



# Asthma Education Curriculum for School Nurses and Other Elementary-Middle School Professionals

August 2011

by the staff of the North Carolina Asthma Program  
and the Asthma Alliance of North Carolina  
Education and Public Awareness Subcommittee







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**Division of Public Health**  
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From the Chair of the Education and Public Awareness Committee of the  
Asthma Alliance of North Carolina and the North Carolina Asthma Program

The Education and Public Awareness Committee of the Asthma Alliance of North Carolina is pleased to endorse the release of the Asthma Curriculum for School Nurses and Other Elementary and Middle School Professionals. This curriculum is the culmination of efforts and support from the statewide committee and the North Carolina Asthma Program. Our members and stakeholders have been instrumental in the planning and development of this curriculum and are proud to share this product with school nurses and other school professionals throughout the state. The ideas, expertise, and support mirrored in this project area is a reflection of the committee's commitment and dedication to providing a standardized curriculum for school nurses and other school professionals.

We sincerely thank all those who have devoted their time, effort, and resources to this process. We look forward to the implementation of this curriculum all across the state of North Carolina in effort to provide school nurses and other school professionals with accurate and up to date information on asthma prevention and control.

With Highest Regards,

Melinda S. Shuler  
Chair of the Education and Public Affairs

Miriam McLaughlin  
Special Projects Consultant  
North Carolina Asthma Program

Cindy Haynes-Morgan  
Interim Program Manager  
North Carolina Asthma Program



**North Carolina Public Health**  
Working for a healthier and safer North Carolina  
Everywhere. Everyday. Everybody.





# Preface

The Asthma Education Curriculum for School Nurses and Other Elementary-Middle School Professionals is brought to you by the North Carolina Division of Public Health, Asthma Program, in conjunction with the Education and Public Awareness Committee of the Asthma Alliance of North Carolina (AANC). The purpose of this curriculum is to provide a standardized method of providing asthma education to school nurses and other school professionals in North Carolina. This project was funded as a part of a cooperative agreement from the Centers of Disease Control and Prevention (CDC).

According to the 2008-2009 North Carolina Annual School Health Services Report, asthma is the leading chronic health condition in schools. Since the 2004-2005 school year, it has accounted for 31-39 percent of the chronic health conditions among all public school students, grades K-12. From 2004-2009, elementary and middle school students with asthma comprised about 80 percent of all students, K through 12, with asthma. An estimated 142,000 children in North Carolina between the ages of 5 and 13, grades K through 8, were diagnosed with asthma in 2009. Except for the 14-17 and 18-24 age groups, more from this group

of children reported still having asthma than those younger than 5 or older than 24. Although asthma hospitalization rates for the general population in North Carolina declined from 1999-2008, the rate for children 14 and younger was still higher than for the state as a whole. In 2009, more than one fourth of all children aged 5 through 10 visited a hospital emergency room or urgent care clinic because of their asthma.

This curriculum is designed to be used by school nurses and other elementary and middle school professionals to train school staff to understand the needs of students with asthma.

We also wish to invite those of you participating in asthma education to join the Asthma Alliance of North Carolina. This group of Asthma Champions from all over the state is working through this curriculum and other initiatives to improve the quality of life for all North Carolinians with asthma.

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#### SOURCES:

2008-2009 North Carolina Annual School Health Services Report  
[www.nchealthyschools.org/docs/data/reports/2008-09eoy.pdf](http://www.nchealthyschools.org/docs/data/reports/2008-09eoy.pdf)

2009 CHAMP, State Center for Health Statistics  
[www.schs.state.nc.us/SCHS/champ/2009/k09q01.htm](http://www.schs.state.nc.us/SCHS/champ/2009/k09q01.htm)

1999-2008 North Carolina Hospital Discharge Data,  
State Center for Health Statistics  
[www.schs.state.nc.us/SCHS/data/county.cfm](http://www.schs.state.nc.us/SCHS/data/county.cfm)



# Introduction

Improving the health of students ages 5-12 is a high priority in North Carolina, as well as providing asthma education information to those who work with them. Nurses and other school professionals must understand the condition, how it affects students, and what can be done to manage it. Thus, the *N.C. Asthma Education Curriculum for School Nurses and Other Elementary-Middle School Professionals* modules cover the following categories of information:

**What is Asthma?**

**Common Asthma Triggers and Environmental Control Measures**

**Signs and Symptoms of Asthma Trouble**

**How is Asthma Treated and Managed?**

**Asthma in School**

**Appendices and Handouts**

We have obtained information permission to use resources from the following:

*The American Lung Association*  
[www.lungusa.org](http://www.lungusa.org) (asthma)

*National Institutes of Health*  
[www.nih.gov](http://www.nih.gov)

*Environmental Protection Agency*  
[www.epa.gov](http://www.epa.gov) (air pollution)

*Centers for Disease Control and Prevention*  
[www.nhbi.nih.gov](http://www.nhbi.nih.gov) (lung information)

*NIH Heart, Lungs and Blood Institute*  
[www.nhbi.nih.gov](http://www.nhbi.nih.gov)

*Minnesota Department of Health*  
[www.health.state.mn.us](http://www.health.state.mn.us)  
(Disease and Conditions)

*American College of Chest Physicians*  
(picture illustrations )  
[www.chestnet.org/accp](http://www.chestnet.org/accp)



# Curriculum Instruction Guide

**As a trainer for the *Education Curriculum for School Nurses and Other Elementary-Middle School Professionals*, we ask that you follow these guidelines for administering the curriculum.**

**NOTE:** You are not required to provide instruction on the entire curriculum in one session. Each module can be instructed individually or in separate sessions as time allows.

- Several items in the appendices are included to assist you. Please review this section before teaching the modules.
- If you have them, bring items for “show and tell.” Peak flow meters, MDIs, and spacers are all good visuals.
- Teaching the whole curriculum takes about 2 ½ hours. Each module can be taught separately and will take about 30 minutes.
- Have participants sign in for each training session. The sign-in sheet should request contact information.
- All participants are required to complete the pre/post assessments at the beginning and end of each module or the beginning and end of a complete curriculum training.
- An instructor evaluation should also be completed by each participant at the end of the training.
- The instructor should collect all assessments and evaluations and send copies to the NC Asthma Program (see below). Copies of this material will allow us to keep our funders apprised of our progress in disseminating this curriculum.
- At the end of the last session, please give a Certificate of Participation to each participant who completed the entire curriculum training. The Certificate is included in the curriculum tool kit.
- If you need technical assistance while using or teaching this curriculum, please contact the N.C. Asthma Program (see below).

**N.C. Asthma Program, North Carolina Division of Public Health, 1915 Mail Service Center, Raleigh N.C. 27699-1915, or fax the documents to: N.C. Asthma Program at (919) 870-4811. If you need technical support in using this manual, contact the NC Asthma Program at (919) 707-5313.**



## What is Asthma?

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# MODULE 1

## What is Asthma?

### Pre-Module Assessment

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. Is asthma a rare disease among students in elementary and middle school?		
2. Is asthma caused by the student dressing inappropriately for the weather?		
3. Can both children and adults have asthma?		
4. Are there ways students can check on how well their lungs are working?		
5. Is it true that during an asthma episode, the student’s airways become swollen and inflamed?		
6. Is it possible for asthma episodes to occur in certain places?		
7. Is it true that mild asthma is fairly easy to control and rarely bothers the student?		
8. Can students with asthma be as active as their friends?		

**SOURCE:**

Adapted from “Asthma Education:An Integrated Approach” with the Minnesota Department of Health, 1998.





## MODULE 1

# What is Asthma?

## Pre-Module Assessment Answer Sheet

**Instructions:** Answer “Yes” or “No” to the questions by putting an X in the “Yes” or “No” box to the right of each question.

QUESTION	YES	NO
1. <b>No.</b> Asthma is the leading chronic health condition in schools.		<b>X</b>
2. <b>No.</b> The way a student dresses for the weather does not cause asthma.		<b>X</b>
3. <b>Yes.</b> Both children and adults can have asthma. Sometimes, it appears that asthma has gone away as a person gets older. Asthma does not go away, although a person with asthma may go a long time without symptoms.	<b>X</b>	
4. <b>Yes.</b> Students with asthma can check how well their lungs are working by using a peak flow meter. This device measures a student’s ability to push air out of his or her lungs. It may show signs of asthma before symptoms appear.	<b>X</b>	
5. <b>Yes.</b> As the airways swell and become inflamed, less air can pass through them, causing the student with asthma to experience breathing difficulties.	<b>X</b>	
6. <b>Yes.</b> An environment that contains a “trigger,” that is, an irritant to the student with asthma, may cause the student to have an asthma episode.	<b>X</b>	
7. <b>Yes.</b> Students with more severe asthma must focus more on controlling their symptoms. They can do this by avoiding their “triggers”--the things in the environment that irritate them--and by taking their medications according to their asthma action plans.	<b>X</b>	
8. <b>Yes.</b> Students with asthma can be as active as their friends with the approval of their health care provider and as long as it is consistent with their asthma action plan.	<b>X</b>	

**SOURCE:**

Adapted from “Asthma Education: An Integrated Approach” with the Minnesota Department of Health, 1998.





## MODULE 1

# What is Asthma?

## Module 1 Outline

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
<p>When the module is completed, participants will be able to:</p> <ul style="list-style-type: none"> <li>■ Provide a description of asthma and the breathing process</li> <li>■ Describe the symptoms of asthma</li> <li>■ Describe what happens in an asthma episode</li> </ul>		<p><b>MATERIALS FOR SESSION:</b></p> <ul style="list-style-type: none"> <li>■ Asthma Pre and Post Module Assessments and answer sheets</li> <li>■ Diagram of lungs</li> <li>■ Regular drinking straws and coffee stirrer straws for each participant in class</li> <li>■ “What is Asthma” handout sheet at the end of Module 1</li> <li>■ Fact Sheet about asthma entitled “What is Asthma?”</li> </ul>
1. Introduce the topic of asthma	Have the participants complete the Pre-Module Assessment. Review correct answers with participants.	Asthma Pre-Module Assessment – completion by participants and review answers.
2. Definition of asthma	<p>Provide age appropriate definition of asthma</p> <p><b>DEFINITION:</b> Asthma is a chronic (long-term) disease of the airways in the lungs. A student with asthma may not have symptoms at all and then have a flare-up. Item to be stressed: “Asthma can be controlled”.</p>	<p>Discuss “What is Asthma?” handout sheet.</p> <p>Diagram of the lungs and the breathing process.</p>

CONTINUED

## Module 1 Outline, p. 2

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
3. Describe the symptoms of asthma	<p>Asthma is a disease that affects the lungs. It is the most common long-term disease of students, but adults have asthma, too. Asthma causes repeated episodes of:</p> <ul style="list-style-type: none"> <li>■ wheezing</li> <li>■ breathlessness</li> <li>■ chest tightness</li> <li>■ coughing</li> </ul> <p>If a student has asthma, that student has it all the time. The student will have asthma flare-ups only when some thing bothers the lungs.</p>	Diagram of lungs and what happens when breathing with asthma.
4. Discuss normal breathing and lung tasks	<p>When we breathe in, air enters the lungs through the nose and mouth, moves down the windpipe through tiny airways and into air sacs. When we breathe out, air leaves the lungs in reverse order. (Show pictures of lungs while discussing normal breathing and breathing with asthma.)</p> <p>The lungs perform several tasks:</p> <ul style="list-style-type: none"> <li>■ removes wastes and toxins from the body</li> <li>■ protects a person from germs that might cause infections</li> <li>■ sends oxygen to the organs</li> </ul> <p>Discuss normal breathing rates for children and youth– see chart.</p>	Show pictures of lungs.

CONTINUED



## Module 1 Outline, p. 3

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
<p>Discuss breathing with asthma.</p> <p>Describe what happens during an asthma episode</p>	<p>During an asthma episode the airways leading to the lungs become swollen and inflamed, creating less space for the air to move in and out of the lungs. As the episode progresses, excessive mucus may begin to clog the airways making it even more difficult to breath.</p> <p>An asthma episode occurs when a student with asthma comes in contact with an asthma trigger.</p> <p>When asthma is under control, the airways may be slightly inflamed, but the student can breath easily. Mucus production is normal and the airways are open and relaxed.</p>	<p><b>ACTIVITY:</b> Give a regular drinking straw to each participant. Have participants breathe through the straws normally. Then give each participant a coffee stirrer straw and have them try to breathe through it. The breathing becomes harder. This is what it feels like to a student having an asthma episode.</p>

CONTINUED



## Module 1 Outline, p. 4

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
5. Facts about asthma	<p>A student cannot get asthma from someone else.</p> <p>Asthma does run in families.</p> <p>Asthma is a chronic condition which means the student will always have it. The student will not “out-grow” it.</p> <p>The student may have long periods of time without having any problems and then all of a sudden have a flare-up.</p> <p>Asthma can be controlled. For mild asthma, control means asthma rarely bothers the student. For severe asthma, control means having fewer symptoms that keep the student from doing what he/ she wants to do.</p>	Fact sheet about asthma from Module 1.
6. At end of the session, review answers from assessments	Distribute the Post-Module Assessment and administer. When completed, review answers to assessment.	Post-Module Assessment – have participants complete. Review answer sheet to Post-Module Assessment.

**SOURCE:**

Lesson adapted with permission from Project Accord with the Minnesota Department of Health, 1998.

Centers for Disease Control and Prevention

[www.cdc.gov/asthma/faqs.htm](http://www.cdc.gov/asthma/faqs.htm)

# What is Asthma?

## Module 1 Narrative

### 1. Describe the symptoms of asthma:

Asthma often causes coughing, wheezing, shortness of breath, and/or chest tightness. If a student has asthma, that student has it all the time. The student will have asthma flare-ups only when something bothers the lungs.

A student will not outgrow asthma, but asthma can be controlled with proper treatment. Asthma is likely to run in families.

Students with asthma have:

- Super-sensitive airways.
- Airways which become inflamed and swollen. They sometimes become narrow and blocked. This causes wheezing, coughing, or difficulty in breathing.
- Airways that react to certain things (called triggers) such as having a cold or being exposed to cigarette smoke, pollen, dust, fumes, pets, cold air, or other environmental triggers. When there is an asthma flare-up or episode, something is bothering the lungs.

**NOTE:** While showing a picture of the lungs, describe the normal breathing pattern and breathing with asthma. Describe the differences.

### 2. Discuss normal breathing:

In normal breathing, the air flows in and out of the lungs through the airways. As you breathe each day, your lungs fill with air as well as pollutants such as pollen, smoke, germs, dust, chemicals, and animal dander. **(Show pictures of lungs while discussing normal breathing and breathing with asthma.)**

#### The lungs perform several tasks:

- remove wastes and toxins from the body
- protect a person from germs that might cause infections
- send oxygen to the organs

#### What happens during normal breathing?

When we breathe in, air enters the lungs through the nose and mouth, moves down the windpipe through tiny airways and proceeds into air sacs.

When we breathe out, air leaves the lungs in reverse order.

CONTINUED

## Module 1 Narrative, p. 2

### Normal breathing rates for children

Age	Breaths per minute
1 to 5 years	20–30
6 to 12 years	12–20

### 3. Describe an asthma episode:

During an asthma episode, the airways become swollen or inflamed creating less space in the airways for air to move in and out of the lungs. As the episode progresses, excessive mucus may begin to clog the airways, making it even more difficult to breathe. An episode is an indication that the asthma is not under control.

As asthma episode occurs when a student with asthma comes in contact with a trigger. A trigger is something that causes a reaction in the lungs of a student with asthma. Pollen, smoke, and dust are common triggers. Asthma quick relief/rescue medications are used at this time to relieve the symptoms. If the medication does not relieve the symptoms, the episode will get worse and it will be necessary to call for medical help.

### 4. Demonstrate the process of breathing with asthma with the straw activity:

**NOTE:** If a class participant has asthma, have that person use caution when performing this activity.

Give a regular drinking straw to each participant. Have the participants breathe through the straw normally. Afterwards, give the participant a coffee stirrer straw and have them try to breathe through these straws for three minutes. Ask each participant what the difference is between the two types of straws.

**NOTE:** This experience is what a student feels during an asthma episode.

### The status of the student's asthma control is an essential part of asthma self-management education. You can help the student learn asthma self-management by:

- Encouraging him or her to recognize the early warning signs of an asthma episode, including coughing, wheezing, shortness of breath and/or chest tightness.
- Assisting the student in identifying asthma triggers and ways to avoid them.
- Stressing the importance of taking his or her asthma medicines exactly as prescribed.

CONTINUED



## Module 1 Narrative, p. 3

- Checking to see if the student has an asthma action plan on file at school and knowing where it is kept.

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### SOURCES:

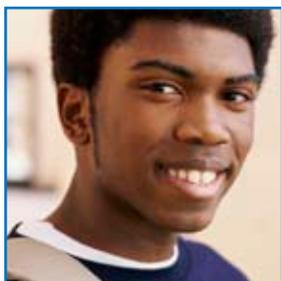
Lesson adapted with permission from Project Accord with the Minnesota Department of Health, 1998.

Information obtained by permission from the U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. *Expert Panel Report3: Guidelines for the Diagnosis and Management of Asthma, 2007.*

American College of Chest Physicians. *Controlling Your Asthma: A Patient Guide.* [www.chestnet.org/downloads/patients/guides/controllingYourAsthma\\_eng.pdf](http://www.chestnet.org/downloads/patients/guides/controllingYourAsthma_eng.pdf), October 2008. 3300 Dundee Road, Northbrook, IL 60062-2348  
PHONE: (800) 343-2227 or (847) 498-1400 FAX: (847) 498-5460  
or (847) 498-8313, E-mail: [science@chestnet.org](mailto:science@chestnet.org),  
Home page: [www.chestnet.org](http://www.chestnet.org)



## What is Asthma?



### You can help the student to control his/her asthma by:

- knowing the early warning signs, including coughing, wheezing, shortness of breath, and/or chest tightness;
- finding out what can trigger a student's asthma episode(s) and helping him/her stay away from these triggers;
- giving the student's medicine as instructed;
- having the parent/caregiver talk with the health care provider to develop an asthma action plan; and
- making sure the student has regular asthma check-ups.

Asthma is a disease that affects the lungs. **It is the most common long-term (chronic) disease in students.** Asthma is likely to run in families. It often causes coughing, wheezing, shortness of breath, and/or chest tightness. A student will not outgrow asthma, but asthma can be controlled. Lungs often become sensitive to triggers, such as dust, fumes, pets, etc. When there is an asthma flare-up or episode, something is bothering the lungs.

### When asthma is under control...

- Symptoms like wheezing or coughing will improve.
- The student will feel and sleep better.
- The student can be involved in physical activities.
- The student should not have to go to the hospital/emergency room due to an asthma episode.

#### SOURCES:

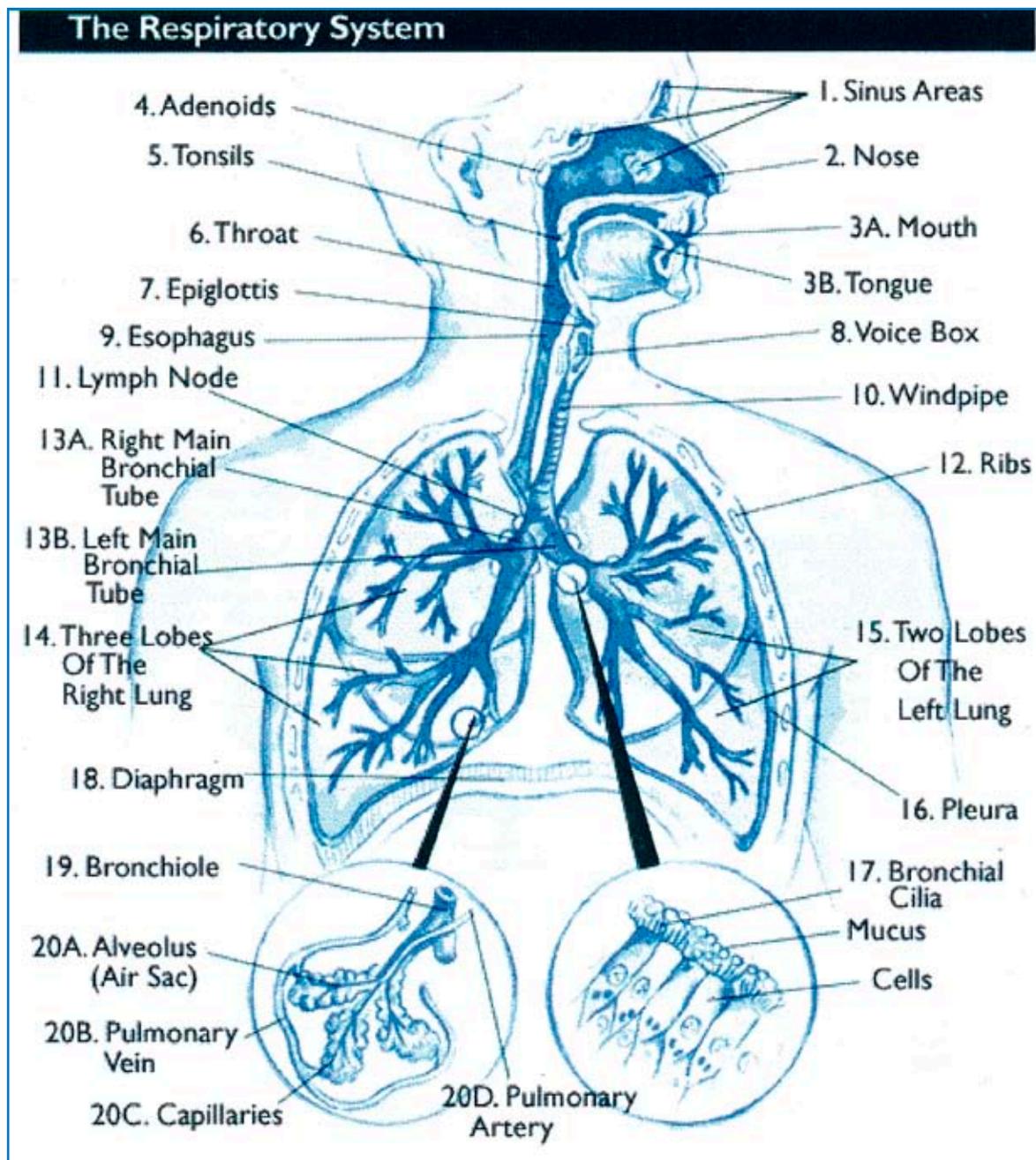
Centers for Disease Control and Prevention. *Asthma: Basic Facts*. Environmental Hazards and Health Effects Program, Air Pollution and Respiratory Health Branch. Information available at: [www.cdc.gov/asthma/basics.htm](http://www.cdc.gov/asthma/basics.htm), June 2008.

U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma*, 2007.





## Normal Breathing and Human Respiratory System



The figure above shows the Human Respiratory System and portrays normal lungs and lung function.

## Breathing with Asthma

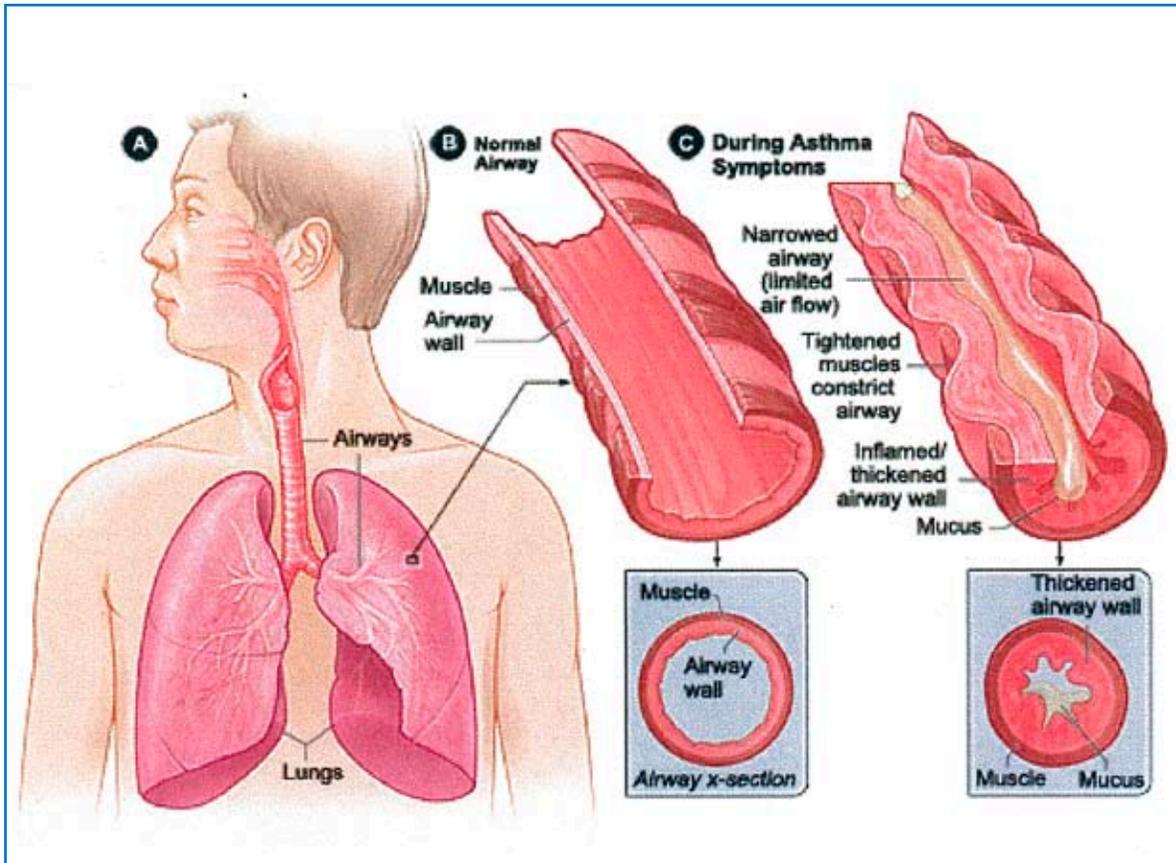


Figure A shows the location of the lungs and airways in the body. Figure B shows a cross-section of a normal airway. Figure C shows a cross-section of an airway during asthma symptoms.



