects include adrenal suppression, osteoporosis, and growth delay. Children’s growth should be monitored. These drugs should not be stopped without consulting a health care provider.

THEOPHYLLINE

In Asthma:

- An alternative treatment for mild persistent asthma, or in addition to ICS for moderate persistent asthma
- As adjunct to beta 2 agonist and anti-inflammatory therapy in persistent asthma
- It is not recommended for emergency department treatment of acute exacerbation
- IV administration along with other therapy is sometimes implemented for hospitalized patients
- Serum levels are monitored (maintain level between 5-10 ug/ml)

Pharmacology:

- Maximal therapeutic range is steady state serum concentration of 10-20 ug/ml
- A more conservative range of 5-10 ug/ml is generally recommended.
- Periodic serum monitoring is required.
- Metabolized by the liver.
- Dosage is calculated on ideal body weight.
- Side effects: GI and central nervous system side effects, as well as tachycardia.

Serum Monitoring When:

- Patient first begins theophylline therapy, and at regular intervals of 6-12 months. Patient experiences adverse effects.
- Patient fails to respond optimally when a dose is increased.
- Conditions exist that are known to alter theophylline metabolism.

Drugs & Conditions Altering Theophylline Metabolism:

MANY drug interactions:

Decreased Metabolism (elevated level)

- Liver disease
- Congestive heart failure
- Cimetidine
- Quinoline
- Febrile Illness
- Some antibiotics
- Older Age

Increased Metabolism (decreased level):

- Cigarette smoking
- Young age
- Phenytoin

Exacerbates GERD (gastroesophageal reflux disease is a common contributing factor in moderate and severe asthma)

Toxicity:

- Generally not associated with doses under 15 ug/ml
- Increases progressively with levels above 20 ug/ml
- Nausea and vomiting may be evident
- Symptoms of over-stimulation and/or seizures may occur
- Tachycardia and/or arrhythmias may occur.

STANDING ORDERS FOR MANAGING RESPIRATORY DISTRESS

1. Evaluate and assess respiratory status for defining characteristics: nasal flaring, respiratory rate, retractions, auscultation for wheezes, crackles, or stridor, and color.
 - Use student's peak flow meter if appropriate

2. Children with prior history of asthma or reactive airway disease:
 - Follow the asthma action plan if available (medication is administered by a school nurse or trained or authorized trained person, or student if able and authorized to self-administer medication).
 - Students without an asthma action plan should be given a single albuterol aerosol treatment according to the dosage chart below while the parent/guardian is being contacted (Recommend that the parent/guardian call primary care provider to inform them the child is being sent to the hospital due to a respiratory emergency. The provider cannot direct medical care without parent consent).
 - The written asthma action plan covers the necessary steps to follow. When you reach the parent, you can provide the number for them to contact their health care provider from the chart. The parent can call you back or have the physician call back if the child will remain in school with instructions.
 - Students who respond favorably to the treatment should be observed until the primary care physician or parent/guardian can be reached, or for at least one (1) hour after treatment
 - Call 911 if NO RESPONSE TO ASTHMA QUICK RELIEF MEDICATION.
 - Note where student is transported and by which EMS vehicle.
 - CONTACT PARENT OR RESPONSIBLE PERSON.

3. Children in respiratory distress without prior history of asthma:
 - Call 911.
 - Begin assembling medication to alleviate respiratory distress.
 - Administer medication according to protocols and observe response.
 - Have someone else contact the parent/guardian while waiting for ambulance.
 - DO NOT CALL child's physician or PARENTS FIRST FOR A CHILD IN RESPIRATORY DISTRESS! If the child's physician has not diagnosed asthma before, now is not the time to try and get a medical opinion over the phone as to the possible causes for the acute breathing difficulty.
 - Note where student is transported and by which EMS vehicle.

Dosing of albuterol nebulizer solution 0.5% (5mg/ml), trade name Ventolin or Proventil, to be given in saline over ten (10 minutes by a nebulizer.)

Respiratory Distress Dosage Chart			
By Age	Student Age	Dosage of Albuterol	Dosage of Bronchosaline
	< 7 years	0.5 ml	2.5 ml
	> 7 years	1.0 ml	2.0 ml

Primary Care Physician's Signature: _____ **Date:** _____

STANDING ORDER FOR THE USE OF AN EPINEPHRINE AUTOINJECTOR

In the event of anaphylaxis, a severe allergic reaction that may be triggered by an insect sting or bite, drug, allergy, food allergy, or environmental irritant. Epinephrine is the standard emergency treatment for anaphylactic reactions. Delays in administering epinephrine when signs of early anaphylaxis are present can cost someone their life. Early signs can progress to life threatening and death within the span of 5-10 minutes.

Epinephrine is similar to adrenalin in the body and will briefly open constricted bronchioles and stabilize falling blood pressure associated with severe allergic reactions.

Anytime epinephrine is used, emergency medical services must be called, as this measure helps support survival temporarily. Symptoms may continue as epinephrine effects wear off in 5-10 minutes, necessitating a second dose of epinephrine in some individuals. The correct dosage is based on the weight of the person.

Early symptoms of an allergic reaction can be very similar to a severe asthma episode. The following procedures should be followed by a school nurse or designated first aid responder trained by a school nurse if a student presents with symptoms of severe asthma or a severe allergic reaction.

ALLERGIC REACTIONS

	Symptoms	Actions
Mild Reaction	Mild Rash Itching/Hives Child with asthma may complain of difficulty breathing, speaking, talking, and want inhaler urgently.	Check the student's health history. Administer prescribed medication according to Action Plan (i.e. inhalers). Observe for breathing relief to occur after medication given.
Moderate Reaction	Increased air hunger, facial swelling, wheezing, pale/red flush to skin, weakness. <i>GI symptoms:</i> Stomach pain, vomiting, nausea. <i>CVS:</i> Pale, sudden drop in blood pressure, worsening hives.	Call the nurse and parent. Locate the EpiPen. Administer the EpiPen to prevent progression of symptoms.
Severe Reaction	Airway obstruction, increased head/neck/body swelling. Throat/tongue swelling, difficulty speaking. Pale or dusky discoloration, fearful expression, cardiac or respiratory arrest, unconsciousness.	See below for detailed instructions.

Action for SEVERE allergic reaction:

- ◆ **Call 911 or local emergency medical services number IMMEDIATELY!!**
- ◆ **Choose appropriate EpiPen or other injectable epinephrine according to the child's weight:**
Child weight below 30 kg (60 pounds) use EpiPen Jr (0.15 mg epinephrine) Child weight above 30 kg (60 pounds) use EpiPen (0.3 mg epinephrine)
- ◆ **Administer EpiPen according to these directions:**
 1. **Pull off safety cap**
 2. **Place tip on outer thigh at right angle to leg (for insect sting, inject leg opposite to sting).**
 3. **Press firmly into thigh (you may inject through clothing)**
 4. **Hold in place for 10 seconds**
 5. **Remove and massage area for 10 seconds**
 6. **Summon the nurse or after giving epinephrine, or another 1st responder.**
 7. **Monitor response while awaiting the arrival of EMS and vital signs if possible.**
 8. **If symptoms are unrelieved after 10 minutes and EMS has not arrived, administer a 2nd dose, and call EMS back to ascertain estimated arrival time. Stay with child.**

Primary Care Physician's Signature: _____ **Date:** _____



Section I
SCHOOL STAFF
& COMMUNITY
TRAINING

ASTHMA “I.Q.”

from the National Asthma Education Program

The following true-or-false statements test what you know about asthma.
Be sure to read the correct answers and explanations on the next page.

- | | <u>True/False</u> |
|--|---|
| 1. Asthma is a common disease among children and adults in the United States. | T <input type="checkbox"/> F <input type="checkbox"/> |
| 2. Asthma is an emotional or psychological illness. | T <input type="checkbox"/> F <input type="checkbox"/> |
| 3. The way that parents raise their children can cause asthma. | T <input type="checkbox"/> F <input type="checkbox"/> |
| 4. Asthma episodes may cause breathing problems, but these episodes are not really harmful or dangerous. | T <input type="checkbox"/> F <input type="checkbox"/> |
| 5. Asthma episodes usually occur suddenly without warning. | T <input type="checkbox"/> F <input type="checkbox"/> |
| 6. Many different things can bring on an asthma episode. | T <input type="checkbox"/> F <input type="checkbox"/> |
| 7. Asthma cannot be cured, but it can be controlled. | T <input type="checkbox"/> F <input type="checkbox"/> |
| 8. There are different types of medicine to control asthma. | T <input type="checkbox"/> F <input type="checkbox"/> |
| 9. People with asthma have no way to monitor how well their lungs are functioning. | T <input type="checkbox"/> F <input type="checkbox"/> |
| 10. Both children and adults can have asthma. | T <input type="checkbox"/> F <input type="checkbox"/> |
| 11. Tobacco smoke can make an asthma episode worse. | T <input type="checkbox"/> F <input type="checkbox"/> |
| 12. People with asthma should not exercise. | T <input type="checkbox"/> F <input type="checkbox"/> |

Your score — How many answers did you get correct?

- 11 - 12 = Congratulations! You know a lot about asthma. Share this information with your family and friends.
10 - 11 = Very good.
< 10 = Go over the answers and try to learn more about asthma.

Source: National Heart, Lung, & Blood Institute

ANSWERS TO THE ASTHMA “I.Q.” QUIZ

1. **TRUE.** Asthma is a common disease among children and adults in the U.S., and it is increasing. About 10 million people have asthma, of whom 3 million are under 18 years of age.
2. **FALSE.** Asthma is not an emotional or psychological disease, although strong emotions can sometimes make asthma worse. People with asthma have sensitive lungs that react to certain things, causing the airways to tighten, swell, and fill with mucus. The person then has trouble and may cough and wheeze.
3. **FALSE.** The way parents raise their children does not cause asthma. It is not caused by a poor parent-child relationship, or by being overprotective.
4. **FALSE.** Asthma episodes can be very harmful. People can get very sick and need hospitalization. Some people have died from asthma episodes. Frequent asthma episodes, even if they are mild, may cause people to stop being active and living normal lives.
5. **FALSE.** Sometimes an asthma episode may come on quite quickly. However, before a person has any wheezing or shortness of breath, there are usually symptoms such as a cough, a scratchy throat, or tightness in the chest. Most patients learn to recognize these symptoms and can take medicine to prevent a serious episode.
6. **TRUE.** For most people with asthma, an episode can start from many different triggers. Some of these things are pollen from trees or grasses; molds or house dust; weather changes; strong odors; cigarette smoke; and certain foods. Other triggers include being upset; laughing or crying hard; having a cold or the flu; or being near furry or hairy animals. Each person with asthma has an individual set of asthma triggers.
7. **TRUE.** There is no cure yet for asthma. However, asthma patients can control it to a large degree by:
 - Getting advice from a doctor who treats asthma patients
 - Learning to notice early signs of an asthma episode
 - Avoiding things that cause asthma episodes
 - Taking medicine just as the doctor says
 - Knowing when to get medical help with a severe episode.
8. **TRUE.** Several types of medicines are available to control asthma. Some people with mild asthma need to take medication only when they have symptoms. But most people need to take medicine every day to prevent symptoms and also to take medicine when symptoms do occur. A doctor needs to decide the best type of medicine for each patient and how often it should be taken. Asthma patients and their doctors need to work together to manage the disease.
9. **FALSE.** People with asthma can monitor how well their lungs are functioning with a peak flow meter. This small device can be used at home, work, or school. The peak flow meter may show that the asthma is getting worse before the usual symptoms appear.
10. **TRUE.** Both children and adults can have asthma. Sometimes, but not always, symptoms will go away as children get older. However, many children continue to have asthma symptoms through-out adulthood. In some cases, symptoms of asthma are not recognized until a person is an adult.
11. **TRUE.** Smoke from cigarettes, cigars, and pipes can bring on an asthma attack. Indoor smoky air from fireplaces and outdoor smog can make asthma worse. Some can also “set off” other triggers. Smokers should be asked not to smoke near someone with asthma. Moving to another room may help, but smoke travels from room to room. No smoking is best for everyone!
12. **FALSE.** Exercise is good for most people— with or without asthma. When asthma is under good control, people with asthma are able to play most sports. For people whose asthma is brought on by exercise, medicines can be taken before exercising to help avoid an episode. A number of Olympic medalists have asthma.

*Source: National Asthma Education Program.
National Heart, Lung, & Blood Institute (1992)
Reviewed May 2010.*

FOR SCHOOL STAFF

General information about asthma

Asthma is the most common chronic illness among children. Most children with asthma have symptoms that can be controlled by medicine. (don't 2nd guess the severity degree, because severity is not fixed. It can change with good management and good response to medications). Don't want teachers to get complacent and think that asthma isn't serious. Deaths have occurred in people with mild asthma that escalated to life-threatening).

Asthma is characterized by:

- ◆ airway inflammation
- ◆ airway hyperresponsiveness
- ◆ airway obstruction

Breathing difficulty results from changes in the air passages of the lungs:

- ◆ inner walls of the airways swell
- ◆ muscles of the airway walls tighten and constrict
- ◆ swollen walls produce excess mucus, which clogs the airways

Factors that may trigger asthma include:

- ◆ respiratory infections, colds
- ◆ allergic reactions to pollen, mold, animal dander, dust, food, etc.
- ◆ vigorous exercise
- ◆ exposure to cold air or sudden temperature changes
- ◆ air pollution, fumes, or strong odors
- ◆ cigarette smoke
- ◆ excitement, stress
- ◆ menses

Teachers and Staff as Friends

Children with asthma may feel scared and different than other classmates. The staff person who knows what to do, and who treats children with understanding and kindness, can help to empower students and reduce their fear of asthma. If it is possible to do without embarrassing children with asthma, explain to the class what asthma is, its effects on breathing, and how classmates can be helpful.



*Source: Asthma Alert for Teachers American Lung Association (2003).
Reviewed by Asthma Ready® Communities Staff (2010).*

FOR SCHOOL FACULTY AND STAFF
First-Aid Tips for Breathing Difficulties

Help the student sit in a comfortable position with his or her shoulders relaxed. Leaning forward with elbows on knees may be helpful. Talk with the child reassuringly.

If there is an asthma action plan for the student, follow the steps prescribed by the child's provider. Encourage the child to take appropriate medicine that the child's provider has prescribed.

If the medicines do not appear to be working effectively, within 10-15 minutes after administration, notify the school nurse (or school administrator who handles these situations) and the parent or guardian. In some cases children with asthma will need emergency medical care.

**Never send a student complaining of asthma or breathing problems to the nurse,
school office, or anywhere else by themselves!**



*Source: Asthma Alert for Teachers. American Lung Association (2003).
Reviewed by Asthma Ready® Communities Staff (2010).*

FOR TEACHERS

Asthma symptoms you should know

Common Symptoms:

- Wheezing
- Tightness or pain in the chest
- Coughing throughout the day
- Difficulty breathing and shortness of breath
- Little energy for active play

A child may have only one of the above symptoms or a combination of the above.



More Serious Symptoms (Signs that Need Quick Medical Attention):

- If the child's wheeze, cough, or shortness of breath worsens, even after the medicine has been given time to work (most inhaled bronchodilator medicines produce an effect within 5 to 10 minutes).
- The child feels uncomfortable and is having trouble breathing, but you don't hear wheezing sounds (this may still indicate extreme bronchial distress).
- The child has trouble walking or talking, stops playing and cannot start again.
- The child's chest and neck are pulled or sucked in with each breath.
- The child's peak flow rate gets lower, or does not improve after treatment with bronchodilators, or drops 50% of the child's personal best (check with the school nurse or the appropriate personnel about peak flow measurement).
- The child's lips or fingernails are grey or blue. If this happens, get emergency help right away!

Source: Asthma Alert for Teachers. American Lung Association (2003). Reviewed by Asthma Ready® Communities Staff (2010).

TIPS FOR TEACHERS

It is helpful for teachers to understand asthma, given the increasing number of children diagnosed with asthma in this country. It is not uncommon to have several asthmatic students in one classroom.

Teachers should be aware of early signs of an asthma attack, methods of reducing triggers in the classroom environment, and ways to make asthmatic students feel more comfortable about asthma while at school.

Providing Comfort

- Encourage students with asthma to participate in all activities, including physical education.
- Develop a protocol for making up missed schoolwork with parents and students with asthma.
- Educate other students in the classroom about asthma.

Teachers have the unique opportunity to notice subtle changes in students within their classes. As a result of the considerable time spent with each student, teachers can assess the social and physical changes in students as a result of their asthma. Teachers can benefit the asthmatic student by promoting self-esteem in spite of the condition, and by minimizing differences between asthmatic students and other students. This allows them to better fit in with peers.

Concerning Signs

- The student seems to feel that he/she is different from other students
- The student avoids taking medications, often toughing it out during an attack
- The student is reluctant to go to the office for medication.
- The student does not notify school staff when self-administering medication, or does not inform staff of need for medication.
- The student shares his/her medication with other students.
- The student avoids physical activity out of fear of asthma symptoms, rather than the presence of actual asthma symptoms.

Field Trips

Teachers should be aware of issues unique to asthmatic students when planning field trips. Sites such as botanical gardens, petting zoos, and smoky locations may trigger asthma.

Make sure the students' reliever medications are brought on all field trips, as well as a peak flow meter (if prescribed). The Emergency Care Plan should always accompany the child outside of school.

*Adapted from: Asthma Management in the School Setting: American Lung Association of Washington.
Reviewed by Asthma Ready® Communities Staff (2010).*

FOR TEACHERS

What You Can Do

- ◆ Find out which students have asthma. A conference with the parent, child, teacher, and school nurse may be needed. Discuss the child's asthma, medicines, and school management. This information can be entered into an asthma action plan for the child. Make certain copies of the plan are easily accessible. The plan should have information about the child's symptoms and signs, types of medicines and dosages needed, the peak flow readings, what to do in emergencies, and whom to contact.
- ◆ You are in control of the classroom environment. Understand what starts the child's asthma and make the classroom as "trigger-free" as possible. Help the child avoid triggers such as excessive dust, sharp odors, other children with respiratory infections, and very cold air.
- ◆ On very cold days, it may be best to have the child spend recess time indoors. A friend may wish to join in the indoor activities. During the pollen season, children allergic to pollen should not sit near open windows.
- ◆ Furry animals and bedding materials such as wood chips, strong odors from cosmetics, chemicals and art supplies can sometimes trigger asthma. If possible, remove such irritants from the classroom. Gym mats, shoes, lockers, as well as old library books are often loaded with dust and molds. Regular cleaning and airing can help.
- ◆ Encourage children to be as active as possible to participate in physical education activities. Children will learn their limits. Not all children will be capable of normal activity. They can stop playing if wheezing or coughing begins. Have them do warm-up exercises before playing. Also, some medicines can be taken prior to physical activity in order to prevent some episodes.
- ◆ Children with severe asthma may miss school. You can provide extra encouragement and time to help children keep up with class work.
- ◆ If the child seems unusually tired, inattentive or hyperactive, advise the school nurse or parents, as changes in the child's asthma management may be needed. Encourage parents to get continuous asthma care for their child. Lack of ongoing, regular asthma care can lead to serious problems.

*Source: Asthma Alert for Teachers. American Lung Association (2003).
Reviewed by Asthma Ready® Communities Staff (2010).*

ACTIONS FOR THE CLASSROOM TEACHER

Help Children With Asthma and Their Families Manage Asthma

- **Consult with your school nurse** or principal for updated policy and procedures for managing students with asthma, including managing medication and responding to emergencies, such as an asthma episode.
- **Know your role.** Know how to easily access a student's asthma action plan or have a copy of it in the classroom, maintained in a confidential manner. Review it with the student and the parent(s) or guardian(s) to determine if classroom modifications are needed and how to work toward the goal of the student's full participation in classroom activities. Ask the student to tell you when he/she is having any difficulty in breathing. Know the early warning signs of an asthma episode and what steps to take in the event of an asthma episode. **Don't delay getting medical help** for a student with severe or persistent breathing difficulty.
- **Develop a clear procedure** with the student and parent/guardian **for handling schoolwork missed** due to asthma or illness.
- **Report if student's symptoms are interfering** with learning or activities with peers. Refer any problem to the school nurse and the parent(s). Common side effects of medicine that warrant referral are nervousness, nausea, hyperactivity, jitteriness, and drowsiness.
- **Alert** school administrators, school nurses, and parent/guardian of **changes in a student's performance** or behavior that might reflect trouble with asthma. The vast majority of students with asthma are able to participate fully in the school when their asthma is well managed.
- Encourage the student with asthma to **participate fully in physical activities**. Plan activities to allow for variations in stamina or tolerance for exercise, especially if the student is recovering from illness. Changes in weather (hot, cold, breezy) and poor air quality (smoke, smog, pollen) often aggravate asthma.
- **Plan field trips** and other activities in a way that ensures students with asthma can fully participate.

Look for Children with Uncontrolled Asthma

- **Be alert for signs of uncontrolled asthma.**
 - o Lingering cough after a cold
 - o Persistent cough during the day
 - o Coughing during the night or early in the morning
 - o Coughing, wheezing, chest tightness, or shortness of breath after vigorous physical activity or activity in cold or windy weather
 - o Low level of stamina during physical activity or reluctance to participate
 - o Coughing, wheezing, chest tightness, or shortness of breath even though the child is taking medicine for asthma
 - o Increased use of asthma medicine to relieve coughing, wheezing, chest tightness, or shortness of breath
- **Advise the school nurse** when you suspect **poorly controlled asthma** in a student, so that the school nurse can discuss the situation with the student's parent or guardian and suggest referral to their physician for a proper diagnosis or treatment update.
- **Be aware of** students with asthma in your class. Understand their **triggers and symptoms**. Observe what seems to make them better or worse, and share your observations with the school nurse.

Source: Managing Asthma: A Guide for Schools. National Heart, Lung, and Blood Institute (NHLBI), National Institutes of Health, U.S. Department of Health and Human Services, and the Fund for the Improvement and Reform of Schools and Teaching, Office of Educational Research and Improvement (OERI), U.S. Department of Education. September 1991. Revised July 2003. NIH Publication No 91-2650. Reviewed by Asthma Ready® Communities staff (2010).

PHYSICAL EDUCATION FACULTY AND STAFF

A diagnosis of asthma does not necessarily mean that students should restrict their participation in sports or other physical activity. While some students may require modified physical activity, this is often not the case.

Students with asthma may feel isolated or left out as a result of activity avoidance. This can result in low self-esteem, lack of motivation, and teasing by classmates. Students with asthma should be included in physical activity whenever possible.

Modifications for physical activity involvement may include decreased intensity or length of involvement, or consideration for the type of activity planned. These modifications may be especially helpful if the student has recently experienced an acute asthma flare-up.

Exercise Induced Asthma is a condition where airways become constricted in response to activity (bronchoconstriction). Exercise is a common trigger of asthma, and should be recognized and

understood by all school staff. Symptoms of Exercise Induced Asthma may include wheezing, coughing, chest tightness, and/ or shortness of breath both during and after exercise. Other symptoms can include fatigue or chest congestion. Not all people with Exercise Induced Asthma have chronic asthma.

The severity of Exercise Induced Asthma is dependent on the type and duration of physical activity involved. A student's individualized health plan may include guidelines for physical activity. This information should be readily accessible for coaches, physical education instructors, and recess monitors. Frequent symptoms of asthma during exercise may indicate that asthma is not adequately managed, and the school nurse should be notified to communicate this information to the student's parent and/or provider.

Adapted from: Asthma (2001, Vol 6, No. 2). Management of Exercise-Induced Asthma: Helpful Hints for Sports Coaches. Reviewed by Asthma Ready® Communities Staff (2010).

ACTIONS FOR THE PHYSICAL EDUCATION INSTRUCTOR AND COACH

Help Children with Asthma and Their Families Manage Asthma

- **Follow the student's asthma action plan.** Support the student's treatment plan if it requires pre-medication before exercise. Know how to easily access the action plan. Consult with the school nurse for clarification.
- **Appreciate that exercise can cause episodes for many students with asthma.** Exercise in cold, dry air and activities that require extended running appear to trigger asthma more readily than other forms of exercise. However, medicines can be taken before exertion to help avoid an episode. This preventative medicine enables most students with to participate in any sport they choose. Warm-up and cool-down activities appropriate for any exercise will also help the student with asthma.
- **Be sure that the student's medications are available** for exercise activities that take place away from school or after regular school hours.
- **Keep students' quick relief medicines readily available.** Even with precautions, breathing problems may occur. Learn the signs of severe distress and allergic reactions. Have an emergency plan. Don't delay getting medical help for a student with severe or persistent breathing difficulty. Encourage exercise and participation in sports for students with asthma.
- Maximize participation and minimize the risks by **establishing good communication** among parents or guardians, students, health care providers.
- **Encourage exercise and participation in sports for students with asthma.** When asthma is under good control, most students with asthma are able to play most sports. A number of Olympic medalists have asthma, including Jackie Joyner-Kersey, Olympic gold medalist in track and field; Amy Van Dyken, Olympic gold medalist in swimming.
- Encourage students with asthma to participate actively in sports but also recognize and **respect their limits.** Plan to adjust the type, pace, and intensity of activities during extreme weather, the pollen season, poor air quality, or when the student has allergy symptoms or a peak flow number lower than usual. Permit less strenuous activities if a recent illness precludes full participation.

Source: Managing Asthma: A Guide for Schools. National Heart, Lung, and Blood Institute (NHLBI), National Institutes of Health, U. S. Department of Health and Human Services, and the Fund for the Improvement and Reform of Schools and Teaching, Office of Educational Research and Improvement (OERI), U.S. Department of Education. September 1991; Revised July 2003. NIH Publication No. 91-2650. Reviewed by Asthma Ready® Communities staff (2010).

PLAN FOR STAYING ACTIVE

For children

Even with asthma, you can play and take part in many activities, including sports like other kids. Many kids with asthma cough or wheeze when they exercise, run, or play hard. This does not have to happen. Your asthma medicine will help you be active without coughing or wheezing. Some kids keep asthma symptoms from starting if they take a certain asthma medicine right before they start their activity. Talk to your doctor about this.

It also helps you feel good while you are active if you do stretching exercises (“warm up” and “cool down”) before and after your activity. Here is a plan to help you be active:

- List the things you do now to stay active.
- List the things you would like to try.
- Check off the things you will do to be more active.

Physical Activities I Do Now:

Physical Activities I Would Like to Try:

To Be Active I will:

(Check Here)

- Talk to my parent(s) about an activity I would like to do.
- Try the activity to see if I can do it without wheezing.
- Show my parent(s) how much I can do without wheezing.
- Talk to my parents and my doctor about taking medicine before I begin exercise. This will keep asthma attacks or episodes from starting.
- Take a break from activity if I feel I may start wheezing. Follow my asthma control plan.

*Source: National Asthma Education Program. National Heart, Lung & Blood Institute (1992).
Reviewed by Asthma Ready® Communities Staff (2010).*

BREATHING DIFFICULTIES RELATED TO PHYSICAL ACTIVITY FOR STUDENTS WITH ASTHMA: EXERCISE-INDUCED ASTHMA

Information for Physical Educators, Coaches and Trainers

First Aid for Exercise-Induced Asthma

If, during physical activity, you notice that a student is having difficulty breathing, coughing frequently, or wheezing (noisy when breathing out), it may be asthma:

- **STOP the student's activity** and encourage the student to sit and rest.
- **Call 911** immediately if student requests or is in severe distress—struggling to breathe, lips blue, unable to walk or talk.
- Follow the designated **asthma management plan** (individual student plan, if available, or school protocol).
- Follow the school protocol to **notify the school nurse** (or other designated staff) if medication is not available or if symptoms are not resolved within 5 to 10 minutes after using the inhaler.
- **Never** let a child with breathing problems leave the gym or field **alone**.
- If symptoms resolve, permit students to **resume activity** when they are ready, according to their asthma management plan.
- Follow the school protocol to **inform parents** of the event and document actions taken.



*This guidance sheet was developed as a partnership activity facilitated by the NAEPP,
coordinated by the NHLBI of the NIH/DHHS. March 2005*

WAYS TO HELP STUDENTS WITH ASTHMA PARTICIPATE IN PHYSICAL ACTIVITY

Identify Students with Asthma in Your Class or on Your Team

- Ask your school nurse or use student health information to identify those students who have a diagnosis of asthma or a history of asthma symptoms with physical activity.
- Ask the school nurse for a copy of each student's asthma action plan. Keep the copies easily available for all on-site and off-site activities.
- Discuss with students (and parents, if appropriate), the individual student's triggers, signs and symptoms that relate to physical activity.
- Take appropriate steps to inform a student's parents/guardians if the student frequently experiences asthma symptoms with physical activity. The student's asthma management plan may need to be reevaluated by the student's provider because most students with asthma should be able to participate fully in physical activities, most of the time.
- Help students and the school nurse make sure that the students' prescribed asthma medicines are available for use, according to their asthma action plans, before physical activity and as needed for acute symptoms,

Encourage Students to Prepare for Physical Exercise

- Students who have been prescribed pre-exercise treatment (usually an inhaled quick relief bronchodilator) should take their medicine 5 to 10 minutes prior to exercise
- Encourage a period of warm up activity before exertion (e.g., walking, flexibility exercises, or other low intensity activities).
- Check the student's asthma action plan for information about his or her triggers, and help the student avoid them when possible. Each student with asthma is sensitive to different factors in the environment, called triggers. Common triggers include dust, pollen, mold, air pollution, and smoke. Cold, dry air can also trigger asthma; wearing a scarf or cold air mask will help because it warms and humidifies the air before it reaches the airways.