## Fact Sheet about Asthma



- Asthma is a chronic disease that affects the lungs. It is the most common long term disease of students.
- Asthma is a chronic condition which means the student will always have it. The student will not “outgrow” it.
- A student cannot get asthma from someone else.
- Asthma does run in families.
- Asthma can be treated but cannot be cured. You and the student can do things to help make asthma easier to control.
- You should be aware of the warning signs of an asthma episode and help the student to learn what they are.
- You can help the student to stay away from things that trigger an episode.

- The student may have long periods of time without having any problems and then all of a sudden have a flare-up.
- You should follow the advice of the student’s health care provider as stated on the student’s asthma action plan.

As was mentioned above, asthma can be controlled. For mild cases of asthma, control means asthma rarely bothers the student. For severe cases of asthma, control means having fewer symptoms which keeps the student from doing what he/she wants to do.

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### RESOURCES:

Lesson adapted with permission from Project Accord with the Minnesota Department of Health, 1998.

Centers for Disease Control and Prevention. *Asthma: Basic Facts*. Environmental Hazards and Health Effects Program, Air Pollution and Respiratory Health Branch. [www.cdc.gov/asthma/faqs.htm](http://www.cdc.gov/asthma/faqs.htm), September 2008.

US Department of Health and Human Services; National Institutes of Health; National Heart, Lung, and Blood Institute; National Asthma Education and Prevention Program, EPR-3. *Expert panel report 3: Guidelines for the Diagnosis and Management of Asthma (EPR-3 2007)*. 2007. Information available at: [www.nhlbi.nih.gov/health/public/lung/asthma/chc\\_chk.htm](http://www.nhlbi.nih.gov/health/public/lung/asthma/chc_chk.htm), July 2008.







# MODULE 1

## What is Asthma?

### Post-Module Assessment

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. Is asthma a rare disease among students in elementary and middle school?		
2. Is asthma caused by the student dressing inappropriately for the weather?		
3. Can both children and adults have asthma?		
4. Are there ways students can check on how well their lungs are working?		
5. Is it true that during an asthma episode, the student’s airways become swollen and inflamed?		
6. Is it possible for asthma episodes to occur in certain places?		
7. Is it true that mild asthma is fairly easy to control and rarely bothers the student?		
8. Can students with asthma be as active as their friends?		

**SOURCES:**

Adapted from “Asthma Education:An Integrated Approach” with the Minnesota Department of Health, 1998.

Adapted from the National Institutes of Health Heart, Lungs and Blood Institute publication, “Asthma I.Q.”





# What is Asthma?

## Post-Module Assessment Answer Sheet

**Instructions:** Answer “Agree” or “Disagree” to the questions by putting an X in the “Agree” or “Disagree” box to the right of each question.

QUESTION	YES	NO
1. <b>No.</b> Asthma is the leading chronic health condition in schools.		<b>X</b>
2. <b>No.</b> The way a student dresses for the weather does not cause asthma.		<b>X</b>
3. <b>Yes.</b> Both children and adults can have asthma. Sometimes, it appears that asthma has gone away as a person gets older. Asthma does not go away, although a person with asthma may go a long time without symptoms.	<b>X</b>	
4. <b>Yes.</b> Students with asthma can check how well their lungs are working by using a peak flow meter. This device measures a student’s ability to push air out of his or her lungs. It may show signs of asthma before symptoms appear.	<b>X</b>	
5. <b>Yes.</b> As the airways swell and become inflamed, less air can pass through them, causing the student with asthma to experience breathing difficulties.	<b>X</b>	
6. <b>Yes.</b> An environment that contains a “trigger,” that is, an irritant to the student with asthma, may cause the student to have an asthma episode.	<b>X</b>	
7. <b>Yes.</b> Students with more severe asthma must focus more on controlling their symptoms. They can do this by avoiding their “triggers”--the things in the environment that irritate them--and by taking their medications according to their asthma action plans.	<b>X</b>	
8. <b>Yes.</b> Students with asthma can be as active as their friends with the approval of their health care provider and as long as it is consistent with their asthma action plan.	<b>X</b>	

**SOURCES:**

Adapted from “Asthma Education:An Integrated Approach” with the Minnesota Department of Health, 1998.Adapted from the National Institutes of Health Heart, Lungs and Blood Institute publication,“Asthma I.Q.”





**Module 1: What is Asthma?**

## Instructor Evaluation

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Telephone: (     ) \_\_\_\_\_ Email: \_\_\_\_\_

Agency or Affiliation: \_\_\_\_\_

**Please place a check mark for your response to each of the following five statements.**

	Strongly Agree	Agree	Disagree	Strongly Disagree	Undecided
This module was well-received by participants.					
This module fit the way of life, background, and experiences of the participants.					
This module was easy for the participants to understand.					
The instructor materials were helpful.					
The module narrative was easy to use.					

How can the Asthma Program improve this module? \_\_\_\_\_

Additional Comments: \_\_\_\_\_

**Please submit completed evaluation form by way of:**

**Fax:** N.C. Asthma Program – (919) 870-4801

**Mail:** N.C. Asthma Program – Division of Public Health  
 1915 Mail Service Center  
 Raleigh NC 27699-1915

**Thank You!**





## Common Asthma Triggers and Environmental Control Measures





# Common Asthma Triggers

## Pre-Module Assessment

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. Does each person with asthma have the same asthma triggers?		
2. Is it important for a student to know his or her asthma triggers?		
3. Do triggers cause changes to the airways of a student with asthma?		
4. Is it true that one of the best ways of reducing indoor air pollution is with good ventilation?		
5. Are cats, dogs and other warm blooded, furry animals triggers for some students with asthma?		
6. Does living in a home with a person who smokes have any affect on a student with asthma?		
7. Can strong odors cause problems for student with asthma?		
8. Outdoor air pollution is an increasing problem. Can it affect a student with asthma?		
9. Are there ways to find out how safe it is for students with asthma to be outdoors on any particular day?		





# Common Asthma Triggers

## Pre-Module Assessment Answer Sheet

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. <b>No.</b> Every person’s triggers are different. One student’s triggers might be cats and pollen and another student’s triggers might be strong odors like paint and perfume.		<b>X</b>
2. <b>Yes.</b> A student who knows his/her triggers will be more in control of his or her asthma than one who does not. For example, if cats trigger a student’s asthma episode, the student can avoid cats.	<b>X</b>	
3. <b>Yes.</b> Triggers and environmental exposures can cause swelling and inflammation of the airways.	<b>X</b>	
4. <b>Yes.</b> Good ventilation keeps the air fresher by reducing dust and particulate matter that floats in the air.	<b>X</b>	
5. <b>Yes.</b> Common triggers for students with asthma are furry, warm blooded animals. Even if the students don’t touch them, the animals give off a dander that floats in the air and is likely to be inhaled by the students.	<b>X</b>	
6. <b>Yes.</b> Cigarette and other kinds of smoke are irritants for people with asthma and can trigger asthma episodes.	<b>X</b>	
7. <b>Yes.</b> Many students with asthma are very sensitive to strong odors. Cleaning supplies, perfumes, markers, and paints are among everyday items students encounter in school. It is important for teachers to be aware of this and keep these triggers out of the classroom or in an appropriate location.	<b>X</b>	
8. <b>Yes.</b> Outdoor air pollution can increase asthma symptoms because pollution makes it hard to breathe air into the lungs as well as irritates the lungs. It also reduces lung function.	<b>X</b>	
9. <b>Yes.</b> Most local news programs and daily papers have outdoor air quality reports daily. Information on air quality can be found on the Internet at <a href="http://www.ncair.org">www.ncair.org</a> . These reports indicate by color how safe the air is to breathe each day.	<b>X</b>	





# MODULE 2

## Common Asthma Triggers and Environmental Control Measures

### Module 2 Outline

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
<p>When the class is completed, participants will be able to:</p> <ul style="list-style-type: none"> <li>■ Describe asthma triggers</li> <li>■ Describe how asthma triggers affect a student with asthma</li> <li>■ Describe some common triggers</li> <li>■ Describe how an asthma episode can be prevented by knowing the triggers.</li> </ul>		<p><b>MATERIALS FOR SESSION:</b></p> <ul style="list-style-type: none"> <li>■ “How Asthma-Friendly is the School Setting?”</li> <li>■ “Common Asthma Triggers” handout sheet</li> <li>■ A collection of items found in school that may or may not be common asthma triggers. Examples of triggers: small stuffed animal, chalk or chalky eraser, scented markers, paint, scented cleaning products, air fresheners, perfumes, and small sandwich bags labeled <i>Dust</i>, <i>Pollen</i>, or <i>Roaches</i>. Examples of non-triggers: ruler, book, pencil, paper, stapler, rubber eraser, lunch box and small plastic bag labeled “Water”. Assemble items in the training room and cover with a cloth.</li> <li>■ Environmental Control sheets</li> <li>■ Pre-and Post-Module Assessments and answer sheets.</li> </ul>
<p>I. Have participants complete the “How Asthma-Friendly is the School Setting?” at the beginning of the session.</p> <p>Have the participants complete the Pre-Module assessment</p> <p>Discuss the definition of asthma triggers</p>	<p>Provide the definition of asthma triggers</p> <p><b>DEFINITION:</b> Students with asthma have airways that are super-sensitive to things that cause the airways to swell or become irritated, making breathing difficult. These things are called asthma triggers.</p>	<ul style="list-style-type: none"> <li>■ Distribute the Pre-Module Assessment and have participants complete. When complete, review answers.</li> <li>■ Common Asthma Triggers handout sheet.</li> <li>■ “How Asthma-Friendly is the School Setting”?</li> </ul>

CONTINUED

## Module 2 Outline, p. 2

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	QUESTION: What causes asthma symptoms?	
2. Discuss how triggers affect a student with asthma	For students with asthma, triggers like chemicals, odors, animal dander, smoke and physical activity can irritate the lungs. Triggers cause changes in the airways. Sometimes they cause the airways to tighten, swell and produce excess mucus.	
3. Discuss the common asthma triggers	Review the “Common Asthma Triggers” handout sheet. Ask participants why they think certain items are or are not triggers.	<b>ACTIVITY:</b> “Find the Triggers.” Instruct participants to get a paper and pencil and gather around the ‘triggers table.’ Remove the cloth and tell participants to write down everything on the ‘triggers table’ that they think is a trigger. Review the items with the whole group.
4. Discuss how asthma episodes can be prevented or managed by knowing the student’s asthma triggers	To prevent asthma episodes, students with asthma need to know what his/her asthma triggers are and plan ways to avoid or reduce them. Some questions for you to ask yourself are: <ul style="list-style-type: none"> <li>■ When did his/her asthma start getting out of control?</li> <li>■ Where was the student?</li> <li>■ What conditions or triggers were present?</li> <li>■ What was the student doing?</li> <li>■ What mood was he/she in?</li> </ul>	
5. Discuss the Environmental Control sheets and how to reduce the triggers.	Review the Environmental Control sheets and review ways to reduce asthma triggers listed on the sheets.	
6. Post-Module assessment	Distribute Post-Module Assessments and have participants complete	Post-Module Assessment sheet and answer sheet.



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



# Common Asthma Triggers

## Module 2 Narrative

1. **Distribute the “How Asthma Friendly is the School Setting?” questionnaire for completion in class**
2. **Ask for feedback from participants about how well their schools did on the checklist. Triggers identified in participants’ schools may create obstacles to students trying to control their asthma.**
3. **Discuss the definition of asthma triggers**

**Definition:** Students with asthma have airways that are super-sensitive to things in their environment like pollen, pet dander and dust. These things are called “triggers.” Triggers can cause asthma episodes .

Asthma triggers vary and are different for every student. There are indoor, outdoor, and allergic asthma triggers. There are also some medical conditions that can be asthma triggers. Some of these are: obesity, gastric reflux, sinusitis, infections, and other medical factors.

For student with asthma, triggers like chemicals, odors, animal dander, smoke, and physical activity can irritate the lungs. Triggers cause changes in the airways. Sometimes they cause the airways to tighten and produce mucus or swell. The first and most important step in controlling allergen-induced asthma is to reduce the exposure to the triggers to which the student is sensitive.

4. **Discuss the common asthma triggers**

After completing the “How Asthma Friendly is the School Setting” sheet, look at it as we review the “Common Asthma Triggers” handout sheet.

5. **Discuss how asthma episodes can be prevented or managed by knowing the student’s asthma triggers**

To prevent asthma episodes, students with asthma need to know what their asthma triggers are and plan ways to avoid or reduce them. As a school professional, some questions for you to ask yourself when the student is having an asthma episode are:

- When did his/her asthma start getting out of control?
- Where was the student?
- What conditions or triggers were present?
- What was the student doing?
- What mood was he/she in?

6. **Discuss the Environmental Control Sheets and how to reduce the triggers**

During the last portion of this lesson, review the Environmental Control sheets and discuss ways to reduce asthma triggers.

#### SOURCE:

Lesson adapted with permission from Project Accord with the Minnesota Department of Health, 1998.

Asthma and Allergy Foundation of America  
www.aafa.org/display



## Common Asthma Triggers



### General Irritants

Be careful if the student is around any of these.

- Strong chemicals, aerosol sprays, cleaning products, pesticides
- Strong odors (air fresheners, scented candles, and colognes/perfumes)
- Environmental tobacco smoke (secondhand smoke)
- Smoke from burning wood (in fireplaces, wood stoves, etc.), leaves, or burning fields
- Kerosene heaters and un-vented gas stoves or heaters
- Paints, varnishes, and solvents containing volatile organic compounds (VOC)



### Allergic Triggers

Avoid if the student is allergic to these.

- Mold and mildew (in bathroom, refrigerators, basements, water leaks, soil of house plants, etc)
- Warm-blooded animals (gerbils, cats, dogs, birds, etc)
- Pests (cockroaches, mice, and lady bugs)
- Dust mites present in stuffed animals, pillows, mattresses, comforters, and carpets
- Pollens (flowers, grasses, trees, weeds)



**NOTE:** These are just some of the known triggers. If you have concerns about other items that could cause an asthma episode, please discuss this with the parent, caregiver, or healthcare provider.

#### SOURCES:

- [www.cdc.gov/asthma/faqs.htm#triggers](http://www.cdc.gov/asthma/faqs.htm#triggers), June 2008.
- [www.epa.gov/asthma/triggers.html](http://www.epa.gov/asthma/triggers.html), June 2008.
- [www.niehs.nih.gov/health/topics/conditions/asthma/allergens.cfm](http://www.niehs.nih.gov/health/topics/conditions/asthma/allergens.cfm), June 2008.





# Environmental Control Measures

## Mold and Mildew

Mold grows on damp things such as shower curtains, bath items, tubs, basins and tiles. Moisture control is essential to limiting indoor mold growth. The moisture problem must be repaired. If the moisture problem is not gotten rid of, the mold growth will return.

### What school staff can do?

- Clean mold or mildew with a cleaning solution made up of detergent and water. Wear gloves when mixing or applying solution. After the area has been cleaned, make sure to dry it.
- Use exhaust fans or open a window in the bathroom.
- Report leaky plumbing or other sources of water (faucets, pipes, roof leaks, window leaks) as soon as possible.
- Dry damp or wet items within 1-2 days to avoid mold growth.
- Use air conditioning to cool schoolrooms. Air conditioners remove moisture from the environment.



- Allow air conditioners to run a few minutes before students come to the classroom to allow mold spores to disperse.
- Do not use humidifiers anywhere in the school.
- Do not install carpet in the school. Carpet holds dust mites and can also hold dampness.
- If you have moisture in a small, enclosed space in a school, such as an office or small classroom, leave the doors open to help the spaces dry.

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### SOURCES:

[www.atsdr.cdc.gov/csem/asthma/treatment.html](http://www.atsdr.cdc.gov/csem/asthma/treatment.html), June 2008.  
[www.epa.gov/asthma/triggers.html](http://www.epa.gov/asthma/triggers.html), Aug 2008



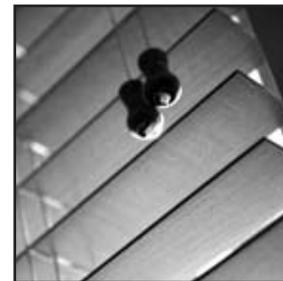
# Environmental Control Measures

## Dust Mites

Dust mites are tiny bugs you can't see. They live in sheets, blankets, pillows, mattresses, box springs, soft furniture, carpets, and stuffed toys, such as stuffed animals.

### What school staff can do:

- Ensure that your classroom, office or other space is frequently vacuumed. Carpet and stuffed furniture like sofas should be vacuumed frequently.
- Remove rugs from your school space.
- Choose washable stuffed toys for your classroom; wash them often in hot water and dry them thoroughly.
- Keep humidity low, ideally between 30-50% relative humidity. Use your air conditioner in your school space if you have one. It will help to reduce the moisture in your school space.
- Consider removing upholstered furniture if it cannot be properly cleaned.



- Use a damp mop or rag to remove dust from floors, desks and other surfaces in the school.
- Keep people with asthma or respiratory problems out of the area when it is being cleaned.

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### SOURCES:

[www.epa.gov/asthma/triggers.html](http://www.epa.gov/asthma/triggers.html), Aug 2008.

[www.atsdr.cdc.gov/csem/asthma/treatment.html](http://www.atsdr.cdc.gov/csem/asthma/treatment.html), June 2008.



# Environmental Control Measures

## Secondhand Smoke

Asthma can be triggered by the smoke from the burning end of a cigarette, pipe, or cigar, or the smoke breathed out by a smoker. Choose not to smoke in the home or car, and don't allow others to do so. Simply smoking outside is not enough to limit the harm to people with asthma from tobacco smoke.

### What school staff can do:

- Help ensure that the smoking policy for the school is enforced.
- Wear a smock to cover clothes when smoking and remove it before coming into contact with others.
- Stay away from students and other non-smokers when smoking.
- Seek support to quit smoking; consider aids such as nicotine gum, patch, and medication from your doctor to help in quitting.



- Contact [www.quitnownc.org](http://www.quitnownc.org) for support to quit smoking.
- Choose smoke-free settings. All public schools are smoke free.

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### SOURCES:

[www.tobaccopreventionandcontrol.ncdhhs.gov](http://www.tobaccopreventionandcontrol.ncdhhs.gov), June 2008.  
[www.nctobaccofreeschools.com](http://www.nctobaccofreeschools.com), Aug 2008.  
[www.smokefree.gov](http://www.smokefree.gov), Aug 2008.  
[www.atsdr.cdc.gov/csem/asthma/treatment.html](http://www.atsdr.cdc.gov/csem/asthma/treatment.html), Aug 2008



# Environmental Control Measures

## Pest Management

Ideally, schools should be using the integrated pest management (IPM) approach for extermination and lower toxicity. Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices.

### What school staff can do:

- Keep the school clean and dry. Remove any moisture.
- Remove any left-over food items. Keep food in air tight containers and clean dirty dishes.
- Use boric acid powder under stoves and other appliances. Wear face mask and gloves when applying powder.
- Use bait stations and gels.
- Support the use of outdoor treatments on school grounds as much as possible to prevent insects from coming indoors.
- If those steps are unsuccessful, seek help from a professional, licensed exterminator rather than spraying chemicals yourself.
- Stay away from the area for several hours after pesticides are applied.



- Avoid using liquid sprays inside the school, especially near places where students crawl, play, or sleep.
- Never attempt to use industrial-strength pesticide sprays that require dilution.

## Cockroaches

Cockroach body parts and droppings may trigger asthma attacks.

### What school staff can do:

- Keep counters, sinks, tables, and floors clean and dry.
- Clean dishes, crumbs, and spills.
- Store food in air tight containers.
- Cover trash cans.
- Limit spread of food around the school, especially in classrooms.

### SOURCES:

[www.epa.gov/asthma/triggers.html](http://www.epa.gov/asthma/triggers.html), Aug 2008.

[www.epa.gov/asthma](http://www.epa.gov/asthma), June 2008.

[www.atsdr.cdc.gov/csem/asthma/treatment.html](http://www.atsdr.cdc.gov/csem/asthma/treatment.html), June 2008



# Environmental Control Measures

## Animal Allergens

A warm-blooded animal's urine, skin, and saliva may also trigger attacks.

### What school staff can do:

- Do not keep warm-blooded animals in the classroom. Gerbils, rats and rabbits are common classroom mascots and can be trigger for students with asthma. If the classroom needs a pet, consider a goldfish.
- If the school has a pet day, have the program outside and do not allow animals to enter the school.



- Make certain that the families of students with asthma know if a field trip will involve contact with warm-blooded animals. Visits to zoos, farms and stables can cause problems for some students with asthma.

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### SOURCES:

[www.epa.gov/asthma/triggers.html](http://www.epa.gov/asthma/triggers.html), Aug 2008.

[www.epa.gov/asthma](http://www.epa.gov/asthma), June 2008.

[www.atsdr.cdc.gov/csem/asthma/treatment.html](http://www.atsdr.cdc.gov/csem/asthma/treatment.html), June 2008.



# Environmental Control Measures

## Chemical Irritants

Chemical irritants found in some scented and unscented products in the school, such as cleaners, paints, adhesives, pesticides, cosmetics, or air fresheners, may make the student's asthma worse.

### What school staff can do:

- Avoid using these products when students are present.
- Take great care to follow the instructions on the label. Open windows or doors, and use an exhaust fan.



- Limit use of products and materials that give off strong odors and irritants, such as:
  - air fresheners, sprays, air wicks, scented candles, plug ins
  - chalk dust
  - cleaning sprays and products
  - hair sprays
  - insect sprays
  - sawdust
  - paint vapors
  - smoke
  - strong perfumes
  - body powder

### SOURCES:

[www.epa.gov/asthma](http://www.epa.gov/asthma), June 2008.

[www.atsdr.cdc.gov/csem/asthma/treatment.html](http://www.atsdr.cdc.gov/csem/asthma/treatment.html), June 2008.

[www.epa.gov/asthma/triggers.html](http://www.epa.gov/asthma/triggers.html), Aug 2008.



# Environmental Control Measures

## Indoor Air Pollution

The two best approaches to reducing indoor air pollution are source control and ventilation.

### What school staff can do:

- Limit indoor humidity and moisture during high humidity days by keeping windows in the school closed and allowing the air conditioners to keep the school rooms cool and dry.
- Use good housekeeping practices to reduce the presence of airborne particles.
- Install an exhaust fan close to the source of airborne contaminants or odors, and vent it to the outside.
- Properly ventilate rooms in which fuel-burning appliances are used.
- Do not use un-vented space heaters or other appliances. If you have to then open a window in the area.



- Treat the school buses as part of the school building and ensure they are vacuumed and wiped down. Bus drivers should be made aware of poor air quality days and keep the bus windows closed during these days.

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### SOURCES:

[www.epa.gov/asthma/triggers.html](http://www.epa.gov/asthma/triggers.html), Aug 2008.

[www.epa.gov/asthma](http://www.epa.gov/asthma), June 2008.

[www.atsdr.cdc.gov/csem/asthma/treatment.html](http://www.atsdr.cdc.gov/csem/asthma/treatment.html), June 2008.



# Environmental Control Measures

## Outdoor Air Pollution

Outdoor air pollution, especially ozone and particulate matter, can increase asthma symptoms. There are many ways to limit exposure to outdoor air pollution.

### What school staff can do:

- Monitor air quality and pollen levels, and keep students with asthma indoors when pollutants are high.
- Avoid contact with vehicle exhaust gases and particulates (such as student exposure to idling school buses).
- Schedule outdoor activities for times when ozone levels are lowest, typically in the morning.
- Monitor air quality each day. Many television and radio weather reports include air quality reports for the day. There are also computer sites that report air quality. Some organizations even offer air quality reports over cell phones.



- Coaches and physical education teachers should be made aware of poor air quality days.
- A plan should be in place for asthma students on red and orange days.

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### SOURCES:

- [www.epa.gov/asthma/triggers.html](http://www.epa.gov/asthma/triggers.html), Aug 2008.
- [www.epa.gov/asthma](http://www.epa.gov/asthma), June 2008.
- [www.atsdr.cdc.gov/csem/asthma/treatment.html](http://www.atsdr.cdc.gov/csem/asthma/treatment.html), June 2008.



# Common Asthma Triggers

## Post-Module Assessment

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. Does each person with asthma have the same asthma triggers?		
2. Is it important for a student to know his or her asthma triggers?		
3. Do triggers cause changes to the airways of a student with asthma?		
4. Is it true that one of the best ways of reducing indoor air pollution is with good ventilation?		
5. Are cats, dogs and other warm blooded, furry animals triggers for some students with asthma?		
6. Does living in a home with a person who smokes have any affect on a student with asthma?		
7. Can strong odors cause problems for student with asthma?		
8. Outdoor air pollution is an increasing problem. Can it affect a student with asthma?		
9. Are there ways to find out how safe it is for students with asthma to be outdoors on any particular day?		





# Common Asthma Triggers

## Post-Module Assessment Answer Sheet

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. <b>No.</b> Every person’s triggers are different. One student’s triggers might be cats and pollen and another student’s triggers might be strong odors like paint and perfume.		<b>X</b>
2. <b>Yes.</b> A student who knows his/her triggers will be more in control of his or her asthma than one who does not. For example, if cats trigger a student’s asthma episode, the student can avoid cats.	<b>X</b>	
3. <b>Yes.</b> Triggers and environmental exposures can cause swelling and inflammation of the airways.	<b>X</b>	
4. <b>Yes.</b> Good ventilation keeps the air fresher by reducing dust and particulate matter that floats in the air.	<b>X</b>	
5. <b>Yes.</b> Common triggers for students with asthma are furry, warm blooded animals. Even if the students don’t touch them, the animals give off a dander that floats in the air and is likely to be inhaled by the students.	<b>X</b>	
6. <b>Yes.</b> Cigarette and other kinds of smoke are irritants for people with asthma and can trigger asthma episodes.	<b>X</b>	
7. <b>Yes.</b> Many students with asthma are very sensitive to strong odors. Cleaning supplies, perfumes, markers, and paints are among everyday items students encounter in school. It is important for teachers to be aware of this and keep these triggers out of the classroom or in an appropriate location.	<b>X</b>	
8. <b>Yes.</b> Outdoor air pollution can increase asthma symptoms because pollution makes it hard to breathe air into the lungs as well as irritates the lungs. It also reduces lung function.	<b>X</b>	
9. <b>Yes.</b> Most local news programs and daily papers have outdoor air quality reports daily. Information on air quality can be found on the Internet at <a href="http://www.ncair.org">www.ncair.org</a> . These reports indicate by color how safe the air is to breathe each day.	<b>X</b>	





**Module 2: Asthma Triggers and Environmental Control Measures**

## Instructor Evaluation

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Telephone: (     ) \_\_\_\_\_ Email: \_\_\_\_\_

Agency or Affiliation: \_\_\_\_\_

**Please place a check mark for your response to each of the following five statements.**

	Strongly Agree	Agree	Disagree	Strongly Disagree	Undecided
This module was well-received by participants.					
This module fit the way of life, background, and experiences of the participants.					
This module was easy for the participants to understand.					
The instructor materials were helpful.					
The module narrative was easy to use.					