Consider Modified Exercise as Needed

- If a student has obvious wheeze, breathing difficulty, or measures a low peak flow rate prior to exercise, have the student treat his/her symptoms according to the asthma management plan. The treatment is usually with prescribed inhaled quick-relief bronchodilator. Physical activity may then be either resumed, modified or halted, depending on the student's response to treatment.
- When a student is having mild symptoms or when triggers are present, consider modifying the intensity, location, or duration of physical activity. Very intense, continuous activity is more likely to cause asthma symptoms than intermittent or very light or non aerobic exercise (e.g., walking, some field events, or weight training). There is no perfect physical activity for people with exercise-induced asthma. All sports are tolerated well when a student's asthma is under control.
- When environmental conditions are bad (e.g., ozone alerts, high pollen counts, freshly cut or sprayed fields) students with asthma may need to avoid being physically active outdoors.

ACTIONS FOR THE PRINCIPAL

Help Children with Asthma and Their Families Manage Asthma

- Involve your staff** in the school's asthma management program. Many members of the school staff can play a role in maintaining your school's asthma management program, although the principal or the school nurse may be most instrumental in getting a program started. A school asthma management is a cooperative effort that involves the students, parents, teachers, school staff, and health care providers. Take the steps listed below to help set up an asthma management program in your school.
- Develop a clear policy** on medication administration that is safe, reliable, and effective. Work with parents, teachers, the school nurse, and others to provide the most supportive policy that your school system allows so that the student can get the medication he/she needs. **If appropriate, allow students to carry quick-relief inhaler or epinephrine.** Consult state regulations and nursing practice acts to ensure appropriate professional standards for student care.
- Designate one person** on the school staff, preferably the school nurse, to be responsible for maintaining each student's asthma action plan and for educating appropriate staff members, including teachers, about each student's individual asthma action plan. **Have a backup plan** for emergencies in case the designee is not immediately available.
- Provide health alerts and institute appropriate guidance for outside play designed to protect students from extreme temperatures, high pollen counts, and air pollutants that may affect asthma.

Teach Staff, Students, and Families about Asthma

- Make sure that staff members **understand the school's responsibilities** under the Individuals With Disabilities Education Act (IDEA), Section 504 of the Rehabilitation Act of 1973, Title II of the Americans With Disabilities Act (ADA), and where applicable, Title III of the ADA, which applies to nonreligious private schools. In addition, staff should be familiar with any applicable state and local legal requirements.
- Provide opportunities for staff to learn about managing asthma and allergies.** You may get assistance from your school nurse, your local pediatrician or specialist, or a local hospital or medical society. Other sources of information are the American Lung Association, Asthma and Allergy Foundation of America, National Jewish Health, and the Allergy and Asthma, Network Mothers of Asthmatics.
- Develop and **present an information program for all students** to make them aware of the symptoms of asthma. Involve the public health nurse and/ or school nurse.
- Support and **encourage communication** with parents or guardians and health care providers to improve school asthma services.
- Arrange** for the development of **an asthma resource file** for parents or guardians, students and school personnel.

Source: Managing Asthma: A Guide for Schools. National Heart, Lung, and Blood Institute (NHLBI), National Institutes of Health, U. S. Department of Health and Human Services, and the Fund for the Improvement and Reform of Schools and Teaching, Office of Educational Research and Improvement (OERI), U.S. Department of Education (1991) revised July 2003. Publication No. 91-2650. Reviewed by Asthma Ready® Communities staff (2010)

INFORMATION FOR FOOD SERVICE PERSONNEL

Anaphylaxis

Research has shown that children with asthma are at increased risk for severe allergic reactions to food. The most serious allergic reaction is called anaphylaxis. Symptoms of anaphylaxis can occur immediately after eating, or after several hours. It is important to consider that each episode of anaphylaxis is potentially life-threatening.

Symptoms of Anaphylaxis

- Itching and swelling of the lips, tongue, or mouth.
- Itching with tightness in the throat, hoarseness, and hacking cough.
- Hives, itchy rash, and/or Swelling of the face/extremities.
- Nausea, abdominal cramping, vomiting, or diarrhea.
- Shortness of breath, repetitive coughing or wheezing.
- “Thready” pulse, “passing out”
- Sudden blood pressure drop

The Link Between Allergy and Asthma

Research suggests that food allergies can bring on an asthma attack, but they are not the common cause of asthma attacks.

It is important for parents to communicate to staff members, so staff members understand what the child is allergic to, identify trigger foods, recognize symptoms, and initiate treatment when necessary.

Anyone with a previous reaction to food is at risk for a repeat reaction. The majority of all food allergy reactions are caused by: milk, soy, eggs, wheat, peanuts, tree nuts, fish and shellfish. In addition to food, the most common causes of severe allergic reactions include insect stings, latex, and medications.

NUTRITION TIPS

School Faculty (Teachers, Coaches, etc.)

- Inquire about each student's food allergies during parent/teacher conferences at the beginning of the year.

NOTE: *(a severe reaction could occur the first day of school-don't wait to get epinephrine and an action plan—death can occur in under 10 minutes!!)*

- Work with parents to protect students from life-threatening reactions to food.
- Keep students with food allergies away from foods known to cause allergies.
- Educate students in the classroom about food allergies.

School Nurse

- Educate school personnel about the seriousness of food allergies and asthma, steps they can take to prevent allergy reactions from occurring.
- Maintain communication with parents, students, and health care providers to make sure the Action Plan in place is current, and reflects any food allergies or special dietary needs. Keep the students' Asthma Action Plans readily accessible.
- Educate all staff about administering injectable epinephrine and other emergency response procedures for food-induced anaphylaxis, or other life-threatening respiratory emergencies.

MANAGING STUDENTS WITH FOOD ALLERGIES

Food allergies can threaten your life. Accidental exposure to foods known to cause allergic reactions for some students can be reduced in the school setting when parents, students, physicians and all school staff members work together.

Family Responsibility

- Notify the school of the child's allergies.
- Work with the school team to develop a plan that accommodates the child's needs throughout the school.
- Provide written medical documentation, instructions, and medications as directed by a physician.
- Provide properly labeled medications and replace medications upon expiration.
- Educate the child in the self-management of the food allergy, including safe and unsafe foods, strategies for avoiding unsafe foods, symptoms of allergic reactions, how and when to notify an adult of an allergic reaction, and how to read food labels (age appropriate).
- Review policies/procedures with school staff, physician, and the child after a reaction has occurred.
- Provide emergency contact information.

Keep in mind that anaphylaxis episodes have occurred without prior allergy diagnoses in both adults and children.

School Responsibility

- Be knowledgeable about federal laws, including ADA, IDEA, Section 504, and any state or district policies.
- Review health records submitted by parents/physicians.
- Students should not be excluded from school activities on the basis of food allergies.
- Identify a core team to respond to the student's needs.
- Assure all staff who interact with the student understand the nature of the food allergy. Eliminate the use of food allergens in meals, educational tools, craft projects, and incentives.
- Practice a Food/Allergy Action Plan before an allergic reaction occurs.
- Coordinate the storage of medications, emergency kit, and standing orders for epinephrine.
- Coordinate implementation of state self-carry laws if applicable.
- Designate school personnel who are properly trained to administer medication with state nursing laws.
- Review policies/prevention with core team members, parents/guardians, student, and physician after reaction has occurred.
- Recommend that all buses have communication devices in case of an emergency.
- Enforce a "no eating" policy on school buses
- Discuss field trips with the child's family
- Follow state/district privacy policies

Source: American School Food Service Association, in cooperation with the National Association of Elementary School Principals, National Association of School Nurses, National School Boards Association, & the Food Allergy & Anaphylaxis Network (2003). Reviewed by Asthma Ready® Communities staff (2010)

MAJOR CAUSES OF FOOD ALLERGIES



Peanuts

- Peanuts are the leading cause of severe allergic reactions related to food.



Milk



Wheat



Shellfish



Fish



Soy



Tree Nuts (Walnuts, Peacans)



Eggs

Source: The Food Allergy Network

HOW TO READ FOOD LABELS

HOW TO READ A LABEL for a MILK-FREE DIET	
Avoid foods that contain milk or any of these ingredients:	
artificial butter flavor	milk (<i>in all forms including condensed, derivative, dry, evaporated, goat's milk and milk from other animals, lowfat, malted, milk fat, non-fat, powder, protein, skimmed, solids, whole</i>)
butter, butter fat, butter oil	nisin
buttermilk	nougat
casein (<i>casein hydrolysate</i>)	pudding
caseinates (<i>in all forms</i>)	rennet casein
cheese	sour cream, sour cream solids
cream	sour milk solids
cottage cheese	whey (<i>in all forms</i>)
curds	yogurt
custard	
ghee	
half & half	
lactalbumin, lactalbumin phosphate	
lactoferrin	
lactulose	
May indicate the presence of milk protein:	
caramel candies	
chocolate	
flavorings (<i>including natural and artificial</i>)	
high-protein flour	
lactic acid starter culture	
lactose	
luncheon meat, hot dogs, sausages	
margarine	
non-dairy products	
HOW TO READ A LABEL for an EGG-FREE DIET	
Avoid foods that contain eggs or any of these ingredients:	
albumin (<i>also spelled as albumen</i>)	
egg (<i>dried, powdered, solids, white, yolk</i>)	
eggnog	
lysozyme	
mayonnaise	
meringue (<i>meringue powder</i>)	
surimi	
May indicate the presence of egg protein:	
flavoring (<i>including natural and artificial</i>)	
lecithin	
macaroni	
marzipan	
marshmallows	
nougat	
pasta	

Source: *Guidelines for Allergy Prevention and Response (August 2010)*,
Retrieved from http://www.mo.gov/living/families/schoolhealth/pdf/mo_allergy_manual.pdf

HOW TO READ FOOD LABELS

HOW TO READ A LABEL for a WHEAT-FREE DIET	
Avoid foods that contain wheat or any of these ingredients:	
bran	gluten
bread crumbs	kamut
bulgur	matzoh, matzoh meal (<i>also spelled as matzo</i>) pasta
couscous	pasta
cracker meal	seitán
durum	semolina
farina	spelt
flour (<i>all purpose, bread, durum, cake, enriched, graham, high gluten, high protein, instant, pastry, self-rising, soft wheat, steel ground, stone ground, whole wheat</i>)	vital gluten
	wheat (<i>bran, germ, gluten, malt, sprouts</i>)
	wheat grass
	whole-wheat berries
May indicate the presence of wheat protein:	
flavoring (<i>including natural and artificial</i>)	
hydrolyzed protein	
soy sauce	
starch (<i>gelatinized starch, modified starch, modified food starch, vegetable starch, wheat starch</i>)	
surimi	

HOW TO READ A LABEL for a PEANUT-FREE DIET	
Avoid foods that contain peanuts or any of these ingredients:	
artificial nuts	monkey nuts
beer nuts	nutmeat
cold pressed, expelled, extruded peanut oil	nut pieces
goobers	peanut
ground nuts	peanut butter
mixed nuts	peanut flour
May indicate the presence of peanut protein:	
African, Asian (<i>especially Chinese, Indian, Indonesian, Thai, and Vietnamese</i>), and Mexican dishes	Mandelonas are peanuts soaked in almond flavoring.
baked goods (<i>pastries, cookies, etc.</i>)	Studies show that most allergic individuals can safely eat peanut oil (not cold pressed, expelled, or extruded peanut oil).
candy (<i>including chocolate candy</i>)	
chili	
egg rolls	Arachis oil is peanut oil.
enchilada sauce	
flavoring (<i>including natural and artificial</i>)	Experts advise patients allergic to peanuts to avoid tree nuts as well.
marzipan	
mole sauce	A study showed that unlike other legumes, there is a strong possibility of cross-reaction between peanuts and lupine.
nougat	Sunflower seeds are often produced on equipment shared with peanuts.

Source: *Guidelines for Allergy Prevention and Response (August 2010)*,
Retrieved from http://health.mo.gov/living/families/schoolhealth/pdf/mo_allergy_manual.pdf

HOW TO READ FOOD LABELS

HOW TO READ A LABEL for a TREE-NUT-FREE DIET	
Avoid foods that contain nuts or any of these ingredients:	
almonds artificial nuts Brazil nuts caponata cashews chestnuts filbert/hazelnuts gianduja (<i>a nut mixture found in some chocolate</i>) hickory nuts macadamia nuts marzipan/almond paste nan-gai nuts	natural nut extract (<i>i.e., almond, walnut</i>) nougat nut butters (<i>i.e., cashew butter</i>) nut meal nutmeat nut oil nut paste (<i>i.e., almond paste</i>) pecans (<i>Mashuga Nuts®</i>) pesto pine nuts (<i>also referred to as Indian, piñon,</i> pistachios pralines walnuts
Mandelonas are peanuts soaked in almond flavoring. Mortadella may contain pistachios. Natural and artificial flavoring may contain tree nuts. Experts advise patients allergic to tree nut butters (<i>i.e., cashew butter</i>) to avoid peanuts as well. Talk to your doctor if you find other nuts not listed here.	
HOW TO READ A LABEL for a SOY-FREE DIET	
Avoid foods that contain soy or any of these ingredients:	
hydrolyzed soy protein natto soy (<i>soy albumin, soy fiber, soy flour, soy grits, soy milk, soy nuts, soy sprouts</i>) soya soybean (<i>curd, granules</i>)	soy protein (<i>concentrate, isolate</i>) soy sauce Tamari Tempeh textured vegetable protein (TVP) tofu
May indicate the presence of soy protein:	
Asian cuisine flavoring (<i>including natural and artificial</i>) vegetable broth vegetable gum vegetable starch	Studies show most individuals allergic to soy may safely eat soy lecithin and soybean oil.

Source: *Guidelines for Allergy Prevention and Response (August 2010)*,
 Retrieved from http://health.mo.gov/living/families/schoolhealth/pdf/mo_allergy_manual.pdf

HOW TO READ FOOD LABELS

HOW TO READ A LABEL for a SHELLFISH-FREE DIET

Avoid foods that contain shellfish or any of these ingredients:

abalone clams (<i>cherrystone, littleneck, pismo, quahog</i>) cockle (<i>periwinkle, sea urchin</i>) crab crawfish (<i>crayfish, ecrevisse</i>) lobster (<i>langouste, langoustine, scampo, coral, tomalley</i>) mollusks	mussels octopus oysters prawns scallops shrimp (<i>crevette</i>) snails (<i>escargot</i>) squid (<i>calamari</i>)
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May indicate the presence of shellfish protein:

bouillabaisse cuttlefish ink fish stock flavoring (<i>including natural and artificial</i>) seafood flavoring (<i>such as crab or clam extract</i>) surimi	Keep the following in mind: Any food served in a seafood restaurant may be cross-contaminated with fish or shellfish. For some individuals, a reaction may occur from cooking odors or from handling fish or shellfish. Always carry medications and use them as soon as symptoms develop.
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Nutrition Facts			
Serving Size 3 oz. (85g)			
Amount Per Serving		As Served	
Calories 38		Calories from Fat 0	
		<small>% Daily Value</small>	
Total Fat 0g			0%
Saturated Fat 0g			0%
Cholesterol 0g			0%
Sodium 0g			2%
Total Carbohydrate 0g			3%
Dietary Fiber 0g			8%
Sugars 0g			
Protein 0g			
Vitamin A 270%	¥	Vitamin C 10%	
Calcium 2%	¥	Iron 0%	
Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:			
	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	80g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Source: *Guidelines for Allergy Prevention and Response (August 2010)*,
 Retrieved from http://www.health.mo.gov/living/families/schoolhealth/pdf/mo_allergy_manual.pdf

J

Section J
SCHOOL
ENVIRONMENTAL
SUPPORT

INDOOR AIR QUALITY TOOLS FOR SCHOOLS PROGRAM

Step-by-step guidance to improving the air quality in our nation's schools

The Problem

Nearly 56 million people in the United States spend their days in elementary and secondary schools. According to the Department of Education's National Center for Education Statistics, in 1999, 43 percent of America's public schools—about 33,800—reported at least one unsatisfactory environmental condition (i.e., lighting, heating, ventilation, indoor air quality, acoustics or noise control, or physical security of the building). Approximately 25 percent of public schools reported that ventilation was unsatisfactory, while indoor air quality (IAQ) was reported to be unsatisfactory in about twenty percent of schools. Poor indoor air quality can impact the comfort and health of students and staff, which in turn can affect concentration, attendance, and student performance. Schools that fail to respond promptly and effectively to poor IAQ run the risk of increased short-term health problems, such as fatigue and nausea, as well as long-term health problems like asthma. In serious cases, schools have been shut down and have had to move staff and students to temporary facilities. Delaying remediation of IAQ problems can also be costly and may even lead to liability claims and lawsuits that can damage a school's reputation. Clearly, IAQ issues are best addressed early and better still proactively

The Solution

The IAQ Tools for Schools (IAQ TFS) Program is a comprehensive resource that can help you maintain a healthy environment in your school buildings, by identifying, correcting, and preventing IAQ problems. The Kit is provided to schools at no cost and includes easy-to-follow checklists, videos, sample memos and policies, a recommended management plan, and a unique problem-solving wheel. Using the tools in the Kit, school officials can educate staff students, and parents about the importance of good IAQ and their roles in ensuring a healthy, comfortable

learning environment. Armed with the knowledge of good IAQ practices and commonsense preventive measures, schools can address most IAQ problems on their own. After all, ensuring a healthy school environment is an investment in your students and staff. To learn more about the *IAQ TFS Kit* and other resources available to you, visit EPA's Web site at www.epa.gov/iaq/schools or order a free Kit by calling the IAQ INFO hotline at (800) 438-4318.

Awards and Recognition

The *IAQ TFS Awards Program* provides incentives and public recognition to schools and school districts that are implementing the Kit. Three award categories are offered: **Great Start**, **Leadership**, and **Excellence**, each honoring schools and school districts as they progress through the various stages of the *IAQ TFS Kit*. Many school districts have been recognized for outstanding achievement and leadership in improving indoor air quality. See our Web site at www.epa.gov/iaq/schools/awards for additional information and applications.

Training and Networking Resources

Learn from the experts! Training and networking resources for schools managing IAQ issues are widely available. The IAQ TFS Program sponsors an annual Symposium, internet presentations, and offers specialized training on financing, communications, and facilities maintenance. See www.epa.gov/iaq/schools/index.html for additional information.

*<http://www.epa.gov/iaq/schools/>
United States Environmental Protection Agency
EPA 402-F-03-011*

Indoor Air Quality



Tools for Schools

How to Implement a District-Wide IAQ Tools for Schools Program

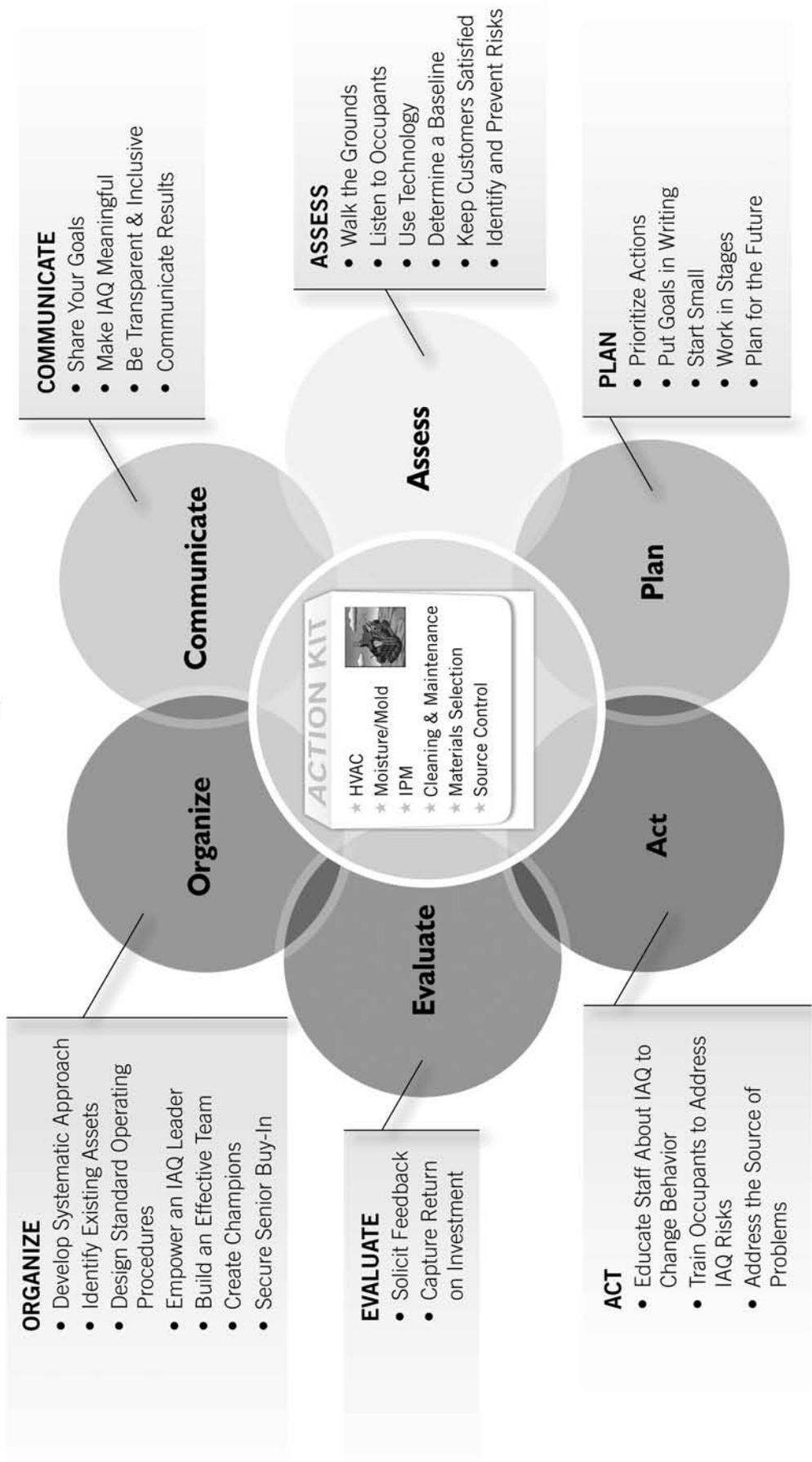
The *Indoor Air Quality Tools for Schools (IAQ TFS)* Program is a flexible, comprehensive resource for a school building's health. The district-wide approach for implementing the *IAQ TFS* Kit has become the standard for schools that are looking to initiate proactive indoor air quality (IAQ) practices in their school system. Successful programs rely on IAQ Teams that are dedicated to eliminating poor IAQ and are armed with the knowledge of IAQ issues and commonsense preventative measures. Working together, the IAQ Team will accomplish the steps needed to successfully implement the *IAQ TFS* Kit district-wide. As implementation progresses, the Team will launch their IAQ management plan, after securing buy-in from the superintendent and school board. The success of the *IAQ TFS* Program depends on motivated, dedicated people. After all, ensuring a healthy school is an investment in the students and staff. This guide can help launch a district-wide plan today!

- **Be Proactive.** Make IAQ management a priority within the school district.
- **Obtain Buy-In.** One of the initial steps is to obtain buy-in from the upper management (superintendents, school boards, chief financial officers, facility management directors, etc.) within the school district. These decision makers are key to an IAQ program being adopted district-wide.
- **Organize District-Wide.** Organize a district-wide IAQ Team. Ideally, individuals who are part of this team should be key players in the implementation of the *IAQ TFS* Program. As a prerequisite, IAQ team members should have a good understanding of IAQ problems in their district. These individuals need to know IAQ procedures and have the technical background to evaluate their facilities.
- **IAQ Coordinators.** Assign IAQ coordinators to each school in your District. They will serve as the primary contact at each school and as on-site manager for IAQ concerns.
- **Training and Education.** Conduct training and education for all your school IAQ coordinators, school faculty, and staff to familiarize them with the *IAQ TFS* Kit. A Kit should be available at each school as a reference guide. All school personnel can potentially be affected by IAQ, and they will be better advocates of promoting good IAQ if they understand the health effects associated with poor IAQ.
- **Distribute *IAQ TFS* Checklists.** Distribute checklists and establish a checklist log. Summarize completed checklist to assess status of radon, lead, and pest management programs in each school in your district.
- **Conduct School Walkthroughs.** Conduct walkthroughs at each school. The district IAQ Team should assign one or more individual(s) to assess current and potential IAQ problems in each school building, using the walkthrough checklist found in the Kit. It is recommended that other school staff participate in order to learn about the assessment of IAQ in the building. The findings will be forwarded to the district IAQ Team, which will review each school's findings and prioritize them into short-term and long-term IAQ improvement projects.

- **Prioritize IAQ Improvement Projects and Take Action.** Projects for each school should be prioritized into short-term and long-term categories based on health-related and financial considerations. After the IAQ improvement list has been finalized, the low-cost solutions should be implemented first. Many IAQ hazards can be remediated by simply educating the school staff and changing the current habits of the school occupants (i.e., explaining to the teachers that placing posters or books on unit-ventilators reduces fresh air circulation). Develop an implementation plan for long-term IAQ improvements.
- **Financing Options.** Research financing vehicles to obtain funding for the long term, more expensive IAQ improvements. There are many options available to schools and states (grants, performance contracting savings, etc.). Initiate a meeting with a financial expert and include the CFO and business officials of the school. These individuals are key to understanding the available funding options for schools. Because these key decision makers have been involved from the beginning with the implementation of an IAQ action plan, understanding potential funding mechanisms will strengthen the school's commitment to working towards the goal of improved indoor air quality.
- **Continuing Education.** Conduct refresher classes about IAQ to make sure that the staff understands how behavior can influence IAQ in a school building. Address any overall *IAQ TFS* implementation concerns that school staff and faculty may have. Let this be an opportunity where the district IAQ coordinator can address and explain all the improvements in each school.
- **Internal and External Communications Strategy.** Develop an active internal and external communications plan that will educate and raise awareness among school district employees and in the community about IAQ issues in the school/school district and the benefits of good IAQ.
- **Pro-Active IAQ Management Plan.** Develop an ongoing preventive IAQ management plan supported by district-wide decision makers. The IAQ management plan should prioritize activities and identify areas needing special funding or attention. Medical emergency response should also be addressed.
- **Establish Good IAQ Policies.** Consider district-wide policies which support good IAQ:
 - ✓ Implement integrated pest management practices.
 - ✓ Establish a "No Animals in the Classroom" protocol.
 - ✓ Secure food in the classroom in air-tight containers.
 - ✓ Direct idling motor vehicles (e.g., buses) away from air intake vents.
 - ✓ Promote good IAQ painting practices (e.g., use low volatile organic compound paints and paint when building is unoccupied).
 - ✓ Clean carpets according to manufacturer's recommendations.
- **Program Evaluation.** Review and evaluate the effects of your district-wide *IAQ TFS* Program.
- **Apply for an IAQ TFS Award.** Districts are eligible to receive a Great Start Award at the beginning stages of implementing the *IAQ TFS* Program. After showing substantial progress in the Program, districts are eligible to apply for the *IAQ TFS* Leadership Award. Finally, districts that demonstrate exemplary IAQ programs and outstanding achievements are eligible for the *IAQ TFS* Excellence Award. For further information on the Awards Program criteria and applications, see the *IAQ TFS* Web site at www.epa.gov/iaq/schools.



The Framework for Effective School IAQ Management: Six Key Drivers



ASTHMA TIPS FOR CUSTODIANS

Cleaning Suggestions:

Carpeted rooms should be vacuumed daily. All other rooms should be vacuumed every other day with commercial efficiency particle arresting (HEPA) filter or cleaner.

Hard Floors are less likely to be an asthma trigger if kept clean. Dust with static electricity or mineral oil treated mops daily. Wet mops should be used weekly.

Bookshelves trap dust easily. Dust horizontal surfaces weekly, when students are not present in the classroom.

Cleaning Supplies contain chemicals that irritate students with asthma. Replace irritating cleaners with safer, effective alternatives when possible.

Pests should be controlled with Integrated Pest Management (IPM). This program focuses on preventing pests by minimizing the resources needed for survival in the school setting. This decreases the need for application of pesticides. When pests become problematic, alternatives are used prior to the application of pesticide.

Rugs should be removed where possible, and tile kept clean. Bare wood or tile floors are best for keeping asthma under control.

Carpet Squares trap dust. Clean them weekly. Avoid vacuuming when students are in school.

Curtains should be kept off windows where possible. If a valance is needed, synthetic rather than natural fibers are preferable. Curtains and valances should be washed twice yearly.

Shades are better than curtains, and should be washed with a damp cloth weekly.



MORE ASTHMA TIPS FOR CUSTODIANS

Heating and Cooling System:

Fan blade and front grate should be cleaned monthly. Face fan to blow out toward the window, thereby decreasing the amount of pollen and pollution brought into the classroom.

Towels should not be placed under window units to collect condensation. This is an excellent place for mold and bacteria to grow.

Air conditioner filters should be cleaned every two weeks.

Belt-Type Humidifiers should be avoided in the school setting.

Air Conditioners or dehumidifiers should be used to keep relative humidity in the classroom low, between 30-50%.

General Tips:

Identify areas in the school that may be contributing to indoor air pollution.

Participate on Indoor Air Quality (IAQ) management in your school, and help evaluate school air quality needs.

Determine with administration how well the current air quality program at your school works, and modify the plan as necessary.

Identify barriers to maintaining good indoor air quality.

Determine reasonable methods of eliminating environmental pollutants from the school facilities.

Use Integrated Pest Management Plans.



NATURAL CLEANING AGENTS
for an asthma-friendly classroom

- White or apple cider vinegar removes mold, mineral deposits, and crayon marks.
- Baking soda is a good general cleaner that can be used as a rug deodorizer, or a refrigerator deodorizer.
- Baking soda followed by vinegar 1:1 solution to clean drains
- Club soda is a good spot remover.
- Use a vinegar solution or soap and water, mold remover, and cleaning agent.
- Use liquid rather than bar soap (mild or unscented) for hand washing.

Some cleaning products have strong fumes. Replace caps quickly, and use when students are not around, whenever possible.

Avoid using aerosol sprays with students around.

Make sure danger stickers are in place on all cleaning materials kept in the classroom. Keep such materials stored out of the reach of students.



Source: Chicago Public Schools

SAMPLE DISTRICT POLICY FOR CARPETING IN SCHOOLS

General

Recognize the potential problematic health implications of carpeting in schools, particularly in basements and on bare concrete, where moisture and mold are potential problems.

Consider carpeting those areas of schools where teachers and administrators are likely to bring in their own area rugs, mats, and carpets (e.g. places where students sit on the floor, noisy areas where carpeting is needed to buffer the echo of sound.)

When carpeting areas of a school:

1. Clean old carpet before removal and clean the area thoroughly prior to installation of new carpet (otherwise the dust and dirt of the old carpet is emitted into the air system and collects onto the new carpet).
2. Assure that only approved carpets with specific properties be allowed into the school district. The following properties (and in this order of importance) are recommended: low pile density in loop carpet, low height, fluorocarbon coating of fibers, high denier per filament, and a fiber shape with a low surface area. These properties are associated with increased release and recovery of common allergens when vacuumed.
3. Area rugs and children's mats need to meet the same health standards as wall-to-wall carpeting in schools.
4. For large renovation projects, request that the manufacturer specify the adhesive, offer a warranty for volatile organic compound (VOC) emissions, and test beyond federal standards for a total VOC emission level that is less than 100 mcg/m²/hour (measured after 24 hours).
5. Use new, available non-adhesive fastening systems. If adhesive is absolutely necessary, utilize solvent-free, low VOC products.
6. Pre-ventilate carpets elsewhere for several days, when there are VOC's present.
7. Maximize ventilation during installation and isolate the area from the rest of the school (including air circulation).
8. Clean the new carpet prior to opening area to students and staff. Use HEPA filtration vacuum (to remove any loose fibers and particles resulting from the installation process).
9. Keep students and staff away from the newly installed carpets as long as possible.
10. Keep carpet away from entrances where toxins track in from the outside and water sources.

General Maintenance of Carpets

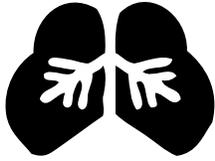
1. Area rugs and student mats need to be included with wall-to-wall carpeting as part of the district's maintenance responsibilities.
2. Provide deep, extensive vacuuming at least every other day with High-Efficiency vacuums and HEPA-style filters in order to control contaminant levels in carpets.
3. Ensure adequate, continuous ventilation throughout the carpeted space.
4. Replace wet carpets, rather than try to dry them and preserve, because of mold and mildew residues that cannot be removed.
5. Provide steam-cleaning to carpets regularly.
6. Do not consider use of the araicide "benzyl benzoate" or denaturing agent "tannic acid" at this time.
7. Replace carpeting frequently.

K

Section K
**PLANNING &
EVALUATING OUR
SCHOOL ASTHMA
SERVICES**

NATIONAL ASTHMA EDUCATION AND PREVENTION PROGRAM

Resolution on Asthma Management at School



National Asthma Education and
Prevention Program

Asthma affects nearly 6.2 million children in the United States. This chronic lung disease causes unnecessary restriction of childhood activities and is a leading cause of school absenteeism. Asthma is controllable, however. With proper treatment and support, children with asthma can lead fully active lives.

The National Asthma Education and Prevention Program (NAEPP) believes that schools should adopt policies for the management of asthma that encourage the active participation of students in the self-management of their condition and allow for the most consistent, active participation in all school activities. These policies should allow:

- A smoke-free environment for all school activities.
- Access to health services supervised by a school nurse. These services should include identification of students with asthma; a written asthma management plan for each student with asthma; appropriate medical equipment; and the support of an adult, as appropriate, to evaluate, monitor, and report on the administration of medication to the parent/guardian and/or health provider.
- A written medication policy that allows safe, reliable, and prompt access to medications in the least restrictive way during all school-related activities and self-managed administration of medication (including consideration of allowing students to carry and self-administer medications) consistent with the needs of the individual child and the safety of others.
- A school-wide emergency plan for handling severe exacerbations of asthma.
- Staff development for all school personnel on school medication policies, emergency procedures, and procedures for communicating health concerns about students.
- Development of a supportive and healthy environment that respects the abilities and needs of each student with asthma.

NAEPP Coordinating Committee Organizations

Agency for Health Care Policy and Research ☼ Allergy and Asthma Network/Mothers of Asthmatics ☼ American Academy of Allergy, Asthma, and Immunology ☼ American Academy of Family Physicians ☼ American Academy of Pediatrics ☼ American Academy of Physician Assistants ☼ American Association for Respiratory Care ☼ American Association of Occupational Health Nurses ☼ American College of Allergy, Asthma, and Immunology ☼ American College of Chest Physicians ☼ American College of Emergency Physicians ☼ American Lung Association ☼ American Medical Association ☼ American Nurses Association ☼ American Pharmaceutical Association ☼ American Public Health Association ☼ American School Health Association ☼ American Society of Health-System Pharmacists ☼ American Thoracic Society ☼ Association of State and Territorial Directors of Public Health Education ☼ Asthma and Allergy Foundation of America ☼ Centers for Disease Control and Prevention ☼ National Association of School Nurses ☼ National Black Nurses Association ☼ National Center for Environmental Health ☼ National Center for Health Statistics ☼ National Heart, Lung, and Blood Institute ☼ NHLBI Ad Hoc Committee on Minority Populations ☼ National Institute for Occupational Safety and Health ☼ National Institute of Allergy and Infectious Diseases ☼ National Institute of Environmental Health Sciences ☼ National Medical Association ☼ Society for Public Health Education ☼ U.S. Environmental Protection Agency ☼ U.S. Public Health Service

*Coordinated by the National Heart, Lung, and Blood Institute, National Institutes of Health
For additional information, contact the NAEPP at 301-592-8573 (phone) or 301-592-8563 (fax)*

STUDENTS WITH CHRONIC ILLNESSES:

Guidance for Families, Schools, and Students

Chronic illnesses affect at least 10 to 15 percent of American children. Responding to the needs of students with chronic conditions, such as asthma, allergies, diabetes, and epilepsy (also known as seizure disorders), in the school setting requires a comprehensive, coordinated, and systematic approach. Students with chronic health conditions can function to their maximum potential if their needs are met. The benefits to students can include better attendance, improved alertness and physical stamina, fewer symptoms, fewer restrictions on participation in physical activities and special activities, such as field trips, and fewer medical emergencies. Schools can work together with parents, students, health care providers, and the community to provide a safe and supportive educational environment for students with chronic illnesses and to ensure that students with chronic illnesses have the same educational opportunities as do other students.

Family's Responsibilities

- Notify the school of the student's health management needs and diagnosis when appropriate. Notify schools as early as possible and whenever the student's health needs change.
 - Provide a written description of the student's health needs at school, including authorizations for medication administration and emergency treatment, signed by the student's health care provider.
 - Participate in the development of a school plan to implement the student's health needs:
 - Meet with the school team to develop a plan to accommodate the student's needs in all school settings.
 - Authorize appropriate exchange of information between school health program staff and the student's personal health care providers.
 - Communicate significant changes in the student's needs or health status promptly to appropriate school staff.
- Provide an adequate supply of student's medication, in pharmacy-labeled containers, and other supplies to the designated school staff, and replace medications and supplies as needed. This supply should remain at school.
 - Provide the school a means of contacting you or another responsible person at all times in case of an emergency or medical problem.
 - Educate the student to develop age-appropriate self-care skills.
 - Promote good general health, personal care, nutrition, and physical activity.

School District's Responsibilities

- Develop and implement district wide guidelines and protocols applicable to chronic illnesses generally and specific protocols for asthma, allergies, diabetes, epilepsy (seizure disorders), and other common chronic illnesses of students.
- Guidelines should include safe, coordinated practices (as age and skill level appropriate) that enable the student to successfully manage his or her health in the classroom and at all school-related activities.
- Protocols should be consistent with established standards of care for students with chronic illnesses and Federal laws that provide protection to students with disabilities, including ensuring confidentiality of student health care information and appropriate information sharing.
- Protocols should address education of all members of the school environment about chronic illnesses, including a component addressing the promotion of acceptance and the elimination of stigma surrounding chronic illnesses.



- Develop, coordinate, and implement necessary training programs for staff that will be responsible for chronic illness care tasks at school and school-related activities.
- Monitor schools for compliance with chronic illness care protocols.
- Meet with parents, school personnel, and Health care providers to address issues of concern about the provision of care to students with chronic illnesses by school district staff.
- Communicate with families regularly and as authorized with the student's health care providers.
- Ensure that the student receives prescribed medications in a safe, reliable, and effective manner and has access to needed medication at all times during the school day and at school-related activities.
- Be prepared to handle health needs and emergencies and to ensure that there is a staff member available who is properly trained to administer medications or other immediate care during the school day and at all school-related activities, regardless of time or location.

School's Responsibilities

- Identify students with chronic conditions, and review their health records as submitted by families and health care providers.
- Arrange a meeting to discuss health accommodations and educational aids and services that the student may need and to develop a 504 Plan, Individualized Education Program (IEP), or other school plan, as appropriate. The participants should include the family, student (if appropriate), school health staff, 504/IEP coordinator (as applicable), individuals trained to assist the student, and the teacher who has primary responsibility for the student. Health care provider input may be provided in person or in writing.
- Provide nondiscriminatory opportunities to students with disabilities. Be knowledgeable about and ensure compliance with applicable Federal laws, including Americans With Disabilities Act (ADA), Individuals With Disabilities Education Act (IDEA), Section 504, and Family Educational Rights and Privacy Act of 1974 (FERPA). Be knowledgeable about any State or local laws or district policies that affect the implementation of students' rights under Federal law.
- Clarify the roles and obligations of specific school staff, and provide education and communication systems necessary to ensure that students' health and educational needs are met in a safe and coordinated manner.
- Implement strategies that reduce disruption in the student's school activities, including physical education, recess, offsite events, extracurricular activities, and field trips.
- Ensure that all staff who interact with the student on a regular basis receive appropriate guidance and training on routine needs, precautions, and emergency actions.
- Provide appropriate health education to students and staff.
- Provide a safe and healthy school environment.
- Ensure that case management is provided as needed.
- Ensure proper record keeping, including appropriate measures to both protect confidentiality and to share information.
- Promote a supportive learning environment that views students with chronic illnesses the same as other students except to respond to health needs.
- Promote good general health, personal care, nutrition, and physical activity.

Student's Responsibilities

- Notify an adult about concerns and needs in managing his or her symptoms or the school environment.
- Participate in the care and management of his or her health as appropriate to his or her developmental level.

STRATEGIES FOR ADDRESSING ASTHMA

Within a Coordinated School Health Program

<http://www.cdc.gov/HealthyYouth/Asthma/strategies.htm>

Asthma-friendly schools have policies and procedures that allow students to successfully manage their asthma. Chances for success are better when the entire educational community takes part—school administrators, teachers, and staff along with the students and parents/guardians. Here are six strategies identified by the Centers for Disease Control and Prevention (CDC) to employ when establishing a school asthma program.

1. Establish management and support systems

- Identify your school's or district's existing asthma needs, resources and potential barriers
- Develop and implement written policies concerning asthma education and management
- Use or adapt present school health records to identify all students with diagnosed asthma
- Use 504 Plans or IEPs as appropriate for health services and changes in physical activity
- Obtain administrative support and others in the school community
- Develop systems to promote ongoing communication among students, parents/guardians, teachers, school nurses, and health care providers
- Evaluate asthma program strategies and policies annually
- Designate a person to coordinate asthma activities at the district and school level
- Use health room and attendance records to track students with asthma. Focus particularly on students with poorly managed asthma as demonstrated by frequent absences, school health office visits, emergency room visits, or hospitalizations.
- Seek available federal, state and private funding for school asthma programs.

2. Provide appropriate school health services for students with asthma

- Obtain a written asthma action plan for each student with asthma
 - a. Plan should be provided and signed by parents/guardians
 - b. Plan should include individual emergency protocol, medications, peak flow monitoring, environmental triggers, and emergency contact information
- Ensure that at all times students have immediate access to medications as prescribed by their provider and approved by parents
- Use standard emergency protocols for students in respiratory distress who have no asthma action plan
- Ensure that case management is provided for students with frequent school absences
- Ensure access to a consulting provider for each school

3. Provide asthma education and awareness programs for students and staff

- Ensure that students with asthma receive education on asthma basics
- Provide school staff with education on asthma basics, management, and emergency response as part of their professional development activities
- Integrate asthma awareness and lung health education lessons into health curricula
- Provide and/or support smoking and cessation prevention programs for students and staff

4. Provide a safe and healthy school environment to reduce asthma triggers

- Prohibit tobacco use at all times on school property and at all school related activities
- Eliminate indoor air quality problems by reducing or eliminating allergens and irritants
- Use integrated pest management (IPM) techniques to control pests

5. Provide enjoyable physical education opportunities for asthma students

- Encourage full participation in physical activities when students are well
- Ensure that students have access to preventive medications before activity and immediate access to emergency medications during activity as prescribed by their provider and approved by parents/guardians

6. Coordinate school, family, and community efforts to better manage asthma symptoms and reduce school absences among students with asthma.

- Obtain written parental permission for school health staff and primary care providers to share student health information.
- Educate, support, and involve family members in efforts to reduce students' asthma symptoms and school absences.
- Work with local community programs. Coordinate school and community services, including community health care providers, community asthma programs and coalitions, community counselors, social workers, case managers, and before and after school programs. Encourage interested school staff to participate in community asthma coalitions.



Adapted from: Strategies for Addressing Asthma Within a Coordinated School Health Program. Department of Health and Human Services; Centers for Disease Control and Prevention

DEVELOPING AN ASTHMA MANAGEMENT PROGRAM FOR YOUR SCHOOL

Developing an asthma management program shows that your school is responsive to the needs of students with asthma. By developing procedures and guidelines, the asthma management program ensures that staff knows how to help students with asthma. A management program should contain:

- A confidential list of students who have asthma.
- School policies and procedures for administering medications, including protocols for emergency response to a severe asthma episode.
- Specific actions for staff members to perform in the asthma management program.
- A written action plan for every student with asthma.
- Education for staff and students about asthma.

Student Asthma Action Plan

Schools should request that parents or guardians send a written student asthma action plan to school. This action plan should include daily management guidelines and emergency steps in case of an asthma episode. The plan should describe the student's medical information and specific steps for responding to worsening asthma symptoms. The asthma action plan should contain:

- A list of medications the student receives, noting which ones need to be taken during school hours. Also, medications needed during school activities "off-site" and "off-hours" should be noted and available.
- A specific plan of action for school staff in case of an acute episode that includes guidance for monitoring peak flow.
- Identified triggers that can make asthma worse.
- Emergency procedures and phone numbers.

This action plan should be developed by a licensed health care provider or physician, signed by a parent and the physician, kept on file at school, and renewed every year. Because every student's asthma is different, the action plan must be specific to each student's needs. The asthma action plans included in this guide serve as examples that may be adapted to fit the needs of your school in gathering and sharing asthma management information among school staff, parents or guardians and physicians.

Partnerships for an Asthma-Friendly School

A strong family-physician-school partnership is essential for students with asthma. A strong partnership improves attendance and positive educational outcomes for students with asthma. School policies supportive of partnerships contain the following:

- Outreach to families to encourage participation in managing students' asthma at school.
- Professional development for teachers and staff to enhance their effectiveness in asthma management and their skills in communicating with families.
- Good communication among physicians, school staff, and families, such as an ongoing exchange of information, agreement on goals and strategies, and a sharing of responsibilities.
- Opportunities for families to share in decision making regarding school policies and procedures affecting their children.
- Linkages with special service agencies and community groups to address family and community issues when appropriate.

Source: Managing Asthma: A Guide for Schools. National Heart, Lung, and Blood Institute (NHLBI), National Institutes of Health, U.S. Department of Health and Human Services, and the Fund for the Improvement and Reform of Schools and Teaching, Office of Educational Research and Improvement (OERI), U.S. Department of Education. September 1991. Revised July 2003. NIH Publication No 91-2650. Reviewed by Asthma Ready® Communities staff (2010).

HOW COMPREHENSIVE IS YOUR SCHOOL ASTHMA MANAGEMENT PROGRAM?

From the list below, check off those basic elements that make up the school asthma management program that you already have in place at your school.

- Identified staff person(s) to coordinate the program
- A confidential list of students who have asthma
- School policies and procedures for administering medications, including protocols for emergency response to a severe asthma episode
- Specific actions for staff members to perform in the asthma management program
- Education for staff and students about asthma
- A written action plan on file for every student with asthma, including:
 - A list of medications to be taken
 - Steps for school staff to take in case of an asthma episode
 - Identified triggers that can make asthma worse
 - Emergency procedures and phone numbers
- A strong family-physician-school partnership

If there are gaps in the basic elements included in your current school asthma management program, or if you are looking for resources to enhance your current efforts, visit *Managing Asthma: a Guide for Schools* for more helpful resources, available at http://www.nhlbi.nih.gov/health/prof/lung/asthma/asth_sch.pdf

Source: Managing Asthma: A Guide for Schools. National Heart, Lung, and Blood Institute (NHLBI), National Institutes of Health, U.S. Department of Health and Human Services, and the Fund for the Improvement and Reform of Schools and Teaching, Office of Educational Research and Improvement (OERI), U.S. Department of Education. September 1991. Revised July 2003. NIH Publication No 91-2650. Reviewed by Asthma Ready® Communities staff (2010).

TOP ONLINE ASTHMA RESOURCES FOR SCHOOL NURSES

Allergy and Asthma Network Mothers of Asthmatics

<http://www.aanma.org/?s=school+nurse> or

<http://www.aanma.org/faqs/asthma/>

Indoor AirRepair™ at Home, School, and Play

<http://www.aanma.org/publication/indoor-air-repair-kit/>

American Academy of Allergy, Asthma, & Immunology

Pollen counts, e-mail notification, much more

<http://www.aaaai.org/nab/index.cfm>

555 East Wells Street Suite 1100

Milwaukee, WI 53202-3823

(414) 272-6071

About asthma:

<http://www.aaaai.org/patients/gallery/asthma.asp>

American Academy of Pediatrics

141 Northwest Point Boulevard

Elk Grove Village, IL 60007

(800) 433-9016

<http://www.aap.org>

Asthma and Allergy Foundation of America

1125 15th Street, NW, Suite 502

Washington, DC 20005

(800) 7-ASTHMA

<http://www.aafa.org>

Asthma Management and Education Course

<http://www.aafa.org/display.cfm?id=4&sub=79&cont=432>

American College of Allergy, Allergy, & Immunology Self-Tests for Adults and Children

<http://www.acaai.org/patients/asthma-screening/Pages/asthma-self-tests.aspx>

American Lung Association

<http://www.lungusa.org/asthma/index.html>

Asthma Here & Now

News and information service of the Missouri

Asthma Coalition

<http://www.asthmahere.org/>

Asthma Ready® Communities

Missouri statewide effort to close service gaps in schools, daycare, primary care, ERs and hospitals, and specialty care.

<http://www.asthmaready.org/>

Asthma Index National Heart, Lung, and Blood Institute National Asthma Education and Prevention Program

P.O. Box 30105, Bethesda, MD 20824-0105

(301) 251-1222

<http://www.nhlbi.nih.gov/health/public/lung/index.htm>

<http://www.nhlbi.nih.gov/health/prof/lung/index.htm>

Association of Asthma Educators

1215 Anthony Avenue

Columbia, SC 29201-1701

888-988-7747

<http://www.asthmaeducators.org>

Executive Summary, NHLBI Asthma Guidelines

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

Full text of 2007 NHLBI EPR3 Asthma Guidelines

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

Family Asthma Guide in English and Spanish

<http://www.childrenshealthfund.org/publications/family-asthma-guide>

Food Allergy & Anaphylaxis Network

<http://www.foodallergy.org/school.html>

Food Allergy Initiative

<http://www.faiusa.org/>

Impact Asthma Kids CD© & Screening Program

University of Missouri, Department of Child Health One

Hospital Drive, Columbia, MO 65212

(573) 884-8629

<http://impactasthma.missouri.edu>

Kids with Food Allergies

<http://www.kidswithfoodallergies.org/index.html>

Managing Asthma: A Guide for Schools

National Heart, Lung, and Blood Institute

http://www.nhlbi.nih.gov/health/prof/lung/asthma/asth_sch.pdf

National Association of School Nurses

<http://www.nasn.org/>

Quest for the Code asthma game

<http://www.starlight.org/asthma>

Strategies for addressing school asthma: DASH/ Healthy Youth!

CDC, National Center for Disease Prevention

<http://www.cdc.gov/healthyyouth/healthtopics/asthma>

Strategies for Addressing Asthma Within a Coordinated School Health Program

http://www.cdc.gov/nccdphp/dash/00_pdf/asthma.pdf

U.S. Environmental Protection Agency

Asthma Home Environment Checklist

http://www.epa.gov/asthma/pdfs/home_environment_checklist.pdf

Indoor Air Quality Tools for Schools

401 M Street, S.W.

Washington, DC 20460

(800) 438-4318

<http://www.epa.gov/iaq/schools/>

EVALUATING YOUR SCHOOL ASTHMA SERVICES

It takes time to improve school asthma services. Each school has different strengths and needs. The following tools can help you identify your accomplishments and target areas for improvement of school asthma services. First, review and edit the list of service goals below. Are any of these goals inappropriate for your setting? Should you add to this list?

Next, review the “School Asthma Program Evaluation Tool for Asthma Management in Schools” that follows this page. Are these items consistent with your program plan? Will your record-keeping system make it possible for you to complete this evaluation form from semester to semester and year to year? Do you want to add any other items to this form?

Finally, once a year complete the “Where Are the Gaps in Asthma Care for Children at School” survey. Discuss this with your health aides and school nurse peers. How could the identified barriers to good asthma care be removed? Develop one or two objectives for the upcoming school year. Take time to identify a specific indicator you can measure before and after you change things to determine if this component of care is improving over the coming months. Keep it simple and practical.

School Asthma Services (SAS) - Goals, School Nurse

- Supervise the administration of children’s asthma medications in the school setting:
 - a) written asthma action plan,
 - b) appropriate drug, dose and use,
 - c) appropriate delivery device and technique
- Judge level of control - achieved if child tolerates physical activity, is not absent from classroom due to asthma, and child and parent report that asthma is well controlled
- Provide structured opportunities for child to learn to control their asthma
- Evaluate child’s asthma knowledge, skills, and control
- Prepare reports of child’s asthma symptoms, medicine use to aid caregivers, clinicians
- Collaborate with school staff to ensure supportive policies and healthy environment
- Identify and support the various people who help control child’s asthma

SCHOOL ASTHMA PROGRAM EVALUATION TOOL FOR ASTHMA MANAGEMENT IN SCHOOLS

Goals for School Asthma Management

- Students with persistent asthma will have an Asthma Action Plan (Students have persistent asthma if they take daily asthma medication or they have asthma symptoms 2 or more times a week – See D1-D3 of manual)
- Staff providing direct care to children with asthma will participate in an annual continuing education program regarding asthma
- Teachers, coaches, playground personnel, bus drivers and music instructors will participate in an annual in-service addressing asthma
- Children with persistent asthma will complete a formal asthma self management education program
- No avoidable 911 calls from school related to asthma symptoms

Basic School Asthma Service Indicators

	Beginning of School Year	End of First Semester	End of Second Semester
Total Number of Students Identified with Asthma	_____	_____	_____
Percent of students with asthma (# with asthma/Total students x 100)	_____	_____	_____
Total Number of students with meds for asthma at school	_____	_____	_____
Total Number of student taking asthma medications at school	_____	_____	_____
Total Number of students identified with persistent asthma (Those students with “yes” answers on the medication administration form) Also see D1-D3 of manual	_____	_____	_____
Number of Students with an Asthma Action Plan	_____	_____	_____
Number of 911 calls made from school for asthma symptoms	_____	_____	_____

Asthma Training:

Number of asthma training sessions offered to staff	_____	_____
How many staff attended	_____	_____
Percent of staff trained	_____	_____
Number of asthma training sessions offered to parents or other caregivers	_____	_____
How many parents attended	_____	_____
Number of asthma training sessions offered to students	_____	_____
How many students attended	_____	_____

WHERE ARE THE GAPS IN ASTHMA CARE FOR CHILDREN AT SCHOOL? (SCHOOL NURSE)

Please rate each item below using the following scale, circling your answer:

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

1) I have current asthma action plans and medication administration authorization forms for children with asthma who require medication at my school.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

2) I have and use age-appropriate asthma instructional materials for individual children at my school(s).

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

3) I document students' inhalation technique and coach children to improve their use of inhaled asthma medicines.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

4) I have a written emergency plan for children with asthma at my school(s).

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

5) I provide written reports to parents of children who have asthma to share information concerning their symptoms and medication use at school.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

6) A child with asthma at my school(s) will complete a formal asthma self-management course that I coordinate at least every other year.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

7) I report students' asthma symptoms, medication use, other information to prescribing clinicians. This report influences future care and improves control.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

8) I interview families of children who have asthma to complete a school asthma action plan and to discuss special needs or concerns.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

9) Do you have Albuterol for use by any student with an asthma episode? (either a personal inhaler for every student or a stock Albuterol inhaler).

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

10) I work with a community worker and parents when the need for home-based resources is apparent for children with asthma.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

11) Parents notify me at school when children are experiencing a worsening pattern of asthma symptoms at home.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

12) When I have questions about asthma I am able to get help by phone from a knowledgeable clinician.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

13) I work with school staff to address environmental and policy issues effecting children who have asthma.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

14) I coordinate asthma education for school staff, students and parents to equip those who provide direct care and to enhance professional and public awareness.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

15) I contact parents when children with asthma are often absent to discuss their concerns and to determine the cause of absenteeism.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

16) I assure that a current "School Asthma Action Plan" is included in students IEP or 504 Plan.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

17) I have attended a helpful continuing education offering concerning the practical management of school asthma in the last three years.

1	2
Yes	No

18) There is strong administrative support for appropriate school asthma services in my district.

1	2	3	4	5	6
Never	Seldom	Sometimes	Usually	Often	Always

19) In my view the principal gaps in pediatric asthma care in my school(s) are:

APPENDIX

APPENDIX



National Association of School Nurses

POSITION STATEMENT

School Nursing Management of Students with Chronic Health Conditions

HISTORY

New technologies and treatments in health care make it possible for students with chronic health conditions to attend school and participate in the regular education classroom; and their right of participation is protected by federal law (Gelfman & Schwab, 2001). A chronic health condition is defined by Schwab and Gelfman as “one that is long term (usually more than three months duration) and is either not curable or has residual features that result in limitations in daily living requiring adaptation in function or special assistance,” (Schwab & Gelfman, 2001, p. 609, Glossary).

Examples of chronic health conditions include, but are not limited to, asthma, diabetes, allergies, including life-threatening allergies, genetic disorders, immunological disorders, cancer, orthopedic disorders, neuromotor disorders, and mental health disorders. Chronic health conditions are not always immediately apparent and may lead to chronic disabilities for students, disabilities that require complex health care interventions and possibly the routine use of medical devices or equipment. A professional registered school nurse has the expertise to safely and effectively manage the health care of students with chronic health conditions to enable them to participate in school.

DESCRIPTION OF ISSUE

The main issues surrounding health management of students with chronic health conditions in schools are:

- Health care services must be provided for students who qualify for services under IDEA or Section 504 to meet requirements of federal laws;
- State health laws, including Nurse Practice Acts, and education laws decide who will provide the health care services (Schwab, Gelfman & Cohn, 2001) and those laws in most states do not mandate that school health services are provided by licensed professional school nurses.
- Effective and safe management of chronic health conditions is complex, requires careful planning by a licensed professional school nurse, and may involve delegation of nursing tasks to both licensed and unlicensed assistive personnel (UAP).
- Individualized health care planning is a nursing responsibility and standard of care that is regulated by State Nurse Practice Acts and cannot be delegated to unlicensed individuals (National Council of State Boards of Nursing, 2005).
- A full-time professional licensed school nurse is essential to quality student health services.
- Dependable funding is essential to quality student health services (NASN, 2006).

RATIONALE

Health care needs of students with chronic health conditions are complex, and increasingly those students are attending school. In 1998, Newacheck, et al. estimated, based on the 1994 National Health Interview Survey, that in the United States, 18% of children under the age of 18 years had a chronic physical, developmental, behavioral, or emotional condition, and required health or related services beyond those required by children generally (Newacheck, et al., 1998). As the numbers of students with chronic health conditions increases, more school nurses are needed to provide health care services during the school day. The ratio of professional school nurses to students exceeds 1:3000 in many school districts (Praeger, Zickler, & Mosca, 2002). Only one state, Delaware, mandates the employment of a school nurse for every school. In schools where there is not a full-time licensed professional school nurse, disease management is left to either a part-time school nurse, or to UAP, who may be trained to carry out certain procedures or administer certain medications, but who do not have the knowledge or skills to make judgments in regard to side effects of medication or to prevention of, or action in, an emergency.

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Individualized health care planning, a professional school nursing function that cannot be delegated (National Council State Boards of Nursing, 2005), is necessary for the successful management of students with chronic health conditions to enable them to fully access their educational programs, to prevent the development of serious and life-threatening complications and emergencies, and to prolong life. The registered professional school nurse is responsible and accountable for creating the individualized health care plan (IHP), for management of activities of the plan and for the outcomes of the plan, even when implementation of the plan requires delegation to UAP.