How can the Asthma Program improve this module? \_\_\_\_\_

Additional Comments: \_\_\_\_\_

**Please submit completed evaluation form by way of:**

**Fax:** N.C. Asthma Program – (919) 870-4801

**Mail:** N.C. Asthma Program – Division of Public Health  
 1915 Mail Service Center  
 Raleigh NC 27699-1915

**Thank You!**





## Signs and Symptoms of Asthma Trouble





## Signs and Symptoms of Asthma Trouble

### Pre-Module Assessment

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. Is a persistent cough one of the early warning signs of asthma trouble?		
2. Is not being able to talk easily a late warning sign of asthma trouble?		
3. Would you consider an Asthma Action Plan important to a student with asthma and the school staff who work with him or her?		
4. Are neck and chest retractions (sucked in) a late warning sign of asthma?		
5. Is the student’s health care provider involved in developing an action plan?		
6. When a student is in the Green Zone, should he/she limit normal activity?		
7. Is shortness of breath an early warning sign of asthma?		
8. When a student is in the Yellow Zone, can he or she can participate in all normal activities?		
9. If a student is in the Red Zone, should you call his/her parents or even 911?		





# Signs and Symptoms of Asthma Trouble

## Pre-Module Assessment Answer Sheet

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. <b>Yes.</b> Coughing is an early warning sign of asthma trouble.	X	
2. <b>Yes.</b> As an asthma episode progresses, the airways not only become swollen and Inflamed, but they become clogged with mucus. Talking requires breath, and the student by this time is struggling just to breathe.	X	
3. <b>Yes.</b> An asthma action plan tells professional staff as well as the student what to do in the event of an asthma episode.	X	
4. <b>Yes.</b> As the asthma episode progresses, the student must work harder and harder to get air in and out of his or her lungs. The tight chest and neck indicate how hard the student is working in order to breathe.	X	
5. <b>Yes.</b> The health care provider develops the asthma action plan with input from the student and parents. It is the provider that specifies the kind and amount of rescue medication to be administered during the early stages of an asthma episode. The health care provider will monitor the prescribed medicines and their side effects, with the intent of controlling the student’s asthma with as few side effects as possible.	X	
6. <b>No.</b> When a student is in the Green Zone, he or she can participate in all normal activities. In the Green Zone, there are no signs of asthma trouble.		X
7. <b>Yes.</b> In the early stages, a student may breathe faster and can appear to be out of breath.	X	
8. <b>No.</b> In the Yellow Zone, the student is showing the early signs of asthma trouble. He or she should sit down, use an inhaler as instructed in his or her asthma action plan, and continue to sit until the medicine takes effect and he or she is breathing more easily. If symptoms persist longer than 2-3 hours, follow-up with health care provider.		X
9. <b>Yes.</b> The student’s asthma plan will give instructions on who to call—usually parents first, and then health care providers. If no one can be reached or if the student is in extreme distress, call 911.	X	





# Signs and Symptoms of Asthma Trouble

## Module 3 Outline

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
<p>When the class is completed, participants will be able to:</p> <ul style="list-style-type: none"> <li>■ State the four signs of asthma trouble.</li> <li>■ State the procedures to follow in case a student is in the yellow or red area on the Asthma Action Plan.</li> <li>■ State two or three general goals of asthma treatment.</li> </ul>		<p><b>MATERIALS FOR SESSION:</b></p> <ul style="list-style-type: none"> <li>■ Pre and Post Assessments</li> <li>■ “Signs and Symptoms of Asthma Trouble” Sheet</li> <li>■ North Carolina Asthma Action Plan</li> </ul>
<p>1. Have participants fill out the Pre-Assessment for Module 3. Discuss the answers.</p> <p>2. Signs of asthma trouble</p> <p>Discuss the <b>GREEN</b> zone briefly then lead into the four main signs.</p>	<p>When a student is in the <b>green zone</b> –</p> <p>*his/her breathing will be good</p> <ul style="list-style-type: none"> <li>■ there is no cough or wheeze</li> <li>■ he/she can be normally active</li> </ul> <p>The <b>green zone</b> means the student’s asthma is under control.</p>	<p>Other examples of Asthma Action Plans in Appendicies</p>

CONTINUED



## Module 3 Outline, p. 2

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
<p>3. Discuss the early warning signs of an asthma episode.</p> <p>(YELLOW ZONE on Asthma Action Plan)</p>	<p><b>EARLY WARNING SIGNS OF AN ASTHMA EPISODE</b></p> <p>(YELLOW ZONE on Asthma Action Plan)</p> <p>Begin treatment with rescue medicines and contact the parent and health care provider if the student has any of these:</p> <ul style="list-style-type: none"> <li>■ Coughing</li> <li>■ First sign of a cold</li> <li>■ Wheezing</li> <li>■ Chest tightness</li> <li>■ Shortness of breath</li> <li>■ Frequent night-time awakenings indicated by the student's sleepiness at school</li> </ul> <p>The student should sit quietly and administer his/her rescue medications. The medication should begin to relieve the symptoms within 15 to 20 minutes.</p> <p>During that time, the student must not be left alone. Send for someone else if you need additional help.</p> <p>If the rescue medication does not help, the student's asthma will continue to worsen.++</p>	<p>Review "Signs and Symptoms of Asthma Trouble" sheet</p> <p>Instruct on the "NC Asthma Action Plan"</p>

CONTINUED





## Module 3 Outline, p. 4

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
		<p>Green Zone, two fingers for the Yellow Zone and 3 fingers for the Red Zone.</p> <p>Tell them the asthmatic student's name is James. Read starting with #1.</p> <ol style="list-style-type: none"> <li>James seems to have the start of a cold and appears short of breath when he moves around the classroom. (Zone?) <b>ANSWER: Yellow Zone. James is showing early signs of an asthma episode.</b></li> <li>James did well in the basketball game today. He played hard and scored two goals. (Zone?) <b>ANSWER: Green Zone. James had no problems with normal activities.</b></li> <li>James has used his rescue medications as prescribed on his asthma plan, but after almost 30 minutes he is still having a great deal of trouble breathing. (Zone?) <b>ANSWER: Red Zone. James has followed the procedures for treating asthma symptoms and has not improved.</b></li> </ol>

CONTINUED



## Module 3 Outline, p. 5

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
		<p>4. James is coughing and wheezing. (Zone?)</p> <p>ANSWER: <b>Yellow Zone.</b> James has some early symptoms of an asthma episode and needs to follow the instructions on his asthma action plan for using his rescue medication.</p> <p>5. James is sitting in a chair and is not responding clearly to questions. His neck and chest appear tight. (Zone?)</p> <p>ANSWER: <b>Red Zone.</b> James is showing signs of a severe asthma episode. School staff should immediately get medical help. If James is struggling to breathe staff must call 911.</p>



# Signs and Symptoms of Asthma Trouble

## Module 3 Narrative

When a student is in the **GREEN ZONE**, he/she can breathe well, play well, and sleep through the night.

**There are four main symptoms or signs of asthma:**

1. **Cough** day or night.
2. **Wheeze** – a whistling noise heard while breathing; hard or noisy breathing.
3. **Shortness of breath or breathing much faster or slower than usual** – count the number of breaths for 30 seconds. Compare this to the number of breaths for 30 seconds when the student is well.
4. **Chest tightness or pain.**

**NOTE:** If you notice any of these signs, help the student avoid his/her asthma triggers. Start or increase his/her asthma medicine as instructed on the [asthma action plan](#). If the [condition worsens](#), seek medical help from his/her health care provider or the closest emergency room.

**Early Warning Signs of an Asthma Episode (YELLOW ZONE on Asthma Action Plan)**

**Begin treatment with rescue medicines and contact the health care provider if the student has any of these:**

- Coughing or coughing to the point of vomiting
- First sign of a cold
- Wheezing – hard or noisy breathing
- Chest tightness
- Shortness of breath
- Decrease in peak flow to yellow zone

- Frequent nighttime awakenings

**Other symptoms and signs of possible trouble in preschool students are:**

- Trouble eating.
- Being cranky and tired.

**NOTE:** If a student is in the **YELLOW ZONE**,

- Stay with the student.
- Do not let the student go anywhere alone.
- Send someone for his/her asthma action plan.
- Student should stay seated and resting until the symptoms from the episode improve.
- Call parent

**Late Warning Signs of an Asthma Episode (RED ZONE on Asthma Action Plan)**

When the student is in the **RED ZONE**, the student is very sick – get help immediately.

**CALL 911 if the student's asthma is getting worse quickly and for any of the following:**

- Rescue medicine is not helping within 15-20 minutes after use.
- Breathing is hard and fast or working hard to breathe.
- Constant cough.
- Nostrils open wide when breathing through the nose.
- Trouble walking and/or talking in complete sentences.
- Lips or fingernails blue.

CONTINUED

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## Module 3 Narrative, cont.

- Not able to blow peak flow and/or peak flow is in red zone.
- Chest retraction (tightening of chest muscles) - you see this between the ribs and at the front of the neck.
- Unable to perform regular activities.
- Student looks very sick.

### After the action plan is completed –

- All school professionals should know where the action plan is kept in case of emergency
  - They should read and understand what the early and late warning signs are and what steps to follow.
  - They should follow school protocol regarding calling the parent if there are concerns about the student.
  - They should know when to call 911 and what procedures to follow until help arrives.

### Activity: “In the Zone”

Tell participants you are going to read statements about a student with asthma’s behavior. After you read each statement, tell participants to hold up the number of fingers that indicate the Zone they think is described in the statement—one finger for the Green Zone, two fingers for the Yellow Zone and three fingers for the Red Zone.

Tell them the asthmatic student’s name is James. Read starting with #1.

1. James seems to have the start of a cold and appears short of breath when he moves around the classroom. (Zone?)  
**Answer:** Yellow Zone. James is showing early signs of an asthma episode.

2. James did well in the basketball game today. He played hard and scored two goals. (Zone?)

**Answer:** Green Zone. James had no problems with normal activities.

3. James has used his rescue medications as prescribed on his asthma plan, but after almost 30 minutes he is still having a great deal of trouble breathing. (Zone?)

**Answer:** Red Zone. James has followed the procedures for treating asthma symptoms and has not improved.

4. James is coughing and wheezing. (Zone?)

**Answer:** Yellow Zone. James has some early symptoms of an asthma episode and needs to follow the instructions on his asthma action plan for using his rescue medication.

5. James is sitting in a chair and is not responding clearly to questions. His neck and chest appear tight. (Zone?)

**Answer:** Red Zone. James is showing signs of a severe asthma episode. School staff should immediately try to contact parents or caregivers and his primary care provider. If James is struggling to breathe, staff must call 911.

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#### SOURCES:

Centers for Disease Control and Prevention. *Asthma: Basic Facts*. Environmental Hazards and Health Effects Program, Air Pollution and Respiratory Health Branch. Information available at: [www.cdc.gov/asthma/basics.htm](http://www.cdc.gov/asthma/basics.htm), June 2008.

U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma*, 2007.

## What are the Signs and Symptoms of Asthma Trouble?



There are **four main symptoms or signs of asthma**:

1. **Cough**
2. **Wheeze** – a whistling noise heard while breathing
3. **Shortness of breath or breathing much faster or slower than usual** – count the number of breaths for 30 seconds. Compare this to the number of breaths for 30 seconds when the student is well.
4. **Chest tightness or pain**

**NOTE:** If you notice any of these signs, help the student avoid his/her asthma triggers. Start or increase his/her asthma medicine as instructed on their [asthma action plan](#). If the [condition worsens](#), seek medical help from his/her health care provider or the closest emergency room.

### SOURCES:

Centers for Disease Control and Prevention. *Asthma: Basic Facts*. Environmental Hazards and Health Effects Program, Air Pollution and Respiratory Health Branch. Information available at: [www.cdc.gov/asthma/basics.htm](http://www.cdc.gov/asthma/basics.htm), June 2008.

U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma*, 2007.

### Early Warning Signs of an Asthma Episode (YELLOW ZONE on Asthma Action Plan)

**Begin treatment with rescue medicines and contact the health care provider if the student has any of these:**

- Coughing or coughing to the point of vomiting.
- First sign of a cold.
- Wheezing.
- Chest tightness.
- Shortness of breath.
- Decrease in peak flow to yellow zone.
- Frequent night-time awakenings.

### Late Warning Signs of an Asthma Episode (RED ZONE on Asthma Action Plan)

**Continue rescue medicines and seek immediate medical help if the student's asthma is getting worse and for any of the following:**

- Rescue medicine is not helping within 15-20 minutes after use.
- Nostrils open wide when breathing through the nose.
- Trouble walking and/or talking in complete sentences.
- Lips or fingernails blue.
- Not able to blow peak flow and/or peak flow is in red zone.
- Chest retraction (tightening of chest muscles) - you see this between the ribs and at the front of the neck.
- Unable to perform regular activities.





## Signs and Symptoms of Asthma Trouble

### Post-Module Assessment

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. Is a persistent cough one of the early warning signs of asthma trouble?		
2. Is not being able to talk easily a late warning sign of asthma trouble?		
3. Would you consider an Asthma Action Plan important to a student with asthma and the school staff who work with him or her?		
4. Are neck and chest retractions (sucked in) a late warning sign of asthma?		
5. Is the student’s health care provider involved in developing an action plan?		
6. When a student is in the Green Zone, should he/she limit normal activity?		
7. Is shortness of breath an early warning sign of asthma?		
8. When a student is in the Yellow Zone, can he or she can participate in all normal activities?		
9. If a student is in the Red Zone, should you call his/her parents or even 911?		





# Signs and Symptoms of Asthma Trouble

## Post-Module Assessment Answer Sheet

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. <b>Yes.</b> Coughing is an early warning sign of asthma trouble.	X	
2. <b>Yes.</b> As an asthma episode progresses, the airways not only become swollen and Inflamed, but they become clogged with mucus. Talking requires breath, and the student by this time is struggling just to breathe.	X	
3. <b>Yes.</b> An asthma action plan tells professional staff as well as the student what to do in the event of an asthma episode.	X	
4. <b>Yes.</b> As the asthma episode progresses, the student must work harder and harder to get air in and out of his or her lungs. The tight chest and neck indicate how hard the student is working in order to breathe.	X	
5. <b>Yes.</b> The health care provider develops the asthma action plan with input from the student and parents. It is the provider that specifies the kind and amount of rescue medication to be administered during the early stages of an asthma episode. The health care provider will monitor the prescribed medicines and their side effects, with the intent of controlling the student’s asthma with as few side effects as possible.	X	
6. <b>No.</b> When a student is in the Green Zone, he or she can participate in all normal activities. In the Green Zone, there are no signs of asthma trouble.		X
7. <b>Yes.</b> In the early stages, a student may breathe faster and can appear to be out of breath.	X	
8. <b>No.</b> In the Yellow Zone, the student is showing the early signs of asthma trouble. He or she should sit down, use an inhaler as instructed in his or her asthma action plan, and continue to sit until the medicine takes effect and he or she is breathing more easily. If symptoms persist longer than 2-3 hours, follow-up with health care provider.		X
9. <b>Yes.</b> The student’s asthma plan will give instructions on who to call—usually parents first, and then health care providers. If no one can be reached or if the student is in extreme distress, call 911.	X	





**Module 3: Signs and Symptoms of Asthma Trouble**

**Instructor Evaluation**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Telephone: (     ) \_\_\_\_\_ Email: \_\_\_\_\_

Agency or Affiliation: \_\_\_\_\_

**Please place a check mark for your response to each of the following five statements.**

	Strongly Agree	Agree	Disagree	Strongly Disagree	Undecided
This module was well-received by participants.					
This module fit the way of life, background, and experiences of the participants.					
This module was easy for the participants to understand.					
The instructor materials were helpful.					
The module narrative was easy to use.					

How can the Asthma Program improve this module? \_\_\_\_\_

Additional Comments: \_\_\_\_\_

**Please submit completed evaluation form by way of:**

**Fax:** N.C. Asthma Program – (919) 870-4801

**Mail:** N.C. Asthma Program – Division of Public Health  
 1915 Mail Service Center  
 Raleigh NC 27699-1915

**Thank You!**



# How is Asthma Treated and Managed?

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# How is Asthma Treated and Managed?

## Pre-Module Assessment

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. Do you think an asthma symptom diary is helpful to a student with asthma?		
2. Do you think that when a student is having an asthma episode, controller medications will relieve the symptoms?		
3. Is it true that a peak flow meter is used to measure air flow from the lungs of a student with asthma?		
4. Do all students with asthma take the same medications?		
5. Are quick-relief medications used to relieve the symptoms of an asthma episode?		
6. Do you agree that no one but the student with asthma needs to know where his or her action plan is kept in school?		
7. Are there three types of asthma medicines?		
8. Can you help students control their asthma by helping them avoid their asthma triggers?		
9. Asthma medications come in many forms. Is it true that one form of medication is inhaled?		
10. Is a student's asthma action plan developed by the principal of his or her school?		





# How is Asthma Treated and Managed?

## Pre-Module Assessment Answer Sheet

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. <b>Yes.</b> An asthma symptom diary provides the student’s parents and health care provider a history of asthma symptoms.	X	
2. <b>No.</b> Controller medications are usually taken daily and will help control the frequency and severity of asthma symptoms. The rescue inhaler is used when a student is having an asthma episode.		X
3. <b>Yes.</b> A peak flow meter measures the outflow of air from the lungs. The device tells the student with asthma how open his or her airways are at any given time.	X	
4. <b>No.</b> Asthma medications are not all the same and students with asthma are treated individually, based on the history of symptoms, by their health care providers.		X
5. <b>Yes.</b> When students are in the early stages of an asthma episode, the use of their quick-relief medications can relieve the symptoms of the episode as well as keep an episode from becoming any worse.	X	
6. <b>No.</b> It is vital that all professionals in the school know where the action plan of any student with asthma is kept. The asthma action plan provides instructions from the student’s health care provider on how to use medications and what actions may be appropriate to help the student having an asthma episode.		X
7. <b>Yes.</b> Quick-relief medications help relieve the symptoms of an asthma episode. Controller medications are taken every day and will help the student have fewer and milder asthma episodes. Oral steroids are usually used for short periods of time to reduce swelling in the airways and inflammation during a moderate or severe episode.	X	
8. <b>Yes.</b> You can help a student with asthma have better control by removing the asthma triggers from the environment or encouraging him or her to avoid them.	X	
9. <b>Yes.</b> Inhalers are most often used for quick-relief or controller medicines.	X	
10. <b>No.</b> The student’s asthma action plan is developed by the primary healthcare provider and the student’s parents or guardians. A copy of the asthma action plan is kept at the school for use when an asthma episode occurs.		X







# MODULE 4

## Module 4 Outline, p. 2

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
2. Asthma medicines and types	<p>Students with asthma do not always take the same brand or type of asthma medicine. Some medicines can be inhaled (breathed in) and others can be taken as a pill by mouth or as a liquid.</p> <p>Asthma medicines come in three types—</p> <ol style="list-style-type: none"> <li>1. QUICK-RELIEF</li> <li>2. CONTROLLER MEDICINES</li> <li>3. ORAL STEROIDS</li> </ol> <p>INFORMATION ABOUT EACH OF THESE TYPES:</p> <ol style="list-style-type: none"> <li>1. QUICK-RELIEF: <ul style="list-style-type: none"> <li>■ Quick-relief medicines help relieve the symptoms of an asthma episode.</li> <li>■ If a student is having an asthma episode , with symptoms such as coughing, wheezing, shortness of breath and/or chest pain, this is the time for him/her to take quick-relief medicine.</li> </ul> </li> </ol>	

CONTINUED



## Module 4 Outline, p. 3

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	<p>2. CONTROLLER MEDICINES:</p> <ul style="list-style-type: none"> <li>■ Controller medicines help the child have fewer and milder asthma episodes and should be taken every day.</li> <li>■ The student should take his/her controller medicine every day even when he/she has no symptoms. Usually students take this medication at home.</li> </ul> <p>3. ORAL STEROIDS:</p> <ul style="list-style-type: none"> <li>■ Oral steroids are often used for a short period of time to reduce the swelling in the airways during a moderate or severe asthma episode.</li> <li>■ They may also be used to treat people with severe persistent asthma whose symptoms cannot be controlled any other way.</li> </ul>	
<p>3. Discuss the Asthma Action Plans</p>	<p><b>Asthma Action Plan:</b> The Asthma Action Plan is very important to the successful treatment of asthma. It provides a record of the health care provider's prescribed treatment for the student with asthma, including how and when to use medicines. The plan also indicates how to respond to an asthma episode that is mild, moderate or severe.</p>	<p>North Carolina Asthma Action Plan. Other examples of Asthma Action Plans found in the Appendices.</p>

CONTINUED



## Module 4 Outline, p. 4

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	<p>Schools should always have a copy of the asthma action plan for every student with asthma. School professionals should know where the plans are kept and have easy access to them in the event of an emergency.</p>	
<p>4. Discussion of peak flow and how to measure (how to measure what? – air flow?)using a peak flow meter</p>	<p><b>A. WHAT IS A PEAK FLOW METER?</b> A Peak flow Meter is a small, hand held tool that is used to measure how well air flows in and out of the lungs. For a student who has asthma, the reading can indicate if there is a narrowing in the airways even before their symptoms start. It is a simple test which students with asthma can use to monitor themselves. However, the student with asthma must be able to perform the test correctly.</p> <p><b>NOTE:</b> Usually a student must be 5 years of age or older to perform the test.</p> <p><b>B. HOW DOES A PERSON WITH ASTHMA MEASURE PEAK FLOW?</b></p> <ul style="list-style-type: none"> <li>■ Slide the little marker down as far as it will go. This sets the meter to zero.</li> <li>■ Have the student take a big breath with his/her mouth open. Hold the meter in one hand and keep fingers away from the numbers.</li> </ul>	

CONTINUED

## Module 4 Outline, p. 5

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	<ul style="list-style-type: none"> <li>■ Place the peak flow meter in the mouth sealing the lips around the mouthpiece. Tell the student to take a deep breath in and blow out into the mouthpiece as hard as he/she can.</li> <li>■ Find the number where the marker stopped. Write the number down on a paper or chart.</li> <li>■ Have the student blow two more times. Push the bottom down each time and write down the high number of the three readings in the asthma diary.</li> </ul>	
5. Discussion of the asthma symptom diary form.	<p>An asthma symptom diary is necessary in order for the student's health care provider to determine the care necessary.</p> <p><b>INSTRUCTIONS FOR USE:</b></p> <ol style="list-style-type: none"> <li>1. This diary is designed for recording two weeks of information. Continue to use the same format every day during the two weeks to assess the personal best. Give this information to the parent or guardian to give to the health care provider.</li> <li>2. Fill in the dates. Follow the asthma action plan for the student's current asthma zone.</li> </ol>	Review the Asthma Symptom Diary sheet and provide the instructions for use.

CONTINUED



## Module 4 Outline, p. 6

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	<ol style="list-style-type: none"> <li>3. Identify and avoid triggers.</li> <li>4. Rank the student's asthma symptoms using the ranking list at the bottom of the diary form.</li> <li>5. Write down any medicine that the student takes and any concerns you have.</li> <li>6. Make a note of any activity the student cannot do.</li> </ol> <p><b>NOTE:</b> Many North Carolina school nurses do not have access to peak flow meters. The diary is still effective in recording a student's use of medications, episodes and feelings for that period of time</p>	

# How is Asthma Treated and Managed?

## Module 4 Narrative

### There are three major groups of asthma medicines.

- Quick Relief Medicine
- Controller Medicine
- Oral Steroids – these are not given at school.

### Medicines:

Students with asthma do not always take the same brand or type of asthma medicine. Some medicines can be inhaled (breathed in) and others can be taken as a pill by mouth or as a liquid.

#### I. Quick Relief:

- Quick relief (rescue) medicines help relieve the symptoms of an asthma episode or prevent symptoms caused by exercise. These medicines are carried by the student or stored at school.
- If the student uses the quick-relief medicine more than twice a week, other than for exercise induced asthma (that is, from physical activities), the parent or caregiver should contact the student's health care provider to see if a different medicine is needed.
- If a student is having an asthma episode, such as coughing, shortness of breath, wheezing, and/or chest tightness, give him/her the quick-relief medicine.

#### 2. Controller:

- Controller medicines help the student have fewer and milder asthma episodes and should be taken every day at home.

### Discussion of peak flow meters and use:

**A. What is a peak flow meter?** A peak flow meter is a small, hand held tool that is used to measure how well air flows in and out of the lungs. For a student who has asthma, the reading can indicate if there is a narrowing in the airways even before his/ her symptoms start. It is a simple test that people with asthma can do to monitor themselves, thus enabling them to take preventive medicine and perhaps avoid an episode.

#### B. How do you measure peak flow?

- Slide the little marker down as far as it will go. This sets the meter to zero.
- Have the student place the peak flow meter in the mouth, sealing the lips around the mouth piece. Instruct the student take a deep breath in, place the meter into the mouth sealing the lips around the mouth piece. Have him/her to blow out as hard and as fast as he/she can into the mouth piece.
- The marker will go up and stay up. Find the number where it stopped.

CONTINUED

## Module 4 Narrative, p. 2

- Repeat two more times, pushing the marker down all the way to the bottom after each time. Write down the highest number of the three times on the peak flow chart. This number will be the student's personal best.

### Items to Note:

- As with all medicines, asthma medicines can have possible side effects. However, most are mild and easy to control.
- Do not allow the student to stop using the asthma medicine before contacting the health care provider.

### Asthma Symptom Diary:

An asthma symptom diary is necessary for the student's health care provider to assess the proper care and treatment.

The symptom diary can help to:

- determine what triggers cause a problem for the student.
- keep track of asthma medicines and when to use them.

### Asthma Action Plan:

Review and instruct on the North Carolina Asthma Action Plan.