CONCLUSION

Licensed professional school nurses are responsible and accountable for assessment of and planning for safe and effective medical management of students with chronic health conditions, practice responsibilities that cannot be delegated (National Council of State Boards of Nursing, 2005). Therefore, it is the position of NASN that school districts should provide a full-time professionally prepared registered nurse in every school building. NASN recommends minimum ratios of nurses to students depending on the needs of the student populations:

- 1:750 for students in the general population,
- 1:225 in the student populations that may require daily professional school nursing services or interventions,
- 1:125 in student populations with complex health care needs,
- 1:1 may be necessary for individual students who require daily and continuous professional nursing services.

Also recommended is additional school nurse staff to accommodate other student health needs including, but not limited to, special education evaluations, nursing services included in IEPs, nursing services for students with 504 Plans, and schools with large populations and large numbers of students with mental or social concerns (NASN, 2004).

References/Resources

- Cedar Rapids Community School District v. Garrett F*, 119 S.Ct. 992, 29 IDELR 966 (U.S. 1999). Retrieved February 7, 2006 from <http://supct.law.cornell.edu/supct/html/96-1793.ZS.html>.
- Gelfman, M. H. B. and Schwab, N. (2001). Discrimination in School: § 504, ADA, and Title IX. In N. C. Schwab, & M. H. B. Gelfman (Eds.), *Legal issues in school health services: A resource for school administrators, school attorneys and school nurses* (pp.335-371). North Branch, MN: Sunrise River Press.
- National Association of School Nurses. (2004). *Position statement: Caseload assignments*. Retrieved February 21, 2006, from <http://www.nasn.org/Default.aspx?tabid=209>.
- National Association of School Nurses. (2006). *Issue brief: School nursing management of students with chronic health conditions*. Scarborough, ME: Author.
- National Council of State Boards of Nursing. (2005). *Working with others: A position paper*. Retrieved January 10, 2005, from http://www.ncsbn.org/pdfs/Working_with_Others.pdf.
- Newacheck, P. W., Strickland, B., Shonkoff, J. P., Perrin, J. M., McPherson, P. A., McManus, M., Lauver, C., Fox, H., and Arango, P. (1998). An epidemiologic profile of children with special health care needs. *Pediatrics*, 102, 117-123. Retrieved February 9, 2006, from <http://www.pediatrics.org/cgi/content/full/102/1/117>
- Praeger, S., Zickler, C., & Mosca, N. W. (2002). *Care of students with special needs in schools: Application of professional school nursing practice standards*. Scarborough, ME: National Association of School Nurses.
- Schwab, N. C., Gelfman, M. H. B., & Cohn S. D. (2001). Fundamentals of U.S. law. In N. C. Schwab & M. H. B. Gelfman (Eds.), *Legal issues in school health services: A resource for school administrators, school attorneys and school nurses* (pp.55-79). North Branch, MN: Sunrise River Press.
- Schwab, N. C., Gelfman, M. H. B., & Cohn S. D. (2001). In N. C. Schwab & M. H. B. Gelfman (Eds.), *Legal issues in school health services: A resource for school administrators, school attorneys and school nurses* (p.609, Glossary). North Branch, MN: Sunrise River Press.

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National Association of School Nurses

POSITION STATEMENT

The Use of Volunteers for Health Services

SUMMARY

It is the position of the National Association of School Nurses (NASN) that quality health care in the school environment can best be attained through employment of a full-time registered nurse for each school building. A registered nurse who meets applicable state requirements to be employed as a school nurse is qualified to manage school health programs and services. It is the position of NASN that volunteers should be used only to assist the school nurse, not to replace the nurse. Health care needs of students and school communities are increasingly complex. Volunteers, licensed and unlicensed, should cautiously be utilized to assist the professional school nurse, never to replace the school nurse.

HISTORY

Partnerships are growing among schools, parents, and communities to meet educational demands of students. Volunteers are sometimes used by school personnel to provide school health services. Volunteers offer diversity of experiences, credentials, and levels of expertise. They may be licensed health care providers, such as registered nurses or physicians; unlicensed health care providers, such as emergency medical technicians or health aids; or non-medical people, such as parents.

DESCRIPTION OF ISSUE

The school is a unique environment for providing health services, and consequently, the utilization of volunteers requires careful training, planning, and on-going supervision by the school nurse. The school nurse's ability to provide comprehensive health services to students can be enhanced or complicated by utilizing volunteers. Safety and nursing practice concerns may outweigh the advantages of using volunteers as student health needs become increasingly complex. Issues of dependability, liability, confidentiality, and competency must be considered when determining a volunteer's role. More appropriately, volunteers may provide clerical assistance in the health room and assist with special projects under the direction of the school nurse.

District policy should clearly define the role of health service volunteers and whether nursing tasks may be delegated by the school nurse to unlicensed volunteers in accordance with state nurse practice acts. If a task is assigned to a volunteer, the licensed nurse is responsible for assessing the competency of the volunteer performing the task and for supervising the volunteer. The nurse may not delegate to unlicensed assistive (including volunteer) personnel any task requiring the specialized knowledge, judgment, and skill of a licensed professional nurse (ANA, 1997). State nurse practice acts and the Nursing Code of Ethics hold the licensed nurse responsible and accountable for individual nursing practice, and the obligation to provide optimum patient care (ANA Code of Ethics, 2001). Licensed volunteers may function within the Scope and Standards of School Nursing Practice (NASN/ANA, 2001) and according to school district policy.

When utilized, volunteers providing health services should receive documented training in universal precautions to prevent exposure to blood borne pathogens, confidentiality laws, injury prevention, and documentation. The school nurse is the most qualified professional to provide annual training and management of volunteers.

RATIONALE

The health, safety, and welfare of students, especially those with special needs, are of primary importance in school health. School nurses are licensed professionals trained to meet complex health care needs. Due to funding constraints, school districts may not employ adequate nursing staff to deliver comprehensive school health services. Therefore, licensed and unlicensed persons may be utilized, under the supervision of the school nurse, to assist with clerical duties, health screening, and simple first aid to enable the nurse to better serve students.

References/Resources

American Nurses Association (ANA). (1997). *Position statement: Registered nurse utilization of unlicensed assistive personnel*. Retrieved December 23, 2004 from <http://ana.org/readroom/position/uap/uapuse.htm>.

American Nurses Association (ANA). (2001). Code of ethics for nurses with interpretive statements. Retrieved November 22, 2005, from <http://www.nursingworld.org/ethics>.

Haley, M., Conklin, V.G., & Wolfe, M.C. (2001). Nurse volunteers in school-based hepatitis B immunization programs. *Journal of School Nursing*. 17(4). 185-188.

National Association of School Nurses (NASN) and the American Nurses Association (ANA). (2001). *Scope and standards of professional school nursing practice*. Washington, DC. American Nurses Publishing.

Schwab, N.C., & Pohlman, K.J. (2000). Managing risks in professional and clinical performance dilemmas: Part II, *Journal of School Nursing*. 16(3). 47-52.

Volunteers in the Health Office:

Adopted: June 2000

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National Association of School Nurses

ISSUE BRIEF

School Health Nursing Services Role in Health Care Asthma Management in the School Setting

INTRODUCTION

In the United States, 17.3 million people of all ages have asthma, according to estimates by the Centers for Disease Control and Prevention. One child in 13 (about 5 million) has been diagnosed with asthma, making it the most common chronic illness of childhood (Adams & Marano, 1994). Over the last 15 years, pediatric asthma has also increased in severity as well as in numbers. Although asthma affects children of all backgrounds, children in minority groups are more highly represented among those with this disease.

The noted increase in pediatric asthma is thought to be due to a combination of factors: better recognition and diagnosis of the condition at younger ages; changes in the prevalence and distribution of risk factors (obesity, single parent families, poverty, racial minority status, and decreased physical activity); increased time spent indoors in tightly sealed buildings; increased exposure to air pollution; and an increased prevalence of allergies (U.S. Department of Health and Human Services, 2000).

BACKGROUND

Asthma is an inflammatory lung condition in which the airways become blocked or narrowed. It is characterized by acute episodes, or attacks, of breathing problems that include coughing, wheezing, chest tightness, and shortness of breath. These symptoms are caused by three primary factors: airway muscle tightening, airway swelling, and mucous-blocked airways associated with increased airway responsiveness to a variety of stimuli, or "triggers". The triggers that cause an asthma episode vary both within and across individuals, but many with this disease experience an increase in asthma symptoms when exposed to the following:

- Allergens, such as pollen, animal dander, dust mites, cockroaches, and molds.
- Irritants, such as cold air, strong odors, chemicals, indoor and outdoor pollutants, weather changes, and cigarette smoke.
- Upper respiratory infections.
- Physical exercise, especially when there are changes in weather, including changes in temperature, humidity, and wind.
- Ambient temperature changes, such as going out into cold air or coming in from the heat into cool air.
- Strong emotions, such as hard laughing or crying.

Although psychological factors, such as stress, are not sufficient to cause asthma symptoms alone, stress can potentiate wheezing in those predisposed to or with the disease. Recurrent episodes of asthma can range in severity from inconvenient to life threatening.

It is estimated that in the United States, costs related to asthma were at least \$12.7 billion in 2000 (Public Health Policy Advisory Board, 2002). Direct costs include medical expenditures associated with hospitalizations, doctors' visits, and medications. Each year two million people are treated in emergency rooms and approximately 500,000 are hospitalized for their asthma. In 1998, children 0-17 years had 5.8 million visits to doctors' offices and hospital outpatient departments (Public Health Policy Advisory Board, 2002). All too often, after a health care provider office visit, an emergency room visit, or a hospitalization, these children present with wheezing and/or cough in the school health room. Not infrequently, the school nurse has never been told about the child's diagnosis or the children arrive at school with asthma medications, no instructions, and little understanding of their use.

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In the United States, the majority of the population spends 90 percent (about 20 hours a day) of their time indoors. Each day, one in five Americans, mostly children, spends the day in a school building. Because children breathe more rapidly and inhale more pollutants per pound of body weight than adults, children are especially vulnerable to respiratory hazards that may be in the air in and around their schools and homes. Therefore, reducing exposure to both indoor and outdoor environmental asthma triggers is an important step in controlling this condition.

Asthma also impacts children's quality of life. Asthma accounts for more than 100 million days of restricted activity annually and contributes to avoidance of school and activities. Children who have had interrupted sleep due to nighttime asthma symptoms come to school tired and may fall asleep in the classroom. They can also be lethargic or irritable. Additionally, students who experience difficulty in breathing find it difficult to concentrate on schoolwork, and those who need breathing treatments during school hours miss class time. When severe episodes occur, children also miss time from class and school. Furthermore, the side effects from some medications used in the treatment of asthma can interfere with performance and concentration as well, particularly when the child's medication regimen is not well-managed or monitored (Environmental Protection Agency, 2001).

Indirect costs from the burden of asthma are attributed to lost workdays, school absences, and decreased productivity. An estimated 11.8 million missed school days per year are attributed to asthma (Weiss, Sullivan, & Lyttle, 2000), making it the leading cause of school absenteeism due to a health condition. Other indirect costs include caretaker's lost workdays and costs associated with asthma deaths. With 5,000 deaths - 246 in children - occurring each year from asthma, the seriousness of this disease cannot be overlooked. And, both hospitalization and death rates among young children are increasing (Centers for Disease Control, 2001; U.S. Department of Health and Human Services, 2001).

RATIONALE

The National Association of School Nurses believes that:

- Every child should have access to a school nurse at a ratio of no more than 1:750. This ratio is particularly critical for children with a potentially life-threatening condition like asthma.
- The effective management of childhood asthma includes four components (American Academy of Allergy, Asthma & Immunology, 1999):
 - Regularly assessing and monitoring asthma, including use of objective measures of lung functioning.
 - Controlling factors that trigger asthma episodes and contribute to asthma severity.
 - Adequately managing asthma with pharmacologic therapy.
 - Educating asthma patients and their parents to become partners in their own care.
- The school nurse has an active role in coordinating effective asthma management in the school setting using a coordinated school health program approach and collaborating with local health care providers and asthma-related organizations and agencies to ensure that asthma care is appropriately integrated throughout the child's school activities.
- The school nurse is an effective change agent in the student's mastery of his/her self-management of asthma.
- Children have the right to easily accessible quick relief inhalers, including the right to carry these inhalers and self-administer medications when developmentally able.
- The school nurse has the responsibility to encourage and promote communication about the child's asthma among parents, school staff, and health care providers.
- The best way to provide optimal care for children is for health care providers to effectively communicate with one another about the child's care. Health care providers at emergency rooms and clinics should obtain permission from the parent/guardian to share Asthma Action Plans directly with the school nurse.

ROLE OF THE SCHOOL NURSE

School nurses play an important role in serving as a liaison between the school and child's home and between the school and health care providers in efforts to promote adherence with health care providers' orders related to asthma management. The school nurse develops and implements, in coordination with local providers and the coordinated school health team members, the child's asthma management plan; establishes and monitors compliance with school policy related to the management of children at school and during school-related activities; develops protocols for the care of children with acute respiratory distress at school; provides or supervises proper medication administration; supports education of the child in self-management; monitors the child's condition; advocates for the child's inclusion in school-related activities; and works with school staff to assure that accommodations are in place for the child's well-being.

Using the four components of asthma care, there are numerous ways for the school nurse to contribute to the effective management of students with asthma in the school setting by:

- Educating the student and his/her family in asthma management, including content about pathology, pharmacology, environmental irritants and allergens, and proper use of treatment and management devices, such as peak flow meters, metered dose inhalers, and nebulizers.
- Delivering developmentally-appropriate asthma self-management skill lessons.
- Developing asthma care plans and asthma action plans in collaboration with the student, his/her family, school staff, and the student's health care provider.
- Gathering asthma materials and resources for students, parents, and staff and disseminating these appropriately through a variety of media.
- Developing an asthma management policy or plan for the school that includes plans for respiratory emergencies and the management of acute asthma episodes at school, school-related activities, and crisis situations.
- Educating school staff about the effective use of individual asthma action plans.
- Educating the school board, school community, and school staff about asthma and asthma triggers in the school that need to be controlled and decreasing exposure to allergens and irritants by educating school staff about how its activities affect air quality.
- Proposing the development of indoor air quality teams in the school so that school staff is involved in making necessary changes to improve air quality.
- Working with local community groups to mobilize community resources for a comprehensive, culturally and linguistically competent approach to controlling asthma.
- Collaborating with health care providers to secure permission from parents to mail information directly to school nurses.
- Collaborating with emergency rooms and hospitals to provide a copy of discharge orders for the school nurse.
- Helping parents understand the importance of sharing appropriate information about the child's asthma with the school nurse and others in the school community involved with the child, including teachers, school staff, coaches, on-site or after-school daycare providers, etc.

REFERENCES

- Adams, P.F. & Marano, M.A. (1994). Current estimates from the National Health Interview Survey. *Vital Health Statistics* 1995, 10(193), 1094.
- American Academy of Allergy, Asthma and Immunology. (1999). *Pediatric asthma: Promoting best practice*. Retrieved October 18, 2001, from <http://www.aaaai.org/professional/initiatives/pediatricasthma.stm> database.
- Asthma and Allergy Foundation of America. (2001). *Costs of asthma. Introduction*. Retrieved October 17, 2001, from <http://www.aafa.org/templ/display.cfm?id=67> database.
- Centers for Disease Control. (2001, October). *New asthma estimates: Tracking prevalence, health care, and mortality*. Retrieved October 17, 2001, from <http://www.cdc.gov/nchs/products/pubs/pubd/hestats/asthma/asthma.htm>
- Environmental Protection Agency (2001). *Indoor Air Quality (IAQ). Indoor Air Quality (IAQ) in Schools*. Retrieved October 22, 2001, from <http://www.epa.gov/iaq/schools> database.
- Gregory, E. (2000). Empowering students on medication for asthma to be active participants in their care: An exploratory study. *Journal of School Nursing*, 16(1), 20-27.
- Public Health Policy Advisory Board. (2002). *Asthma: Epidemic increase cause unknown*. Retrieved April 21, 2002, from <http://www.phpab.org> database.
- U.S. Department of Health and Human Services. (2000). *Healthy people 2010, Vol. I (2nd ed.)*. Washington, DC: U.S. Government Printing Office.
- Weiss, K. B., Sullivan, S. D., & Lyttle, C. S. (2000). Trends in the cost of illness for asthma in the United States, 1985-1994. *Journal of Allergy and Clinical Immunology*, 106(3), 493-500.
- Weiss, K. B., Gergen, P. J., Hodgson, T. A. (1992). An economic evaluation of asthma in the United States. *New England Journal of Medicine*, 326(13), 862-866.

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POSITION STATEMENT

The Use of Asthma Rescue Inhalers in the School Setting

SUMMARY

It is the position of the National Association of School Nurses to support students with asthma who actively participate in the self-management of their condition and in the self-administration of prescribed, inhaled asthma medications [rescue inhalers]. The self-administration of rescue inhalers should be evaluated on a case-by-case basis with parent, physician, student, and school nurse involvement. Written permission from the parent should be accompanied by documentation from the health care provider confirming that the student has the knowledge and skill to safely possess and use a rescue inhaler in the school setting. The student should have on file a written asthma action plan that includes a plan for monitoring rescue inhaler usage, monitoring of symptoms, and evaluation of the student's self monitoring skills by the school nurse. When administered safely and properly, self-administration of rescue inhalers can be one important step in a student's overall asthma management. Student self-administration of emergency medication must also consider the availability of a full-time school nurse. When full-time school nursing services are available, the administration of medication under supervision of the school nurse provides the student with the assessment for need of medication and proper technique in administration, monitoring for desired and untoward effects and expiration dates of medication, a record of number of times medication has been used for the identification of patterns of concern, an opportunity for valuable one-on-one health education, and most importantly, rapid response if medication is unsuccessful in reversing a student's allergic response.

HISTORY

The Centers for Disease Control reports the prevalence of asthma in school age children as 5-10 percent or 4 to 5 million children under age 18 years. The American Lung Association [ALA] reports that in 2004 that number increased to 9 million children under age 14. ALA also finds that 130 of 1000 students have asthma, which equates to about 3 children per classroom in the United States (2004). Asthma is the number one chronic illness causing school absenteeism. It accounts for nearly 20 million school days lost annually, or an average of 7.6 days per year missed for each student with asthma (Rodehurst, 2003). The normal average is 3 days per year missed by students due to illness. (Tellijohann, Dake, & Price, 2004). In the past, students have typically received medications for all types of health conditions through the school health office. Rescue inhalers do not always fit into this customary model of medication delivery since they must often be dispensed quickly to effectively aid breathing. Additionally, a professional school nurse is not always on site to assess the student and administer medication in the health office.

DESCRIPTION OF ISSUE

For the majority of children with asthma, proper monitoring and management ensures that the child is able to participate in normal, everyday activities. Rescue inhalers are prescribed medications that act rapidly upon the airway to relieve shortness of breath and compromised respiratory status. Timely and rapid administration of the rescue inhaler can be crucial for a student with asthma. Because children spend a good portion of their day in the school setting, students must have appropriate access to rescue medication to control asthma at school. The decision to allow student self-administration of a rescue inhaler must always include: (1) overall supervision by the professional school nurse with appropriate, periodic nursing evaluation of the student's technique and self-assessment skills and supervision of any delegatory functions that may apply to unlicensed assistive personnel, (2) the consent of the parent/guardian, and (3) collaboration with the prescribing provider. In addition, it is recommended that students who self-carry a rescue inhaler also maintain a back-up inhaler in the school health office.

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RATIONALE

School district medication policies and procedures that provide for the best quality of care for students with asthma while at the same time ensuring the safety of all students must be developed. School district medication policies/procedures should include a provision for students with asthma to carry and self-administer asthma rescue inhalers as part of an overall asthma management and treatment plan. These policies/procedures should take into account the age/developmental level of the student, the recommendations of the student's parent and health care provider, the specific school environment, and the availability of a professional school nurse.

References/Resources

Aetna Intellihealth. (2005). Asthma, children and school. Available at <http://www.intelihealth.com>

American Lung Association. (2004). Landmark survey reveals asthma in children remains significantly out of control in the United States. Available at www.lung.usa.org

Centers for Disease Control. *Asthma's impact on children and adolescents*. Available at www.cdc.gov/asthma/children.htm

GlaxoSmithKline. (2004). Children and asthma in America. (2004). Available at <http://www.asthmainamerica.com>

National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program. *Resolution on asthma management at school*. Available at www.nhlbi.nih.gov/health/public/lung/asthma/resolut.htm

Rodehurst, T.K., 2003. *Rural elementary school teachers intent to manage children with asthma symptoms*. Pediatric Nursing, 29, 184-192.

Tellijohann, S., Dake, J., & Price, J. (2004). *The effect of full-time versus part-time school nurses on attendance of elementary students with asthma*. Journal of School Nursing, 20(6), 331-334.

The Use of Asthma Inhalers in the School Setting:

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National Association of School Nurses

POSITION STATEMENT

The Role of School Nurses in Allergy/Anaphylaxis Management

HISTORY

Anaphylaxis can be deadly to children as well as adults. Among the general population, one to two percent are described as at risk for anaphylaxis from food and insects and a somewhat lower percentage are at risk from drugs and latex. Approximately five to six percent of the general pediatric population have an incidence of food allergy, with eight foods (peanuts, shellfish, fish, tree nuts, eggs, milk, soy, and wheat) accounting for 90% of allergic reactions. Food allergies are, in fact, the leading cause of anaphylaxis outside the hospital setting, accounting for an estimated 30,000 emergency room visits annually. It is estimated that 100 to 200 people die each year from food allergy-related reactions, and approximately 50 people die from insect sting reactions.

DESCRIPTION OF ISSUE

Care must be taken to differentiate between a true allergic response and an adverse reaction. True allergies result from an interaction between the allergen and the immune systems. Anaphylaxis is a potentially fatal reaction of multiple body systems. It can occur spontaneously. Data clearly demonstrate that fatalities associated with anaphylaxis occur more often away from home and are associated with the absence or delayed use of epinephrine.

RATIONALE

Education and planning are key to establishing and maintaining a safe school environment for all students. Those responsible for the care and well being of children must be aware of the potential dangers of allergies. Prevention of allergy symptoms involves coordination and cooperation within the entire school team and should include parents, students, school nurses, and appropriate school personnel. Early recognition of symptoms and prompt interventions of appropriate therapy are vital to survival.

CONCLUSION

It is the position of the National Association of School Nurses that schools have a basic duty to care for students, utilizing appropriate resources and personnel. School nurses are uniquely prepared to develop and implement individualized health care plans within state nurse practice act parameters and to coordinate the team approach required to manage students with the potential for experiencing allergic reactions.

References/Resources

American Academy of Allergy, Asthma and Immunology Board of Directors (1998). Position Statement-Anaphylaxis in schools and other child-care settings. *Journal of Allergy Clinical Immunology*: 102(2), 173-175.

Food Allergy Network (2001). *Information about anaphylaxis: Commonly asked questions about anaphylaxis*.
www.foodallergy.org.

Mudd, K. E. & Noone, S. A., (1995). Management of severe food allergy in the school setting. *Journal of School Nursing*: 11(3), 30-32.

National Association of School Nurses (2000). *Position Statement-Epinephrine use in life-threatening emergencies*.
Scarborough, ME: Author.

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National Association of School Nurses

POSITION STATEMENT

Emergency Care Plans for Students with Special Health Care Needs

HISTORY

Children with special health care needs (CSHCN) are those who have chronic physical, developmental, behavioral, or emotional conditions or are at risk for developing these conditions. They require health and related services of a type or amount that is usually not required by typically developing children (Committee on Pediatric Emergency Medicine, 1999). In the United States, 12.6 million children under age 18 are in this category. These children are at much greater risk for requiring emergency care (Emergency Medical Services for Children, 2001). In schools, approximately 2% of children have a serious enough disability that they require special education services or supportive care (Praeger, Zickler, & Mosca, 2002). Schools, families, and communities have the responsibility to be well prepared for prompt, safe, and individualized care in the event of a medical emergency involving these children. School nurses are involved in the development of nursing care plans for students, including Emergency Care Plans, as a part of their application of the nursing process in their school nursing practice (Schwab & Gelfman, 2001).

DESCRIPTION OF ISSUE

In the educational setting, the Individualized Educational Plan (IEP), the 504 Plan, the Individualized Health Plan (IHP), and the Emergency Care Plan (ECP) all document preparation and planning for student success. Some students require two or more of these plans to ensure their health needs will be adequately addressed. Professional nursing standards are used in the development of IHP's and ECP's. The ECP component concerns actions to manage a specific, potential medical emergency (Arnold & Silkworth, 1999). It serves as a written, accessible, and up-to-date template for action for an individual student (Emergency Medical Services for Children, 2001). The school nurse's professional judgment is used in determining which students need an ECP and what training is needed for school personnel. Confidentiality is maintained by sharing the ECP only with school staff that have a need to know (Harrigan, 2002).

Best practice dictates that individuals who will be involved prior to or during an emergency situation with a student with special health care needs should be invited to participate in the development, implementation, and evaluation of ECP's. The child's family plays a central role in decisions of the multidisciplinary team about how the child will be managed at school and during school related activities. According to the philosophy of family-centered care, the family is the constant in its child's life (Committee on Pediatric Emergency Medicine, 1999), rather than the educational or health care system. If indicated, family can be supported to participate actively in developing its child's ECP by appropriately pairing it with someone who has greater experience with the relevant health issues needing to be addressed at school. In addition, community involvement in ECP development is critical and, when possible, should include the child's health provider, hospital emergency department, and community first responders (Emergency Medical Services for Children, 2001).

RATIONALE

A written Emergency Care Plan, coordinated by the school nurse, ensures a plan of action is in place to maintain the student's health and safety during a life-threatening emergency (Arnold & Silkworth, 1999). In developing an ECP, the multidisciplinary team should consider the following:

- Content, format, and language that are understandable to lay people
- A system for maintaining current and ready access to information including parent and health care provider contacts (Emergency Medical Services for Children, 2001)

- Information that is pertinent and succinct about the child's medical condition, medications, necessary supplies and equipment, and appropriate emergency intervention
- Distribution to a minimum of two appropriate school staff (AAP, 2001) in addition to the school nurse and provision for necessary training (Arnold & Silkworth, 1999)
- Prevention of an emergency as well as preparation for an emergency situation, identifying initial symptoms for concern and the response to escalating situations
- Confidentiality when determining location of ECPs
- Providing a copy of the ECP (with parent permission) to first responders and emergency department personnel (Emergency Medical Services for Children, 2001).

CONCLUSION

It is the position of the National Association of School Nurses (NASN) that students who have special health care needs that place them at greater risk for a medical emergency should have an individualized Emergency Care Plan. NASN also believes that the registered school nurse, the student (if appropriate and he/she is developmentally able), the student's family, and health care providers, should be members of the multidisciplinary team responsible for writing and implementing the ECP. Note that the ECP should never be considered a substitute for an IHP that addresses all of a student's health needs. The Individualized Health Plan is the responsibility of the school nurse and focuses on health needs. The Emergency Care Plan flows from the IHP with special emphasis on emergency care needed for a student who may have a life-threatening episode (Harrigan, 2002) and is generally written for the purpose of directing the actions of school personnel (Schwab & Gelfman, 2001).

References/Resources

- American Academy of Pediatrics, Committee on School Health (AAP). (2001). Guidelines for emergency medical care in school (RE9954). *Pediatrics*, 107(2). Available at: <http://www.aap.org/policy/re9954.html>
- Arnold, M.J., & Silkworth, C.K. (Eds.). (1999). *The school nurse's source book of individualized health care plans*. Volume II. North Branch, MN: Sunrise River Press.
- Committee on Pediatric Emergency Medicine. (1999). Emergency preparedness for children with special health care needs. *Pediatrics*, 104(4). Available at: <http://pediatrics.aappublications.org/cgi/content/full/104/4/e53>
- Emergency Medical Services for Children. (2001). *Recommendations for emergency care plans for children with special health care needs*. Available at: <http://www.emsc.org/downloads/pdf/933nachri.pdf>
- Harrigan, J. F. (2002). *Overview of school health services*. Castle Rock, CO: National Association of School Nurses.
- Hazinski, M.F., Markenson, D., Neish, S., Gerardi, M., Hootman, J., Nichol, G., et al. (2004). Response to cardiac arrest and selected life-threatening medical emergencies: The medical emergency response plan for schools. A statement for health care providers, policymakers, school administrators, and community leaders. *Pediatrics*, 113(1). Available at: <http://www.aap.org/policy/erplanschool04.pdf>
- Praeger, S., Zickler, C., & Mosca, N.W. (2002). *Care of students with special needs in schools: Applications of professional school nursing practice standards*. Scarborough, ME: National Association of School Nurses.
- Schwab, N.C. & Gelfman, M.H.B. (Eds.). (2001). *Legal issues in school health services: A resource for school administrators, school attorneys, and school nurses*. North Branch, MN: Sunrise River Press

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National Association of School Nurses

POSITION STATEMENT

Indoor Air Quality

SUMMARY

It is the position of the National Association of School Nurses that supporting evidence-based indoor air quality policies promotes occupant health and educational success. The school nurse is in a unique position to work with administration, staff, teachers, maintenance personnel, parents, students, and other health professionals in detecting, monitoring, and eliminating sources of indoor air contaminants. School nurses possess the knowledge and skills to be proactive in educating students, staff, and parents about indoor air quality issues.

HISTORY

During the last several decades, exposure to indoor air pollution (IAP) has increased due to a variety of factors, which include, but are not limited to, the construction of more tightly sealed buildings, reduced ventilation rates to save energy, the use of synthetic materials in buildings and furnishings, and the use of chemicals in various products for many school activities. Environmental Protection Agency (EPA) studies of human exposure to air pollutants indicate that indoor levels of pollutants may be two to five times and occasionally 100 times more than outdoor levels of pollutants (EPA, 2000). This is a concern because most people spend about 90% of their time indoors.