### After the action plan is completed:

- Let all school professionals **know where** the action plan is kept in case of emergency.
- Read and understand** what the early and late warning signs are and what steps to follow.
- Call** the parent or health care provider if you have concerns about the student.
- Know when to **call 911** and what procedures to follow until they arrive.
- Help students with asthma identify and avoid** asthma triggers.

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### SOURCES:

EPR-3. Expert panel report 3: guidelines for the diagnosis and management of asthma (EPR-3 2007). NIH Publication. 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.

Centers for Disease Control and Prevention. *Asthma: Basic Facts*. Environmental Hazards and Health Effects Program, Air Pollution and Respiratory Health Branch, June 2008.

## How is Asthma Treated and Managed?



### YOU can help control the student's asthma by...

- giving the student's medicine exactly as instructed; and
- helping the student to avoid triggers (things which can cause an asthma episode).

**Students with asthma do not always take the same brand or type of asthma medicine. Some medicines can be inhaled (breathed in) and others can be taken as a pill by mouth. Asthma medicines come in two types—**

**1. quick-relief and 2. controller.**

#### 1. Quick Relief:

- Quick-relief medicines help relieve the symptoms of an asthma episode.
- If the student uses the quick-relief medicine more than twice a week, other than for exercise-induced asthma (that

is, from physical activities), the parent or guardian should contact the student's health care provider to see if a different medication is needed.

- If a student is having an asthma episode, controller medicines **will not** relieve the symptoms, such as coughing, shortness of breath, wheezing, and/or chest pain. This is the time to give him/her the quick-relief medicine.

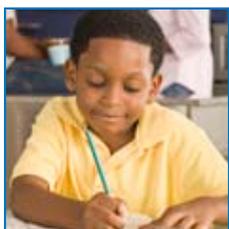
#### 2. Controller:

- Controller medicines help the student have fewer and milder asthma episodes and should be taken every day.
- Give the student their controller medicine even when you do not notice any symptoms.

#### Items to Note:

- As with all medicines, asthma medicines can have possible side effects but most are mild and should soon go away or are easy to control.
- Do not stop the asthma medicine before contacting the health care provider.
- Talk with the parent or guardian about any concerns you have.

CONTINUED



## How is Asthma Treated and Managed?, cont.

The important thing to remember is: **asthma can be controlled**. Make sure that the parent/guardian talks with their student's health care provider to **develop an asthma action plan**. After the plan is completed, **go over the action plan** with the parent/guardian and **follow the instructions**.



### After the action plan is completed, you should:

- Let all caregivers **know where** the action plan is kept in case of emergency.
- **Read and understand** what the early and late warning signs are and what steps to follow.
- **Call** the parent or health care provider if you have concerns about the student.
- Know when to **call 911** and what procedures to follow until they arrive.
- **Know** how to use a peak flow meter, and **understand** the changes in peak flow meter scores/readings.

- **Learn and understand** what medicines to give and how often to give them. Follow the doctor's orders.
- **Identify and avoid** asthma triggers.

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#### SOURCES:

U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma*, 2007.

Centers for Disease Control and Prevention. *Asthma: Basic Facts*. Environmental Hazards and Health Effects Program, Air Pollution and Respiratory Health Branch. Information available at: [www.cdc.gov/asthma/basics.htm](http://www.cdc.gov/asthma/basics.htm), June 2008.

# Asthma Symptom Diary

An asthma symptom diary will provide the parent or school professional information about how asthma triggers and medications affect the student's peak flow and asthma symptoms. This information will be important to the school professional when assessments are made.

The diary can help determine:

- the triggers which cause a problem for the student.
- how to keep track of the asthma medicine and when to use them.
- when to seek medical help when problems arise.

DATE	PEAK FLOW READINGS AM/ZONE	PEAK FLOW READINGS PM/ZONE	TRIGGERS NOTED	SYMPTOMS PLEASE RANK FROM LIST BELOW	MEDICINE(S) TAKEN AND CONCERN	RESTRICTED ACTIVITY
<b>EXAMPLE</b> 8/10/08	Peak flow – 245  Yellow Zone	Peak flow – 360  Green Zone	Played in grass	_0_ Cough _1_ Wheeze _0_ Short of breath _0_ Chest tightness _0_ Other:	Albuterol 2 puffs  Wheezing stopped	None
				___ Cough ___ Wheeze ___ Short of breath ___ Chest tightness ___ Other:		
				___ Cough ___ Wheeze ___ Short of breath ___ Chest tightness ___ Other:		
				___ Cough ___ Wheeze ___ Short of breath ___ Chest tightness ___ Other:		
				___ Cough ___ Wheeze ___ Short of breath ___ Chest tightness ___ Other:		

Rank Asthma Symptoms:    None = 0    Rarely = 1    Often = 2    All the time = 3

CONTINUED



## Asthma Symptom Diary, cont.

DATE	PEAK FLOW READINGS AM/ZONE	PEAK FLOW READINGS PM/ZONE	TRIGGERS NOTED	SYMPTOMS PLEASE RANK FROM LIST BELOW	MEDICINE(S) TAKEN AND CONCERN	RESTRICTED ACTIVITY
				<input type="checkbox"/> Cough <input type="checkbox"/> Wheeze <input type="checkbox"/> Short of breathe <input type="checkbox"/> Chest tightness <input type="checkbox"/> Other:		
				<input type="checkbox"/> Cough <input type="checkbox"/> Wheeze <input type="checkbox"/> Short of breathe <input type="checkbox"/> Chest tightness <input type="checkbox"/> Other:		
				<input type="checkbox"/> Cough <input type="checkbox"/> Wheeze <input type="checkbox"/> Short of breathe <input type="checkbox"/> Chest tightness <input type="checkbox"/> Other:		
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				<input type="checkbox"/> Cough <input type="checkbox"/> Wheeze <input type="checkbox"/> Short of breathe <input type="checkbox"/> Chest tightness <input type="checkbox"/> Other:		
				<input type="checkbox"/> Cough <input type="checkbox"/> Wheeze <input type="checkbox"/> Short of breathe <input type="checkbox"/> Chest tightness <input type="checkbox"/> Other:		

Rank Asthma Symptoms:    None = 0      Rarely = 1      Often = 2      All the time = 3

**SOURCES:**

EPR-3. Expert panel report 3: guidelines for the diagnosis and management of asthma (EPR-3 2007). NIH Publication. 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.

Centers for Disease Control and Prevention. *Asthma: Basic Facts*. Environmental Hazards and Health Effects Program, Air Pollution and Respiratory Health Branch, June 2008.



# How is Asthma Treated and Managed?

## Post-Module Assessment

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. Do you think an asthma symptom diary is helpful to a student with asthma?		
2. Do you think that when a student is having an asthma episode, controller medications will relieve the symptoms?		
3. Is it true that a peak flow meter is used to measure air flow from the lungs of a student with asthma?		
4. Do all students with asthma take the same medications?		
5. Are quick-relief medications used to relieve the symptoms of an asthma episode?		
6. Do you agree that no one but the student with asthma needs to know where his or her action plan is kept in school?		
7. Are there three types of asthma medicines?		
8. Can you help students control their asthma by helping them avoid their asthma triggers?		
9. Asthma medications come in many forms. Is it true that one form of medication is inhaled?		
10. Is a student's asthma action plan developed by the principal of his or her school?		



# How is Asthma Treated and Managed?

## Post-Module Assessment Answer Sheet

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. <b>Yes.</b> An asthma symptom diary provides the student’s parents and health care provider a history of asthma symptoms.	X	
2. <b>No.</b> Controller medications are usually taken daily and will help control the frequency and severity of asthma symptoms. The rescue inhaler is used when a student is having an asthma episode.		X
3. <b>Yes.</b> A peak flow meter measures the outflow of air from the lungs. The device tells the student with asthma how open his or her airways are at any given time.	X	
4. <b>No.</b> Asthma medications are not all the same and students with asthma are treated individually, based on the history of symptoms, by their health care providers.		X
5. <b>Yes.</b> When students are in the early stages of an asthma episode, the use of their quick-relief medications can relieve the symptoms of the episode as well as keep an episode from becoming any worse.	X	
6. <b>No.</b> It is vital that all professionals in the school know where the action plan of any student with asthma is kept. The asthma action plan provides instructions from the student’s health care provider on how to use medications and what actions may be appropriate to help the student having an asthma episode.		X
7. <b>Yes.</b> Quick-relief medications help relieve the symptoms of an asthma episode. Controller medications are taken every day and will help the student have fewer and milder asthma episodes. Oral steroids are usually used for short periods of time to reduce swelling in the airways and inflammation during a moderate or severe episode.	X	
8. <b>Yes.</b> You can help a student with asthma have better control by removing the asthma triggers from the environment or encouraging him or her to avoid them.	X	
9. <b>Yes.</b> Inhalers are most often used for quick-relief or controller medicines.	X	
10. <b>No.</b> The student’s asthma action plan is developed by the primary healthcare provider and the student’s parents or guardians. A copy of the asthma action plan is kept at the school for use when an asthma episode occurs.		X





**Module 4: How is Asthma Treated and Managed?**

## Instructor Evaluation

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Telephone: (     ) \_\_\_\_\_ Email: \_\_\_\_\_

Agency or Affiliation: \_\_\_\_\_

**Please place a check mark for your response to each of the following five statements.**

	Strongly Agree	Agree	Disagree	Strongly Disagree	Undecided
This module was well-received by participants.					
This module fit the way of life, background, and experiences of the participants.					
This module was easy for the participants to understand.					
The instructor materials were helpful.					
The module narrative was easy to use.					

How can the Asthma Program improve this module? \_\_\_\_\_

Additional Comments: \_\_\_\_\_

**Please submit completed evaluation form by way of:**

**Fax:** N.C. Asthma Program – (919) 870-4801

**Mail:** N.C. Asthma Program – Division of Public Health  
 1915 Mail Service Center  
 Raleigh NC 27699-1915

**Thank You!**





## Asthma in School





# Asthma in School

## Pre-Module Assessment

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. In order to carry his/her medicine in school, must a student have the medicine prescribed by the primary care provider and the approval of his/her parents?		
2. Is it against the law for anyone except the school nurse to administer medication?		
3. North Carolina students required to take health education classes in asthma awareness?		
4. Is smoking allowed on school campuses in Western North Carolina?		
5. Do you agree that school staff can help support students with asthma by knowing what to do if a student has an asthma episode?		
6. Is the custodian the only staff member in the school who needs to be concerned about a healthy school environment?		
7. Should students with asthma have an asthma action plan at school?		
8. Should PE teachers be concerned about outdoor air quality?		



# Asthma in School

## Pre-Module Assessment Answer Sheet

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. <b>Yes.</b> It is a requirement of state law.	X	
2. <b>No.</b> There is a NC law that allows people in the school, with approval from the school board, to administer medication.		X
3. <b>Yes.</b> All North Carolina students are required to take asthma awareness education in grades 4, 6, and 8.	X	
4. <b>No.</b> No smoking is allowed on any K-12 school campus in North Carolina.		X
5. <b>Yes.</b> Asthma episodes can come on suddenly and staff need to know how to respond.	X	
6. <b>No.</b> The entire school staff be involved in keeping the school environment healthy for all students.		X
7. <b>Yes.</b> Asthma Action Plans are vital to the well-being of students with asthma when they are in school. The plans contain instructions and information from the student’s primary care provider.	X	
8. <b>Yes.</b> Any school staff working with students outdoors should be tracking air quality	X	



# Asthma in School

## Module 5 Outline

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
<p>When this class is completed, participants will be able to:</p> <ul style="list-style-type: none"> <li>■ Describe the laws and policies related to asthma in North Carolina Schools.</li> <li>■ Identify the strategies schools, school nurses, and school professionals can use to address the needs of students with asthma.</li> <li>■ List ideas that allow nurses and other school professionals to connect with parents and caregivers of students with asthma.</li> </ul>		<p><b>MATERIALS FOR SESSION:</b></p> <ul style="list-style-type: none"> <li>■ Copies of North Carolina laws pertaining to asthma in school.</li> </ul>
<p>I. State Law GS115C-375.2</p>	<p>Instruct participants to fill out module 5 pre-assessment</p> <p>This law is of major significance to students with asthma, as it allows them to carry their rescue/quick relief medications with them in school. Prior to this law being enacted, rescue medications were kept in a locked cabinet with other student medications. The necessity of having quick access to rescue/quick relief medicines for students with asthma was recognized by legislators and made into law in 2005.</p> <p><b>QUESTION:</b> What are the requirements for a student with asthma to be able to carry his/her rescue/quick-relief medications?</p>	<p>Copy of law GS115C-375.2</p> <p><b>ANSWER:</b> The medication must be prescribed by the student's primary care provider and have the parents' approval for the student to carry.</p>

CONTINUED



## Module 5 Outline, p. 2

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
<p>2. GSI 15C-375.1</p>	<p>This law is part of the legislation regarding carrying medications. It states that anyone in the school can administer medication or other emergency care if that employee has been given the authority by the school board, the medicine is prescribed by the student's doctor and requested by the parents.</p> <p>The statute recognizes the importance of having more than one person on the school site who has access to medications and can intervene in a medical emergency.</p> <p>Many school nurses in North Carolina have two or more schools they are responsible for and cannot be at one school site full-time. Currently the average school nurse in North Carolina is responsible for about 1185 students. (2011)</p>	<p>Copy GSI 15-375.1</p>
<p>3. Session Law 2006-143 HB 1502 "An Act to Enact the Children's Health Act of 2006"</p> <p>GSI 15C-12 And GSI 15-47</p>	<p>This law addresses environmental issues in schools and on school grounds. It is interesting that many of the issues addressed in the law are known triggers for asthma.</p> <p><b>QUESTION:</b> What are some of the known triggers addressed in the law?</p>	<p>Copy of Session Law 2006-143.</p> <p><b>ANSWER:</b> The law mentions pests and the products often used to control them as well as the diesel fumes from idling school buses.</p>

CONTINUED

## Module 5 Outline, p. 3

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
4. There is no legal requirement for identifying students with asthma	There is a health assessment required for North Carolina students when they enter kindergarten. However, if students enter the school system at a later age and grade, there is no requirement. School nurses and other school professionals will only know about a new (grades 1-12) student's asthma if the parents, caregiver, primary care provider or the student him/her self reports it.	
5. GSI15C-81 (2003)	<p>This statute requires school districts to use the Healthful Living Standard Course of Study (2008), which includes Asthma Awareness education to be taught in grades 4, 6 and 8.</p> <p><b>QUESTION:</b> Do you think Asthma Awareness Education is helpful to students who do not have asthma?</p>	<p>Copy of GSI15-81 (2003)</p> <p><b>ANSWER:</b> It is helpful because it explains the "difference" other students may see in the student with asthma. Students with asthma are less likely to be stigmatized if others understand what is happening.</p>
Smoke-Free School Policies	The federal government first stated, in legislation introduced in the 1990s, that the schools should be tobacco-free inside. The legislations stipulated that school districts in all states would risk any federal funds they received if they did not comply.	

CONTINUED

## Module 5 Outline, p. 4

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	<p>It was a gradual process, but by 2008 all school districts in North Carolina were in compliance with the federal law. Local policies often went further and declared school grounds and school activities off site to be tobacco free.</p> <p>Since 2008, laws preventing smoking have increased to include public places, restaurants and bars and all government buildings.</p> <p><b>QUESTION:</b> Why is this legislation important to students and school staff with asthma</p>	<p><b>ANSWER:</b> Second hand smoke is a major trigger for people with asthma.</p>
<p><b>Strategies used in schools to support students with asthma:</b></p> <p>I. Staff Training in Asthma— Staff trained should include bus drivers, faculty and other professionals, custodians, dietary aides, administration and anyone else who comes in contact with students.</p>		<p>Copies of an Asthma Action Plan.</p> <p>List of Common Triggers</p> <p><b>(Note:</b> both handouts available in this curriculum).</p>

CONTINUED



## Module 5 Outline, p. 5

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
<p>2. Health Environment Education</p>	<p>Educating school personnel can be an ongoing effort by an individual school or by a school district to ensure that their schools are maintaining healthy indoor environments for all students.</p> <p>Schools can establish a district-wide Indoor Air Quality Management Program. If the district is not receptive to this approach, then a single school can accomplish this by adopting the <i>Tools for Schools</i> Program. This program offers the tools necessary for school to develop practices that initiate and sustain good indoor air quality. The health and well-being of students is discussed throughout this curriculum. Good management of indoor air quality can make a major difference to students and staff as well. One does not have to have a serious respiratory disease to be affected by strong fumes, excessive mold or indoor air containing excessive dust and other particulate matter.</p>	<p><b>IAQ Tools for Schools</b></p> <p>You are here:</p> <p><a href="#">EPA Home</a></p> <p><a href="#">Air</a></p> <p><a href="#">Indoor Air</a></p> <p><a href="#">IAQ Schools Tools for School Action Kit</a></p> <p><a href="#">National Symposium</a></p> <p><a href="#">National Awards Program</a></p> <p><a href="#">Basic Information</a></p> <p><a href="#">Publications</a></p> <p><a href="#">Frequent Questions</a></p> <p><a href="#">Related Links</a></p> <p><a href="#">Resources for Schools</a></p> <p><b>ESPAÑOL</b></p> <p><a href="#">Other EPA Schools Programs</a></p>
<p>3. Communication with Parents.</p>	<p>Direct contact with parents of students with asthma is necessary for the student to have an asthma action plan. The student may only be approved to carry his/her medicine/s with the permission of the primary care provider and the parents.</p> <p>Connecting with parents is one of the greatest challenges nurses and other school personnel face.</p>	

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## Module 5 Outline, p. 7

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	<p><b>Note:</b> Access to this Charlotte Mecklenburg website is available to the community as well as parents of students with asthma and promotes asthma awareness to the general population.</p>	
<p>4. The unique responsibilities of school staff to students with asthma.</p>	<p>Teachers should have copies of their students' asthma action plans and know where the rescue/quick relief meds are kept if the student does not carry Their own. Teachers can, to a degree, manage indoor air pollution in their classrooms by keeping windows closed and air conditioning on during poor air quality days and when mowing and other activities are going on outside. They should also keep their classrooms as trigger-free as possible. A teacher's role may include helping a student to feel comfortable enough to share concerns and feelings about his/her asthma. Teachers can also be helpful in ensuring that students stay caught up with their work if they miss school.</p> <p>Social Workers, Psychologist, Counselors and Office Staff need to know what to do in case of an asthma episode. This group should be able to identify potential asthma triggers and keep their offices and rooms as free of triggers as possible.</p>	

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## Module 5 Outline, p. 8

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	<p>Coaches and PE Teachers— Outdoor Air Quality should be of concern to anyone working with students outdoors. These professionals should also know which students have exercise-induced asthma to ensure that they use their rescue/quick relief medications before physical activity.</p> <p>Bus Drivers—Bus Drivers are alone with students during the ride to and from school. They must know what to do in a medical emergency like an asthma episode. They should be trained at the very beginning of the school year along with other non-certified school staff.</p> <p>Custodians should be aware of potential asthma triggers and remove or report them, as required, to school administration.</p> <p>School Nurses—Part of the school nurses job is to coordinate the school health program and to provide case management to support health and safety. They are also responsible for the training of all school personnel. They are the leaders in the schools in the efforts to keep students with asthma safe and healthy.</p>	

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## Module 5 Outline, p. 9

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	<p>School Administrators—It is vital that the administrators of the school support the efforts to keep the school safe and healthy. Their support is an endorsement of these efforts.</p> <p>Instruct participants to complete module 5 post-assessment</p>	



# Asthma in School

## General Assembly of North Carolina Session 2005 Session Law 2006-143 House Bill 1502

AN ACT TO ENACT THE SCHOOLCHILDREN'S HEALTH ACT OF 2006.

The General Assembly of North Carolina enacts:

**SECTION 1.** G.S. 115C-12 is amended by adding a new subdivision to read:

“(33) Duty to Protect the Health of School-Age Children From Toxicants at School. – The State Board shall address public health and environmental issues in the classroom and on school grounds by doing all of the following:

- a. Develop guidelines for sealing existing arsenic-treated wood in playground equipment or establish a time line for removing existing arsenic-treated wood on playgrounds and testing the soil on school grounds for contamination caused by the leaching of arsenic-treated wood in other areas where children may be at particularly high risk of exposure.
- b. Establish guidelines to reduce students' exposure to diesel emissions that can occur as a result of unnecessary school bus idling, nose-to-tail parking, and inefficient route assignments.
- c. Study methods for mold and mildew prevention and mitigation and incorporate recommendations into the public school facilities guidelines as needed.
- d. Establish guidelines for Integrated Pest Management consistent with the policy of The North Carolina School Boards Association, Inc., as published in 2004. These guidelines may be updated as needed to reflect changes in technology.
- e. Establish guidelines for notification of students' parents, guardians, or custodians as well as school staff of pesticide use on school grounds.”

**SECTION 2.** G.S. 115C-47 is amended by adding four new subdivisions to read:

“(45) To Address the Use of Pesticides in Schools. – Local boards of education shall adopt policies that address the use of pesticides in schools. These policies shall:

- a. Require the principal or the principal's designee to annually notify the students' parents, guardians, or custodians as well as school staff of the schedule of pesticide use on school property and their right to request notification. Such notification shall be made, to the extent possible, at least 72 hours in advance of nonscheduled pesticide use on school property. The notification requirements

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- under this subdivision do not apply to the application of the following types of pesticide products: antimicrobial cleansers, disinfectants, self-contained baits and crack-and-crevice treatments, and any pesticide products classified by the United States Environmental Protection Agency as belonging to the U.S.E.P.A. Toxicity Class IV, Page 2 Session Law 2006-143 SL2006-0143 “relatively nontoxic” (no signal word required on the product’s label).
- b. Require the use of Integrated Pest Management. As used in this sub-subdivision, “Integrated Pest Management” or “IPM” means the comprehensive approach to pest management that combines biological, physical, chemical, and cultural tactics as well as effective, economic, environmentally sound, and socially acceptable methods to prevent and solve pest problems that emphasizes pest prevention and provides a decision-making process for determining if, when, and where pest suppression is needed and what control tactics and methods are appropriate.
- (46) To Address Arsenic-Treated Wood in the Classroom and on School Grounds. – Local boards of education shall prohibit the purchase or acceptance of chromated copper arsenate-treated wood for future use on school grounds. Local boards of education shall seal existing arsenic-treated wood in playground equipment or establish a time line for removing existing arsenic-treated wood on playgrounds, according to the guidelines established under G.S. 115C-12(33). Local boards of education are encouraged to test the soil on school grounds for contamination caused by the leaching of arsenic-treated wood.
- (47) To Address Mercury in the Classroom and on School Grounds. – Local boards of education are encouraged to remove and properly dispose of all bulk elemental mercury, chemical mercury, and bulk mercury compounds used as teaching aids in science classrooms, not including barometers. Local boards of education shall prohibit the future use of bulk elemental mercury, chemical mercury compounds, and bulk mercury compounds used as teaching aids in science classrooms, not including barometers.
- (48) To Address Exposure to Diesel Exhaust Fumes. – Local boards of education shall adopt policies and procedures to reduce students’ exposure to diesel emissions.”

**SECTION 3.** Nothing in this act shall be construed to create a private cause of action against the State Board of Education, a local board of education, or their agents or employees.

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**SECTION 4.** G.S. 115C-47(45)b., as enacted by Section 2 of this act, becomes effective October 1, 2011. The remainder of this act becomes effective October 1, 2006. In the General Assembly read three times and ratified this the 10th day of July, 2006.

s/ Beverly E. Perdue  
President of the Senate

s/ James B. Black  
Speaker of the House of Representatives

s/ Michael F. Easley  
Governor

Approved 7:39 p.m. this 19th day of July, 2006



# Asthma in School

## General Assembly of North Carolina Session 2005 Session Law 2005-22 House Bill 496

AN ACT REQUIRING LOCAL SCHOOL BOARDS TO ADOPT POLICIES PERMITTING STUDENTS WITH ASTHMA OR STUDENTS SUBJECT TO ANAPHYLACTIC REACTIONS, OR BOTH, TO POSSESS AND SELF-ADMINISTER ASTHMA MEDICATION, AND TO RECODIFY CERTAIN STATUTES TO CREATE A NEW ARTICLE 26A IN CHAPTER 115C OF THE GENERAL STATUTES.

The General Assembly of North Carolina enacts:

**SECTION 1.** Subchapter VI of Chapter 115C of the General Statutes is amended by adding the following new Article to read:

“Article 26A.

“Special Medical Needs of Students.

**“§ 115C-375.2. Possession and self-administration of asthma medication by students with asthma or students subject to anaphylactic reactions, or both.**

- (a) Local boards of education shall adopt a policy authorizing a student with asthma or a student subject to anaphylactic reactions, or both, to possess and self-administer asthma medication on school property during the school day, at school-sponsored activities, or while in transit to or from school or school-sponsored events. As used in this section, “asthma medication” means a medicine prescribed for the treatment of asthma or anaphylactic reactions and includes a prescribed asthma inhaler or epinephrine auto-injector. The policy shall include a requirement that the student’s parent or guardian provide to the school:
- (1) Written authorization from the student’s parent or guardian for the student to possess and self-administer asthma medication.
  - (2) A written statement from the student’s health care practitioner verifying that the student has asthma or an allergy that could result in an anaphylactic reaction, or both, and that the health care practitioner prescribed medication for use on school property during the school day, at school-sponsored activities, or while in transit to or from school or school-sponsored events.
  - (3) A written statement from the student’s health care practitioner who prescribed the asthma medication that the student understands, has been instructed in self-administration of the asthma medication, and has demonstrated the skill level necessary to use the asthma Page 2 Session Law 2005-22 House Bill 496

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- medication and any device that is necessary to administer the asthma medication.
- (4) A written treatment plan and written emergency protocol formulated by the health care practitioner who prescribed the medicine for managing the student's asthma or anaphylaxis episodes and for medication use by the student.
- (5) A statement provided by the school and signed by the student's parent or guardian acknowledging that the local school administrative unit and its employees and agents are not liable for an injury arising from a student's possession and self-administration of asthma medication.
- (6) Other requirements necessary to comply with State and federal laws.
- (b) The student must demonstrate to the school nurse, or the nurse's designee, the skill level necessary to use the asthma medication and any device that is necessary to administer the medication.
- (c) The student's parent or guardian shall provide to the school backup asthma medication that shall be kept at the student's school in a location to which the student has immediate access in the event of an asthma or anaphylaxis emergency.
- (d) Information provided to the school by the student's parent or guardian shall be kept on file at the student's school in a location easily accessible in the event of an asthma or anaphylaxis emergency.
- (e) If a student uses asthma medication prescribed for the student in a manner other than as prescribed, a school may impose on the student disciplinary action according to the school's disciplinary policy. A school may not impose disciplinary action that limits or restricts the student's immediate access to the asthma medication.
- (f) The requirement that permission granted for a student to possess and self-administer asthma medication shall be effective only for the same school and for 365 calendar days and must be renewed annually.
- (g) No local board of education, nor its members, employees, designees, agents, or volunteers, shall be liable in civil damages to any party for any act authorized by this subsection, or for any omission relating to that act, unless that act or omission amounts to gross negligence, wanton conduct, or intentional wrongdoing."

**SECTION 2.**(a) G.S. 115C-307(c) reads as rewritten:

~~"(c) To Provide Some Medical Care to Students. – It is within the scope of duty of teachers, including substitute teachers, teacher assistants, student teachers or any other public school employee when given such authority by the board of education or its designee, (i) to administer any drugs or medication prescribed by a doctor upon written request of the parents, (ii) to give emergency health care when reasonably apparent circumstances indicate that any delay would seriously worsen the physical condition or endanger the life of the pupil, and (iii) to perform any other first aid or life saving~~

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~~techniques in which the employee has been trained in a program approved by the State Board of Education: Provided, that no one shall be required to administer drugs or medication or attend life saving techniques programs.~~

~~Any public school employee, authorized by the board of education or its designee to act under (i), (ii), or (iii) above, shall not be liable in civil damages for any such House Bill 496 Session Law 2005-22 Page 3 authorized act or for any omission relating to such act unless such act or omission amounts to gross negligence, wanton conduct or intentional wrongdoing. Any person, serving in a voluntary position at the request of or with the permission or consent of the board of education or its designee, who has been given the authority by the board of education or its designee to act under (ii) above shall not be liable in civil damages for any such authorized act or for any omission relating to such act unless the act amounts to gross negligence, wanton conduct or intentional wrongdoing.~~

~~At the commencement of each school year, but prior to the beginning of classes, and thereafter as circumstances require, the principal of each school shall determine which persons will participate in the medical care program. designee to provide medical care to students as provided in G.S. 115C-375.1.~~

**SECTION 2.(b)** Article 26A, as created in Section 1 of this act, is amended by adding the following new section to read:

**“§ 115C-375.1. To provide some medical care to students.**

It is within the scope of duty of teachers, including substitute teachers, teacher assistants, student teachers, or any other public school employee when authorized by the board of education or its designee, (i) to administer any drugs or medication prescribed by a doctor upon written request of the parents, (ii) to give emergency health care when reasonably apparent circumstances indicate that any delay would seriously worsen the physical condition or endanger the life of the pupil, and (iii) to perform any other first aid or lifesaving techniques in which the employee has been trained in a program approved by the State Board of Education. No employee, however, shall be required to administer drugs or medication or attend lifesaving techniques programs.

Any public school employee, authorized by the board of education or its designee to act under (i), (ii), or (iii) above, shall not be liable in civil damages for any authorized act or for any omission relating to that act unless the act or omission amounts to gross negligence, wanton conduct, or intentional wrongdoing. Any person, serving in a voluntary position at the request of or with the permission or consent of the board of education or its designee, who has been given the authority by the board of education or its designee to act under (ii) above shall not be liable in civil damages for any authorized act or for any omission relating to the act unless the act amounts to gross negligence, wanton conduct, or intentional wrongdoing.

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At the commencement of each school year, but before the beginning of classes, and thereafter as circumstances require, the principal of each school shall determine which persons will participate in the medical care program.”

**SECTION 3.(a)** G.S. 115C-47(42) is recodified as G.S. 115C-375.3.

**SECTION 3.(b)** G.S. 115C-375.3, as established in subsection (a) of this section, reads as rewritten:

**“§ 115C-375.3. To Implement Guidelines to support and assist students with diabetes.**

Local boards of education shall ensure that the guidelines adopted by the State Board of Education under G.S. 115C- 12(31) are implemented in schools in which students with diabetes are enrolled. In particular, the boards shall require the implementation of the procedures set forth in those guidelines for the development and Page 4 Session Law 2005-22 House Bill 496 implementation of individual diabetes care plans. Local boards also shall make available necessary information and staff development to teachers and school personnel in order to appropriately support and assist students with diabetes in accordance with their individual diabetes care plans.”

**SECTION 4.(a)** G.S. 115C-47(44) is recodified as G.S. 115C-375.4.

**SECTION 4.(b)** G.S. 115C-375.4, as established in subsection (a) of this section, reads as rewritten:

**“§ 115C-375.4. To Ensure that Schools Provide Information Concerning Meningococcal Meningitis and Influenza and Their Vaccines.**

Local boards of education shall ensure that schools provide parents and guardians with information about meningococcal meningitis and influenza and their vaccines at the beginning of every school year. This information shall include the causes, symptoms, and how meningococcal meningitis and influenza are spread and the places where parents and guardians may obtain additional information and vaccinations for their children.”

**SECTION 5.** G.S. 115C-288(e) reads as rewritten:

“(e)To Discipline Students and to Assign Duties to Teachers with Regard to the Discipline, General Well-being, and Medical Care of Students. – The principal shall have authority to exercise discipline over the pupils of the school pursuant to under policies adopted by the local board of education as prescribed by G.S. 115C-391(a). The principal shall use reasonable force to discipline students and shall assign duties to teachers with regard to the general well-being and the medical care of students pursuant to the provisions of G.S. 115C-307 and 115C-390. The principal also under G.S. 115C-390 and may suspend or dismiss pupils pursuant to the

provisions of under G.S. 115C-391. The principal shall assign duties to teachers with regard to the general well-being and the medical care of students under G.S. 115C-307 and Article 26A of this Chapter.”

**SECTION 6.** The Department of Health and Human Services, Department of Public Instruction, or other appropriate State agencies shall apply for any federal grants for which the entity is eligible under 42 U.S.C. § 280g or other federal statutes or regulations related to treating, preventing, or training on children’s asthma.

**SECTION 7.** This act is effective when it becomes law. G.S. 115C-375.2, as established in Section 1 of this act, applies beginning with the 2005-2006 school year.

In the General Assembly read three times and ratified this the 25th day of April, 2005.

s/ Marc Basnight  
President Pro Tempore of the Senate

s/ James B. Black  
Speaker of the House of Representatives

s/ Michael F. Easley  
Governor

Approved 7:42 p.m. this 28th day of April, 2005



# Asthma in School

## Article 25A. Special Medical Needs of Students.

### § 115C-375.1. To provide some medical care to students.

It is within the scope of duty of teachers, including substitute teachers, teacher assistants, student teachers, or any other public school employee when authorized by the board of education or its designee, (i) to administer any drugs or medication prescribed by a doctor upon written request of the parents, (ii) to give emergency health care when reasonably apparent circumstances indicate that any delay would seriously worsen the physical condition or endanger the life of the pupil, and (iii) to perform any other first aid or lifesaving techniques in which the employee has been trained in a program approved by the State Board of Education. No employee, however, shall be required to administer drugs or medication or attend lifesaving techniques programs.

Any public school employee, authorized by the board of education or its designee to act under (i), (ii), or (iii) above, shall not be liable in civil damages for any authorized act or for any omission relating to that act unless the act or omission amounts to gross negligence, wanton conduct, or intentional wrongdoing. Any person, serving in a voluntary position at the request of or with the permission or consent of the board of education or its designee, who has been given the authority by the board of education or its designee to act under (ii) above shall not be liable in civil damages for any authorized act or for any omission relating to the act unless the act amounts to gross negligence, wanton conduct, or intentional wrongdoing.

At the commencement of each school year, but before the beginning of classes, and thereafter as circumstances require, the principal of each school shall determine which persons will participate in the medical care program. (2005-22, s. 2(b); 2006-264, ss. 57(a), (c).)

### § 115C-375.2. Possession and self-administration of asthma medication by students with asthma or students subject to anaphylactic reactions, or both.

- (a) Local boards of education shall adopt a policy authorizing a student with asthma or a student subject to anaphylactic reactions, or both, to possess and self-administer asthma medication on school property during the school day, at school-sponsored activities, or while in transit to or from school or school-sponsored events. As used in this section, “asthma medication” means a medicine prescribed for the treatment of asthma or anaphylactic reactions and includes a prescribed asthma inhaler or epinephrine auto-injector. The policy shall include a requirement that the student’s parent or guardian provide to the school:

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- (1) Written authorization from the student's parent or guardian for the student to possess and self-administer asthma medication.
  - (2) A written statement from the student's health care practitioner verifying that the student has asthma or an allergy that could result in an anaphylactic reaction, or both, and that the health care practitioner prescribed medication for use on school property during the school day, at school-sponsored activities, or while in transit to or from school or school-sponsored events.
  - (3) A written statement from the student's health care practitioner who prescribed the asthma medication that the student understands, has been instructed in self-administration of the asthma medication, and has demonstrated the skill level necessary to use the asthma medication and any device that is necessary to administer the asthma medication.
  - (4) A written treatment plan and written emergency protocol formulated by the health care practitioner who prescribed the medicine for managing the student's asthma or anaphylaxis episodes and for medication use by the student.
  - (5) A statement provided by the school and signed by the student's parent or guardian acknowledging that the local school administrative unit and its NC General Statutes - Chapter 115C Article 25A 2 employees and agents are not liable for an injury arising from a student's possession and self-administration of asthma medication.
  - (6) Other requirements necessary to comply with State and federal laws.
- (b) The student must demonstrate to the school nurse, or the nurse's designee, the skill level necessary to use the asthma medication and any device that is necessary to administer the medication.
  - (c) The student's parent or guardian shall provide to the school backup asthma medication that shall be kept at the student's school in a location to which the student has immediate access in the event of an asthma or anaphylaxis emergency.
  - (d) Information provided to the school by the student's parent or guardian shall be kept on file at the student's school in a location easily accessible in the event of an asthma or anaphylaxis emergency.
  - (e) If a student uses asthma medication prescribed for the student in a manner other than as prescribed, a school may impose on the student disciplinary action according to the school's disciplinary policy. A school may not impose disciplinary action that limits or restricts the student's immediate access to the asthma medication.
  - (f) The requirement that permission granted for a student to possess and self-administer asthma medication shall be effective only for the same school and for 365 calendar days and must be renewed annually.
  - (g) No local board of education, nor its members, employees, designees, agents, or volunteers, shall be liable in civil damages to any party for any act authorized by this section, or for any omission relating to that act, unless that act or omission amounts

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to gross negligence, wanton conduct, or intentional wrongdoing. (2005-22, s. 1; 2006-264, s. 57(b).)

**§ 115C-375.3. Guidelines to support and assist students with diabetes.**

Local boards of education and boards of directors of charter schools shall ensure that the guidelines adopted by the State Board of Education under G.S. 115C-12(31) are implemented in schools in which students with diabetes are enrolled. In particular, the boards shall require the implementation of the procedures set forth in those guidelines for the development and implementation of individual diabetes care plans. The boards also shall make available necessary information and staff development to teachers and school personnel in order to appropriately support and assist students with diabetes in accordance with their individual diabetes care plans. Local boards of education and boards of directors of charter schools shall report to the State Board of Education annually, on or before August 15, whether they have students with diabetes enrolled and provide information showing compliance with the guidelines adopted by the State Board of Education under G.S. 115C-12(31). These reports shall be in compliance with the federal Family Educational Rights and Privacy Act, 20 U.S.C. § 1232g. (2005-22, s. 3(a), (b); 2009-563, s. 1.)

**§ 115C-375.4. Meningococcal Meningitis and Influenza and Their Vaccines.**

Local boards of education shall ensure that schools provide parents and guardians with information about meningococcal meningitis and influenza and their vaccines at the beginning of every school year. This information shall include the causes, symptoms, and how meningococcal meningitis and influenza are spread and the places where parents and guardians may obtain additional information and vaccinations for their children. (2005-22, s. 4(a), (b).)

**§ 115C-375.5. Education for pregnant and parenting students.**

- (a) Pregnant and parenting students shall receive the same educational instruction or its equivalent as other students. A local school administrative unit may provide programs to meet the special scheduling and curriculum needs of pregnant and parenting students. However, NC General Statutes - Chapter 115C Article 25A 3 student participation in these programs shall be voluntary, and the instruction and curriculum must be comparable to that provided other students.
- (b) Local boards of education shall adopt a policy to ensure that pregnant and parenting students are not discriminated against or excluded from school or any program, class, or extracurricular activity because they are pregnant or parenting students and to provide assistance and support to encourage pregnant and parenting students to remain enrolled in school and graduate. The policy shall include, at a minimum, all of the following:
  - (1) Local school administrative units shall use, as needed, supplemental funds from the At-Risk Student Services allotment to support programs for pregnant and parenting students.

- (2) Notwithstanding Part 1 of Article 26 of this Chapter, pregnant and parenting students shall be given excused absences from school for pregnancy and related conditions for the length of time the student’s physician finds medically necessary. This includes absences due to the illness or medical appointment during school hours of a child of whom the student is the custodial parent.
- (3) Homework and make-up work shall be made available to pregnant and parenting students to ensure that they have the opportunity to keep current with assignments and avoid losing course credit because of their absence from school and, to the extent necessary, a homebound teacher shall be assigned. (2006-69, s. 4(a); 2009-330, s. 3.)

§ 115C-376: Reserved for future codification purposes.

§ 115C-377: Reserved for future codification purposes.

# Asthma in School

## General Assembly of North Carolina Session 2007 Session Law 2007-193 House Bill 24

AN ACT TO PROTECT THE PUBLIC FROM THE HEALTH RISKS OF SECONDHAND SMOKE BY PROHIBITING SMOKING IN BUILDINGS OWNED, LEASED, OR OCCUPIED BY STATE GOVERNMENT; AND TO AUTHORIZE LOCAL GOVERNMENTS TO REGULATE SMOKING IN BUILDINGS AND TRANSPORTATION VEHICLES OWNED, LEASED, OR OCCUPIED BY LOCAL GOVERNMENT AS RECOMMENDED BY THE JUSTUS-WARREN HEART DISEASE AND STROKE PREVENTION TASK FORCE.

Whereas, secondhand smoke has been proven to cause cancer, heart disease, and asthma in both smokers and nonsmokers; and

Whereas, the 2006 Surgeon General's Report on the health consequences of involuntary exposure to tobacco smoke states that the scientific evidence indicates that there is no risk-free level of exposure to secondhand smoke; and

Whereas, the 2006 Surgeon General's Report documents that separating smokers from nonsmokers, cleaning the air, and ventilating smoke cannot eliminate exposure to secondhand smoke; and

Whereas, the Centers for Disease Control and Prevention (CDC) advises that all individuals with coronary heart disease or known risk factors for coronary heart disease should avoid all indoor environments that permit smoking; and

Whereas, exposure to secondhand smoke is costly, costing the nation \$10 billion per year, \$5 billion in direct medical care costs, and \$5 billion in indirect costs according to the 2005 Society of Actuaries; and

Whereas, the vast majority of North Carolinians (77.4% of adults) do not smoke; and

Whereas, the 2006 Surgeon General's Report documents that eliminating indoor smoking fully protects nonsmokers from exposure to secondhand smoke; and

Whereas, North Carolina's General Assembly buildings are smoke-free; Now, therefore,

The General Assembly of North Carolina enacts:

**SECTION 1.** Effective January 1, 2008, Chapter 130A of the General Statutes is amended by adding the following new Article to read:

"Article 23.

"Smoking in Public Places.

"Part 1. Smoking in State Government Buildings.

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**“§ 130A-491. Legislative intent.**

It is the intent of the General Assembly to protect the health of individuals working in or visiting State government buildings from the risks related to secondhand smoke.

**“§ 130A-492. Definitions.**

The following definitions apply in this Article:

- (1) “Smoking”. – The use or possession of a lighted cigarette, lighted cigar, lighted pipe, or any other lighted tobacco product. Page 2 Session Law 2007-193 SL2007-0193
- (2) “State government”. – The political unit for the State of North Carolina, including all agencies of the executive, judicial, and legislative branches of government.
- (3) “State government building”. – A building owned, leased as lessor, or the area leased as lessee and occupied by State government.

**“§ 130A-493. Smoking in State government buildings prohibited.**

- (a) Notwithstanding Article 64 of Chapter 143 of the General Statutes pertaining to State-controlled buildings, smoking is prohibited inside State government buildings as provided in this section. As to smoking rooms in residence halls that were permitted by G.S. 143-597(a)(6), this Article becomes effective beginning with the 2008-2009 academic year.
- (b) Smoking is permitted inside State government buildings that are used for medical or scientific research to the extent that smoking is an integral part of the research. Smoking permitted under this subsection shall be confined to the area where the research is being conducted.
- (c) The individual in charge of the State government building or the individual’s designee shall post signs in conspicuous areas of the building. The signs shall state that “smoking is prohibited” and may include the international “No Smoking” symbol, which consists of a pictorial representation of a burning cigarette enclosed in a red circle with a red bar across it.
- (d) Notwithstanding G.S. 130A-25, a violation of Article 23 of this Chapter shall not be punishable as a criminal violation.

**“§ 130A-493.1. Other prohibitions.**

Nothing in this Article repeals any other law prohibiting smoking, nor does it limit any law allowing regulation or prohibition of smoking on the grounds of buildings.

**“§ 130A-494. Rules.**

The Commission shall adopt rules to implement this Part.”

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**SECTION 2.** Effective January 1, 2008, Article 23 of Chapter 130A of the General Statutes, as enacted in Section 1 of this act, is amended by adding the following new Part to read:

“Part 2. Local Government Regulation of Smoking.

**“§ 130A-498. Local governments may restrict smoking in public places.**

- (a) Notwithstanding any other provision of Article 64 of Chapter 143 of the General Statutes to the contrary, a local government may adopt an ordinance, law, or rule restricting smoking in accordance with subsection (b) of this section.
- (b) Any local ordinance, law, or rule authorized under this section may restrict smoking only in:
- (1) Buildings owned, leased as lessor, or the area leased as lessee and occupied by local government;
  - (2) Building and grounds wherein local health departments and departments of social services are housed;
  - (3) Public schools, school facilities, on school campuses, at school-related or school-sponsored events, in or on other school property, public school buses, or at day care centers. Such restrictions may be imposed by local school boards having ownership or jurisdiction over the building, campus, event, property, or vehicle; and
  - (4) Any place on a public transportation vehicle owned or leased by local government and used by the public.
- (c) As used in this Part, ‘local government’ means any local political subdivision of this State, any airport authority, or any authority or body created by any ordinance or rules of any such entity.
- (d) As used in this Part, ‘grounds’ means the area located within 50 linear feet of a building wherein a local health department or a local department of social services is housed.
- (e) A county ordinance adopted under this section is subject to the provisions of G.S. 153A-122.”

**SECTION 3.** Effective January 1, 2008, G.S. 143-601 reads as rewritten:

**“§ 143-601. Applicability of Article; local government may enact.**

- (a) This Article shall not supersede nor prohibit the enactment or enforcement of any otherwise valid local law, rule, or ordinance enacted prior to October 15, 1993, regulating the use of tobacco products. However, no local law, rule, or ordinance enacted and placed in operation prior to October 15, 1993, shall be amended to impose a more stringent standard than in effect on the date of ratification of this Article.
- (b) Any local ordinance, law, or rule that regulates smoking adopted on or after October 15, 1993, shall not contain restrictions regulating smoking which exceed those

established in this Article. Any such local ordinance, law, or rule may restrict smoking in accordance with this subsection and pursuant to G.S. 143-597 only in the following facilities that are not owned, leased, or occupied by local government: ~~pursuant to G.S. 143-597:~~

- (1) ~~Buildings owned, leased or occupied by local government.~~
- (2) A public meeting.
- (3) The indoor space in an auditorium, arena, or coliseum, or an appurtenant building thereof.
- (4) A library or museum open to the public.
- (5) ~~Any place on a public transportation vehicle owned or leased by local government and used by the public.~~

If any of the facilities listed in this subsection are owned, leased as lessor, or the area leased as lessee and occupied by local government, then the local ordinance, law, or rule restricting smoking shall be governed by Article 23 of Chapter 130A of the General Statutes.”

**SECTION 3.1.** If Senate Bill 1086, 2007 Regular Session, becomes law, G.S. 130A-498(b) (3), as enacted by Section 2 of this act, is repealed effective August 1, 2008.

**SECTION 3.2.** If Senate Bill 862, 2007 Regular Session, becomes law, G.S. 130A-493.1 as enacted by this act reads as rewritten:

**“§ 130A-493.1. Other prohibitions.**

Nothing in this Article repeals any other law prohibiting smoking, nor does it limit any law allowing regulation or prohibition of smoking on walkways or on the grounds of buildings.”

**SECTION 4.** This act is effective when it becomes law.

In the General Assembly read three times and ratified this the 29th day of June, 2007.

s/ Marc Basnight  
President Pro Tempore of the Senate

s/ Joe Hackney  
Speaker of the House of Representatives

s/ Michael F. Easley  
Governor

Approved 12:13 p.m. this 8th day of July, 2007

# Asthma in School

## Module 5 Narrative

### The NC Laws Impacting Students with Asthma.

#### The Carry Law

Significant laws and policies in North Carolina have a direct impact on students with asthma. Perhaps the most significant of these is State Law GS115C-375.2 enacted in 2005, allowing students with asthma to carry their medication with them during the school day. The law requires that the medicine be prescribed by the student's primary care provider and be approved by his/her parents.

Asthma is the leading chronic disease among children and youth in the United States. ([www.cdc.gov/asthma/schools.html](http://www.cdc.gov/asthma/schools.html)). The rescue/quick relief medications are used to stop an asthma episode quickly, before it gets into the (red) danger zone. Prior to this law being enacted, a student's rescue/quick relief medication was kept in a locked cabinet in the school's front office or the nurse's office. A quick response to the beginning of an asthma episode at school was dependent on how close the student was to where the medications were stored and whether the person with a key to the cabinet was easily available. A delay in delivering medication can be life-threatening.

#### Part of the Law

**115C-375** is part of the legislation describe above. It states very simply that anyone in the school, that has been designated

by the school board, may administer medicine or emergency care. Again, the medication must be prescribed by the primary care provider and approved by the parents.

#### Why is this law important?

School nurses in North Carolina often have responsibility for two or more schools in their districts. Because they are not on site at schools full time, there is a need for other school staff to be trained to administer medications and respond to emergencies.

#### The School Environment

##### Session Law 2006-143 HB 1502

addresses some of the environmental problems found in schools and on school grounds. Issues addressed in the law are focused on pests, the products used to control them and school bus idling. These are known triggers for asthma and unhealthy for all students.

#### Health Reporting Requirements in North Carolina Schools.

In the grades above kindergarten, students are not required to have a health assessment when entering North Carolina schools. Because no health issues need to be reported by new students in grades 1 through 12, school nurses and staff may find out about a student's asthma only when he/she has an asthma episode at school.

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## Module 5 Narrative, p. 2

### Health Education.

Statute GS115C-8 (2003) governs Health Education in schools and requires schools to provide all students with Asthma Awareness Education. Currently, Asthma Awareness is offered as part of Health Education in grades 4, 6 and 8.

### A Great Model

In Charlotte-Mecklenburg Schools, as part of their Coordinated School Health Program, all schools are required to have a School Health Team that addresses the health issues of the school. In addition to the nurse, this program brings other school professionals to the table, so health becomes a whole school concern.

The Coordinated School Health Program has eight components, represented on the teams by the professionals who work in those areas. A good example is Physical Education which could be represented by a coach or a PE teacher. The model ensures a staff informed on all the health needs of students and any staff member with asthma.

Information on the Coordinated School Health Program is Available through the Centers for Disease Control and Prevention website listed below.

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### SOURCES:

Centers for Disease Control and Prevention Coordinated School Health Program  
[www.cdc.gov/healthyyouth/cshp](http://www.cdc.gov/healthyyouth/cshp)

Charlotte-Mecklenburg Schools, North Carolina  
[www.cms.k12.nc.us/Pages/default](http://www.cms.k12.nc.us/Pages/default)

### Smoke-Free Policies in Schools

The federal government first stated, in legislation introduced in the 1990s, that all schools should be tobacco-free. The legislation stipulated that school districts in all states would risk the federal funds they were receiving if they did not comply. The possibility of losing federal funding was a powerful incentive and eventually led to schools implementing smoke-free policies. By 2008 all schools in North Carolina were tobacco-free. For students and school staff with asthma, the law was an important achievement. Policies have grown since that time to include all school grounds and school sponsored events on or off campus.

Meanwhile, legislation has been enacted to keep all public places (government buildings, libraries, etc) smoke-free and additions to the 2010 N.C. law now prohibit smoking in bars and restaurants.

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## Module 5 Narrative, p. 3

### Strategies Used in School to Support Students With Asthma.

#### Staff Training

Training school staff about asthma is an effective way to gain staff support for students with asthma. However, training should include not just faculty, but custodians, bus drivers, administrative staff, and anyone else who has contact with students. It is vital that these people know what to do in the event of an asthma episode. Addressing asthma in students is important for several reasons:

- Nationwide, students miss 13 million school days each year due to asthma. Inevitably, absenteeism has an impact on the academic performance of these students.
- Asthma may limit a student’s ability to learn or get proper rest in order to be school-ready.
- Asthma that goes untreated can be fatal.

Staff also need to know what the Asthma Action Plans are and where they are located, in the school, who in the school is trained to handle health emergencies when the nurse is not available, and when to call 911. Even the basics, like not leaving student alone during an asthma episode, or sending him/her off alone, should be covered in the training.

Finally, common asthma triggers should be identified and discussed. Staff can talk about what they can do to keep their classrooms, offices, and other school areas trigger free.

The American Lung Association’s *Asthma Friendly Schools Initiative* offers help and recommended resources for planning a training for school staff. This program suggests using evidence-based materials with proven assessment tools included to assist you in effectively evaluating your training.

#### LESSONS LEARNED!

*“Educating school staff was a very successful strategy for AFSI pilot sites—particularly when efforts included all school staff, especially office staff.”*

*American Lung Association Asthma Friendly Schools Initiative*

#### Healthy Environment Education

##### Indoor Air

Educating school personnel should be an ongoing effort by individual schools or school districts, to ensure that a healthy environment is maintained for all students and staff.