DESCRIPTION OF ISSUE

Indoor air quality problems can be subtle and do not always produce easily recognizable impacts on health, well-being, or the physical plant. Children may be especially susceptible to IAP. They have a smaller body mass than adults and breathe a greater volume of air relative to their body weight (EPA, 2000). The concentration of pollutants can, therefore, result in a greater body burden for children. Proper maintenance of indoor air is more than a "quality" issue. It encompasses safety and stewardship of our investment in the students, staff, and facilities.

Factors affecting indoor air quality include indoor air pollutants, such as mold and animal dander, heating ventilation/air-conditioning systems, all materials and supplies used for educational activities and building maintenance, and building occupants. EPA risk studies have consistently ranked IAP among the top five environmental health risks to the public.

Incentive for improving Indoor air quality would include:

- A decrease in the potential for short-term and long-term health problems for students and staff
- Greater comfort, health, academic performance, and attendance
- Increased productivity of teachers and staff due to less discomfort, sickness, and absenteeism
- Less deterioration and improved efficiency of the school physical plant and equipment
- Less potential for school closures and relocation for renovations and repairs
- Better relationships among school administration, staff, teachers, parents, and students
- Positive publicity affecting the school efficacy and image
- Fewer potential liability issues creating a financial impact. Additionally, environmental quality is one of ten health indicators used in Healthy People 2010 (DHHS, 2000).

RATIONALE

School nurses are skilled in epidemiology methods and can use these skills, in conjunction with the school indoor air quality team, to investigate and detect indicators of potential and actual indoor air quality issues. School nurses also possess the health education skills to provide accurate information about sources and effects of indoor air contaminants. School nurses have the education, knowledge and skills to actively participate on the school indoor air quality team to develop appropriate identification, prevention, intervention and control techniques to provide the best indoor air quality possible.

References/Resources

Environmental Law Institute. (2004, May). *Database of state indoor air quality laws [Excerpt IAQ in Schools]*. Washington, DC: Author. Available at www.eli.org/pdf/schools_excerpt.pdf

National Safety Council. Environmental Health Center. (2000). *Teachers guide to indoor air pollutants*.

Storey, E., Dangman, IK., Schenck, P., et al. (2004). *Guidance for clinicians on the recognition and management of health effects related to mold exposure and moisture indoors*. University of Connecticut Health Center, Division of Occupational and Environmental Medicine, Center for Indoor Environments and Health.

U.S. Department of Education. (2004). *Summary of scientific findings on adverse effects of indoor environments on students' health, academic performance and attendance*. Available at <http://www.iehinc.com/pdf/Effects%20on%20Students.pdf>

U.S. Environmental Protection Agency (EPA). (2000). *Tools for schools: Indoor air quality*. <http://www.epa.gov/iaq/schools/tools4s2.html>

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National Association of School Nurses

POSITION STATEMENT

Delegation

SUMMARY

It is the position of the National Association of School Nurses (NASN) that all children and adolescents deserve safe and effective management of their health care needs (Gelfman & Schwab, 2001a). Further, NASN believes delegation is a tool that school nurses may use in implementing interventions outlined in a student's Individualized Health Care Plan (IHP). The safety and welfare of the individual student and the broader school community, not expediency, delivery of care model, or cost, must be the central focus of all decisions regarding delegation of nursing tasks and functions (National Council of State Boards of Nursing [NCSBN], 1997). The National Association of School Nurses supports appropriate delegation of nursing services in the school setting based on the nursing definition of delegation, requirements of state nurse practice acts, state regulations, guidelines provided by professional nursing organizations and the nursing assessment of the unique needs of the individual student. In many cases, the sound decision may be to not delegate. The practice pervasive functions of assessment, planning, evaluation, and nursing judgment cannot be delegated (NCSBN, 1997, 2005).

HISTORY

Delegation is a tool that may be used by the registered professional school nurse to allow unlicensed assistive personnel (UAP) to provide standardized routine health services under the supervision of the nurse, when permitted by the state Nurse Practice Act and supported by the nurse's clinical judgment to be appropriate. There is increased utilization of delegation as a method to meet the health care needs of children in school because of a growing population of children with significant health needs. Advances in health care and technology offer greater opportunities for children with special health care needs to attend school. The incidence of chronic conditions such as asthma, diabetes, severe allergies, and seizure disorders in school-age children is increasing. Complex medical problems that were previously managed at inpatient settings are now being managed in the school setting. In addition, federal laws set requirements for the provision of health care to children in schools. Laws such as the Individuals with Disabilities Education Act (IDEA), Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act (ADA) of 1990 ensure that children with special health care needs have the right to be educated with their peers in the least restrictive environment (Section 504 Rehabilitation Act, 1973) and to receive support and accommodations for conditions that negatively impact their capacity for learning (Gelfman, 2001). Delegation has been used effectively in some areas, but unsafe and illegal delegation in school settings can occur. It is important for school districts and school nurses, health care professionals, parents and the public to understand what can be delegated and when delegation is appropriate. Prior to delegation, a student assessment is required. The nurse can then determine what training and supervision is required for safe delegation to occur for this specific student. The legal parameters for nursing delegation are defined by State Nurse Practice Acts, State Board of Nursing guidelines, and Nursing Administrative Rules/Regulations (NCSBN, 2005). Delegation of nursing tasks is not allowed in some states.

DESCRIPTION OF ISSUE

Although delegation is a term used in other fields, it has a unique place and meaning in the practice of nursing. Delegation of nursing care is a legal term and a complex skill requiring sophisticated clinical judgment and final accountability for patients' care (NCSBN, 2005). Effective delegation requires experience as a practicing nurse. Nursing defines delegation as transferring the responsibility of performing a nursing activity to another person while retaining accountability for the outcome (American Nurses Association [ANA], 1994; National Association of State School Nurse Consultants [NASSNC], 2000; NCSBN, 1995). Nurses are accountable to: (1) state laws, rules, and regulations, (2) employer/agency regulations, and (3) standards of professional school nursing practice, including those pertaining to delegation. The decision to delegate is a serious responsibility and must be determined on a case-by-case basis by the registered nurse. The nurse delegates tasks based on the needs and

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condition of the student, stability and acuity of the student's condition, potential for harm, complexity of the task, and predictability of the outcome (ANA, 2001).

Nursing tasks commonly performed in the home setting by a student or caregiver take on a more complex dimension in the school setting. Often parents and school administrators are confused about why what appears to be a simple task is held to a much different and higher standard at school (NASN, 2005).

Delegation becomes more complex when applied to settings that do not have organized nursing structures. The registered professional school nurse practices in an environment where health care supports but is secondary to the primary purpose of providing education. Federal mandates and parental expectations that the school is able to manage the health needs of students increase the demands for qualified personnel to ensure the health and safety of students with special health needs. School nurses may be placed in a position where it becomes necessary to decline supervision of an individual who has been designated by an administrator to perform a nursing procedure based on statutes/rules governing education (NCSBN, 2005). The school nurse may be forced to choose between following standards of nursing practice or an administrator's directives.

RATIONALE

Only a registered nurse can delegate nursing care. Further, delegation is not appropriate for all students, all nursing tasks, or all school settings. The American Nurses Association (2005, p.3) "does not support delegation of those registered professional nursing services that require assessment and/or emergency care." Key factors guiding determination for delegation include the following: safety issues; state laws, rules, and regulations; and medical needs of students.

- **Safety issues** unique to providing health services in a school setting, versus in a health care setting or home. (e.g., safety of a fragile student in a large group of other students; safety of other students and school staff; the stimuli of the school environment distracting attention from safe execution of health tasks by a student; use of unlicensed assistive personnel (UAP) versus assistive personnel with standardized credentials typically used in health care settings).
- **State laws, rules and regulations** that govern nursing practice, including delegation of care.
- **Medical needs** of the student, including complexity, stability and acuity of his/her health care status.

To provide for safe care, nurses use the Five Rights of Delegation (ANA, 1997; NCSBN, 2005) to guide their assessment of whether delegation is appropriate for the student and the situation.

1. The Right Task

- Is the task within the nurse's scope of practice?
- Is the task reasonably routine with a predictable outcome?
- Is it based on written medical orders?
- Is it one that is repeated frequently?
- Is it performed according to an established sequence of steps, without modification?
- Is the task one that does not involve assessment, interpretation, or decision-making?

2. The Right Person

- Who is immediately available to the student, willing, and competent to do the task at the required time?

3. The Right Direction

- How much training will be required by the UAP to perform the task in a safe and appropriate way?
- How many tasks will the UAP need to learn?
- What other duties does she/he have?

4. The Right Supervision

- How much initial training will the nurse need to provide to the delegatee for the performance of this task?
- What type of ongoing supervision will be needed (on site, periodic, episodic)?

5. The Right Circumstance

- Is the child particularly vulnerable due to age, developmental level, cognitive abilities, gender, or specific health issues?
- Is the environment safe for UAP to perform the delegated task as planned?

When review of the Five Rights of Delegation indicates that delegation is appropriate, the registered professional school nurse must develop an Individualized Health care Plan outlining the level of care and health care interventions needed by the student and indicating which tasks can and cannot be delegated. Further, the continuous process of evaluation should be based on outcomes of care, ensuring that the delegated task is completed properly and produces the desired outcome.

Thus, delegation is a complex process that requires thorough attention to safety parameters, student health status, and legal standards. The appropriateness of delegation can only be determined by the registered professional school nurse and is determined through a nursing decision-making process.

References/Resources

- American Nurses Association (ANA). (1994). *Registered professional nurses and unlicensed assistive personnel*. Washington, DC: Author.
- American Nurses Association. (1997). *Unlicensed assistive personnel legislation*. Washington, DC: Author.
- American Nurses Association. (2001). *The code of ethics*. Washington, DC: Author.
- American Nurses Association. (2005). *Consent action report to the board of directors on delivery of care in schools for children with diabetes*. Washington, DC: Author.
- Gelfman, M. (2001). Special Education Law. In N. Schwab and M. Gelfman (Eds.). *Legal issues in school health services: A resource for school administrators, school attorneys, and school nurses*. North Branch, MN: Sunrise River Press.
- Gelfman, M., & Schwab, N. (2001). Discrimination in school: 504, ADA, and Title IX. In N. Schwab and M. Gelfman (Eds.). *Legal issues in school health services: A resource for school administrators, school attorneys, and school nurses* (pp. 335-371). North Branch, MN: Sunrise River Press.
- National Association of School Nurses (NASN). (2004). Issue brief: *School health nursing services role in health care: Delegation of care in the school setting*. Castle Rock, CO and Scarborough, ME: Author.
- National Association of School Nurses (NASN). (2005). *Delegation of care: Overview for the registered nurse practicing in the school setting*. Castle Rock, CO and Scarborough, ME: Author.
- National Association of State School Nurse Consultants (NASSNC). (1996). Delegation of school health services to unlicensed assistive personnel: A position paper of the National Association of State School Nurse Consultants. *Journal of School Health*, 66(2), 72-74.
- National Association of State School Nurse Consultants. (2000). Position statement: *Delegation of school health services*. Kent, OH: Author.
- National Council of State Boards of Nursing (NCSBN). (2005). *Working with others: A position paper*. Retrieved February 4, 2005, from http://www.ncsbn.org/pdfs/Working_with_Others.pdf.
- Schwab, N., & Gelfman, M. (Eds.) (2001). *Legal issues in school health services: A resource for school administrators, school attorneys, and school nurses*. North Branch, MN: Sunrise River Press.
- U.S. Department of Health and Human Services (DHHS). Section 504 Rehabilitation Act 1973. Retrieved from <http://www.hhs.gov/ocr/504.html>

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National Association of School Nurses

ISSUE BRIEF

School Health Nursing Services Role in Health Care

DELEGATION OF CARE IN THE SCHOOL SETTING

INTRODUCTION

All children and adolescents coming to school deserve an educational environment that motivates them to achieve learning success. Many of these children also have a wide variety of health, psychosocial, and learning challenges. Meeting the health needs of students is particularly challenging within the educational system due to the increased number and complexity of individual student health needs, high nurse-to-student ratios, lack of dedicated funding, and the work of merging the missions of education and health.

The National Association of School Nurses (NASN) has recommended school nurse-to-student ratios to assure the health and safety for student demographics with varied health acuity levels. However many schools are staffed with school nurses well below these recommendations (Proctor, Lordi & Sanger, 1993; U.S. Department of Health and Human Services, 2000). Therefore, school nurses often find it necessary to utilize the process of delegation whereby the school nurse can delegate nursing tasks or functions to unlicensed assistive personnel (UAP) to support the individualized health care plan developed by the school nurse.

BACKGROUND

Delegation is a term that is not used exclusively in nursing and while the general idea may be similar in other fields (for example: medicine, education, business) it has a unique place and meaning in the practice of nursing. There are several factors that must be understood in order to use delegation safely and effectively in the education setting. The school nurse must understand the state laws, as well as the rules and regulations, that govern nursing practice, the concept of delegation in the nursing process, the Standards of Professional School Nursing Practice, and the Code of Ethics for Nursing.

Nursing practice is governed by professional and regulatory agencies. Professional nurses are held accountable to professional standards and corresponding state laws. Professional agencies set standards of practice and determine the scope of practice for nurses. According to the American Nurses Association (ANA, 1998), standards are authoritative statements by which the nursing profession that:

- describes the responsibilities for which its practitioners are accountable
- provides direction for professional nursing practice
- defines the nursing profession's accountability to the public
- defines the client outcome for which nurses are responsible

Regulatory agencies determine the minimum level of preparation for licensure, enforces the agreed upon scope of practice set forth in the Nurse Practice Act, and enforces the laws in order to protect the public. (Most are also empowered to pass rules and regulations that provide the specific detail not contained in the nurse practice acts.) Because not all state nursing practice acts rules and regulations allow delegation, it is essential that school nurses understand their state Nurse Practice Act. It is imperative that the school nurse be knowledgeable about these guidelines and limitations in their respective states. The degree of detail found in state guidelines for delegation of care will vary. Some states and territories specifically restrict procedures that can be delegated in their guidelines, whereas others do not address delegation at all. Guidelines often, but not always, include language that specifically refers to the supervision of delegated nursing tasks. The school nurse's decision to delegate must always be in line with the applicable state Nurse Practice Act.

Delegation is often looked at in isolation but it is an integral part of the nursing process. "The nursing process encompasses all significant actions taken by nurses in providing care to all clients, and forms the foundation for clinical decision making" (ANA, 1998, p.3). Standards of Care are comprised of the six steps of the nursing process:

Standards of Care (NASN & ANA, 2001)

- Standard 1 Assessment
 The school nurse collects client data.
- Standard 2 Diagnosis
 The school nurse analyzes the assessment data in determining nursing diagnoses.
- Standard 3 Outcome Identification
 The school nurse identifies expected outcomes individualized to the client.
- Standard 4 Planning
 The school nurse develops a plan of care/action that specifies interventions to attain expected outcomes.
- Standard 5 Implementation
 The school nurse implements the interventions identified in the plan of care/action.
- Standard 6 Evaluation
 The school nurse evaluates the client's progress toward attainment of outcomes.

Delegation occurs when the school nurse cannot implement the interventions (Standard 5) identified in the plan of care. It is not appropriate for the nurse to delegate any other portion of the nursing process (Standards 1, 2, 3, 4, and 6) because these require the skill and knowledge of the professional nurse.

In the school setting, most often this delegation is to Unlicensed Assistive Personnel (UAP). In 1992, the American Nurses Association stated the term UAP applies to an unlicensed individual who is trained to function in an assistive role to the licensed nurse in the provision of patient/client activities as delegated by the nurse. The ANA position paper on the utilization of a UAP by the registered nurse (RN) states:

1. It is the nursing profession that determines the scope of nursing practice.
2. It is the nursing profession that defines and supervises the education, training, and utilization for any UAP involved in providing direct patient care.
3. It is the RN who is responsible and accountable for the provision of nursing practice (i.e., physicians cannot prescribe nursing practice.)
4. It is the RN who supervises and determines the appropriate utilization of any UAP involved in providing direct patient care.
5. It is the purpose of UAP to enable the professional nurse to provide nursing care for the patient.

In schools a UAP may be the health aide, teacher, classroom aides, educational assistants, secretary, or anyone who accepts delegation from the school nurse and is not licensed by the State Board of Nursing.

Delegation has been defined as “the transfer of responsibility for the performance of an activity to another, with the former retaining accountability for the outcome” (ANA, 1994, p. 11; NASSNC, 2000). Delegation presumes that the delegator has greater knowledge, experience, and judgment than the delegate, and that the delegated task is only a subcomponent of the total student care process. In delegating, the school nurse uses professional judgment to decide what nursing care may be delegated and to whom. There are several important concepts of delegation in the nursing process that need to be understood.

- Delegation is to a selected person for a specific task in a selected situation. A specific skill is taught for a specific child. Each decision to delegate is an individual issue.
- While non-nurses, such as school principals, may suggest which nursing acts may be delegated, it is the school nurse who ultimately decides the appropriateness of the delegation.
- The UAP cannot re-delegate a delegated task to another UAP to perform.

Several professional organizations outline guidelines to assist the school nurse in the decision-making related to the delegation of care (ANA, 1994; NASSNC, 2000; NASN, 2002). The school nurse should approach delegation decisionmaking with careful consideration for the health and safety of the student. Using a guided decision making process will help school nurses articulate their judgment to those non-nurses who may not agree with their decision. One of the guidelines developed by the ANA (1997) is the Five Rights of Delegation.

1. The Right Task
2. The Right Person
3. The Right Direction
4. The Right Supervision
5. The Right Circumstances

Questions that should be addressed are:

1. Determination of the task, procedure, or function that is to be delegated. Is the procedure reasonably routine with a reasonably predictable outcome?
2. Staff availability. Who is available to do the nursing task, at the required time? Is there enough trained staff available?
3. Assessment of the potential delegatee’s competency. What kind of training has this UAP had? Is the UAP able to understand the limitations of this delegation? Is this a reliable person? Will he or she seek appropriate help? Will he or she do the appropriate documentation? What are his or her other responsibilities during the time the delegated task is performed?
4. Consideration of the level of supervision available and a determination of the level and method of supervision required assuring safe performance. How much initial and ongoing supervision does this procedure for this specific student require? How will the school nurse document and assure that adequate training and supervision has occurred? By what method and how frequently does the school nurse need to assess for the student’s safety and appropriate outcome?
5. Assessment of the client needs including age and vulnerability. Is this child particularly vulnerable due to age, developmental level, cognitive abilities, gender or special health issue?
6. Consideration of the environment in which the delegated task will occur. Is it conducive (safe) for the delegated activity?

Inherent in the decision to delegate is the requirement that the school nurse must supervise the UAP. The ANA defines supervision as “the active process of directing, guiding, and influencing the outcome of an individual performance of an activity.” In addition, many State Nurse Practice Acts define supervision by the RN. Supervision is generally categorized as on-site (the nurse physically present or immediately available while the activity is being performed), or off-site (the nurse has the ability to provide direction through various means of written and verbal communications). A specific amount of time will depend upon the abilities of the UAP, training, and type and number of delegated nursing care tasks. It is the nurse’s responsibility to use professional judgement to make decisions related to the amount, frequency, and type of supervision needed.

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The ANA Code of Ethics (1985) probably best sums up the delegation process for the school nurse.

“The nurse exercises informed judgment and uses individual competency and qualifications as criteria in seeking consultation, accepting responsibilities, and delegating nursing activities to others.” “...Inasmuch as the nurse is accountable for the quality of nursing care rendered to clients, nurses are accountable for the delegation of nursing care activities to other health workers. Therefore, the nurse must assess individual competency in assigning selected components of nursing care to other nursing service personnel. The nurse should not delegate to any member of the nursing team a function for which that person is not prepared or qualified. Employer policies or directives do not relieve the nurse of accountability for making judgments about the delegation of nursing care activities.”

RATIONALE

In order to experience success in learning, children and adolescents have and will continue to have health needs that must be met in the educational setting. School nurses have the expertise to meet the health needs of children. Using the nursing process school nurses develop individual health plans for students. Delegation of nursing tasks to a UAP can be a safe and effective way to perform some of the nursing interventions identified in the individual health plan. It is the school nurse’s responsibility and her or his authority to decide which nursing services may be delegated within the school setting, when allowed by state law, regulations, and/or guidelines.

ROLE OF THE SCHOOL NURSE

The role of the nurse in the school setting is to assess the health needs of the child and to coordinate with staff, family, health care providers, and community agencies in order to provide a comprehensive school health program that facilitates the maximum educational opportunity for the student. This means the school nurse is responsible for using professional nursing judgment to determine the appropriate level of care needed, to determine the appropriate level of staff needed to provide this care, and to ensure that delegated nursing care to a student in the school setting is safely performed and supervised. The school nurse must know how delegation is addressed in the State Nurse Practice Act, understand the professional and ethical standards related to nursing, and utilize a sound decision-making process for delegation decisions. It is also imperative that the school nurse articulate his or her knowledge and decision-making process to those who may not be familiar with delegation, especially as it is defined and applied by the profession of nursing.

REFERENCES

- American Nurses Association [ANA]. (1985). *Code for nurses with interpretive statements*. Washington, DC: American Nurses Publishing.
- American Nurses Association [ANA]. (1992). *Position statement. Registered nurse utilization of unlicensed assistive personnel*. Washington, DC: American Nurses Publishing.
- American Nurses Association [ANA]. (1994). *Registered professional nurses and unlicensed assistive personnel*. Washington, DC: American Nurses Publishing.
- American Nurses Association [ANA]. (1997). *Unlicensed assistive personnel legislation - 1997*. Washington, DC: American Nurses Publishing.
- American Nurses Association [ANA]. (1998). *Standards of Clinical Nursing Practice (2nd ed.)*. Kerneysville, WV: American Nurses Publishing.
- National Association of School Nurses and American Nurses Association (2001). *Scope and standards of professional school nursing practice*. Washington, DC: American Nurses Publishing.
- National Association of School Nurses [NASN] (2002). *Position statement. Delegation*. Scarborough, ME and Castle Rock, CO: Author.

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National Association of State School Nurse Consultants [NASSNC]. (2000 revised). *NASSNC Position statement. Delegation of school health services*. Kent, OH: Author.

Proctor, S., Lordi, S., & Zaiger, D. (1993). *School nursing practice: Roles and standards*. Scarborough, ME: National Association of School Nurses.

U.S. Department of Health and Human Services. (November 2000). *Healthy People 2010. (2nd ed.)*. Washington, DC: U.S. Government Printing Office.

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National Association of School Nurses

ISSUE BRIEF

Individuals with Disabilities Education Act (IDEA): Management of Children in the Least Restrictive Environment

INTRODUCTION

The Individuals with Disabilities Education Act (IDEA) grants to eligible children with disabilities the legal right to receive a free appropriate public education in the least restrictive setting. Access to education for many children is only achieved through the provision of necessary health services (e.g., administration of intravenous medications, catheterization, tracheostomy care, and gastrostomy tube feedings). The safety implications attached to these services for children support the leadership role of the school nurse in advocating for the health and educational needs of students. The National Association of School Nurses (NASN) believes that such children have the right to receive the specialized health services required to assure their inclusion and safety in the school environment, and that further, these special health services should be provided or supervised by a Registered Professional Nurse (serving as and referred to hereinafter as school nurse).

BACKGROUND

The Education for All Handicapped Children Act (EHA) was passed as law in 1975. It established national standards for the free appropriate public education of children with disability-related learning problems in the least restrictive environment. In 1990, the EHA was renamed the Individuals with Disabilities Education Act and since that time has been referred to as IDEA. Congress made amendments to IDEA in 1997 directing educational interventions for children 3 through 21 years of age who have qualifying disabilities that impede their ability to learn. Eligible students are entitled to support services at school. These are known as "related" services. The federal regulations provide definitions for the eligibility criteria and specific related services. The definitions should be considered "educational definitions". In health care, these conditions and services may be defined differently (Schwab, Gelfman, & Cohn, 2001b, p. 387).

The 1997 IDEA amendments included a definition of IEP team members that did not include specification about the participation of a school nurse. The Congressional Record did however, in the preface to IDEA 1997, record that there are situations that merit a licensed registered nurse being on the IEP team (Committee on Labor and Human Resources, U.S. Senate, 1997, in Schwab, Gelfman, & Cohn, 2001.) However, in many jurisdictions, it remains that school nurses are not included in the multidisciplinary team that develops and implements a student's IEP or IFSP. In these areas, specialized health services either are not included or are improperly and dangerously, performed by individuals who lack requisite training and supervision.

In 1999, United States Supreme Court ruling in Cedar Rapids Community School District v. Garret F. (hereinafter known as "Garret F.") held that IDEA requires school districts to provide school nursing services when such supportive services are necessary in order for students to access and benefit from their educational program.

Garret F. held that IDEA requires a school district to be financially responsible for the provision of nursing services that students require in order to access and benefit from their educational program. The Court based its ruling on IDEA's definition of "related services" and on the United States Supreme Court decision Irving Independent School District v. Tatro (hereinafter known as "Tatro") (1984). Garret F. involved a student who required continuous nursing services in school, including urinary bladder catheterization, tracheostomy tube suctioning, nutrition and fluids on a regular schedule, positioning, monitoring of ventilator settings, artificial ventilations by ambu bag when the ventilator malfunctioned, assessment of respiratory status for respiratory distress or autonomic hyperreflexia, blood pressure monitoring, and bowel disimpaction.

NASN played an active role in Garret F. and signed on to amicus curiae (Friend of the Court) brief. This brief argued that the Supreme Court should affirm the lower Court's decisions related to the responsibility of school districts to provide the types of nursing services required by Garret F.

In 2004, IDEA 1997 was reformed again and renamed by Congress as the Individuals with Disabilities Education Improvement Act, which continues to require school districts to educate children in the least restrictive environment with emphasis on participation in the general education curriculum and a strong preference for regular classroom placement. Inclusion in the regular education setting must consider the preference used in determining the educational placement of children with any disability. Appropriate educational placement in an inclusive setting helps to break down the attitudinal and physical barriers that prevent individuals with disabilities from participating fully in society and affords an opportunity for all students to benefit from interaction and active participation with peers of chronological age, and to learn age-appropriate behavior.

Children with health conditions may become eligible for special education services if the child's disability has an impact on his or her educational performance. The school multidisciplinary team determines eligibility and necessary services, with the school nurse serving as a crucial member of the team. Because children with chronic and special health care needs have unique health considerations, individualized nursing assessment, planning, and intervention are critical to identifying appropriate placement and service decisions. The team determines the health services necessary to enable children with disabilities to attend school and to participate fully and safely in educational activities and programs. The team develops an appropriate educational program, known as an Individualized Education Program (IEP) for children 5–21 years or an Individualized Family Service Plan (IFSP) for eligible children ages 3-5 years.

RATIONALE

Managing the health and safety needs of children with profound health conditions is difficult. The interaction with the educational system is often complex because many people are involved in the process and multifaceted regulations must be addressed.

State licensing laws for health care professionals identify and define professionals slightly differently from state to state. State educational certification regulations or other mandates regarding qualifications of school nurses may also add to differences in interpretation of "qualified school nurse or other qualified person" (Schwab, Gelfman, & Cohn, 2001b, p. 393). State Nurse Practice Acts (NPA) continue to need to be reviewed to ascertain what is allowed in a particular state.

No federal law or regulation dictates who must perform certain health care procedures (Rapport & Lasseter, 1998). States' Nurse Practice Acts and other laws set forth these requirements. Delegation of nursing care to unlicensed assistive personnel may be appropriate in situations when proper assessment, training, and continued supervision can occur. Sometimes school nurses are asked to provide or delegate services that may not be delegated under that state's Nurse Practice Act. The parent or school personnel may never assume responsibility for delegating procedures requiring skilled nursing care. These actions would be considered practicing nursing or medicine without a license and could be subject to disciplinary action (Hootman & Hula, 2001).

The school nurse is professionally prepared in both issues of health and the educational process and can serve as a natural interpreter to the student, family, and health and education systems relative to students' special health needs during the school day. While estimates of the actual number of children eligible for "related services" are varied, trends in health, chronic disease, and disability for children support the need for related services. These trends include (1) increases in the number of children in schools with life-threatening allergies, (2) increases in the incidence, prevalence, and severity of asthma, (3) management of HIV as a chronic disease, (4) long-term survival of students with complex medical problems due to advances in medical technology, (5) continued increases in the number of children who are medically-fragile and technology dependent in regular classrooms, and (6) increased parental knowledge about the rights of children to education and "related services" in the least restricted environment.

The impact of Garret F. on school districts and on school nursing is significant. It is important for school districts to be aware of the increasing number of students enrolling in schools with complex medical and nursing needs. The school nurse plays a vital role in developing this awareness by explaining the implications of Garret F, IDEA 1997, and IDEA 2004 on administrative decisions about policy, staffing, collaborative decision-making, and clinical nursing practice in the schools. This landmark

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decision solidifies and reaffirms the central role that school nurses play in the delivery of related school health services under the IDEA and the obligation of school districts to pay for such services.

Regardless of the actual number of students with disabilities who may require the supportive services of a nurse, school districts need to be cognizant of necessary and reasonable services and ever mindful of the inclusion and safety requirements for these students. These may include any level of service on a continuum, from direct or indirect nursing services one hour per week, a nurse on-site in the building at all times, or one-on-one nursing care throughout an entire school day. Regardless of the level of the service required, nursing services must be provided as determined in the student's IEP. It is critical therefore, for school nurses to be part of IEP teams for students whose health conditions have an actual or potential impact on their learning and for school districts to ensure that school nurses are integral members of their schools' early identification and special education teams.