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## Module 5 Narrative, p. 4

Schools can establish a district-wide Indoor Air Quality Management Program. If the district is not receptive to this approach, a single school can take the initiative to adopt the program. Tools for Schools is a program developed by the Environmental Protection Agency. The program offers tools necessary for schools to develop practices that initiate and sustain good indoor air quality. Both students and staff with asthma will benefit. Others in the school will benefit as well. One does not have to have a serious respiratory disease to be negatively affected by strong fumes, excessive mold, or indoor air contain excessive dust and other particulate matter. For more information go to the EPA website listed below.

### SOURCES:

American Lung Association's Asthma Friendly Schools Initiative  
[www.lungusa.org/lung-disease/in-schools/asthma-friendly-school](http://www.lungusa.org/lung-disease/in-schools/asthma-friendly-school)

Environmental Protection Agency Tools for Schools.  
[www.epa.gov/iaq/schools](http://www.epa.gov/iaq/schools)

### Outdoor Air

Healthy outdoor air is just as important as indoor air to students with asthma. In fact, healthy air is important to everyone.

In North Carolina, air quality reports are now available daily on television weather reports, radio, and on-line. Some counties in North Carolina fly colored flags on the flagpoles outside their buildings to report air quality daily. The flags are colored

from **green** (a good day to be outside) to **purple** (the outside air is hazardous to everyone). In between are **yellow** for days when people with compromised respiratory systems should be aware of potential problems, **orange** for moderate pollutions when people with asthma and other breathing issues should limit their time outside, and **red**, which is unsafe, especially for people with asthma and respiratory problems. This is information teachers, coaches and physical education teachers need to know.

### Communicating with Parents

When a student comes to school with asthma, it is necessary to have direct contact with the parents. These students need Asthma Action Plans from their primary care providers, parent permission to carry their medications with them, and parent permission to allow someone else in the school to administer medicine if necessary.

Ideally, nurses and teachers would have regular contact with all parents. Unfortunately, bringing parents into school for any reason is one of the greatest challenges school staff face.

Some of the nurses trained in our pilot shared strategies for connecting with parents. They suggested linking to a family night, open house or other event that parents will attend. The nurse sets up a table and chairs near the event and

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## Module 5 Narrative, p. 5

an announcement is made that he/she is available to meet with parents.

Another suggestion is to let the parents know that their student's participation in sports or other physical activities will be limited until the school has an Asthma Action Plan and an inhaler at school. In elementary school, staff has used that approach by requiring the Asthma Action Plan and medication before a planned field trip or special event in order for the child to participate.

Keeping students from participating in activities they enjoy, is good incentive for them to urge their parents to provide the school with the necessary documentation and medication. These are not idle concerns, as a student with asthma without his/her medication may run into trouble during physical activity. The same can be said for the child who will be traveling away from school and, possibly, even the community he/she lives in without the proper safety measures in place.

### Unique Responsibilities of School Staff to Students with Asthma

#### Teachers

Usually, teachers are on the front lines when it comes to student safety. They should have copies of students asthma action plans and know where the rescue/quick relief medication is kept for the student that doesn't carry. Teachers can,

to a degree, manage indoor air pollution in their classrooms by keeping windows closed and air conditioners on during poor air quality days and when mowing or other dust producing activities are going on outside. They should also keep their classrooms as trigger-free as possible. A teacher's role may include helping a student to feel comfortable enough to share concerns and feelings about his/her asthma. They can also be helpful in ensuring that students stay caught up with their work if they miss school.

#### Other School Professionals (social workers, psychologists, counselors and office staff).

It is important that these professionals know what to do in the event of an asthma episode. This group too, should be able to identify potential asthma triggers and keep offices and rooms trigger-free. School social workers may be helpful in connecting with families of students with asthma and helping them understand how they can help the student. Psychologists may be able to help the student accept his/her disease and the responsibility of taking care of him/herself in order to keep the asthma under control.

#### Coaches and Physical Education Teachers

Outdoor Air Quality should be of concern to anyone working with students outdoors. These professionals should also know which students have exercised-induced

CONTINUED

## Module 5 Narrative, p. 6

asthma to ensure that they use their rescue/quick relief medicine before physical activity. It may be necessary for coaches and/or physical education teachers to meet with parents to determine any activity limitations for the students with asthma.

To assist coaches in understanding asthma, there is a program being implemented in a number of counties in North Carolina entitled *The Coaches Clipboard Program*. The clipboards provide information on signs and symptoms of asthma and what to do when a student has an asthma episode. The clipboards are often purchased by a community organization, health coalition or business and presented to the coaches along with video training about asthma.

### Bus Drivers

Bus Drivers are alone with students during the ride to and from school. They must know what to do in a medical emergency like an asthma episode. Bus Drivers should be trained at the beginning of the school year. Other non-certified school staff need this training as well.

### Custodians

These are important workers in the efforts toward a healthy indoor environment. Often, they are the first in the school to notice potential problems. It is their job to remove or report them, as required, to the school administration.

Custodians should also have an understanding of the dangers of the chemicals and odors in some cleaning products to people with asthma.

### School Nurses

School nurses are responsible for the training of all school personnel. They are the leaders in the schools' efforts to keep students with asthma safe and healthy in school. Nurses ensure the presence of asthma action plans for all students with asthma.

### School Administrators

It is vital that the administrators of the school support the efforts to keep the school safe and healthy. Their support is an endorsement of these efforts.

---

#### SOURCES:

American Academy of Allergy, Asthma and Immunology: School Tools  
[www.aaaai.org/professionals/schools\\_tools.stm](http://www.aaaai.org/professionals/schools_tools.stm)  
 Managing Asthma At School

Healthy Vermonters, 2010  
 Norma Wasko, PhD, Asthma Program Coordinator  
 Vermont Department of Health  
[nwasko@vdh.state.vt.us](mailto:nwasko@vdh.state.vt.us)



# Asthma in School

## Post-Module Assessment

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. In order to carry his/her medicine in school, must a student have the medicine prescribed by the primary care provider and the approval of his/her parents?		
2. Is it against the law for anyone except the school nurse to administer medication?		
3. North Carolina students required to take health education classes in asthma awareness?		
4. Is smoking allowed on school campuses in Western North Carolina?		
5. Do you agree that school staff can help support students with asthma by knowing what to do if a student has an asthma episode?		
6. Is the custodian the only staff member in the school who needs to be concerned about a healthy school environment?		
7. Should students with asthma have an asthma action plan at school?		
8. Should PE teachers be concerned about outdoor air quality?		



# Asthma in School

## Post-Module Assessment Answer Sheet

**Instructions:** Answer “Yes” or “No” to the questions by putting an “X” in the appropriate box to the right of each question.

QUESTION	YES	NO
1. <b>Yes.</b> It is a requirement of state law.	X	
2. <b>No.</b> There is a NC law that allows people in the school, with approval from the school board, may administer medication.		X
3. <b>Yes.</b> All North Carolina students are required to take asthma awareness education in grades 4, 6, and 8.	X	
4. <b>No.</b> No smoking is allowed on any K-12 school campus in North Carolina.		X
5. <b>Yes.</b> Asthma episodes can come on suddenly and staff need to know how to respond.	X	
6. <b>No.</b> The entire school staff be involved in keeping the school environment healthy for all students.		X
7. <b>Yes.</b> Asthma Action Plans are vital to the well-being of students with asthma when they are in school. The plans contain instructions and information from the student’s primary care provider.	X	
8. <b>Yes.</b> Any school staff working with students outdoors should be tracking air quality	X	





## Curriculum Appendices

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**North Carolina Department of Health and Human Services**  
**Division of Public Health**  
**Chronic Disease and Injury Section**  
1915 Mail Service Center • Raleigh, North Carolina 27699-1915  
Phone (919) 707-5213 Fax (919) 870-4801

Beverly Eaves Perdue, Governor

Lanier M Cansler, Secretary

To: Asthma Curriculum Users

From: The North Carolina Asthma Program

Subject: Pre and Post Assessments for Entire Curriculum

The Asthma Education Curriculum for Elementary-Middle School Professional was developed as a tool for training school professionals about asthma. The curriculum is provided in module format to allow for teaching individual modules in separate sessions or the entire curriculum in one setting. To better accommodate both of these formats, the North Carolina Asthma Program, along with the Asthma Alliance of North Carolina (AANC) Education Committee, developed one pre and one post assessment covering the entire curriculum. When teaching the entire curriculum in one setting, pre and post assessments for the individual modules may be replaced with the following assessments. If you have questions, or if you require clarification, please call the North Carolina Asthma Program at 919-707-5213 or write to us at:

The Asthma Program  
Chronic Disease and Injury Section  
North Carolina Department of Health and Human Services  
Division of Public Health  
1915 Mail Service Center • Raleigh, North Carolina 27699-1915



**North Carolina Public Health**  
Working for a healthier and safer North Carolina  
Everywhere. Everyday. Everybody.



Location: 5505 Six Forks Rd. • Raleigh, N.C. 27609-3811  
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## Entire Curriculum Pre-Assessment

QUESTION	AGREE	DISAGREE
1. Do you agree that students with asthma can be as active as their friends?		
2. Is it true that asthma can never be controlled?		
3. Are some basic symptoms of asthma coughing, wheezing, shortness of breath, and chest tightness?		
4. Is it important to know the early warning signs of asthma trouble, such as mood changes (irritability or grouchiness), being tired, scratchy throat, runny or stuffy nose, sneezing, etc.?		
5. Do you agree that dust mites, exercise, cats, dogs, cigarette smoke, etc. can be triggers for asthma?		
6. Is it true that students do not need to know what triggers their asthma?		
7. Can asthma symptoms come on suddenly or progress over a period of time?		
8. Should all school professionals know the location of the student's asthma action plan at the school?		
9. Are quick relief or rescue medicines used when a student is having asthma trouble?		
10. Is the custodian responsible for the healthy indoor environment of the school?		





## Entire Curriculum Post-Assessment

QUESTION	AGREE	DISAGREE
1. Do you agree that students with asthma can be as active as their friends?		
2. Is it true that asthma can never be controlled?		
3. Are some basic symptoms of asthma coughing, wheezing, shortness of breath, and chest tightness?		
4. Is it important to know the early warning signs of asthma trouble, such as mood changes (irritability or grouchiness), being tired, scratchy throat, runny or stuffy nose, sneezing, etc.?		
5. Do you agree that dust mites, exercise, cats, dogs, cigarette smoke, etc. can be triggers for asthma?		
6. Is it true that students do not need to know what triggers their asthma?		
7. Can asthma symptoms come on suddenly or progress over a period of time?		
8. Should all school professionals know the location of the student's asthma action plan at the school?		
9. Are quick relief or rescue medicines used when a student is having asthma trouble?		
10. Is the custodian responsible for the healthy indoor environment of the school?		





## Entire Curriculum Pre- and Post- Assessment Answer Key

QUESTION	AGREE	DISAGREE
1. <b>Yes.</b> Students with asthma can be as active as their friends with the approval of their primary care providers and as long as it is consistent with their asthma action plans.	<b>X</b>	
2. <b>No.</b> Asthma can be controlled. Students can control their asthma by seeing their primary care providers often, using their medications as prescribed and avoiding their triggers.		<b>X</b>
3. <b>Yes.</b> These are signs of an asthma episode and can be treated promptly with the student's rescue/quick relief medicine.	<b>X</b>	
4. <b>Yes.</b> The more quickly the symptoms of an asthma episode are recognized the more quickly they can be treated.	<b>X</b>	
5. <b>Yes.</b> Not all students have the same triggers, but those listed here are common ones.	<b>X</b>	
6. <b>No.</b> It is very important that students know their triggers in order to avoid them.		<b>X</b>
7. <b>Yes.</b> It is one reason why the law allowing students to carry their medications with them is so important. If an asthma episode does come on suddenly, the student is prepared.	<b>X</b>	
8. It is important for school professionals to have access to the student's asthma action plan if they need it. The plan has instructions from the primary care provider on how to handle an episode as well as instructions for using the prescribed medication.	<b>X</b>	
9. <b>Yes.</b> Usually, this medication provides the relief he or she needs and stops the progression of the episode.	<b>X</b>	
10. <b>No.</b> Everyone in school is responsible for a healthy school environment.		<b>X</b>



# Asthma Education Curriculum for School Nurses and other Elementary-Middle School Professionals



The North Carolina Asthma Program is working to reduce the burden of asthma across the state by providing asthma education to Elementary-Middle School Professionals. Asthma is a chronic disease that affects many North Carolina children and adults.

We invite you to join other school professionals in this region in receiving training in using the new North Carolina Asthma Education Curriculum for School Nurses and Other Elementary-Middle School Professionals.

**Training:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Time:** \_\_\_\_\_

**Location:** \_\_\_\_\_

## 2009 NC Asthma Prevalence (includes pop. estimates)

- **<18 years old:**  
 lifetime asthma – **15.5%** (estimated pop. 343,518)  
 current asthma – **10.1%** (estimated pop. 223,841)
- **18+ years old:**  
 lifetime asthma – **12.9%** (estimated pop. 924,460)  
 current asthma – **7.8%** (estimated pop. 558,976)

## NC Hospitalizations Due to Asthma

	2008	2009
■ <b>&lt; 5 years old:</b> 251.7/100,000 pop.		270/100,000 pop.
■ <b>5-14 yrs old:</b> 100.3/100,000 pop.		125/100,000 pop.
■ <b>15-34 yrs old:</b> 39.4/100,000 pop.		43/100,000 pop.

For more information about this asthma training and the educational sessions, please contact: \_\_\_\_\_

\_\_\_\_\_





## Participant Evaluation

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Telephone: (      ) \_\_\_\_\_ Email: \_\_\_\_\_

Agency or Affiliation: \_\_\_\_\_

**Please place a check mark for your response to each of the following five statements.**

	Strongly Agree	Agree	Disagree	Strongly Disagree	Undecided
The instructor was knowledgeable and prepared.					
The curriculum was clear and easy for me to understand.					
The handouts were helpful.					
After this training, I feel more comfortable working with children with asthma.					

How will you use the information that you learned in this training?

---



---



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How could this training or the curriculum be improved?

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---

**Thank You!**





# *Certificate of Participation*

*This is to certify that*

---

*has successfully completed the  
NC Asthma Program Curriculum Training.*

---

Signature

---

Date



# Asthma Action Plan

Name: \_\_\_\_\_ DOB: \_\_\_\_\_

Doctor: \_\_\_\_\_ Date: \_\_\_\_\_

Phone for Doctor or Clinic: \_\_\_\_\_

Predicted/Personal Best Peak Flow Reading: \_\_\_\_\_

### Asthma Triggers

*Try to stay away from or control these things:*

- |  |   |
|--|---|
| <input type="checkbox"/> Exercise        | <input type="checkbox"/> Smoke, strong odors or spray |
| <input type="checkbox"/> Mold            | <input type="checkbox"/> Colds/Respiratory infections |
| <input type="checkbox"/> Chalk dust/dust | <input type="checkbox"/> Carpet                       |
| <input type="checkbox"/> Pollen          | <input type="checkbox"/> Change in temperature        |
| <input type="checkbox"/> Animals         | <input type="checkbox"/> Dust mites                   |
| <input type="checkbox"/> Tobacco smoke   | <input type="checkbox"/> Cockroaches                  |
| <input type="checkbox"/> Food            | <input type="checkbox"/> Other                        |

## 1. Green – Go

- Breathing is good.
- No cough or wheeze.
- Can work and play.



Or Peak Flow \_\_\_\_\_ to \_\_\_\_\_ (80-100%)

Use these controller medicines *every day* to keep you in the green zone:

<u>Medicine:</u>	<u>How much to take:</u>	<u>When to take it:</u>	<input type="checkbox"/> Home
_____	_____	_____	<input type="checkbox"/> School

5-15 minutes before very active exercise, use  Albuterol \_\_\_\_\_ puffs.

## 2. Yellow – Caution



Coughing



Wheezing



Tight Chest



Wakes up at night

Or Peak Flow \_\_\_\_\_ to \_\_\_\_\_ (50-80%)

*Keep using controller green zone medicines everyday.*

**Add these medicines to keep an asthma attack from getting bad:**

<u>Medicine</u>	<u>How much to take</u>	<u>When to take it</u>
Albuterol	<input type="checkbox"/> 2 puffs by inhaler	<input type="checkbox"/> May repeat every
or	<input type="checkbox"/> 4 puffs by inhaler	20 min up to 3 doses
_____	<input type="checkbox"/> with spacer, if available	in first hour, if needed
	<input type="checkbox"/> by nebulizer	

If symptoms **DO NOT** improve after first hour of treatment, then go to **red zone**.

If symptoms **DO** improve after first hour of treatment, then continue:

Albuterol	<input type="checkbox"/> 2 puffs by inhaler	<input type="checkbox"/> Every 4 - 8 hours
or	<input type="checkbox"/> 4 puffs by inhaler	for _____ days
_____	<input type="checkbox"/> with spacer, if available	
	<input type="checkbox"/> by nebulizer	

_____	_____ times a day for _____ days	<input type="checkbox"/> Home
<i>(oral corticosteroid)</i>	<i>(how much)</i>	<input type="checkbox"/> School

**Call your doctor if still having some symptoms for more than 24 hours!**

## 3. Red – Stop – Danger

- Medicine is not helping.
- Breathing is hard and fast.
- Nose opens wide.
- Can't walk.
- Ribs show.
- Can't talk well.



Or Peak Flow \_\_\_\_\_ (Less than 50%)

**Call your doctor and/or parent/guardian NOW!**

**Take these medicines until you talk with a doctor or parent/guardian:**

<u>Medicine:</u>	<u>How much to take:</u>	<u>When to take it:</u>
Albuterol	<input type="checkbox"/> 2 puffs by inhaler	<input type="checkbox"/> May repeat every
or	<input type="checkbox"/> 4 puffs by inhaler	20 minutes until
_____	<input type="checkbox"/> with spacer, if available	you get help
	<input type="checkbox"/> by nebulizer	
_____	_____ times a day for _____ days	<input type="checkbox"/> Home
<i>(oral corticosteroid)</i>	<i>(how much)</i>	<input type="checkbox"/> School

**Call 911 for severe symptoms, if symptoms don't improve, or you can't reach your doctor and/or parent/guardian.**

Physician Signature \_\_\_\_\_ Date \_\_\_\_\_ Phone \_\_\_\_\_

WHITE – PATIENT

YELLOW – CHART

PINK – SCHOOL

Provided by Community Care of N.C., N.C. Asthma Program, and Asthma Alliance of N.C.

10/08





## CHILD CARE INDIVIDUAL HEALTH PLAN ASTHMA

Child's Name: \_\_\_\_\_ DOB: \_\_\_\_\_  
Teacher: \_\_\_\_\_

PARENT/GUARDIAN: \_\_\_\_\_  
Ensure Emergency information is kept up to date on file with facility.

### PHYSICIAN INFORMATION:

Primary Care Physician: \_\_\_\_\_ Phone: \_\_\_\_\_  
Specialist (Pulmonologist): \_\_\_\_\_ Phone: \_\_\_\_\_

(Personal data: i.e. onset, brief history, etc.)

**Asthma** is a chronic lung disease which is characterized by attacks of breathing difficulty. It is caused by spasms of the muscles in the walls of the air passages to the lungs. It is not contagious and tends to run in families. Asthma can be aggravated by allergy to pollen or dust, viral illness, cold, emotions, or exercise. There is no cure but asthma can be controlled with proper diagnosis and management.

Treatment consists of avoiding known triggers, recognizing early symptoms, and medication to reduce or prevent symptoms. Some children who are allergic to specific substances may benefit from desensitization shots.

**Problem:** Potential breathing difficulty.

**Expected Response:**

1. Exposure to asthma triggers will be minimized or avoided and asthma symptoms will be minimized.
2. Any asthma symptoms will be managed effectively with prescribed medication.

**Action:**

1. Eliminate or reduce exposure to known triggers. (\_\_\_\_\_) known triggers include:
2. Administer medications to prevent episodes as prescribed. Follow the **Asthma Action Plan** provided by the physician.
3. Symptoms of an asthma episode include:

<b>Coughing</b>	<b>Tightness in chest</b>	<b>Stops playing</b>
<b>Wheezing</b>	<b>Gasping for air</b>	<b>Blue nails or lips</b>
4. If symptoms of an episode are present or child lets you know an episode is coming on:
  - a. Have him/her sit up or hold the child to assume a position that is easiest for him/her to breathe.
  - b. Administer prescribed medication by inhaler. (See instructions below.)

OR
  - b. Administer medication by nebulizer as prescribed. (See instructions below.)
  - c. Reassure (\_\_\_\_\_) and attempt to keep him/her calm and breathing slowly and deeply.
  - d. (\_\_\_\_\_) should respond to treatment within 15 - 20 minutes.
  - e. If **NO** change or breathing becomes significantly worse, contact parent immediately.
  - f. Most asthma attacks can be successfully managed in this manner. If you feel he/she is getting rapidly worse call for emergency assistance (**911**).
5. (\_\_\_\_\_) requires the following activity limitation /modifications as prescribed by his/her doctor:
  - a. Unless otherwise stated by physician, he/she should have access to a physical exercise. Parents and staff should understand the benefits of physical activity in moderation.

- b. Be aware of poor air quality conditions such as ozone levels orange or above. Limit or restrict activity according to physician's advice.
- c. (\_\_\_\_\_) requires medication as ordered approximately 20 minutes before active play/outdoor play.

**Problem:** Correct use of Nebulizer treatment

**Expected Response:** Medicine will be administered accurately and safely.

**Action:**

1. (\_\_\_\_\_) can receive nebulizer treatments with \_\_\_\_\_ medication every \_\_\_\_\_ hours. Check home/child care notebook to see if he received treatment at home and at what time to avoid over medicating.
2. Squeeze prescribed dose of medication into medication chamber.
3. Attach chamber to nebulizer and turn machine on. Make sure it is plugged in.
4. Have (\_\_\_\_\_) breathe through tubing/face mask slowly and deeply until all liquid is gone from medication chamber.
5. Have (\_\_\_\_\_) remain sitting and resting until symptoms subside.
6. Rinse chamber and face mask with warm water and let them air dry after each use.
7. Document all treatments given on medication log and a note for parent.
8. Only trained staff will administer medication

**Problem:** Correct use of Inhaler (Puffer)

**Expected Response:** Medicine will be administered accurately and safely

**Action:**

1. (\_\_\_\_\_) can receive inhaler treatments with \_\_\_\_\_ medication every \_\_\_\_\_ hours. Check home/child care notebook to see if he received treatment at home and at what time to avoid over medicating.
2. Be sure to shake the inhaler well prior to giving.
3. Attach inhaler to spacer. Spray (Puff) once.
4. Have (\_\_\_\_\_) breathe in and out deeply. Then have them breath through mouth piece/face mask slowly and deeply at least twice.
5. Wait 5 minutes and repeat with second puff if ordered.
6. Have (\_\_\_\_\_) remain sitting and resting until symptoms subside.
7. Document all treatments given on medication log and a note for parent.
8. Only trained staff will administer medication

**Problem:** Potential side effects to medication.

**Expected Response:** Early recognition and reporting of side effects

**Action:**

*Note: The appropriate drug, it's side effects and educational implications, should be inserted here. A list of asthma medications and effects for your use are included in this care plan. Delete those not in use! When there are multiple brand names use the name of the medication the child is receiving.*

1. **Bronchodilators: Proventil, Ventolin (albuterol).**
  - a. Albuterol opens the air passages of the lungs. It is taken by oral inhalation to treat the symptoms of asthma. It relieves coughing, wheezing, shortness of breath, and troubled breathing by increasing the flow of air through the bronchial tubes.
  - b. Side effects that require immediate medical evaluation include: blue color to skin, lips or fingernails, dizziness, fainting, increased breathing rate, increased pulse (heart) rate, skin rash and swelling or face, lips or eyelids.
  - c. More common side effects that usually do not require intervention unless troublesome or worrisome include: nervousness, restlessness, and trembling.
  - d. Symptoms of overdose may include: chest pain, chills, fever, seizures, fast or slow heartbeat, severe muscle cramps, severe nausea or vomiting, unusual paleness, and coldness of skin or severe weakness. Any of these symptoms require calling parent or physician. If child is unconscious or having seizures call 911.
2. (\_\_\_\_\_) is medicated as needed with **Xopenex**

- a. It is used to relax muscles in and around airways and reduce mucus production.
  - b. Common side effects that usually do not require intervention unless troublesome or worrisome include: shakiness, restlessness, rapid heart rate.
  - c. The side effects that must be reported promptly to parents include: breathing worsens or treatment is ineffective,
  - d. Once foil pouch is opened – protect vials from heat and light and use within one week.
3. **Inhaled Steroids: Beclovent, Vanceril, Azmacort, Aerobid, Flovent, Pulmicort, Rhinocort**
- a. It is used to reduce swelling of airways, inflammation and mucus production and decrease airway irritability.
  - b. Common side effects that usually do not require intervention unless troublesome or worrisome include: oral yeast infection and/or hoarseness.
  - c. Exposure to chicken pox or measles should be avoided.
4. **Oral Steroid: Prednisone** (a steroid) to reduce inflammation.
- a. Prednisone is used to decrease airway twitching, reduces inflammation, swelling of airways and mucus production. Short bursts can interrupt asthma episodes.
  - b. The side effects that must be reported promptly to parents and school nurse include: behavior changes, stomach pain, blood in the stool or vomiting blood.
  - c. Common side effects that do not require notifying parent unless worrisome, include: moon-shaped face, flushing, acne, and headache. These side effects can negatively impact a student's self-image and school staff should be sensitive to this.
  - d. Educational implications of prednisone are minimal.
  - e. Prednisone should always be taken with food to prevent stomach upset.
  - d. Prednisone should never be discontinued without physician instruction.
5. **Leukotriene Modifiers: Singulair, Accolate**
- a. Used for chronic treatment of airway edema, smooth muscle contraction and inflammation.
  - b. Side effects to report are nausea, diarrhea, swelling of ears, nose or throat.