Each student with a complex medical condition or a need for modification of the school environment due to a health condition should have an Individualized Health Care Plan that reflects the health needs of the student and directs how those health needs are to be managed during the school day. The school nurse should be responsible for the writing of the IHP in collaboration with the student, family, and health care providers (NASN, 1998).

ROLE OF THE SCHOOL NURSE

The school nurse plays a vital role in applying IDEA and Garret F. and in explaining its implications on administrative decisions about policy, staffing, collaborative decision-making, and clinical nursing practice in the schools. The cost of providing intensive nursing services can no longer be used as a basis for excluding students. School nurses and school nurse administrators must assist school districts in determining and identifying necessary and reasonable levels of care and are in a position to identify potential sources of payment for nursing services, such as Medicaid funds.

Because health insurance companies often have lifetime limits on coverage, some states now require school districts to disclose to families the potential impact of using their own insurance to pay for in-school services. The implication is that when parents use their own insurance benefits to cover school-based nursing services, they may be limiting their child's future available insurance coverage. School nurses can guide districts in understanding their obligation to pay for in-school nursing services when the school nurse has determined the appropriate level of care needed and included it in the student's IEP. This same guidance can be given when discussing these issues with families.

The school nurse is a team member who participates in the identification and evaluation of students who may be eligible for services under IDEA. Through shared responsibility with other team members, the school nurse assists in the planning and implementation of Individual Education Plans or Individual Family Service Plans, as needed. The school nurse ensures the safe delivery of necessary health services to eligible children with disabilities through participation on the multidisciplinary educational team and direct care with the student. As a member of this multidisciplinary education team, the school nurse assists in identifying children who may need special educational or health-related services. These include the following actions:

- assesses the identified child's functional and physical health status, in collaboration with the child, parent(s)/guardian(s), and health care providers;
- develops individualized health and emergency care plans;
- assists the team in developing an Individual Educational Plan (IEP) that provides for the required health needs of the child, which enables the student to participate in his/her educational program;
- assists the parent(s) and child to identify and utilize community resources;
- assists the parent(s) and teachers to identify and remove health-related barriers to learning;
- provides in-service training for teachers and staff regarding the individual health needs of the child;
- provides and/or supervises unlicensed assistive personnel to provide specialized health care services in the school setting;
- evaluates the effectiveness of the health-related components of the IEP with the child, parent(s), and other team members, and makes revisions to the plan as needed;
- participates in the identification and evaluation of students who may be eligible for services under IDEA, and through shared responsibility with other team members, assists in the planning and implementation of Individual Education Plans or Individual Family Service Plans as needed;

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- develops student goals and objectives and nursing protocols to meet student-specific health needs during a school day, monitors student progress, and initiates an IEP reassessment when indicated; and
- serves as the team liaison to the medical community.

REFERENCES

- Cedar Rapids Community School District v. Garret F*, 119 S.Ct. 992, 29 IDELR 966 (U.S. 1999). To view the full decision, go to: <http://supct.law.cornell.edu/supct/html/96-1793.ZS.html>.
- Gaffrey, E. A., & Miller, W. R. (2001). *Contracting with managed care organizations*. In N. C. Schwab & M. H. B. Gelfman (Eds.), *Legal issues in school health services: A resource for school administrators, school attorneys and school nurses*. Pp. 453-471. North Branch, MN: Sunrise River Press.
- Gelfman, M. H. B., & Schwab, N. (2000). School health services after Cedar Rapids Independent School District v. Garret F. *Journal of School Nursing*, 16(4) 54-59.
- Heller, K. W., & Tumlin, J. (2004). Using Expanded Individualized Health Care Plans To Assist Teachers of Students with Complex Health Care Needs. *Journal of School Nursing*. 20(3) 150-160.
- Hootman, J. & Hula, B. (2001). Partnering with the school nurse. *Small Talk*. 1(3), 1-4.
- Individuals with Disabilities Education Act (IDEA). (1975). 20 U.S.C. §§ 1400 et seq., as amended and incorporating the Education of All Handicapped Children Act (EHA), 1975, P.L. 94-142, and subsequent amendments; Regulations at 34 C.F.R. §§ 300-303 [Special education and related services for students, pre-school children, and infants and toddlers].
- Irving Independent School District v. Tatro*, 468 U.S. 883, EHLR 555:511 (1984).
- National Association of School Nurses. (2000, November). *National Association of School Nurses membership survey results*. Scarborough, ME: Author.
- National Association of School Nurses. (2001). *Issue brief: Impact of Cedar Rapids Community School District vs. Garret F. on School Nursing Services*. Scarborough, ME: Author.
- National Association of School Nurses. (2003). *Position statement: Individualized Health Care Plans*. Scarborough, ME: Author.
- National Association of School Nurses. (2004). *Position statement: Caseload assignments*. Scarborough, ME: author.
- National Information Center for Children and Youth with Disabilities. (1997). *The IDEA amendments of 1997*. NICHCY News Digest, 26, 11-39.
- Public Law 105-17. (1997). Reauthorization of the Individuals with Disabilities Education Act.
- Public Law 108- 446. (2004). Reauthorization of the Individuals with Disabilities Education Act.
- Rapport, M.J., & Lasseter, D. J. (1998). *Physical disabilities: Education related services*. 16, 77-94.
- Schwab, N., Gelfman, M., & Cohn, S. (2001). IDEA: Current Issues in Dispute. In N. C. Schwab & M. H. B. Gelfman (Eds.), *Legal issues in school health services: A resource for school administrators, school attorneys and school nurses* (pp. 399-418). North Branch, MN: Sunrise River Press. Schwab, N., Gelfman, M., & Cohn, S. (2001). Special Education Law. In N. C. Schwab & M. H. B. Gelfman (Eds.), *Legal issues in school health services: A resource for school administrators, school attorneys and school nurses* (pp. 373-399). North Branch, MN: Sunrise River Press.

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U.S. Department of Education. (1999) *National Education Association Policy Statement on appropriate inclusion*. Retrieved from <http://www.nea.org/publiced/idea/ideaplcy.html>.

U.S. Department of Education, Office of Special Education and Rehabilitative Services. (1999). *Annual report to Congress on the implementation of the Individuals with Disabilities Education Act, 1988-1998*. Retrieved from <http://www.nces.ed.gov/pubs99>

U.S. Department of Education, Office of Special Education and Rehabilitative Services (1999). *Annual report to Congress on the implementation of the Individuals with Disabilities Education Act, 1988-1998*. Retrieved from <http://www.nces.ed.gov/pubs99>.

Walsh, M. (1999). *Educators say ruling could drain budgets*. Education Week, 18(26): 1 & 12. 2001.

Impact of Cedar Rapids Community School District vs. Garret F. on School Nursing Services

Adopted: 2001

Inclusion

Adopted: 1995; Revised: 2001

School Nurses and the Individuals with Disabilities Act (IDEA)

Adopted: 1996;

Revised: 2002; **Revised: July 2006**

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POSITION STATEMENT

Medication Administration in the School Setting

HISTORY

Medication administration is one of the most common health-related activities performed in schools. Historically, administering medications within the school setting has been a school nurse responsibility. Because the number of students needing medication administration has grown, school nurses increasingly are required to delegate medication administration to unlicensed assistive personnel (UAP) (McCarthy, Kelly, & Reed, 2000).

DESCRIPTION OF ISSUE

The safe and effective use of medications for the treatment of certain medical conditions and illnesses has enabled many children to attend school and achieve academic success. Students receive medications at school for a variety of reasons ranging from treatment of acute conditions to chronic illnesses to complex disabilities. Some students may require medications for life-threatening emergencies (American Academy of Pediatrics, 1997). Important issues confronting the school nurse regarding the administration of medications include, but are not limited to the following:

- Safe administration of the medications
- Adherence to safe nursing practice, state practice acts, and the applicable state laws and regulations
- Ongoing monitoring of therapeutic benefits, adverse reactions and any side effects associated with the medications
- Appropriate communication with the student, family, school personnel and health care providers
- Proper documentation
- Use of alternative and homeopathic remedies for self-limiting conditions
- Management of both over-the-counter (OTC) medications and prescription medications
- Self administration of medications by students
- Need for delegation of medication administration to UAP within the school setting
- Confidentiality
- Ongoing attempts by legislative bodies to change any part of the policies regarding the administration of medications in schools

RATIONALE

The school nurse has the educational background, knowledge, and licensure that provide the unique qualifications to direct the administration of medications in the school setting. As the school staff member most involved in this issue the school nurse must have input into school district policies and procedures relating to medication administration. These policies should be developed considering the safety of all students and staff. School nurses may be able to increase resources available to them by developing partnerships with local pharmacists and/or health care providers. At the state level, the school nurse should be an integral part of the legislative process before any changes or modifications to a state's current laws are addressed.

CONCLUSION

It is the position of the National Association of School Nurses that school districts develop policies and procedures to address medication administration in accordance with federal and state laws and guidelines. NASN recommends that the school nurse, as well as to other school district personnel, parents, school medical advisors, pharmacists, and legal counsel, be included in policy development to ensure that the numerous issues surrounding medication administration are addressed. Confidentiality must be a priority for the school nurse and any designees that administer medications to students in the school setting.

The school nurse can administer medication safely and effectively under the following guidelines, at a minimum:

- Adherence to school policies, school nurse standards of practice, state nurse practice acts and state laws governing these practices.
- The medication is in the original container if over-the-counter (OTC) or in a properly labeled prescription container, subject to state Board of Pharmacy regulations. In some states, a licensed health care provider may package and label the medication.
- Information on the container must include the student's name, the name of the drug, dosage amount, route of administration, the time interval of the dose, and the name of the prescribing licensed health care provider.
- The parent/guardian must request in writing that the medication be administered at school.
- The school nurse, based on nursing assessment, determines that the medication can be given at school.
- The administration of medication in no way violates nursing protocols or standing orders.
- The school nurse is aware of and has access to current reliable information regarding the safe use of the medication including side effects and toxicity, possible drug interactions, adverse effects and expected outcomes.
- Medications are stored in a locked cabinet.
- Procedures must be in place for receiving, administration of, and accountability for all medications in the school setting.

The implementation of appropriate guidelines will assist the school nurse in conjunction with the local education agency in meeting their responsibility to foster the protection of the health, safety, and welfare of the students, school personnel, and general public during the administration of medications in the school setting.

References/Resources:

- American Academy of Pediatrics (1997). *Policy statement. Guidelines for the administration of medication in school* (RE9328). *Pediatrics*, 92(3), 499-500. Retrieved on May 13, 2003 from <http://www.aap.org/policy/04524.html>
- Awbrey, L.M. & Juarez, S.M. (2003). Developing a nursing protocol for over-the-counter medications in high school. *Journal of School Nursing*, 19(1), 12-15.
- Dockrell, T.R. & Leever, J.S. (2000). An overview of herbal medications with implications for the school nurse. *Journal of School Nursing*, 16(3), 53-58.
- McCarthy, A.M., Kelly, M.W., & Reed, D. (2000). Medication administration practices of school nurses. *Journal of School Health*, 70(9), 371-376.
- National Association of School Nurses (1999). *Position statement: The use of asthma inhalers in the school setting*. Available at: <http://www.nasn.org/positions/asthma.htm>
- National Association of School Nurses (2000). *Position statement: Epinephrine use in life-threatening emergencies*. Available at: <http://www.nasn.org/positions/epinephrine.htm>
- National Association of School Nurses (2000). *Position statement: Out-of-school education: Field trips and camps*. Available at: <http://www.nasn.org/positions/outofschool.htm>
- National Association of School Nurses (2001). *Position statement. Alternative medicine use in the school setting*. Available at <http://www.nasn.org/positions/altermedi.htm>

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National Association of School Nurses (2001). *Position statement: Research medications in the school setting*. Available at: <http://www.nasn.org/positions/researchmeds.htm>

National Association of School Nurses (2001). *Position statement: The role of school nurses in allergy/anaphylaxis management*. Available at: <http://www.nasn.org/positions/allergy.htm>

Reutzell, T.J. & Rinku, P. (2001). Medication management problems reported by subscribers to a school nurse listserv. *Journal of School Nursing*, 17(3), 131-139.

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Revised: September 1997
Revised: June 2003

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Missouri Revised Statutes

Chapter 167

Pupils and Special Services

Section 167.627 (August 28, 2008)

<http://www.moga.mo.gov/statutes/C100-199/1670000627.HTM>

Possession and self-administration of medication in school--requirements.

167.627. 1. For purposes of this section, the following terms shall mean:

(1) "Medication", any medicine prescribed or ordered by a physician for the treatment of asthma or anaphylaxis, including without limitation inhaled bronchodilators and autoinjectible epinephrine;

(2) "Self-administration", a pupil's discretionary use of medication prescribed by a physician or under a written treatment plan from a physician.

2. Each board of education and its employees and agents in this state shall grant any pupil in the school authorization for the possession and self-administration of medication to treat such pupil's asthma or anaphylaxis if:

(1) A licensed physician prescribed or ordered such medication for use by the pupil and instructed such pupil in the correct and responsible use of such medication;

(2) The pupil has demonstrated to the pupil's licensed physician or the licensed physician's designee, and the school nurse, if available, the skill level necessary to use the medication and any device necessary to administer such medication prescribed or ordered;

(3) The pupil's physician has approved and signed a written treatment plan for managing asthma or anaphylaxis episodes of the pupil and for medication for use by the pupil. Such plan shall include a statement that the pupil is capable of self-administering the medication under the treatment plan;

(4) The pupil's parent or guardian has completed and submitted to the school any written documentation required by the school, including the treatment plan required under subdivision (3) of this subsection and the liability statement required under subdivision (5) of this subsection; and

(5) The pupil's parent or guardian has signed a statement acknowledging that the school district and its employees or agents shall incur no liability as a result of any injury arising from the self-administration of medication by the pupil or the administration of such medication by school staff. Such statement shall not be construed to release the school district and its employees or agents from liability for negligence.

3. An authorization granted under subsection 2 of this section shall:

(1) Permit such pupil to possess and self-administer such pupil's medication while in school, at a school-sponsored activity, and in transit to or from school or school-sponsored activity; and

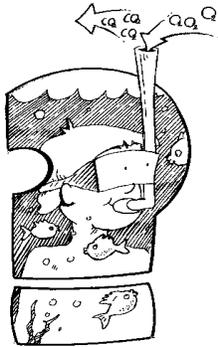
(2) Be effective only for the same school and school year for which it is granted. Such authorization shall be renewed by the pupil's parent or guardian each subsequent school year in accordance with this section.

4. Any current duplicate prescription medication, if provided by a pupil's parent or guardian or by the school, shall be kept at a pupil's school in a location at which the pupil or school staff has immediate access in the event of an asthma or anaphylaxis emergency.

5. The information described in subdivisions (3) and (4) of subsection 2 of this section shall be kept on file at the pupil's school in a location easily accessible in the event of an asthma or anaphylaxis emergency.

(L. 1996 H.B. 1301 & 1298 § 10, A.L. 2006 H.B. 1732)

Questions & answers about breathing & lungs



1. Why do I breathe?

You breathe to get new air in and old air out of your lungs. The new air carries lots of oxygen, or O₂, that your body needs. The air you breathe out carries away lots of carbon dioxide, or CO₂. The CO₂ you breathe out is like the exhaust from a car.

2. How often do I breathe?

A newborn baby breathes about 40 times a minute. As your body grows, breathing slows down to about 12 times a minute. When you work, play or exercise, you breathe faster to get more oxygen to your muscles and to get rid of extra CO₂.



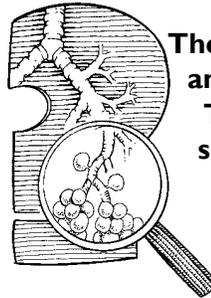
3. How does air get into my body?

You breathe through your nose, mouth, or both. As the air moves through your nose it is filtered and the air becomes warm and moist. Air coming through your mouth is not filtered and it is drier.



4. Where does the air go when I breathe in?

The air moves down your throat and into tubes called "airways." These airways get smaller and smaller. At the very end of the airways are small sacks called "alveoli." These look like bunches of grapes. All the tubes and sacks together make up your lungs.

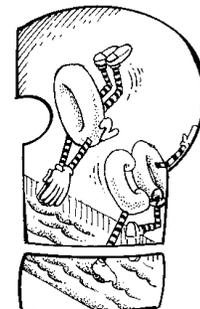


5. Where are my lungs?

Your lungs are under your ribs. There are 2: one on the left, and one on the right. Your heart is in front of your left lung.

6. What happens to the air in the sacks?

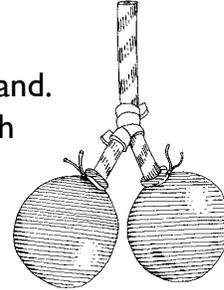
A lot of blood flows past the sacks. The oxygen that you breathe in passes through the walls of the sacks and goes into the blood. At the same time, CO₂ moves from the blood and into the sacks. You then breathe out the CO₂.



Questions & answers about breathing & lungs



- Give children examples they can understand. Point out that lungs are like balloons with a straw attached.



- You might hear other words used when talking with your health team. For each of the following words, there are several other words that mean the same thing:
 - ◆ **Airways** = tubes, trachea, bronchus, bronchioles, air passages
 - ◆ **Sacks** = alveoli, alveolar sacs
 - ◆ **Breathe in** = inhale, inhalation, inspire, inspiration
 - ◆ **Breathe out** = exhale, exhalation, expire, expiration

What is asthma?



Asthma changes the way you breathe.



"Mr. Oxygen"

Usually, air moves in and out of your lungs freely. In an asthma episode, it's harder to breathe. The extra work is felt mostly when you breathe out.



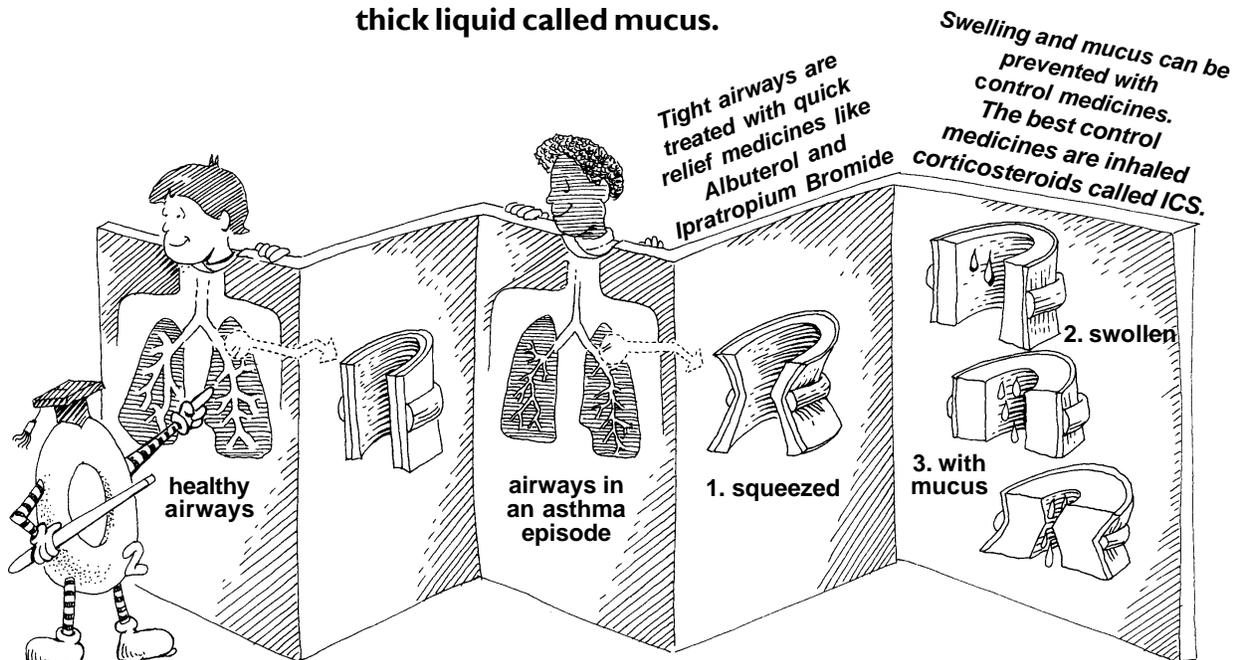
How does asthma make it hard to breathe?

If you have asthma, your airways are "twitchy." They are very sensitive to certain things, like pets or dust. These things can cause you to have an asthma episode.

What happens in an asthma episode?

In an asthma episode, your airways become narrow. This makes it hard for air to move in and out. This happens because:

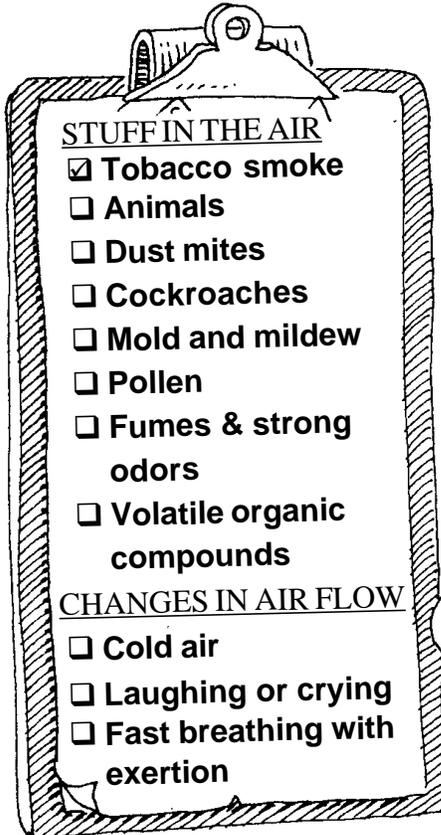
1. Muscles squeeze the small airways.
2. The insides of the airways swell.
3. The insides of the airways make a thick liquid called mucus.



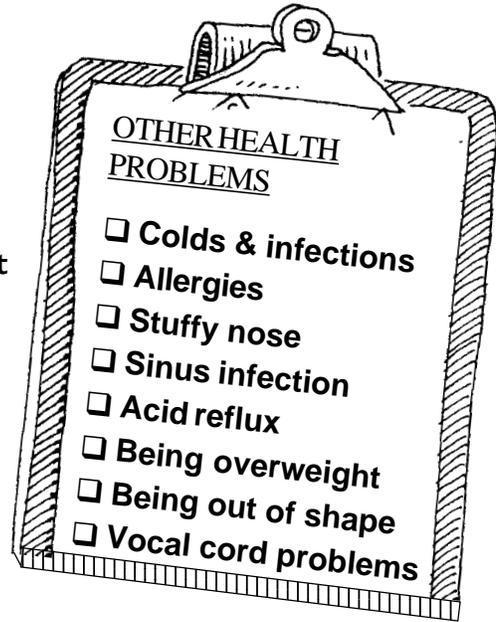
Asthma might make you cough, wheeze, or feel short of breath. It can also make your chest feel tight.

What makes asthma worse?

Many things can make asthma worse:

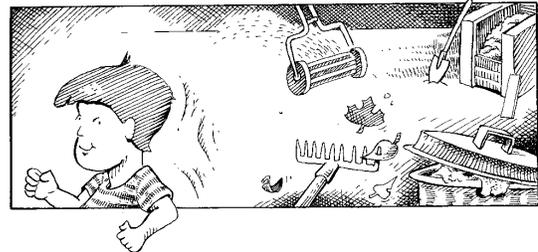


Your health team will help you decide what makes **your** asthma worse.

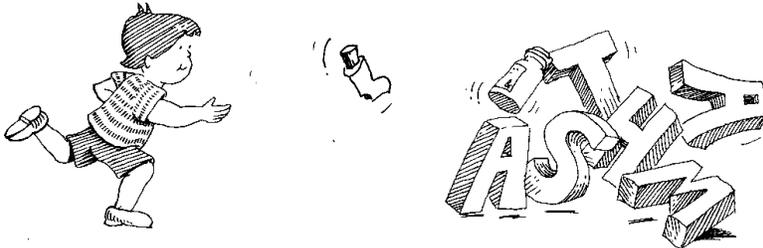


What makes asthma better?

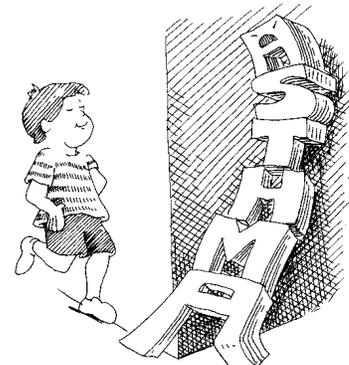
1. If you can, move away from the things that make your asthma worse.



2. Medicines can stop an asthma episode.



3. Treating other health problems can improve your asthma control.



Remember ... even when you feel better, your asthma is still there.

Asthma words

Words from this sheet are hidden in the puzzle. Look for words hidden across, down, and diagonal. When you find a word, circle it. Can you find all of the words listed at the bottom of the page?



A L V S O R P M A O R
T I L Q F C O U G H L
A N R U A T L C L P M
S O P E T S L U N G S
T W H E E Z E S K A C
H L A Z Q Y N M I L U
M F H E P I S O D E N
A D U M U S C L E S A
R A D M O T E D C O R
M I L D E W G J B P R
A H A D U S T U Z A O
E X E R C I S E T S W

air
asthma
cough
dust
✓ episode
exercise
fumes
lungs
mildew

mold
mucus
muscles
narrow
pets
pollen
squeeze
wheeze

What is asthma?



- Asthma is a chronic illness that usually needs ongoing care. Some children may seem to “outgrow” their asthma. Others might not. It is hard to predict which children will have asthma throughout their lives. It is important to watch your child over several months when deciding if asthma is getting better. Only then can you really judge the problem.
- Tightening of the airways is also called “bronchoconstriction,” or “bronchospasm.” This happens when the muscles around the airways tighten.
- The inside of airways can swell, making them even more narrow. This is called “inflammation.” As the airways swell, more mucus is produced.
- There are two types of asthma medicines:
 - ◆ **Quick-relief medicines** (also called “bronchodilator”)—relax tight airways and stop or reduce asthma symptoms. They work within a few minutes, but last only 3 to 4 hours. Albuterol is the most common quick-relief medicine.
 - ◆ **Control medicines** (also called “anti-inflammatory”)—keep the airways from swelling and work over a longer time. They keep you from having asthma problems in the future. They must be consistently taken everyday. Because the medicine is inhaled, only a very small amount is needed to work. You **do not become addicted** to long-term control preventive medicines; they help by gradually controlling the swelling, allowing the air passages to become less sensitive to triggers that cause asthma symptoms. You will have fewer symptoms over time and asthma episodes are prevented.

Asthma Fact: Asthma symptoms should not keep your child from having fun.

Take the following quiz to find out how much asthma is affecting your child’s life.

1. Does coughing wake your child (and you) more than 1 night per month (age 4 or younger) or 2 nights per month (age 5 or older)? ○ Yes ○ No
2. Has your child missed school because of asthma symptoms? ○ Yes ○ No
3. Does your child use a rescue inhaler more than twice per week? ○ Yes ○ No
4. Do you prevent your child from going places or doing things (such as going to a playground or playing sports) because of asthma? ○ Yes ○ No

If you answered Yes to any of these questions, talk to your doctor. A daily control medicine may need to be part of your child’s asthma plan.

How to know if you're having an asthma episode

Do any of these things ever happen to you? They could mean you are having asthma problems (an "asthma episode"):



1. Coughing

2. Whistling sound when breathing (wheezing)

3. Chest feels tight or hurts

4. Can't get enough air

5. Waking up at night with trouble breathing

6. Trouble breathing while playing, running, or climbing stairs

7. Fast breathing

8. Decrease in peak flow reading or FEV₁ (forced expiratory volume in first second)

**If these things happen,
follow your action plan from your health team.**

How to know if you're having an asthma episode



- The signs of an asthma episode are different for everyone. It is important to know the signs and be able to respond. The following signs, along with those listed on the other side of this sheet, can all mean that a child is having an asthma episode:

- ◆ Stops activities, is tired, or quiet
- ◆ Changes behavior, becomes irritable
- ◆ Has trouble sleeping due to breathing problems or coughing

Follow your health team's instructions on what to do if an episode happens.

- The following signs can mean a severe episode:

- ◆ Nose opens wide when breathing in (nasal flaring)
- ◆ Space between or under ribs or around collarbone sinks when breathing in (retractions)
- ◆ Trouble breathing while talking or trouble making sounds
- ◆ Blue or gray color around face, lips and/or fingernails (cyanosis)
- ◆ Trouble breathing while at rest or walking

If any of these happen, you need to seek immediate care. Follow your action plan.

- You can manage most asthma episodes at home by following the action plan from your health team. However, when signs of severe asthma persist, have your own plan that includes the following:

- ◆ Where to go for immediate medical care
- ◆ How you'll get there
- ◆ Who will watch other children

- If an infant has asthma, watch him or her closely for signs to seek immediate care. These signs include:

- ◆ Stops suckling or feeding
- ◆ Fast breathing
- ◆ Cry changes—becomes softer and shorter
- ◆ Skin between ribs is pulled tight
- ◆ Nostrils open wider than usual
- ◆ Grunting when breathing out
- ◆ Coloring changes (pale or red face; fingernails turn blue)

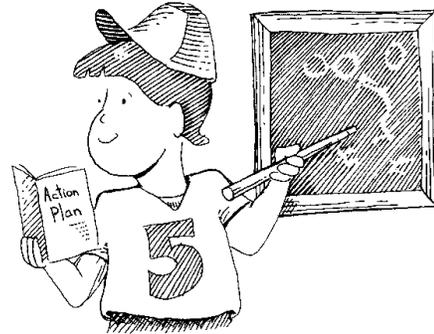
If you notice signs of asthma in an infant, seek help right away. Have an asthma control plan to get to the doctor or hospital. Your plan should include how you'll get there and who will watch any other children.