**I agree to: (parent to initial each line)**

- \_\_\_\_\_ **Revise this action plan whenever my child’s medications or health status changes, or yearly.**
- \_\_\_\_\_ **Provide any and all medications and supplies required for my child’s medical management.**
- \_\_\_\_\_ **Provide a copy of an annual medical exam for my child, with current medications specified by my child’s physician.**
- \_\_\_\_\_ **Obtain a medical evaluation for my child, as requested by my child’s teacher or the Child Care Health Consultant.**
- \_\_\_\_\_ **Update phone numbers of parents, emergency contact persons and health care providers, as needed.**
- \_\_\_\_\_ **The mutual exchange of information between my child’s physician, child care provider and the Child Care Health Consultant.**

\_\_\_\_\_  
Child Care Health Consultant Signature

\_\_\_\_\_  
Parent/ Guardian Signature

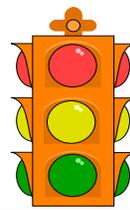
The Child Care Director and Child Care Teachers of this child have read and understand this care plan:

\_\_\_\_\_  
Child Care Director Signature

\_\_\_\_\_  
Child Care Teacher(s)



Child’s Name \_\_\_\_\_



**Avoid Triggers: (Check all that apply)**

<input type="checkbox"/> Illness	<input type="checkbox"/> Cigarette/other smoke	<input type="checkbox"/> Food:
<input type="checkbox"/> Emotions	<input type="checkbox"/> Exercise	<input type="checkbox"/> Allergies:
<input type="checkbox"/> Weather Changes	<input type="checkbox"/> Chemical odors	<input type="checkbox"/> Other:

**Green Zone:**  
**Child breathing at best**  
**Well**

- sleeps through the night without coughing or wheezing
- has no early warning signs of an asthma flare-up
- plays actively



**Take Long-Term Control medications:**

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_



**Take quick-relief medicines 15 minutes before active playtime.**

- \_\_\_\_\_
- \_\_\_\_\_

**Yellow Zone:**  
**Child not breathing at best**  
**Sick**

- coughing or wheezing at night or at child care
- has early warning signs of a flare-up:  
\_\_\_\_\_
- has trouble doing usual activities/play,
- may self limit activities/squat/hunch over
- decrease in appetite/difficulty drinking or taking a bottle.



**Take quick-relief medicines:**

- \_\_\_\_\_
- \_\_\_\_\_

**Adjust Long-Term Control medicines as follows until back in Green Zone:**

- \_\_\_\_\_
- \_\_\_\_\_

**Activity Restrictions:**

- \_\_\_\_\_

**Ozone Restrictions:**

- \_\_\_\_\_

**Call child’s parent if:**

- child’s symptoms do not improve or worsen 15 to 20 minutes after treatment

**Call the physician if:**

- parent not available

**Red Zone:**  
**Danger Zone**  
**Emergency**

- breathing is hard and fast
- coughing, short of breath, wheezing
- neck and chest “suck in” skin between ribs, above the breastbone and collarbone when breathing
- has trouble walking or talking
- stops activities
- unable to drink or take bottle



**Emergency Medicine Plan:**

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_



**Call 911 if** no improvement 15 minutes after quick relief medication given and

- nails or lips are blue
- is having trouble walking or talking
- cannot stop coughing

**Parent:** \_\_\_\_\_  
Telephone: \_\_\_\_\_  
**Physician:** \_\_\_\_\_  
Telephone: \_\_\_\_\_

\_\_\_\_\_  
Physician Signature  
Date: \_\_\_\_\_

 Adapted by the NC Child Care Health Consultants Association



**FIGURE 3-14. HOW TO USE YOUR METERED-DOSE INHALER****HOW TO USE YOUR METERED-DOSE INHALER**

Using an inhaler seems simple, but most patients do not use it the right way. When you use your inhaler the wrong way, less medicine gets to your lungs.

For the next few days, read these steps aloud as you do them or ask someone to read them to you. Ask your doctor or nurse to check how well you are using your inhaler.

Use your inhaler in one of the three ways pictured below. A or B are best, but C can be used if you have trouble with A and B. Your doctor may give you other types of inhalers.

**Steps for Using Your Inhaler****Getting ready**

1. Take off the cap and shake the inhaler.
2. Breathe out all the way.
3. Hold your inhaler the way your doctor said (A, B, or C below).

**Breathe in slowly**

4. As you start breathing in slowly through your mouth, press down on the inhaler one time. (If you use a holding chamber, first press down on the inhaler. Within 5 seconds, begin to breathe in slowly.)

**Hold your breath**

5. Keep breathing in slowly, as deeply as you can.
6. Hold your breath as you count to 10 slowly, if you can.
7. For inhaled quick-relief medicine (beta<sub>2</sub>-agonists), wait about 15–30 seconds between puffs. There is no need to wait between puffs for other medicines.

A. Hold inhaler 1 to 2 inches in front of your mouth (about the width of two fingers).



B. Use a spacer/holding chamber. These come in many shapes and can be useful to any patient.



C. Put the inhaler in your mouth. Do not use for steroids.



Clean your inhaler as needed, and know when to replace your inhaler. For instructions, read the package insert or talk to your doctor, other health care provider, or pharmacist.

## FIGURE 3–11. HOW TO USE YOUR PEAK FLOW METER

A peak flow meter is a device that measures how well air moves out of your lungs. During an asthma episode, the airways of the lungs usually begin to narrow slowly. The peak flow meter may tell you if there is narrowing in the airways hours—sometimes even days—before you have any asthma symptoms.

By taking your medicine(s) early (before symptoms), you may be able to stop the episode quickly and avoid a severe asthma episode. Peak flow meters are used to check your asthma the way that blood pressure cuffs are used to check high blood pressure.

The peak flow meter also can be used to help you and your doctor:

- Learn what makes your asthma worse.
- Decide if your treatment plan is working well.
- Decide when to add or stop medicine.
- Decide when to seek emergency care.

A peak flow meter is most helpful for patients who must take asthma medicine daily. Patients age 5 and older are usually able to use a peak flow meter. Ask your doctor or nurse to show you how to use a peak flow meter.

### How To Use Your Peak Flow Meter

- Do the following five steps with your peak flow meter:
  1. Move the indicator to the bottom of the numbered scale.
  2. Stand up.
  3. Take a deep breath, filling your lungs completely.

4. Place the mouthpiece in your mouth and close your lips around it. Do not put your tongue inside the hole.
5. Blow out as hard and fast as you can in a single blow.

- Write down the number you get. But if you cough or make a mistake, don't write down the number. Do it over again.
- Repeat steps 1 through 5 two more times, and write down the best of the three blows in your asthma diary.

### Find Your Personal Best Peak Flow Number

Your personal best peak flow number is the highest peak flow number you can achieve over a 2-week period when your asthma is under good control. Good control is when you feel good and do not have any asthma symptoms.

Each patient's asthma is different, and your best peak flow may be higher or lower than the peak flow of someone of your same height, weight, and sex. This means that it is important for you to find your own personal best peak flow number. Your treatment plan needs to be based on your own personal best peak flow number.

To find out your personal best peak flow number, take peak flow readings:

- At least twice a day for 2 to 3 weeks.
- When you wake up and in late afternoon or early evening.
- 15–20 minutes after you take your inhaled short-acting beta<sub>2</sub>-agonist for quick relief.
- As instructed by your doctor.

## FIGURE 3–11. HOW TO USE YOUR PEAK FLOW METER (CONTINUED)

### The Peak Flow Zone System

Once you know your personal best peak flow number, your doctor will give you the numbers that tell you what to do. The peak flow numbers are put into zones that are set up like a traffic light. This will help you know what to do when your peak flow number changes. For example:

**Green Zone** (more than \_\_\_ L/min [80 percent of your personal best number]) signals good control. No asthma symptoms are present. Take your medicines as usual.

**Yellow Zone** (between \_\_\_ L/min and \_\_\_ L/min [50 to less than 80 percent of your personal best number]) signals caution. If you remain in the yellow zone after several measures of peak flow, take an inhaled short-acting beta<sub>2</sub>-agonist. If you continue to register peak flow readings in the yellow zone, your asthma may not be under good control. Ask your doctor if you need to change or increase your daily medicines.

**Red Zone** (below \_\_\_ L/min [less than 50 percent of your personal best number]) signals a medical alert. You must take an inhaled short-acting beta<sub>2</sub>-agonist (quick-relief medicine) right away. Call your doctor or emergency room and ask what to do, or go directly to the hospital emergency room.

Record your personal best peak flow number and peak flow zones in your asthma diary.

### Use the Diary To Keep Track of Your Peak Flow

Measure your peak flow when you wake up, *before* taking medicine. Write down your peak flow number in the diary every day, or as instructed by your doctor.

### Actions To Take When Peak Flow Numbers Change

- PEF goes between \_\_\_ L/min and \_\_\_ L/min (50 to less than 80 percent of personal best, yellow zone).

**ACTION:** Take an inhaled short-acting beta<sub>2</sub>-agonist (quick-relief medicine) as prescribed by your doctor.

- PEF increases 20 percent or more when measured before and after taking an inhaled short-acting beta<sub>2</sub>-agonist (quick-relief medicine).

**ACTION:** Talk to your doctor about adding more medicine to control your asthma better (for example, an anti-inflammatory medication).

Source: Adapted from *Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma*. National Asthma Education and Prevention Program, National Heart, Lung, and Blood Institute, 1997.



# Using Your MDI With a Spacer and Mask— Pediatric

## Patient Education Guide

To make your child's breathing better, you **MUST** give your child the medicine as explained below. Following these instructions puts more of the medicine in your child's lungs. This will help open the air passages in your child's lungs and help him or her breathe easier and feel better. You need to ask your child's health-care provider or pharmacist how many puffs the metered-dose inhaler (MDI) has when it is full. You need to keep track of how many puffs of medicine your child takes every day, so you can have the MDI refilled before your child runs out of medicine. Before using the MDI, please read the separate sheet on priming or preparing your MDI. The MDI and spacer should be cleaned once a week. See instructions on cleaning your MDI.



1 Take cap off MDI. Check for and remove any dust, lint, or other objects. Shake MDI well.



2 Attach MDI to spacer.



3 Have the child sit up straight or stand. Place the mask over the child's nose and mouth. The mask should be held on the face firmly enough so none of the medicine can escape.



4 Press down on the MDI. This puts one puff of medicine in the spacer.



5 To breathe in that one puff of medicine, the child should **BREATHE IN AND OUT NORMALLY FOR SIX BREATHS**. Do not remove the mask until the sixth breath is complete.



6 Remove the mask from the child's face.



7 If your child needs to take another puff of medicine, wait 1 minute. After 1 minute repeat steps 3-6.



8 Have your child rinse his or her mouth out with water after the last puff of medicine. Make sure the child spits the water out. Do not allow the child to swallow the water. *Rinsing is only necessary if the medicine you just took was a corticosteroid, such as Flovent®, Beclavent®, Vancen®, Aerobid®, or Azmacort®.* Recap the MDI.

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## Spacers and Holding Chambers

Some people, especially children, have trouble using an inhaler the right way. Using a spacer helps deliver more medicine to the lungs and helps decrease hoarseness that may occur with inhaled corticosteroids. Holding chambers allow you to breathe in and out more than once per puff of medicine. Wash the plastic spacer or chamber with soap and water when it is new to cut down on the electrostatic field that is inside the chamber.



**STEP 1:**  
The holding chamber or spacer attaches to the inhaler.

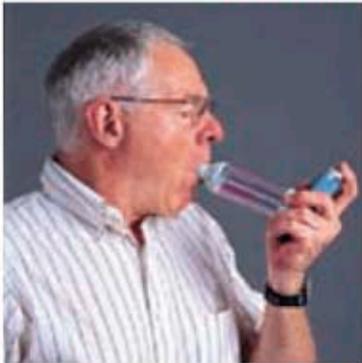


**STEP 2:**  
Shake well.



**STEP 3:**  
Breathe all the way out. Place the mouthpiece in your mouth, then press the inhaler button to release a puff of medicine into the spacer or chamber.

### REPEAT THESE STEPS TWICE



**STEP 4:**  
Breathe in slow and deep, keeping the mouthpiece in place until finished.

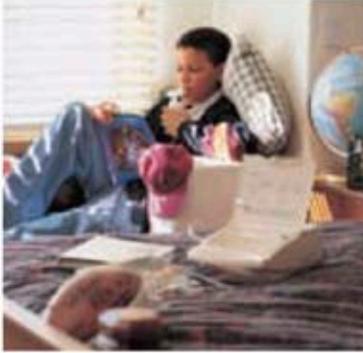


**STEP 5:**  
Hold your breath and count to 10, then relax and breathe out.



**STEP 6:**  
Young children may require a chamber with a mask. It is necessary for the mask to fit securely against the face for the child to receive maximum dose.

- If you need more than one puff of medicine, wait at least a minute before using the spacer again.
- No matter what medicines you take and when, use your asthma diary and asthma action plan that you've created with your provider. Always follow your plan, and your asthma can be controlled.



## Using a Nebulizer

- If using a face mask, the mask must fit properly (right size) and tightly over nose and mouth.
- If using a mouthpiece, it must be between the teeth with lips closed tightly around it.
- Waving the mouthpiece or mask in front of the mouth will NOT get the medicine into the lungs.
- Rinse out mouth after nebulizing Budesonide (Pulmicort Respules).
- Give infants a drink of water.
- If a face mask was used, wash face with soap and water to avoid skin irritation.
- The cup, mouthpiece, or mask should be washed daily with mild soap and water, rinsed in a vinegar and water solution, and dried. Never wash the tubing.
- Change filter on nebulizer compressor according to manufacturer's recommendations.

**FIGURE 3–22. LONG-TERM CONTROL MEDICATIONS**

Name/Products (Listed Alphabetically)	Indications/Mechanisms	Potential Adverse Effects	Therapeutic Issues (Not All Inclusive)
<p><b>Corticosteroids (Glucocorticoids)</b></p> <p><i>Inhaled (ICS):</i> Beclomethasone dipropionate Budesonide Flunisolide Fluticasone propionate Mometasone furoate Triamcinolone acetonide</p>	<p><i>Indications</i></p> <ul style="list-style-type: none"> <li>■ Long-term prevention of symptoms; suppression, control, and reversal of inflammation.</li> <li>■ Reduce need for oral corticosteroid.</li> </ul> <p><i>Mechanisms</i></p> <ul style="list-style-type: none"> <li>■ <b>Anti-inflammatory.</b> Block late reaction to allergen and reduce airway hyperresponsiveness. Inhibit cytokine production, adhesion protein activation, and inflammatory cell migration and activation.</li> <li>■ Reverse beta<sub>2</sub>-receptor downregulation. Inhibit microvascular leakage.</li> </ul>	<ul style="list-style-type: none"> <li>■ Cough, dysphonia, oral thrush (candidiasis).</li> <li>■ In high doses (see figures 4-4b and 4-8b), systemic effects may occur, although studies are not conclusive, and clinical significance of these effects has not been established (e.g., adrenal suppression, osteoporosis, skin thinning, and easy bruising) (Barnes and Pedersen 1993; Kamada et al. 1996). In low-to-medium doses, suppression of growth velocity has been observed in children, but this effect may be transient, and the clinical significance has not been established (CAMP 2000; Guilbert et al. 2006).</li> </ul>	<ul style="list-style-type: none"> <li>■ Spacer/holding chamber devices with nonbreath-activated MDIs and mouth washing after inhalation decrease local side effects.</li> <li>■ Preparations are not absolutely interchangeable on a mcg or per puff basis (see figures 4-4b and 4-8b for estimated clinical comparability). New delivery devices may provide greater delivery to airways; this change may affect dose.</li> <li>■ The risks of uncontrolled asthma should be weighed against the limited risks of ICS therapy. The potential but small risk of adverse events is well balanced by their efficacy. (See text.)</li> <li>■ "Adjustable dose" approach to treatment may enable reduction in cumulative dose of ICS treatment over time without sacrificing maintenance of asthma control.</li> <li>■ Dexamethasone is not included as an ICS for long-term control because it is highly absorbed and has long-term suppressive side effects.</li> </ul>
<p><i>Systemic:</i> Methylprednisolone Prednisolone Prednisone</p>	<p><i>Indications</i></p> <ul style="list-style-type: none"> <li>■ For short-term (3–10 days) "burst": to gain prompt control of inadequately controlled persistent asthma.</li> <li>■ For long-term prevention of symptoms in severe persistent asthma: suppression, control, and reversal of inflammation.</li> </ul> <p><i>Mechanisms</i></p> <ul style="list-style-type: none"> <li>■ Same as inhaled.</li> </ul>	<ul style="list-style-type: none"> <li>■ Short-term use: reversible abnormalities in glucose metabolism, increased appetite, fluid retention, weight gain, mood alteration, hypertension, peptic ulcer, and rarely aseptic necrosis.</li> <li>■ Long-term use: adrenal axis suppression, growth suppression, dermal thinning, hypertension, diabetes, Cushing's syndrome, cataracts, muscle weakness, and—in rare instances—impaired immune function.</li> <li>■ Consideration should be given to coexisting conditions that could be worsened by systemic corticosteroids, such as herpes virus infections, varicella, tuberculosis, hypertension, peptic ulcer, diabetes mellitus, osteoporosis, and <i>Strongyloides</i>.</li> </ul>	<ul style="list-style-type: none"> <li>■ Use at lowest effective dose. For long-term use, alternate-day a.m. dosing produces the least toxicity. If daily doses are required, one study shows improved efficacy with no increase in adrenal suppression when administered at 3 p.m. rather than in the morning (Beam et al. 1992).</li> </ul>

**FIGURE 3–22. LONG-TERM CONTROL MEDICATIONS  
(CONTINUED)**

Name/Products (Listed Alphabetically)	Indications/Mechanisms	Potential Adverse Effects	Therapeutic Issues (Not All Inclusive)
<b>Cromolyn Sodium and Nedocromil</b>	<p><i>Indications</i></p> <ul style="list-style-type: none"> <li>■ Long-term prevention of symptoms in mild persistent asthma; may modify inflammation.</li> <li>■ Preventive treatment prior to exposure to exercise or known allergen.</li> </ul> <p><i>Mechanisms</i></p> <ul style="list-style-type: none"> <li>■ <b>Anti-inflammatory.</b> Blocks early and late reaction to allergen. Interferes with chloride channel function. Stabilizes mast cell membranes and inhibits activation and release of mediators from eosinophils and epithelial cells.</li> <li>■ Inhibits acute response to exercise, cold dry air, and SO<sub>2</sub>.</li> </ul>	<ul style="list-style-type: none"> <li>■ Cough and irritation.</li> <li>■ 15–20 percent of patients complain of an unpleasant taste from nedocromil.</li> </ul>	<ul style="list-style-type: none"> <li>■ Therapeutic response to cromolyn and nedocromil often occurs within 2 weeks, but a 4- to 6-week trial may be needed to determine maximum benefit.</li> <li>■ Dose of cromolyn by MDI (1 mg/puff) may be inadequate to affect airway hyperresponsiveness. Nebulizer delivery (20 mg/ampule) may be preferred for some patients.</li> <li>■ Safety is the primary advantage of these agents.</li> </ul>
<p><b>Immunomodulators</b></p> <p>Omalizumab (Anti-IgE)</p> <p>For subcutaneous use</p>	<p><i>Indications</i></p> <ul style="list-style-type: none"> <li>■ Long-term control and prevention of symptoms in adults (≥12 years old) who have moderate or severe persistent allergic asthma inadequately controlled with ICS.</li> </ul> <p><i>Mechanisms</i></p> <ul style="list-style-type: none"> <li>■ Binds to circulating IgE, preventing it from binding to the high-affinity (FcεRI) receptors on basophils and mast cells.</li> <li>■ Decreases mast cell mediator release from allergen exposure.</li> <li>■ Decreases the number of FcεR1s in basophils and submucosal cells.</li> </ul>	<ul style="list-style-type: none"> <li>■ Pain and bruising of injection sites has been reported in 5–20 percent of patients.</li> <li>■ Anaphylaxis has been reported in 0.2 percent of treated patients.</li> <li>■ Malignant neoplasms were reported in 0.5 percent of patients compared to 0.2 percent receiving placebo; relationship to drug is unclear.</li> </ul>	<ul style="list-style-type: none"> <li>■ Monitor patients following injection. Be prepared and equipped to identify and treat anaphylaxis that may occur.</li> <li>■ The dose is administered either every 2 or 4 weeks and is dependent on the patient's body weight and IgE level before therapy.</li> <li>■ A maximum of 150 mg can be administered in one injection.</li> <li>■ Needs to be stored under refrigeration at 2–8 °C.</li> <li>■ Whether patients will develop significant antibody titers to the drug with long-term administration is unknown.</li> </ul>

**FIGURE 3–22. LONG-TERM CONTROL MEDICATIONS (CONTINUED)**

Name/Products (Listed Alphabetically)	Indications/Mechanisms	Potential Adverse Effects	Therapeutic Issues (Not All Inclusive)
<b>Leukotriene Receptor Antagonists (LTRAs)</b>	<p><i>Mechanisms</i></p> <ul style="list-style-type: none"> <li>■ <b>Leukotriene receptor antagonist;</b> selective competitive inhibitor of CysLT<sub>1</sub> receptor.</li> </ul>		<ul style="list-style-type: none"> <li>■ May attenuate EIB in some patients, but less effective than ICS therapy (Vidal et al. 2001).</li> <li>■ Do not use LTRA + LABA as a substitute for ICS + LABA.</li> </ul>
Montelukast tablets and granules	<p><i>Indications</i></p> <ul style="list-style-type: none"> <li>■ Long-term control and prevention of symptoms in mild persistent asthma for patients ≥1 year of age. May also be used with ICS as combination therapy in moderate persistent asthma.</li> </ul>	<ul style="list-style-type: none"> <li>■ No specific adverse effects have been identified.</li> <li>■ Rare cases of Churg-Strauss have occurred, but the association is unclear.</li> </ul>	<ul style="list-style-type: none"> <li>■ A flat dose-response curve, without further benefit, if dose is increased above those recommended.</li> </ul>
Zafirlukast tablets	<ul style="list-style-type: none"> <li>■ Long-term control and prevention of symptoms in mild persistent asthma for patients ≥7 years of age. May also be used with ICS as combination therapy in moderate persistent asthma.</li> </ul>	<ul style="list-style-type: none"> <li>■ Postmarketing surveillance has reported cases of reversible hepatitis and, rarely, irreversible hepatic failure resulting in death and liver transplantation.</li> </ul>	<ul style="list-style-type: none"> <li>■ Administration with meals decreases bioavailability; take at least 1 hour before or 2 hours after meals.</li> <li>■ Zafirlukast is a microsomal P450 enzyme inhibitor that can inhibit the metabolism of warfarin. INRs should be monitored during coadministration.</li> <li>■ Patients should be warned to discontinue use if they experience signs and symptoms of liver dysfunction (right upper quadrant pain, pruritis, lethargy, jaundice, nausea), and patients' ALTs should be monitored.</li> </ul>
<b>5-Lipoxygenase Inhibitor</b>	<p><i>Mechanisms</i></p> <ul style="list-style-type: none"> <li>■ Inhibits the production of leukotrienes from arachidonic acid, both LTB<sub>4</sub> and the cysteinyl leukotrienes.</li> </ul>		
Zileuton tablets	<p><i>Indications</i></p> <ul style="list-style-type: none"> <li>■ Long-term control and prevention of symptoms in mild persistent asthma for patients ≥12 years of age.</li> <li>■ May be used with ICS as combination therapy in moderate persistent asthma in patients ≥12 years of age.</li> </ul>	<ul style="list-style-type: none"> <li>■ Elevation of liver enzymes has been reported. Limited case reports of reversible hepatitis and hyperbilirubinemia.</li> </ul>	<ul style="list-style-type: none"> <li>■ Zileuton is microsomal P450 enzyme inhibitor that can inhibit the metabolism of warfarin and theophylline. Doses of these drugs should be monitored accordingly.</li> <li>■ Monitor hepatic enzymes (ALT).</li> </ul>



**FIGURE 3–23. QUICK-RELIEF MEDICATIONS**

Name/Products	Indications/Mechanisms	Potential Adverse Effects	Therapeutic Issues
<p><b>Short-Acting Beta<sub>2</sub>-Agonists (SABA)</b></p> <p><i>Inhaled SABA:</i> Albuterol Levalbuterol Pirbuterol</p>	<p><i>Indications</i></p> <ul style="list-style-type: none"> <li>■ Relief of acute symptoms; quick-relief medication.</li> <li>■ Preventive treatment for EIB prior to exercise.</li> </ul> <p><i>Mechanisms</i></p> <ul style="list-style-type: none"> <li>■ <b>Bronchodilation.</b> Binds to the beta<sub>2</sub>-adrenergic receptor, producing smooth muscle relaxation following adenylate cyclase activation and increase in cyclic AMP producing functional antagonism of bronchoconstriction.</li> </ul>	<ul style="list-style-type: none"> <li>■ Tachycardia, skeletal muscle tremor, hypokalemia, increased lactic acid, headache, hyperglycemia. Inhaled route, in general, causes few systemic adverse effects. Patients with preexisting cardiovascular disease, especially the elderly, may have adverse cardiovascular reactions with inhaled therapy.</li> </ul>	<ul style="list-style-type: none"> <li>■ Drugs of choice for acute bronchospasm. Inhaled route has faster onset, fewer adverse effects, and is more effective than systemic routes. The less beta<sub>2</sub>-selective agents (isoproterenol, metaproterenol, isoetharine, and epinephrine) are not recommended due to their potential for excessive cardiac stimulation, especially in high doses. Oral systemic beta<sub>2</sub>-agonists are not recommended.</li> <li>■ For patients who have intermittent asthma, regularly scheduled daily use neither harms nor benefits asthma control (Drazen et al. 1996). Regularly scheduled daily use is not recommended.</li> <li>■ Regular use &gt;2 days/week for symptom control (not prevention of EIB), increasing use, or lack of expected effect indicates inadequate asthma control.</li> <li>■ For patients frequently using SABA, anti-inflammatory medication should be initiated or intensified.</li> <li>■ Levalbuterol at one-half the mcg dose produces clinically comparable bronchodilation and systemic side effects as racemic albuterol.</li> </ul>