- You might hear other words when talking with your health team:

- ◆ trouble breathing = dyspnea (DISP-nee-uh)
- ◆ fast breathing = tachypnea (tack-IP-nee-uh)

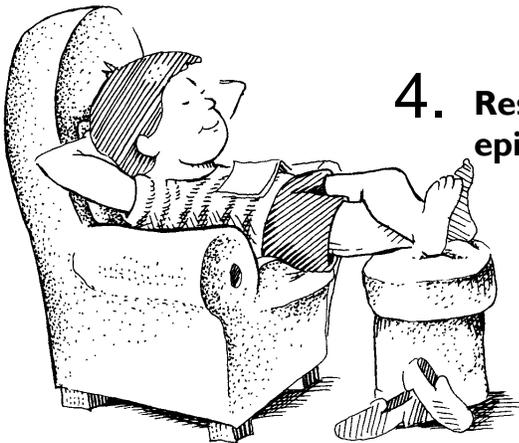
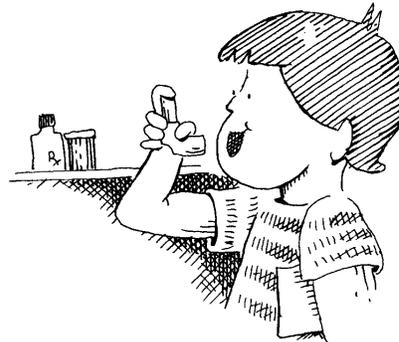
What to do if you have an asthma episode

1. You should have an Action Plan from your health team. Read it **before** you have an asthma episode. Follow the instructions on what to do if there is trouble.

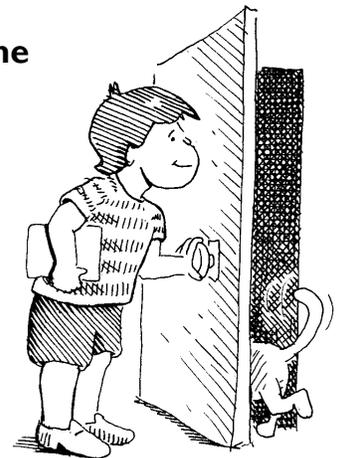


2. Early action is important. **Before** you have an asthma episode, know the signs. Read the sheets called "How to know if you're having an asthma episode" (pages 7 and 8).

3. Take your quick-relief medicine right away. It is important to use a spacer/spacer with mask when you take your quick-relief medicine.



4. Rest and stay calm, or the episode may get worse.



5. Get away from what makes your asthma worse (like pets or smoke).

What to do if you have an asthma episode



- Make sure that the action plan from your health team is available and up-to-date. Even if you follow the action plan, you may need to get further help. Look for the following signs and symptoms. If any of these happen, you should seek medical care right away:
 - ◆ Breathing remains hard after medicine
 - ◆ Low peak flow or FEV₁* number does not get higher after quick relief medicine
 - ◆ Asthma problems return before 3 or 4 hours after using quick-relief medicines
 - ◆ Nose opens wide when breathing in (nasal flaring)
 - ◆ Space between or under ribs or around collarbone sinks when breathing in (retractions)
 - ◆ Trouble walking due to shortness of breath
 - ◆ Trouble talking in sentences or phrases, or trouble making sounds due to breathing problems
 - ◆ Blue or gray color around face, lips, or fingernails (cyanosis)

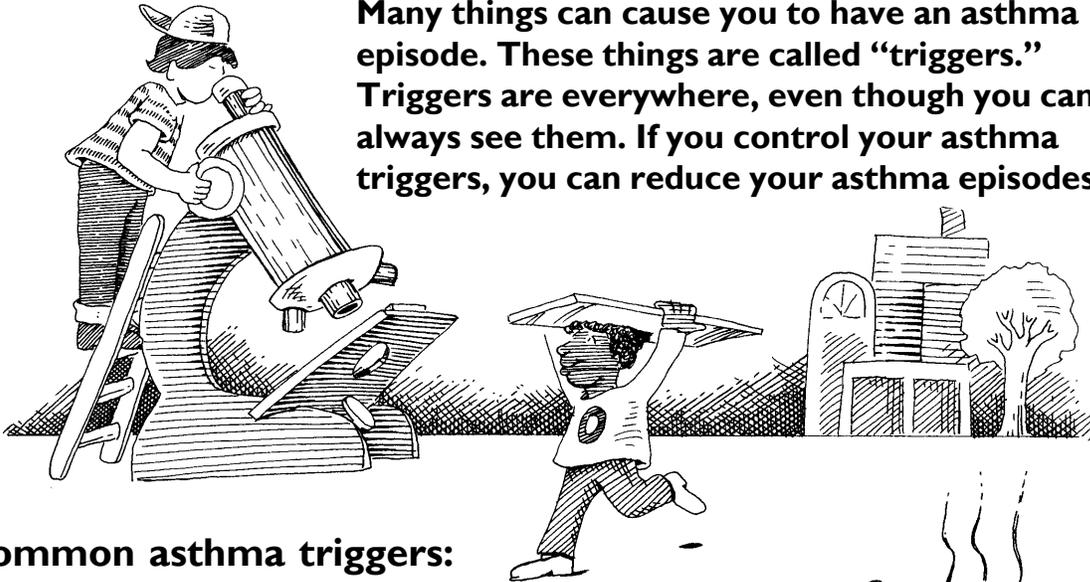
- How will you know when things are better? The following are signs that an asthma episode is getting better:
 - ◆ Breathing is easier
 - ◆ Can walk and lie down without trouble breathing
 - ◆ Can speak without trouble
 - ◆ Space around ribs and collarbone does not sink when breathing in
 - ◆ Skin color is normal
 - ◆ Peak flow or FEV₁ number is better (not in red zone)

*The FEV₁ (Forced Expiratory Volume in the first second) is the maximum amount of air forcefully exhaled in one second after filling the lungs with air. If airflow out of the lungs is obstructed, the FEV₁ falls to less than 100% of normal. If the FEV₁ falls below 80%, special medicines are needed to reopen the airways. FEV₁ is a more sensitive measure of airflow obstruction than peak flow and is useful in assessing the risk of future asthma exacerbations. When FEV₁ is unavailable, peak flow readings may be used. Your school nurse may have a digital flow meter at school that can measure both FEV₁ and peak flow (PEF). From *Guidelines for the Management of Asthma, Expert Panel 3* (2007).

What makes asthma worse?



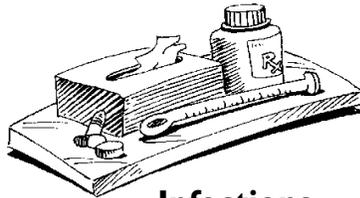
Many things can cause you to have an asthma episode. These things are called “triggers.” Triggers are everywhere, even though you can’t always see them. If you control your asthma triggers, you can reduce your asthma episodes.



Common asthma triggers:



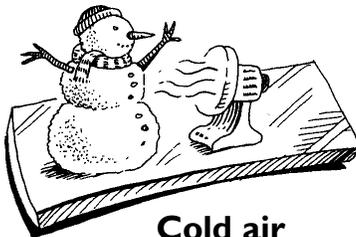
Cockroaches



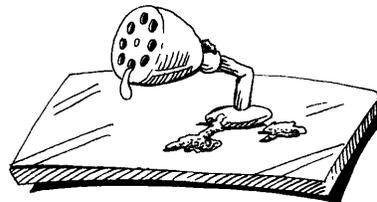
Infections



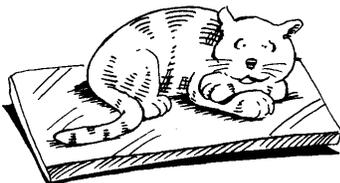
Smoke (active and passive), fumes, and strong odors



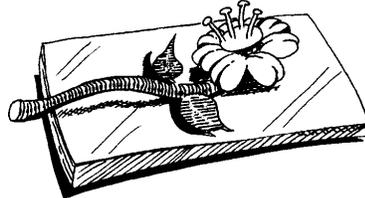
Cold air



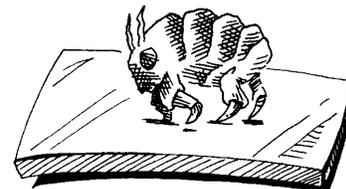
Mold and mildew



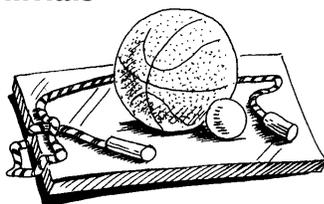
Animals



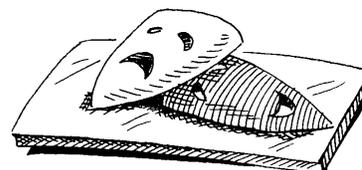
Pollen



Dust mites



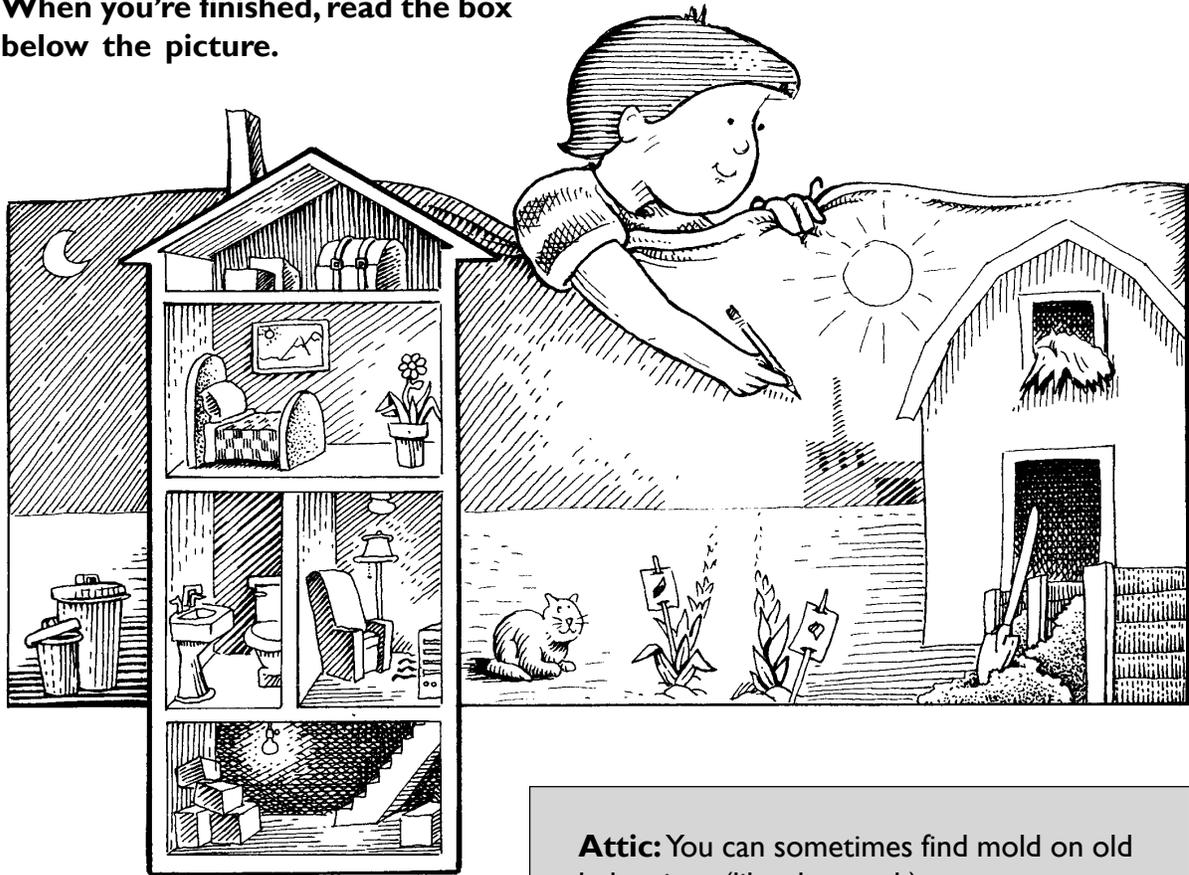
Exercise



Strong feelings (laughing and crying)

Hidden triggers

Can you find places in this picture where asthma triggers might be hiding?
When you're finished, read the box below the picture.



What are some of your asthma triggers? Write them below.

Attic: You can sometimes find mold on old belongings (like the trunk).

Bedroom: Dust mites can hide in pillows and mattresses.

Bathroom: Mold and mildew can grow in the shower or sink.

Living room: Dust mites live in cloth-covered furniture and carpet.

Basement: Mold can grow in the basement.

Trash cans: Cockroaches love trash.

Cat: Animals can cause an asthma episode.

Plants: Pollen can blow off of plants.

Barns: Mold grows in hay bales.

How to control triggers: Smoke, fumes, & strong odors

Tobacco smoke is the worst asthma trigger.

You might breathe in smoke from other people who are smoking. This is called “second-hand smoke,” or “passive smoke.” Tobacco smoke can cause very bad asthma episodes. Strong odors, fumes, and air pollution can also cause asthma problems.

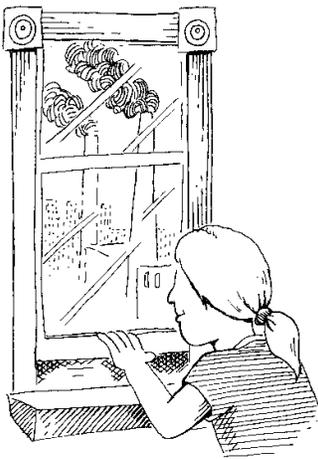


How you can help:

1. Stay away from tobacco smoke.
2. Ask people around you not to smoke.
3. Move away from people who are smoking.



4. If you smell strong odors, move away from them. Strong odors can come from soap, perfume, paint, or cleaning liquids.
5. Stay indoors on days when air pollution is bad.



How to control triggers: Smoke, fumes, & strong odors



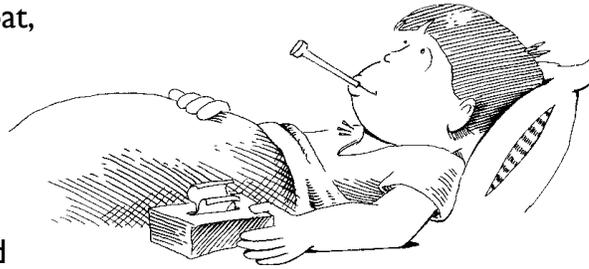
**Family
Notes**

- Children who live with smokers have more severe asthma problems. They're more likely to need emergency care and hospital stays.
- Ask people not to smoke in your home or car, even when those with asthma are not present.
- If family members smoke, have them smoke only outside. Better yet, try to quit. Everyone's health would benefit. **PROTECT YOUR CHILD FROM TOBACCO SMOKE.**
- Avoid volatile organic compounds (VOCs). VOCs are irritants commonly found in paints and solvents.
- Some common examples of VOCs include: acetone, benzene, ethylene glycol, formaldehyde, and methylene chloride.
- VOCs can arise from sources such as new carpeting, particle board, and paint.
- If you use cleaners with strong odors, do so only when those with asthma are not around. Air out the room for a few hours before they return.
- Do not use strong soap, perfume, cologne, or after-shave.
- Avoid pressurized aerosol deodorants, air fresheners, and hair sprays. Choose hand-pump products instead.
- Choose VOC-free paint and household products to improve air quality in your home.

How to control triggers: Infections



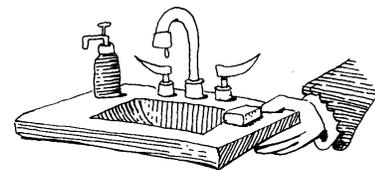
Infections or colds can start an asthma episode. Some signs of an infection are a scratchy throat, fever, and stuffy or runny nose. Often asthma problems worsen several days after the first signs of a cold or infection.



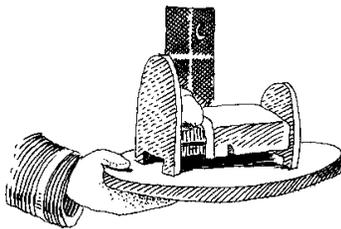
How you can help:



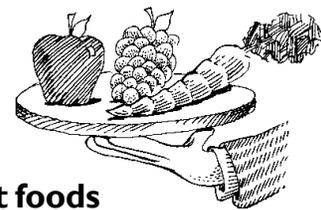
1. Take your medicines the way your doctor tells you.



2. Wash your hands when you are around people with colds.

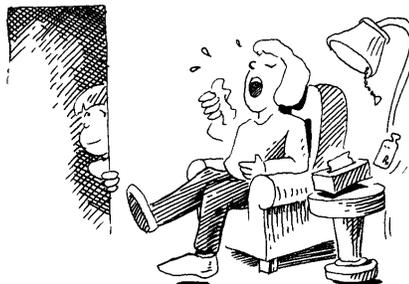


3. Get plenty of sleep.



4. Eat foods that are good for you, like fruits and vegetables.

5. Try to stay away from people who have colds or infections.



6. Get the flu vaccine EVERY fall.

How to control triggers: Infections



- Watch for signs of an infection, such as scratchy throat, stuffy nose, fever, aches, and no appetite.
- When nasal congestion or nasal discharge first occurs, consider 7 to 10 days of daily nasal rinsing using hypertonic salt water to help clear nasal secretions and possibly prevent the need for antibiotic therapy. Nasal rinses or washes and the hypertonic solution do not require a prescription. These products may be purchased over-the-counter at many drug stores.
- Tell your doctor if your child has green or yellow nasal discharge that lasts more than 7 to 10 days.
- Young children have more colds if they are in day care with large numbers of kids. If possible, choose small-group (2 to 5 kids) or family-centered day care.
- Follow the CDC recommendations for vaccination against influenza and other preventable infections.
- Follow your asthma action plan and step up the dose of your ICS control medicine if recommended by your health team.
- People with asthma and allergies often have trouble with nasal congestion and sinus infections. For many years, it has been known that swimming in the ocean (and getting salt water into the nose) reduces nasal congestion and the risk of sinus infections. Water with no salt or only a small amount of salt does not offer the same benefits. Hypertonic salt water is like ocean water. Three benefits come from rinsing the nose with the hypertonic salt water: 1) clear debris from the nose, 2) reduce nasal congestion, and 3) increase the clearance of secretions from the sinuses. See pages 17 and 18 to learn how to rinse the nose with salt water.

How to rinse the nose with salt water



The benefits of rinsing the nose with salt water

- When you rinse the nose with this salt water and baking soda mixture, you wash crusts, thick mucus, and other debris from the nose and sinus openings.
- Salty water pulls fluids out of swollen tissue, which decongests the nose and improves air flow. This makes breathing easier and helps open the sinus passages.
- This salt water and baking soda mixture helps the nose membranes move mucus faster.

The recipe for the salt water and baking soda mixture

- Carefully clean a 1-quart glass jar. Rinse well.
- Fill the clean jar with water that is suitable for drinking. Use warm water. Test the solution's temperature by squeezing a few drops on your wrist.
- Add 2 or 3 heaping teaspoons of pickling salt, canning salt, kosher salt, or sea salt. You can ask for these at your grocery store. **Do not use table salt.** Table salt has additives you don't want in your nose rinse.
- Add 1 rounded teaspoon of baking soda (pure bicarbonate).
- Stir or shake before each use.
- Store at room temperature.
- After a week, pour out any mixture that is left and make a new batch.

NOTE: If the mixture seems **too strong**, use the same amount of baking soda but less salt; try 1½ to 2 teaspoons of salt. For children, **start** with the smaller amount of salt. Gradually increase to 2 to 3 teaspoons of salt, or whatever your child will accept.

How to rinse the nose

- Make the salt water and baking soda mixture according to the recipe above.
- Consider rinsing the nose after exposure to dust, mold, allergens, smoke, or other irritants or pollutants.
- You may also purchase sinus rinse kits over-the-counter at your local pharmacy. There are many varieties to choose. They will include a saline rinse bottle and pre-measured packets to mix the salt and baking soda mixture with water. You can use one of these purchased bottles, a bulb/ear syringe, or a large medical syringe (30 ml).

Instructions

- Pour some of the mixture into a clean bowl.
- Fill the rinse bottle or syringe with the mixture from the bowl. **Do not** put your used syringe into the jar with your mixture because it will contaminate your weekly supply.
- To warm the solution, place the rinse bottle or syringe under warm running water, set the rinse bottle or syringe in a sink or bowl filled with warm water, or add a small amount of warm water to the mixture. **NEVER** use solution that is hot to the touch.
- In the shower or over the sink, lean forward, tilt your head to the left, and gently seal the tip of the rinse bottle in your right nostril. Point the bottle tip or stream toward the back of the throat. **DO NOT POINT** the tip or stream upward.
- Take a deep breath and begin slowly blowing air out of the open nostril. You may find it helpful to seal your throat with your tongue as if you were gargling or holding your breath.
- **Gently squeeze the bottle**, pushing a little water into one nostril as you blow it out the other side.
- While you are still leaning forward, tilt your head to the right and repeat the procedure, pushing a little water into the left nostril, blowing it out the right.

Most people notice a mild burning feeling the first few times they use the mixture. This is normal; this sensation will usually go away with repeated use.

For young children

- You can put the mixture in a small spray container, like a saline spray or nasal steroid spray bottle.
- Squirt into each side of the nose several times.
- Always have the child upright to prevent choking. Do not force your child to lay down. Rinsing the nose is easier when sitting or standing.

If you use a nasal steroid spray such as Flonase[®], Nasonex[®], Rhinocort[®], Veramyst[®], Nasacort[®], or Omnaris[®]:

- Always use the salt water mixture **first**. Wait about 10 minutes and then use your nasal steroid spray. The nasal steroid reaches deeper into the nose and sinuses when it is sprayed onto clean, decongested nasal tissues.

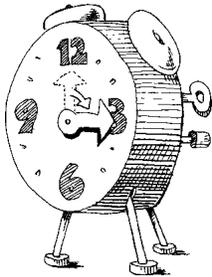
Albuterol (alb-YOO-ter-ol)



Your health team has given you a medicine called Albuterol. This sheet tells you about Albuterol and how you should use it.



What does Albuterol do?



Albuterol is a “quick-relief” medicine. It works within minutes so you can breathe easier. Always use Albuterol with a spacer for maximum benefit.

Albuterol works by relaxing tight muscles that squeeze your small airways. It should help you breathe easier for 3 hours or more.

When should I use my Albuterol?

Use it as often as you were told by your health team. Use it to treat coughing, wheezing, shortness of breath, and chest tightness.

Your health team may ask you to use your Albuterol:



before exercise, or ...



before going out in cold air.



Can I use my Albuterol too often?

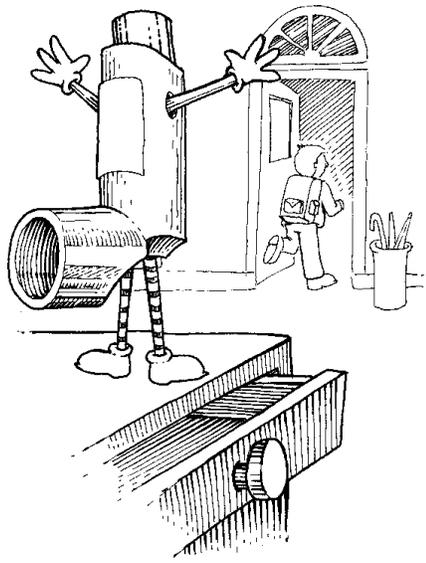
Yes, and this can cause problems. If you need to use Albuterol more often than you were told, tell your health team right away. This might mean that your asthma is not well controlled. You might need another medicine.

How do I use my Albuterol?

If you use an inhaler, read the sheet called “How to use your metered dose inhaler (MDI).” If you use a nebulizer, read the sheet called “How to use your nebulizer.” Ask a member of your health team about what medicines can be mixed together in the nebulizer.



Wait! Don't forget me!



Where should I keep my Albuterol?

Keep your medicine with you at all times. Always have it handy in case you need it.

Albuterol (alb-YOO-ter-ol)



**Family
Notes**

- Albuterol is a very helpful medicine, but it can sometimes cause side effects. These can include:
 - ◆ shakiness or nervousness
 - ◆ trouble sleeping
 - ◆ rapid, pounding heartbeat
 - ◆ restlessness
 - ◆ upset stomach
- These side effects often go away in a short time. Call a member of your health team if side effects become a problem. A special form of albuterol is available for use in these cases. This more expensive medicine is levalbuterol (Xopenex™). It might reduce side effects while still providing the needed relief for tight airways.
- If your child uses albuterol at the same time as another inhaler, he or she should use the albuterol **first**. Albuterol helps open up tight airways so other inhaled medicines can reach deeper into your lungs.
- Call your health team if:
 - ◆ albuterol does not relieve breathing problems for at least 3 to 4 hours, or
 - ◆ extra doses of albuterol are needed for 5 or more days.
- For a **severe life-threatening asthma episode**, your child may take 2 to 6 puffs of albuterol with a spacer/spacer with mask*. Seek emergency care. You may repeat the albuterol dose in 20 minutes if your child has not reached emergency care.
- Keep albuterol between 59° and 86° F and away from direct sunlight.
- Albuterol is also called Proventil®, Ventolin®, or Proair®.
- A ReliOn Ventolin HFA inhaler is available with fewer doses (60 metered inhalations) and is currently the lowest priced albuterol inhaler available.

Notes about medicines

- Carefully follow the instructions for taking medicines. Please ask questions to be sure you understand everything.
- If the medicines do not seem to help, please tell a member of your health team. Your child should have the most effective medicines possible.

Notes about medicines



- Be sure your child never runs out of medicine. Keep track of how much medicine you have at home and be sure to get more **before** you run out or leave town. Refill the prescription in plenty of time to last through weekends, vacations, and holidays.
- Try to get all your medicines from one pharmacy so that your medicine records are all together in one place.
- Be sure your child's health team knows about **all** medicines your child is taking, especially new ones. Some of these may interact and cause problems.
- Try to keep all medicines away from too much heat, light, or moisture. Also, keep medicines away from young children who might use them by accident.
- For more information about medicines, ask your pharmacist.
- If your child needs albuterol to relieve asthma symptoms more than 2 days a week, call your health care provider. A change in the dose or type of control medication might be necessary.
- Finally, make sure your child knows to ask for help if one dose of albuterol fails to relieve breathing problems. Urgent steps might be necessary when serious asthma symptoms do not respond to albuterol. Albuterol given by nebulizer might be more effective than metered dose inhaler for relieving serious asthma symptoms.

*From Management of Asthma Exacerbations: Home Treatment, *Guidelines for the Management of Asthma, Expert Panel Report 3: 2007*, p. 382.

Notes about medicines



Inhaler Cleaning and Priming Information

Name	HFA/MDI	When and how much should I discharge?	How do I clean my inhaler?	How do I know when it is empty?
Proair®	HFA, MDI	New and when not used for 2 weeks: 3 test sprays into air away from face	Clean sleeve weekly with warm water, shake, allow to dry before using	Count doses
Proventil®	HFA, MDI	New and when not used for 2 weeks: 4 test sprays	Clean sleeve weekly by running water through, allow to dry before use	Count doses
Ventolin HFA®	MDI	New and when not used for 14 days or if dropped: Shake well, 4 sprays away from face	Clean sleeve weekly by running water through, allow to dry before use	Dose counter in newest device, if not present, count doses; discard 6 months after taken out of foil pouch
Xopenex®	HFA, MDI	New and when not used for 3 days: Shake well, 4 test sprays	Clean sleeve weekly by running water through, allow to dry before use	Count doses

What is HFA?

This is the new propellant that does not damage the earth's protective ozone layer of the atmosphere. HFA produces a softer mist with smaller particles that can go deeper into the lungs. It is normal to feel and taste HFA medicines less than the old CFC type.



Developed by the Children's Hospital Asthma Task Force
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 1/8/98, revised 10/19/99, 6/3/02, 2/16/04, 10/2/09
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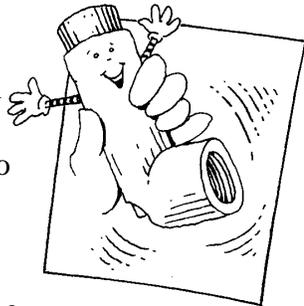
One Hospital Drive
 Columbia, Missouri 65212
 (573) 882-4141

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How to Use Your Metered-Dose Inhaler (MDI)

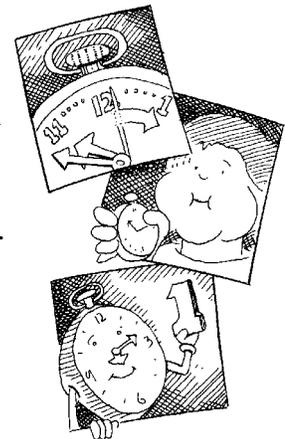
Take your time and don't rush. Each step is important to get the most from your medicine.

1. Many inhalers need to be shaken to mix the contents, so be sure to **check the package instructions** for your inhaler.
2. Take the cap off of the inhaler and look inside. Make sure the mouthpiece and the opening where the medicine comes out is **clean and free of debris and build-up**.
3. When using a valve-holding chamber (VHC) or spacer, insert the plastic mouthpiece through the rubber ring at the end of the chamber. The inhaler should fit tightly into the hole.
4. When using a chamber, remove the plastic cap from the mouthpiece and look inside to be sure it is free of debris.
5. Gently **blow** out all the old air from your lungs.
6. Place the mouthpiece of the chamber in your mouth, being sure your lips are sealed around the mouthpiece and your teeth are not blocking the opening of the chamber's mouthpiece.
7. Lift the chin and then spray **ONE** puff of medicine into the chamber.
8. **Immediately breathe in slowly and continuously for at least 3 to 5 seconds**, allowing the medicine to travel deep into



the lungs, filling the lungs with new air and medicine. Teens and adults may be able to breathe in longer than 3 to 5 seconds.

9. **Hold your breath for 10 seconds** or as long as you can comfortably do so.
10. After 10 seconds, breathe out.
11. Wait at least one minute before repeating the next puff of medicine.



Special Considerations

If your child is using the spacer with a face-mask and is able to blow out air on command (usually by age 4), use the following approach:

1. Complete Steps 1–3 in the previous list.
2. Covering both the mouth and nose, place the mask on your child's face to make a good seal. Lift the chin to open the airway.
3. Have your child gently blow out all the old air from their lungs. Say "Blow out **ALL** your air like you are blowing out candles on a cake."
4. Now, press down on the inhaler to actuate the medicine.
5. Then say, "Take a slow deep breath and hold it. Hold it. Hold it. Hold it. Good work!"

If the effort is not great, just keep the mask in place and repeat this sequence one or more times to clear the medicine from the chamber.

Infants are going to be passive participants. With the chin lifted and mask sealed over the face, spray ONE puff into the chamber. Make sure the child takes 5 to 6 breaths in and out with the chamber mask in place. If the chamber mask has an exhalation valve (nose valve), watch for the child to take 6 breaths after each actuation of the MDI. Otherwise the rise and fall of the chest/abdomen will be the indicator for breaths. Toddlers will usually respond with patience if the parent counts out loud for the required 6 breaths (one, two, three, four, five, six—clap and applaud NOW).

Getting the MOST of your Inhaled Medicine

- **Know your medicine.** It is important to know the name, dose, when, and how your medicine should be used.
- The only way to be sure that you have inhaled medicine left is to count each time you use it. Each inhaled medicine contains a specific amount of sprays/puffs; you can find the number in the drug insert that comes with your medicine. There are several inhaled medicines that have counter devices. Watch the dose counter if your device has this feature.
- A spacer is often recommended with a metered-dose inhaler to help deliver the medicine to the airways of the lungs instead of the mouth. This helps the medicine work better and lessens side effects. A spacer is a device that attaches to the MDI. Do not share your spacers with others. We recommend a second spacer for school or day care.
- Metered dose inhalers differ in the way they should be made ready for use and cleaned. **ALWAYS** read the instructions for each type of inhaler to ensure the

medicine comes out with each puff you take.

- Priming instructions tell you how many puffs should be used as “test” doses. Test doses are needed at special times to ensure that the mist coming out of the device contains the right amount of medicine. Examples of special times to use test doses with your MDI are: 1) when the inhaler is first taken out of the package, 2) when the inhaler has not been used for a while (time period varies depending on the brand of inhaler), and 3) if the inhaler is dropped (depending on brand). **DO NOT** exchange the metal canister of one inhaler with the plastic holder of a different brand.
- If you or your child are using an inhaled steroid, rinse your mouth after each use. When using a spacer with mask, be sure to wipe the face.

Things to Remember

- It is important to clean your inhaler’s mouthpiece and spacer according to the package directions. Make sure it is dry before you use it.
- Do not use anyone else’s inhaler. Do not let anyone else use your inhaler.
- Store your inhaler in the upright position and protect it from hot and cold.
- Some spacers whistle to let you know if you inhale too quickly.
- Spacers are available for children with different mask sizes.



ASTHMA HOME ENVIRONMENT

CHECKLIST

Home visits provide an opportunity to educate and equip asthma patients with the tools to effectively manage their disease in concert with a physician's care. This checklist—designed for home care visitors—provides a list of questions and action steps to assist in the identification and mitigation of environmental asthma triggers commonly found in and around the home. The checklist is organized into three sections—building information, home interior and room interior. The room interior is further subdivided by categories (such as bedding and sleeping arrangements, flooring, window treatments, and moisture control). This will allow the home care visitor to focus on the specific activities or things in a room—in particular the asthma patient's sleeping area—that might produce or harbor environmental triggers. The activities recommended in this checklist are generally simple and low cost. Information on outdoor air pollution follows the checklist. The last page includes information on U.S. Environmental Protection Agency (EPA) resources and an area for the home care visitor to record a home visit summary.

If the patient's sensitivities to allergens (such as dust mites, pests, warm-blooded pets and mold) and irritants (such as secondhand smoke and nitrogen dioxide) are known, the home care visitor should begin by focusing on relevant areas. This checklist covers the following allergens and irritants, which are commonly found in homes. Information is also provided on chemical irritants—found in some scented and unscented consumer products—which may worsen asthma symptoms.

Dust Mites

Triggers: Body parts and droppings.
Where Found: Highest levels found in mattresses and bedding. Also found in carpeting, curtains and draperies, upholstered furniture, and stuffed toys. Dust mites are too small to be seen with the naked eye and are found in almost every home.

Pests (such as cockroaches and rodents)

Triggers: Cockroaches – Body parts, secretions, and droppings.
Rodents – Hair, skin flakes, urine, and saliva.
Where Found: Often found in areas with food and water such as kitchens, bathrooms, and basements.

Warm-Blooded Pets (such as cats and dogs)

Triggers: Skin flakes, urine, and saliva.
Where Found: Throughout entire house, if allowed inside.

Mold

Triggers: Mold and mold spores which may begin growing indoors when they land on damp or wet surfaces.
Where Found: Often found in areas with excess moisture such as kitchens, bathrooms, and basements. There are many types of mold and they can be found in any climate.

Secondhand Smoke

Trigger: Secondhand smoke – Mixture of smoke from the burning end of a cigarette, pipe or cigar and the smoke exhaled by a smoker.
Where Found: Home or car where smoking is allowed.

Nitrogen Dioxide (combustion by-product)

Trigger: Nitrogen dioxide – An odorless gas that can irritate your eyes, nose, and throat and may cause shortness of breath.
Where Found: Associated with gas cooking appliances, fireplaces, woodstoves, and unvented kerosene and gas space heaters.

BUILDING INFORMATION

(This information may be helpful to determine reasonable mitigations.)

- What type of building does the patient live in?
- House
 - Duplex
 - Apartment
 - Mobile home
 - Other _____

Notes:

- Does the patient own or rent?
- Own
 - Rent

Notes:

Questions	Answers	Action Steps
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H O M E I N T E R I O R		▲ MAY REQUIRE ADDITIONAL TIME AND/OR RESOURCES.
--------------------------------	--	--

Secondhand Smoke		
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- | | | |
|---------------------------------------|--|---|
| Does anyone smoke in the home or car? | <input type="checkbox"/> Y
<input type="checkbox"/> N | <ul style="list-style-type: none"> ■ Keep the home and car smoke-free. ■ Do not allow visitors to smoke in the home. ■ Take the smoke-free home pledge and post a smoke-free home decal or magnet to show that the house is a “smoke-free” zone. |
|---------------------------------------|--|---|

Notes:

Warm-blooded Pets (such as cats and dogs)		
--	--	--

- | | | |
|--|--|--|
| Is the patient’s asthma worse when around warm-blooded pets? | <input type="checkbox"/> Y
<input type="checkbox"/> N | <ul style="list-style-type: none"> ■ If possible, remove the pet from the home or keep the pet outside. ■ If this is not possible, keep the pet out of the patient’s sleeping area and off of the furniture. |
|--|--|--|

Notes:

Consumer Products		
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- | | | |
|--|--|--|
| Is the patient’s asthma worse when around chemicals or products with strong odors (such as cleaners, paints, adhesives, pesticides, air fresheners, or cosmetics)? | <input type="checkbox"/> Y
<input type="checkbox"/> N | <ul style="list-style-type: none"> ■ Limit patient’s exposure as much as possible by minimizing product use, using products only when patient is not present, or trying alternative products. ■ If products are used, carefully follow manufacturer’s instructions on the label and make sure the area is well ventilated. |
|--|--|--|

Notes:

Heating and Cooling Systems		
------------------------------------	--	--

- | | | |
|--|--|--|
| Does the heating and cooling system use filters? | <input type="checkbox"/> Y
<input type="checkbox"/> N | <ul style="list-style-type: none"> ▲ If so, replace the filters quarterly. ▲ Use filters with higher efficiency than standard furnace filters, such as upgraded pleated filters, if heating or cooling system manufacturer’s specifications allow. |
|--|--|--|

Notes:

Questions	Questions Answers	Action Steps
H O M E I N T E R I O R (continued)		
Does the heating system use a fuel-burning appliance (such as an oil or gas furnace)?	<input type="checkbox"/> Y <input type="checkbox"/> N	<p>▲ MAY REQUIRE ADDITIONAL TIME AND/OR RESOURCES.</p> <ul style="list-style-type: none"> ▲ Have the heating system - including furnaces, flues and chimneys - professionally inspected annually. ▲ Promptly repair cracks or damaged parts.
<i>Notes:</i>		
Are supplemental heating sources used? (Check all that apply)	<input type="checkbox"/> Fireplace <input type="checkbox"/> Wood-burning stove <input type="checkbox"/> Unvented kerosene or gas space heater <input type="checkbox"/> Other _____	<ul style="list-style-type: none"> ■ Properly ventilate the room where a fuel-burning appliance is used. Consider using appliances that vent to the outside whenever possible. ■ Never use a gas-cooking appliance as a heating source. ■ If using a fireplace, make sure it is properly vented to help ensure smoke escapes through the chimney. ■ If using a wood-burning stove, make sure that doors are tight-fitting. Use aged or cured wood only and follow the manufacturer's instructions for starting, stoking, and putting out the fire. ■ If using an unvented kerosene or gas space heater, follow the manufacturer's instructions for proper fuel to use and keep the heater properly adjusted.
<i>Notes:</i>		
Are there air conditioning window units?	<input type="checkbox"/> Y <input type="checkbox"/> N	<ul style="list-style-type: none"> ■ Run window air conditioner with the vent control open to increase the outdoor ventilation rate during the cooling season.
<i>Notes:</i>		
R O O M I N T E R I O R		
Bedding and Sleeping Arrangements		
What does the patient sleep on? (Check all that apply)	<input type="checkbox"/> Mattress with box springs <input type="checkbox"/> Sofa <input type="checkbox"/> Other _____	<ul style="list-style-type: none"> ▲ Cover patient's mattress in a dust-proof (allergen impermeable) zippered cover. Clean cover according to manufacturer's instructions. ■ If it is necessary for the patient to sleep on upholstered furniture such as a sofa, then cover furniture with washable slipcovers or sheets and vacuum furniture regularly (including removing cushions and vacuuming in cracks and crevices).
<i>Notes:</i>		
What types of bedding does the patient use? (Check all that apply)	<input type="checkbox"/> Bedspread (e.g., comforter, quilt) <input type="checkbox"/> Blankets <input type="checkbox"/> Pillows <input type="checkbox"/> Sheets <input type="checkbox"/> Other (e.g., sleeping bag)	<ul style="list-style-type: none"> ■ Choose washable bedding. ■ Wash bedding regularly in hot water and dry completely. ▲ Cover patient's pillow in a dust-proof (allergen impermeable) zippered cover. Clean cover according to manufacturer's instructions.
<i>Notes:</i>		

Questions	Answers	Action Steps
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R O O M I N T E R I O R (continued)		▲ MAY REQUIRE ADDITIONAL TIME AND/OR RESOURCES.
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Flooring		
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What type of floor covering is present? (Check all that apply)	<input type="checkbox"/> Carpeting <input type="checkbox"/> Hardwood floor, tile, or vinyl flooring <input type="checkbox"/> Throw rugs <input type="checkbox"/> Other _____	<ul style="list-style-type: none"> ■ If carpeting is present, vacuum carpets, area rugs, and floors regularly. ■ If possible, use a vacuum cleaner with a high efficiency filter. ■ Mop hard surface floors regularly. ■ Wash throw rugs regularly in hot water. Dry completely. ■ Clean baseboards regularly using a damp cloth with warm, soapy water. ■ Someone besides the patient should vacuum, sweep, empty the dust canister and change the vacuum bag. ■ If possible, the patient should stay out of rooms when they are being vacuumed or swept. ■ If the patient vacuums, sweeps, empties the dust canister, or changes the vacuum bag, he or she should wear a dust mask.
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Notes:

Upholstered Furniture and Stuffed Toys		
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Is there upholstered furniture present?	<input type="checkbox"/> Y <input type="checkbox"/> N	<ul style="list-style-type: none"> ■ Cover upholstered furniture with washable slipcovers or sheets. ■ Vacuum upholstered furniture regularly, including removing cushions and vacuuming in cracks and crevices. ▲ If replacing furniture, consider purchasing a non-upholstered furniture - such as vinyl, wood, or leather - that can be easily wiped down.
---	--	--

Notes:

Are stuffed toys present?	<input type="checkbox"/> Y <input type="checkbox"/> N	<ul style="list-style-type: none"> ■ Choose washable stuffed toys, and wash frequently in hot water. Dry completely. ■ Limit the number of stuffed toys in patient's bed and sleeping area.
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Notes:

Window Treatments		
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What window coverings are present? (Check all that apply)	<input type="checkbox"/> Curtains or drapes <input type="checkbox"/> Blinds <input type="checkbox"/> Shades <input type="checkbox"/> Other _____	<ul style="list-style-type: none"> ■ Vacuum drapes regularly. ■ Wash and dry curtains regularly. ■ Dust window sills, blinds, and shades regularly using a damp cloth with warm, soapy water. Dry completely. ▲ If possible, replace curtains or drapes with plastic, vinyl, wood, or aluminum blinds.
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Notes:

Cooking Appliances		
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Are gas cooking appliances used?	<input type="checkbox"/> Y <input type="checkbox"/> N	<ul style="list-style-type: none"> ■ When cooking with a gas appliance, turn on an exhaust fan or open a window. ■ Avoid misuse of the appliance by following the manufacturer's instructions for operation.
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Notes:

Questions	Answers	Action Steps
R O O M I N T E R I O R (continued)		
Moisture Control		
Is there evidence of water damage, moisture, or leaks (such as damp carpet or leaky plumbing)?	<input type="checkbox"/> Y <input type="checkbox"/> N	<p>▲ MAY REQUIRE ADDITIONAL TIME AND/OR RESOURCES.</p> <ul style="list-style-type: none"> ■ Dry damp or wet items within 24-48 hours to avoid mold growth. ▲ Fix water leaks (such as leaky plumbing) as soon as possible. ▲ Replace absorbent materials, such as ceiling tiles and carpet, if mold is present. ▲ Use air conditioner or dehumidifier to maintain low indoor humidity. If possible, keep indoor humidity below 60% (ideally between 30-50%) relative humidity.
<i>Notes:</i>		
Do you see or smell mold or mildew (such as in the bathroom on tub, shower, walls, or windows)?	<input type="checkbox"/> Y <input type="checkbox"/> N	<ul style="list-style-type: none"> ■ Open a window or turn on an exhaust fan when there is excessive moisture in the room, such as when showering or cooking. ■ Scrub mold off hard surfaces with detergent and water. Dry completely. ■ Clean up mold and dry surfaces completely before painting or caulking. ▲ Replace absorbent materials, such as ceiling tiles and carpet, if mold is present.
<i>Notes:</i>		
Is standing water present (such as in refrigerator drip pans, air conditioner drip pans, or house plants)?	<input type="checkbox"/> Y <input type="checkbox"/> N	<ul style="list-style-type: none"> ■ Empty and clean refrigerator and air conditioner drip pans regularly. ■ Avoid standing water in plant containers.
<i>Notes:</i>		
Are humidifiers used in the patient's house?	<input type="checkbox"/> Y <input type="checkbox"/> N	<ul style="list-style-type: none"> ■ Use humidifier only when conditions require it, use the correct setting to maintain indoor relative humidity between 30-50 percent, and clean humidifier reservoirs regularly. ■ Use low mineral content water to prevent the build-up of scale and dispersal of minerals into the air. ■ Follow manufacturer's instructions for use, maintenance, and replacement of any materials supplied with the humidifier.
<i>Notes:</i>		
Are rooms and moisture-producing appliances—such as stoves, clothes dryers, or dishwashers—properly vented (including venting to the outside if specified by the manufacturer)?	<input type="checkbox"/> Y <input type="checkbox"/> N	<ul style="list-style-type: none"> ■ Increase ventilation or air movement by opening doors and/or windows when practical. Use fans as needed. ■ Run the bathroom exhaust fan or open the window when showering. ■ Use exhaust fans or open windows whenever cooking or washing dishes. ■ Vent appliances properly according to manufacturer's specifications.
<i>Notes:</i>		

Questions	Answers	Action Steps
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R O O M I N T E R I O R (continued)

▲ **MAY REQUIRE ADDITIONAL TIME AND/OR RESOURCES.**

Pest Control

Is there evidence of cockroaches and/or rodents (such as droppings or dead specimens in traps)? Y N

- Clean all surfaces where you have seen pests.
- Use poison baits, boric acid, or traps to kill pests. Minimize use of sprays. If sprays are used: limit the spray to the infested area, carefully follow the instructions on the label, make sure there is plenty of fresh air where the spray is being used and, if possible, keep patient out of the room.

Notes:

Are there food crumbs or open or unsealed food? Y N

- Clean all food crumbs or spilled liquids right away.
- Store food in sealed containers.
- Remove food, bags, newspapers, and empty boxes, cans, and bottles from the sleeping area.
- Put all garbage in plastic trash bags. Seal trash bags and put them into garbage cans with fitted lids every day.

Notes:

Are there holes or gaps between construction materials and pipes that could allow pests to enter the house? Y N

- Seal holes or gaps between construction materials and pipes, or ask the owner to do so.

Notes:

Is there evidence of standing water or leaks? Y N

- Dry damp or wet items within 24-48 hours to avoid mold growth.
- Avoid standing water in house plant containers and drip pans.
- ▲ Fix water leaks (such as leaky plumbing) as soon as possible.

Notes:

O U T D O O R A I R P O L L U T I O N

Exposure to air pollution (mainly ozone and particle pollution) can trigger asthma attacks. The Air Quality Index (AQI) is a tool to provide the public with clear and timely information on local air quality and whether air pollution levels pose a possible health concern. The AQI is reported and forecasted every day in many areas throughout the U.S. on local weather reports and through national media. Asthma attacks are most likely to occur the day **after** outdoor pollution levels are high.

People can take simple steps to reduce their exposure to outdoor air pollution. When the AQI reports unhealthy levels:

- ▶ Limit physical exertion outdoors.
- ▶ Consider changing the time of day of strenuous outdoor activity to avoid the period when air pollution levels are high or consider postponing sports activities to another time.
- ▶ Reduce the intensity of the activity, or spend less time engaged in strenuous activities. For example, coaches can rotate players more frequently in strenuous sports, like soccer. Resting players reduces their exposure to air pollution.

To learn more about and access the AQI, visit www.epa.gov/airnow.



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ALL ABOUT INHALED CORTICOSTEROIDS (ICS) FOR ASTHMA

What are “inhaled corticosteroids” (ICS) for asthma?

Inhaled corticosteroids, also called ICS, are medicines used to control and prevent asthma symptoms. Many scientific studies have shown that ICS are the best medicine for children and adults at all levels of persistent asthma.

How do inhaled corticosteroids work?

Asthma symptoms are associated with inflammation inside the airways of the lungs. Inflammation narrows the airways, makes it more difficult for air to flow into and out of the lungs, and increases the risk of respiratory infections. Taken daily for weeks, inhaled corticosteroids (ICS) promote airway healing.

ICS start to decrease inflammation as soon as 24 hours from the time they are taken. However, it takes several weeks of everyday use before the full benefits are realized. This is because it takes weeks for the lining of the airways to return normal. Over time, ICS can dramatically reduce airflow obstruction. If you get a cold or illness, you might need a higher dose of ICS until you are better. Discuss this option with your doctor.

Once your asthma is under control, it is usually possible to reduce the dose of ICS. However, it is very important to **CONTINUE TO TAKE ICS EVERY DAY** even when there are no asthma symptoms. If you stop taking ICS, inflammation can gradually return and asthma will get worse. Don't forget: ICS must usually be taken twice every day to work well and keep the swelling under control. Be sure to follow your provider's instructions about how to take this medicine.

Why are there so many different types of ICS?

“Inhaled corticosteroids” (ICS) is a general name for a group of similar medications. There are many kinds of inhaled corticosteroids that have different drug names, commercial brands, delivery devices, doses and potencies. A lot of confusion surrounds these differences.

Inhaled corticosteroid (ICS) medicines include:

- beclomethasone (QVAR)
- budesonide (Pulmicort)
- ciclesonide (Alvesco)
- flunisolide (Aerobid)
- fluticasone (Flovent)
- mometasone (Asmanex)
- triamcinalone (Azmacort)

Inhaled corticosteroids are also available in combination with long-acting bronchodilators. These combination medications include:

- budesonide and formoterol (Symbicort)
- fluticasone and salmeterol (Advair)
- mometasone and formoterol (Dulera)

Does an ICS stop an asthma attack?

ICS reduce swelling in the airways, but it will not relieve an asthma attack. Quick-relief medicines, such as albuterol, should be used for asthma attacks. However, ICS are the only type of medicine shown to lower the risk of life-threatening asthma attacks.

Taking ICS daily is important to reduce risk of worsening asthma symptoms and future attacks!

People often depend on quick-relief medicines, instead of using an ICS to control asthma. This greatly increases the risk of severe, life-threatening asthma attacks. Quick relief medicines usually open the airways and ease asthma symptoms, but the effect wears off in a few hours. Quick relief medications do not change the course of asthma. High cost of ICS is often a barrier. Financial assistance programs are available for these important medicines. Ask for help.

Aren't steroids bad for you?

Inhaled corticosteroids are not bad for you. ICS are **different** from the “anabolic” steroids some athletes use to build muscle mass. This type of steroid is illegal, used without guidance from a health care provider or prescription. Using anabolic steroids in this way is dangerous and leads to serious health problems. These medicines cause irreversible harm to the body. (SEE NEXT PAGE)

ALL ABOUT INHALED CORTICOSTEROIDS (ICS) FOR ASTHMA

For asthma, health care providers use two different types of prescription steroids: 1) oral (taken by mouth) or injectable steroids or 2) inhaled corticosteroids (ICS).

Oral or injectable “steroids” are helpful for treating the person with asthma who gets VERY sick. However, repeated use of these medicines can slow growth and cause other serious side effects. It is better to use inhaled corticosteroids (ICS) **every day** to avoid the need for stronger, risky, systemic steroids. Oral and injectable forms contain 1000 times as much steroid as ICS.

ICS are similar to “glucocorticoids”, a type of natural steroids made daily by the body. ICS control inflammation that causes symptoms with only tiny doses, inhaled straight into the lungs. Inhaled steroids are much less likely than systemic steroids to affect the rest of the body. It takes **years** of using daily ICS medicine to equal just one shot or 5 days of oral steroids.

What are the side effects of ICS?

Since ICS are inhaled directly into the lungs, only a small amount of the medicine is absorbed into the blood. This leads to a much lower risk of side effects than strong steroid, such as prednisone, that is taken by mouth. After inhaling an ICS it is important to remove the remaining medicine from the mouth, otherwise an increase in the number of yeast might cause sore throat or hoarseness. Overgrowth of yeast appears as red or white sores inside the mouth. If you notice these changes, call your doctor. You can lessen risk of a yeast infection by always using a spacer and by rinsing your mouth with water each time after using ICS. Using a spacer increases the amount of medicine reaching your lungs and reducing the medicine left in the mouth and throat. If a child is using a mask to take ICS, you should also wash the face after each ICS use.

Will using ICS slow children’s growth?

There have been many studies of the growth of children with asthma. Children with very poorly controlled asthma can experience serious growth delays. Repeated doses of oral steroids are also associated with stunting. ICS medications are rarely associated with growth delay. However, it is very important to monitor height-for-age on a growth chart to ensure growth proceeds at the expected rate. Growth status should be reviewed at each visit. Use the lowest effective ICS dose.

How often do I need to see my doctor?

Asthma is a chronic inflammatory disease, which means it does not go away, even when you are feeling better. People do **NOT** usually “grow out” of asthma, so most people will need to take ICS for years to control and prevent asthma symptoms. To do your best AND avoid worsen asthma as you get older, it is important to see your provider regularly at times when you are well, not just when your asthma is bothering you.

You should see your health care provider at least every 3-6 months for asthma check-ups. If your asthma is **not well controlled**, you should see your provider every 2-6 weeks until asthma is under control. During a check-up, your provider will make sure you are taking the smallest amount of ICS possible to keep your asthma under control. Tests measuring airflow are very important for assessing your lung health.

It is important to remember asthma can be a life-threatening disease. Not keeping asthma well controlled is dangerous. Children with asthma who use ICS have a better quality of life, less symptoms, and better school attendance. They require fewer oral and injectable steroids and are far less likely to need emergency care for asthma. **Be sure to talk to your doctor if you have other questions and concerns about ICS.**
CRUSH ASTHMA! Take an ICS twice every day.

"GERD and Asthma"

By Kathleen A. Sheerin, MD, FAAAAI

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Nineteen million Americans, from infants to seniors, suffer from gastroesophageal reflux disease (GERD). If you have asthma, your chances of having GERD are higher than those without the condition. Studies show that as many as 70% of patients with asthma have GERD compared to 20%-30% of the general population.

What is GERD?

After you eat, a part of your digestive system called the lower esophageal sphincter usually remains closed as you digest your food. However, sometimes it relaxes on the job, allowing stomach acid to flow back, or reflux, into the esophagus.

Heartburn is the most common symptom caused by gastro esophageal reflux. Almost everyone has experienced heartburn at one time or another. Other symptoms that occur less frequently but can also indicate that you could have GERD are:

- Acid regurgitation (retasting your food after eating)
- Difficulty or pain when swallowing
- Sudden excess of saliva
- Chronic sore throat
- Laryngitis, hoarseness
- Inflammation of the gums
- Cavities
- Sour taste
- Bad breath
- Chest pain
- No symptoms at all ("silent reflux")

Although symptoms of GERD are common, often the condition is not diagnosed and symptoms go untreated. For patients with asthma, untreated reflux could mean uncontrolled asthma.

The airway connection

Why does GERD occur so frequently in patients with asthma? Changes in pressure in the chest that occur during airway obstruction in asthma can actually help to relax the sphincter at the bottom of the esophagus that controls the flow of stomach contents. The end result is that more negative pressure in the chest can cause stomach contents to flow up the esophagus rather than down. Acid in the esophagus can irritate the lungs either directly by aspiration into the lung or indirectly via stimulation of nerves. This can make the airways more irritable or hyperreactive to other triggers, like cold air, pollen, smoke, etc. Although studies have shown a relationship between asthma and GERD, researchers are not certain of the exact interaction. Reflux may worsen asthma symptoms; on the other hand, asthma and some asthma medications, especially theophylline, may worsen reflux symptoms.

This cycle of reflux and airway obstruction may contribute to the development of progressively worsening asthma and other pulmonary disease. Severe, chronic and treatment-resistant asthma is more likely to be associated with GERD. Obesity, asthma and GERD are all interrelated. So if you are overweight you are more likely to have reflux and asthma as well.

Diagnosis is difficult

The lack of knowledge about the exact relationship between GERD and asthma can make it difficult for your
(SEE NEXT PAGE)

Source: <http://www.aaaai.org/patients/seniorsandasthma/gerd.stm>, accessed January 30, 2011.

Reviewed by Asthma Ready® Communities staff (2011).

doctor to decide on the right diagnosis and proper medication. Clues that may indicate the co-existence of the two conditions include:

- Increased asthma symptoms after meals or exercise;
- Night symptoms (initiated by lying down);
- Respiratory symptoms such as frequent coughing and hoarseness; and
- Recurrent pneumonia.

Physicians may use one or several tests to diagnose GERD, including esophageal pH monitoring, a specialized test that can actually determine if and how much you are refluxing; gastroesophageal scintiscanning; or upper gastrointestinal tract endoscopy. If the tests are positive and your physician diagnoses you with GERD, he or she will then work with you to establish the best treatment program. Your physician may also search for *Helicobacter pylori*, bacteria that thrive in the acid environment of the stomach. This bacterium has been implicated in GERD and peptic ulcer disease.

Treatment

In a review by Field and Sutherland (1), the authors showed that asthma symptoms improved in 69% of the subjects and asthma medication use was reduced in 62% of the subjects. Although final conclusive evidence that reflux therapy helps asthma is lacking, most physicians will aggressively treat reflux symptoms in their asthmatic patients. Treatment includes changes in lifestyle and medication.

Lifestyle changes can include:

- Elevate the head of the bed 6-8 inches
- Lose weight
- Stop smoking
- Decrease alcohol intake
- Limit meal size and avoid heavy evening meals
- Do not lie down within two to three hours of eating
- Decrease caffeine intake
- Avoid theophylline (if possible)

Medications

There are three categories of medications available for treatment of reflux disease. Antacids and H2 blockers are widely available over the counter medication to decrease the effects of stomach acid. New medications called proton pump inhibitors block acid production.

A recent study by O'Connor (2) looked at the most cost effective way to diagnose and treat reflux in the patient with asthma. He suggests starting with a proton pump inhibitor for three months. If that is not effective in controlling symptoms, your doctor can order a pH probe. If your doctor finds reflux, he or she can then increase the medication until symptoms are controlled. Occasionally, if reflux is bad enough, surgery may help.

If you have asthma and GERD symptoms, see your physician for proper diagnosis and treatment.

1. Field SK, Sutherland LR. Does antireflux therapy improve asthma in asthmatics with gastroesophageal reflux? *Chest*:1998;114:275-283
2. O'Conner JF. The cost-effectiveness of strategies to assess gastroesophageal reflux as an exacerbating factor in asthma. *AmJGastroenterol*. 1999;94:1472-1480

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Source: <http://www.aaaai.org/patients/seniorsandasthma/gerd.stm>, accessed January 30, 2011.

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