**FIGURE 3–23. QUICK-RELIEF MEDICATIONS (CONTINUED)**

Name/Products	Indications/Mechanisms	Potential Adverse Effects	Therapeutic Issues
<p><b>Anticholinergics</b> Ipratropium bromide</p>	<p><i>Indications</i></p> <ul style="list-style-type: none"> <li>■ Relief of acute bronchospasm (See Therapeutic Issues column.).</li> </ul> <p><i>Mechanisms</i></p> <ul style="list-style-type: none"> <li>■ <b>Bronchodilation.</b> Competitive inhibition of muscarinic cholinergic receptors.</li> <li>■ Reduces intrinsic vagal tone of the airways. May block reflex bronchoconstriction secondary to irritants or to reflux esophagitis.</li> <li>■ May decrease mucous gland secretion.</li> </ul>	<ul style="list-style-type: none"> <li>■ Drying of mouth and respiratory secretions, increased wheezing in some individuals, blurred vision if sprayed in eyes. If used in the ED, produces less cardiac stimulation than SABAs.</li> </ul>	<ul style="list-style-type: none"> <li>■ Reverses only cholinergically mediated bronchospasm; does not modify reaction to antigen. Does not block EIB.</li> <li>■ Multiple doses of ipratropium in the ED provide additive effects to SABA.</li> <li>■ May be alternative for patients who do not tolerate SABA.</li> <li>■ Treatment of choice for bronchospasm due to beta-blocker medication.</li> <li>■ Has not proven to be efficacious as long-term control therapy for asthma.</li> </ul>
<p><b>Corticosteroids</b> <i>Systemic:</i> Methylprednisolone Prednisolone Prednisone</p>	<p><i>Indications</i></p> <ul style="list-style-type: none"> <li>■ For moderate or severe exacerbations to prevent progression of exacerbation, reverse inflammation, speed recovery, and reduce rate of relapse.</li> </ul> <p><i>Mechanisms</i></p> <ul style="list-style-type: none"> <li>■ <b>Anti-inflammatory.</b> See figure 3–22.</li> </ul>	<ul style="list-style-type: none"> <li>■ Short-term use: reversible abnormalities in glucose metabolism, increased appetite, fluid retention, weight gain, facial flushing, mood alteration, hypertension, peptic ulcer, and rarely aseptic necrosis.</li> <li>■ Consideration should be given to coexisting conditions that could be worsened by systemic corticosteroids, such as herpes virus infections, varicella, tuberculosis, hypertension, peptic ulcer, diabetes mellitus, osteoporosis, and <i>Strongyloides</i>.</li> </ul>	<ul style="list-style-type: none"> <li>■ Short-term therapy should continue until patient's symptoms resolve. This usually requires 3–10 days but may require longer.                             <ul style="list-style-type: none"> <li>— Action may begin within an hour.</li> </ul> </li> <li>■ There is no evidence that tapering the dose following improvement is useful in preventing a relapse in asthma exacerbations.</li> <li>■ Other systemic corticosteroids such as hydrocortisone and dexamethasone given in equipotent daily doses are likely to be as effective as prednisolone.</li> </ul>

Key: ED, emergency department; EIB, exercise-induced bronchospasm

**FIGURE 3–24. AEROSOL DELIVERY DEVICES**

Device/Drugs	Population	Optimal Technique*	Therapeutic Issues
<p>Metered-dose inhaler (MDI)</p> <ul style="list-style-type: none"> <li>Beta<sub>2</sub>-agonists</li> <li>Corticosteroids</li> <li>Cromolyn sodium</li> <li>Anticholinergics</li> </ul>	<p>≥5 years old (&lt;5 with spacer or valved holding chamber (VHC) mask)</p>	<p>Actuation during a slow (30 L/min or 3–5 seconds) deep inhalation, followed by 10-second breathhold.</p> <p>Under laboratory conditions, open-mouth technique (holding MDI 2 inches away from open mouth) enhances delivery to the lung. This technique, however, has not been shown to enhance clinical benefit consistently compared to closed-mouth technique (inserting MDI mouthpiece between lips and teeth).</p>	<p>Slow inhalation and coordination of actuation during inhalation may be difficult, particularly in young children and elderly. Patients may incorrectly stop inhalation at actuation. Deposition of 50–80 percent of actuated dose in oropharynx. Mouth washing and spitting is effective in reducing the amount of drug swallowed and absorbed systemically (Selroos and Halme 1991).</p> <p>Lung delivery under ideal conditions varies significantly between MDIs due to differences in formulation (suspension versus solution), propellant (chlorofluorocarbon (CFC) versus hydrofluoralkane (HFA)), and valve design (Dolovich 2000). For example, inhaled corticosteroid (ICS) delivery varies from 5–50 percent (Kelly 2003).</p>
<p>Breath-actuated MDI</p> <ul style="list-style-type: none"> <li>Beta<sub>2</sub>-agonist</li> </ul>	<p>≥5 years old</p>	<p>Tight seal around mouthpiece and slightly more rapid inhalation than standard MDI (see above) followed by 10-second breathhold.</p>	<p>May be particularly useful for patients unable to coordinate inhalation and actuation. May also be useful for elderly patients (Newman et al. 1991). Patients may incorrectly stop inhalation at actuation. Cannot be used with currently available spacer/valved-holding chamber (VHC) devices.</p>
<p>Dry powder inhaler (DPI)</p> <ul style="list-style-type: none"> <li>Beta<sub>2</sub>-agonists</li> <li>Corticosteroids</li> <li>Anticholinergics</li> </ul>	<p>≥4 years old</p>	<p>Rapid (60 L/min or 1–2 seconds), deep inhalation. Minimally effective inspiratory flow is device dependent.</p> <p>Most children &lt;4 years of age may not generate sufficient inspiratory flow to activate the inhaler.</p>	<p>Dose is lost if patient exhales through device after actuating. Delivery may be greater or lesser than MDI, depending on device and technique. Delivery is more flow dependent in devices with highest internal resistance. Rapid inhalation promotes greater deposition in larger central airways (Dolovich 2000). Mouth washing and spitting is effective in reducing amount of drug swallowed and absorbed (Selroos and Halme 1991).</p>



**FIGURE 3–24. AEROSOL DELIVERY DEVICES (CONTINUED)**

Device/Drugs	Population	Optimal Technique*	Therapeutic Issues
<p>Nebulizer</p> <p>Beta<sub>2</sub>-agonists</p> <p>Corticosteroids</p> <p>Cromolyn sodium</p> <p>Anticholinergics</p>	<p>Patients of any age who cannot use MDI with VHC and face mask.</p>	<p>Slow tidal breathing with occasional deep breaths. Tightly fitting face mask for those unable to use mouthpiece.</p> <p>Using the “blow by” technique (i.e., holding the mask or open tube near the infant’s nose and mouth) is not appropriate.</p>	<p>Less dependent on patient’s coordination and cooperation.</p> <p>Delivery method of choice for cromolyn sodium in young children.</p> <p>May be expensive; time consuming; bulky; output is dependent on device and operating parameters (fill volume, driving gas flow); internebulizer and intranebulizer output variances are significant (Dolovich 2000). Use of a face mask reduces delivery to lungs by 50 percent (Wildhaber et al. 1999). Nebulizers are as effective as MDIs plus VHCs for delivering bronchodilators in the ED for mild to moderate exacerbations; data in severe exacerbations are limited. Choice of delivery system is dependent on resources, availability, and clinical judgment of the clinician caring for the patient (Cates et al. 2002; Dolovich et al. 2005).</p> <p>Potential for bacterial infections if not cleaned properly.</p>

Key: ED, emergency department; SABAs, inhaled short-acting beta<sub>2</sub>-agonists

\*See figures in “Component 2: Education for a Partnership in Asthma Care” for description of MDI and DPI techniques.



**FIGURE 4–4c. USUAL DOSAGES FOR QUICK-RELIEF MEDICATIONS IN CHILDREN\***

Medication	Dosage Form	0–4 Years	5–11 Years	Comments
<b>Inhaled Short-Acting Beta<sub>2</sub>-Agonists</b>				
<i>MDI</i>				
Albuterol CFC	90 mcg/puff, 200 puffs/canister	1–2 puffs 5 minutes before exercise	2 puffs 5 minutes before exercise	<ul style="list-style-type: none"> <li>■ Differences in potencies exist, but all products are essentially comparable on a per puff basis.</li> <li>■ An increasing use or lack of expected effect indicates diminished control of asthma.</li> <li>■ Not recommended for long-term daily treatment. Regular use exceeding 2 days/week for symptom control (not prevention of EIB) indicates the need for additional long-term control therapy.</li> <li>■ May double usual dose for mild exacerbations.</li> <li>■ Should prime the inhaler by releasing 4 actuations prior to use.</li> <li>■ Periodically clean HFA actuator, as drug may plug orifice.</li> <li>■ Children &lt;4 years may not generate sufficient inspiratory flow to activate an auto-inhaler.</li> <li>■ Nonselective agents (i.e., epinephrine, isoproterenol, metaproterenol) are not recommended due to their potential for excessive cardiac stimulation, especially in high doses.</li> </ul>
Albuterol HFA	90 mcg/puff, 200 puffs/canister	2 puffs every 4–6 hours as needed	2 puffs every 4–6 hours as needed	
Levalbuterol HFA	45 mcg/puff, 200 puffs/canister	Safety and efficacy not established in children <4 years	2 puffs every 4–6 hours as needed	
Pirbuterol CFC Autohaler	200 mcg/puff, 400 puffs/canister	Safety and efficacy not established	Safety and efficacy not established	
<i>Nebulizer solution</i>				
Albuterol	0.63 mg/3 mL 1.25 mg/3 mL 2.5 mg/3 mL 5 mg/mL (0.5%)	0.63–2.5 mg in 3 cc of saline q 4–6 hours, as needed	1.25–5 mg in 3 cc of saline q 4–8 hours, as needed	<ul style="list-style-type: none"> <li>■ May mix with cromolyn solution, budesonide inhalant suspension, or ipratropium solution for nebulization. May double dose for severe exacerbations.</li> </ul>
Levalbuterol (R-albuterol)	0.31 mg/3 mL 0.63 mg/3 mL 1.25 mg/0.5 mL 1.25 mg/3 mL	0.31–1.25 mg in 3 cc q 4–6 hours, as needed	0.31–0.63 mg, q 8 hours, as needed	<ul style="list-style-type: none"> <li>■ Does not have FDA-approved labeling for children &lt;6 years of age.</li> <li>■ The product is a sterile-filled preservative-free unit dose vial.</li> <li>■ Compatible with budesonide inhalant suspension.</li> </ul>

**FIGURE 4–4c. USUAL DOSAGES FOR QUICK-RELIEF MEDICATIONS IN CHILDREN\* (CONTINUED)**

Medication	Dosage Form	0–4 Years	5–11 Years	Comments
<b>Anticholinergics</b>				
Ipratropium HFA	<b>MDI</b> 17 mcg/puff, 200 puffs/ canister	Safety and efficacy not established	Safety and efficacy not established	<ul style="list-style-type: none"> <li>■ Evidence is lacking for anticholinergics producing added benefit to beta<sub>2</sub>-agonists in long-term control asthma therapy.</li> <li>■ See "Management of Acute Asthma" for dosing in ED.</li> </ul>
	<b>Nebulizer solution</b> 0.25 mg/mL (0.025%)	Safety and efficacy not established	Safety and efficacy not established	
<b>Systemic Corticosteroids</b>				
Methylprednisolone	2, 4, 6, 8, 16, 32 mg tablets	Short course "burst": 1–2 mg/kg/day, maximum 60 mg/day, for 3–10 days	Short course "burst": 1–2 mg/kg/day, maximum 60 mg/day, for 3–10 days	<p><b>Applies to the first three corticosteroids</b></p> <ul style="list-style-type: none"> <li>■ Short courses or "bursts" are effective for establishing control when initiating therapy or during a period of gradual deterioration.</li> <li>■ The burst should be continued until patient achieves 80% PEF personal best or symptoms resolve. This usually requires 3–10 days but may require longer. There is no evidence that tapering the dose following improvement prevents relapse.</li> </ul>
Prednisolone	5 mg tablets, 5 mg/5 cc, 15 mg/5 cc			
Prednisone	1, 2.5, 5, 10, 20, 50 mg tablets; 5 mg/cc, 5 mg/5 cc			
(Methylprednisolone acetate)	<b>Repository injection</b> 40 mg/mL 80 mg/mL	7.5 mg/kg IM once	240 mg IM once	<ul style="list-style-type: none"> <li>■ May be used in place of a short burst of oral steroids in patients who are vomiting or if adherence is a problem.</li> </ul>
<p>Key: CFC, chlorofluorocarbon; ED, emergency department; EIB, exercise-induced bronchospasm; HFA, hydrofluoroalkane; IM, intramuscular; MDI, metered-dose inhaler; PEF, peak expiratory flow</p> <p>*Dosages are provided for those products that have been approved by the U.S. Food and Drug Administration or have sufficient clinical trial safety and efficacy data in the appropriate age ranges to support their use.</p>				

## Asthma Glossary of Terms

**Action Plan:** A list of specific instructions drawn up by a health care professional for an asthmatic to follow. The plan includes a normal schedule for asthma medicines, as well as what to do if peak flow readings or asthma symptoms become worse than usual. These plans are split into zones (red, green, and yellow). SEE: ZONES.

**Airflow Limitation:** A prolonged forced time to breathe out (longer than 4 seconds).

**Airways:** Hollow tubes to and within the lungs through which air passes during breathing. These include the trachea, bronchi, and bronchioles.

**Allergen:** A protein that causes one to have an allergic reaction. Examples include: foods, animal dander, and certain drugs.

**Allergy:** A type of excessive immune system reaction to a substance in a person's environment.

**Antibody:** A protein that develops in the body in response to an antigen.

**Antigen:** A substance that can trigger an immune response, resulting in the production of an antibody as a part of the body's defense against infection and disease.

**Anti-inflammatory Medicines:** Used to prevent symptoms by keeping airways from swelling when exposed to triggers.

**Asthma (Operational Definition):** Asthma is a chronic disease. This inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and cough particularly at night and/or in the early morning.

**Asthma Specialist:** Health care professional who has received specific training in the diagnosis and management of asthma.

**Attack:** SEE: EPISODE.

**Bronchi:** The airways that lead from the trachea to each lung, and then subdivide into smaller and smaller branches. They connect to the bronchioles. They have many mucus producing glands.

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## Asthma Glossary of Terms, p. 2

**Bronchioles:** The tiny branching airways that lead from the bronchi to the alveoli. They also produce mucus.

**Bronchoconstriction:** The reduction in the diameter of the bronchi, usually because of squeezing of the smooth muscles in the walls. This reduces the space for air to go through and can make breathing difficult.

**Bronchodilator:** A medicine that relaxes the smooth muscles of the airways. This allows the airway to open up, or dilate, because the muscles are not squeezing it shut.

**Chronic:** Lasting a long time. Asthma is a chronic illness because it is ongoing and does not just go away in a few days or weeks. Asthma can last a lifetime.

**Controller Medications:** Medications taken daily on a long-term basis that are useful in getting persistent asthma under control and in maintaining control. Controller medications are also sometimes called preventive or maintenance medications.

**Corticosteroids:** A type of medication used to reduce inflammation. In asthma, these drugs are often taken through an inhaler for long-term control. They may also be taken orally or given intravenously for a short time if asthma symptoms become out of control.

**Dander:** Scales of dead skin from pets. A common allergen.

**DPI (dry powder inhaler):** This is a variety of devices that provide a new way of taking inhaled medicine. The propellants used in regular-metered dose inhalers can be bad for the environment. For this reason, drug companies are in the process of switching over to DPIs, which do not use a propellant at all. The medicine is in the form of a very fine powder that is easily inhaled without the use of an aerosol spray device. DPIs can be easier to use, because the patient does not have to coordinate the timing of activating the inhaler and breathing in, and the problems of bad taste and unpleasant “feel” are also greatly reduced.

**Dust Mites:** Very tiny creatures that live in the dust in people’s homes. They are present in both visible dust (i.e., under the bed or behind the couch) and in soft places like pillows, mattresses, blankets, and stuffed animals. They thrive especially when the air is humid. Because many people are allergic to dust mites, removing them is part of most asthma control programs.

CONTINUED



## Asthma Glossary of Terms, p. 3

**Episode:** A period of markedly worsened symptoms. This may be brought on by exposure to a known trigger or by an upper respiratory infection (a cold), or it may not have a known explanation. An episode may come on all of a sudden or may develop gradually over days. Asthma episodes, at their worst, can be life threatening, and should always be taken seriously.

**Episodic:** Intermittent (irregular), with periods of apparent normal function in-between periods of symptoms.

**Exacerbation:** Any worsening of symptoms. Onset can be acute and sudden, or gradual over several days.. Exacerbation replaces the words “attack” and “episode.”

**Exercise-Induced Asthma:** Asthma triggered by exercise. In some people, it is their only trigger.

**Expiration:** Breathing out.

**Extrinsic Asthma:** Asthma triggered by an allergic reaction, usually something that is inhaled, or in the environment.

**GERD (Gastroesophageal Reflux Disease):** GERD is a chronic disorder in which some of the acid and enzymes that belong in the stomach come up into the esophagus. This leads to the sensation of heartburn and sometimes also an unpleasant sour taste in the mouth. GERD and asthma can make a vicious circle: GERD is more common among people with asthma, and it also seems to make asthma worse in people who have it. Treatment of GERD can lead to an improvement in asthma symptoms.

**Health Care Professional:** Individual who is licensed to care for sick people. Among these: physicians, nurses, nurse practitioners, physician assistants, and therapists.

**HEPA Filter (High Efficiency Particulate Air Filter):** Removes tiny particles that may irritate sensitive respiratory systems from the air.

**Histamine:** A chemical present in cells throughout the body that is released during an allergic or inflammatory reaction. It is responsible for narrowing the bronchi, or airways, in the lungs during an asthma exacerbation.

**Holding Chamber:** (also: extender, spacer, reservoir) Intended to help medicine from an inhaler to get into the lungs. It holds the spray, making it easier to inhale the medication.

CONTINUED



## Asthma Glossary of Terms, p. 4

**Ige (Immunoglobulin E) Antibody:** A special antibody released when the body is exposed to an allergen. This antibody pokes holes in the immune system's white cells, thus releasing chemicals, including histamine, which can trigger allergy symptoms.

**Inflammation:** A complex process in the body involving many types of cells (especially white blood cells) and chemicals. It can be protective or harmful. The signs of inflammation include redness, swelling, warmth, and pain. Loss of function (partial or complete) is often seen, and exudation is common. Inflammation of the airways is the main underlying problem in asthma.

**Inhaled Corticosteroid:** Anti-inflammatory medication is breathed directly into the lungs. The advantage to this is that the medicine goes directly to where the inflammation is, and has minimal effects on the rest of the body (thus, fewer side effects than corticosteroids taken orally).

**Inhaler:** SEE: METERED DOSE INHALER.

**Intrinsic Asthma:** When asthma symptoms are not caused by exposure to allergens.

**Irritant:** Risk factor or trigger that may cause increased symptoms and/or airflow limitation by causing a reaction in the airways.

**Maintenance Medication:** Medication given on a regular basis to help prevent symptoms.

**Mast Cell:** A cell type containing chemicals that produce an asthmatic reaction when exposed to an allergen. These cells are in most body tissues, but are also in connective tissue, such as the innermost layer of skin (dermis) and also in the airways.

**Medication Plan:** A specific plan to achieve and maintain control of asthma based on use of controller and reliever medications in a stepwise approach. A medication plan also includes instructions on how to recognize worsening of asthma and what actions to take. Also known also as an asthma plan.

**Metered Dose Inhaler (MDI):** A device that allows delivery of medication directly into the lungs. The medicine is in the form of a very fine powder, and a propellant is used to move the powder out in a cloud to be inhaled.

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## Asthma Glossary of Terms, p. 5

**Mucus:** A substance secreted by various tissues in the body (mucus membranes). In the lungs, mucus serves to lubricate the insides of the airways and to trap foreign particles so that they can be coughed out. In asthma, however, an excess of mucus is produced and can actually block airways. Mucus also tends to be thicker in asthmatics.

**Nebulizer:** A machine that assists in getting medicine into the lungs. It makes a mixture of liquid medicine and water into a mist that a person then inhales through a mask or a mouthpiece. They are often used for babies and children who are too small to coordinate using a MDI. They are also used for those having severe asthma symptoms, as it is easier to take in the medicine this way when having trouble breathing.

**Peak Flow:** The fastest a person can move air by blowing out as hard as they can.

**Peak Flow Meter:** A device to measure how hard and fast a person can blow air out. This is an indication of how well the lungs and airways are doing. It is an important part of an asthma home monitoring plan.

**Pulmonary Function Tests (PFTs):** A series of tests used to determine whether a person has breathing problems, and precisely what those problems are. These test lung function and capacity. They do not hurt, as they involve tests that include holding your breath, blowing into a tube as hard as you can, and exercising while wearing a special mask.

**Reflux:** SEE: GERD.

**Reliever Medications:** Short-acting bronchodilating medications that act quickly to relieve airflow limitation and its accompanying acute symptoms, such as cough, chest tightness, and wheezing. Relievers are sometimes called quick-relief medicine or rescue medicine.

**Spacer:** A device that attaches to an inhaler by a plastic chamber on one end and a mouthpiece or a mask on the other end. It is intended to help medicine get into the lungs. A spacer works by holding the medicine in its chamber long enough for a person to inhale it in one breath if a mouth piece is used and five breaths if a mask is used. Without a spacer much of the medicine in an inhaler “puff” is deposited on the tongue or in the back of the throat.

**Spirometry:** The machine measures how fast a person can blow out air and how much air is released.

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## Asthma Glossary of Terms, p. 6

**Steroids:** A general term for a wide variety of chemicals, both natural and synthetic. In the context of asthma, “steroids” is usually a shorthand way of referring to corticosteroid medicines.

**Trachea:** The largest breathing tube in the body, passing from the throat down to the chest (where it connects to the two bronchi leading to the lungs).

**Trigger:** Anything that causes asthma symptoms to worsen in a given person. Different things are triggers for different people. Common triggers include exercise, cigarette smoke, pollen, dust, cold air, and aspirin. Upper respiratory infections are perhaps the most common trigger for asthma symptoms.

**Wheeze:** A breathing sound that may be squeaky, whistling, or musical. Wheezes are often (but not always) a symptom of asthma (Some people have asthma but never wheeze, and some people wheeze for reasons other than asthma.). Wheezes are due to air passing through a narrowed opening and are therefore usually accompanied by difficulty breathing.

**Zones:** The classification of asthma signs and symptoms in an asthma action plan. Usually the zones include the Green Zone (all is well, continue with regular medicines and activities); the Yellow Zone (early warning signs start to appear such as coughing; follow doctor’s instructions for Yellow Zone); and Red Zone (DANGER! Get to the emergency room as quickly as possible or call 911). These are determined by symptoms and peak flow readings.

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### ASTHMA GLOSSARY TERMS PROVIDED THROUGH THE FOLLOWING WEBSITES IN JUNE 2008:

- 1) “All About Asthma: Glossary of Asthma Terms”. University of Chicago: Asthma Center. Chicago, IL: 2001. [www.nche.org/2001AsthmaGlossary.pdf](http://www.nche.org/2001AsthmaGlossary.pdf)
- 2) “Asthma Glossary”. Journal of the American Medical Association: Asthma Information Center. American Medical Association: 1997. [www.ama-assn.org/special/asthma/support/glossary/glossary.htm](http://www.ama-assn.org/special/asthma/support/glossary/glossary.htm)
- 3) “Glossary”. Thrive Online: Medical-Asthma. San Francisco, CA: 2001. [www.thriveonline.com/medical/asthma/seek/info.glossary.html](http://www.thriveonline.com/medical/asthma/seek/info.glossary.html)

## School Nurses and Other School Professionals Asthma Resource List

### Specific Agency Web Sites

- **Allergy and Asthma Network, Mothers of Asthmatics** – [www.aanma.org](http://www.aanma.org)
- **American Academy of Asthma, Allergy, and Immunology** – [www.aaaai.org](http://www.aaaai.org)
- **American Academy of Family Physicians**  
[www.familydoctor.org/online/famdocen/home/common/asthma.html](http://www.familydoctor.org/online/famdocen/home/common/asthma.html)
- **American Lung Association** – N.C. – [www.lungnc.org](http://www.lungnc.org)
- **American Lung Association** – US – [www.lungusa.org](http://www.lungusa.org)
- **California Childcare Health Program** – [www.ucsfchildcarehealth.org](http://www.ucsfchildcarehealth.org)
- **Centers for Disease Control and Prevention** – [www.cdc.gov](http://www.cdc.gov)
- **Environmental Protection Agency** – [www.epa.gov](http://www.epa.gov)
- **Healthy Youth: Asthma** – from the National Center for Chronic Disease Prevention and Health Promotion – [www.cdc.gov/HealthyYouth/asthma/index.htm](http://www.cdc.gov/HealthyYouth/asthma/index.htm)
- **National Heart, Lung, and Blood Institute**  
[www.nhlbi.nih.gov/health/dci/Diseases/Asthma/Asthma\\_WhatIs.html](http://www.nhlbi.nih.gov/health/dci/Diseases/Asthma/Asthma_WhatIs.html)
- **National Respiratory Training Center** – [www.nrtc-usa.org](http://www.nrtc-usa.org)
- **N.C. Asthma Program** – [www.asthma.ncdhhs.gov](http://www.asthma.ncdhhs.gov)
- **N.C. Children’s Environmental Health Branch**  
[www.deh.enr.state.nc.us/ehs/Children\\_Health/index.html](http://www.deh.enr.state.nc.us/ehs/Children_Health/index.html)
- **N.C. Cooperative Extension Service** – [www.ces.ncsu.edu](http://www.ces.ncsu.edu)
- **N.C. Department of Environment and Natural Resources** – [www.enr.state.nc.us](http://www.enr.state.nc.us)
- **N.C. Division of Air Quality** – [www.daq.state.nc.us](http://www.daq.state.nc.us)
- **N.C. Occupational and Environmental Epidemiology Branch**  
[www.epi.state.nc.us/epi/air.html](http://www.epi.state.nc.us/epi/air.html)
- **N.C. Tobacco Prevention and Control Branch**  
[www.tobaccopreventionandcontrol.ncdhhs.gov](http://www.tobaccopreventionandcontrol.ncdhhs.gov)

# School Nurses and Other School Professionals Asthma Resource List

## School Asthma-Specific Information

- **School-Based Approaches to Identifying Students with Asthma (Chronic Disease Control)**  
[www.cdc.gov/HealthyYouth/asthma/pdf/approaches.pdf](http://www.cdc.gov/HealthyYouth/asthma/pdf/approaches.pdf)
- **Asthma and the School Environment (Environmental Protection Agency)**  
<http://cfpub.epa.gov/schools/index.cfm>
- **Managing Asthma—A Guide for Schools (National Institute of Health)**  
[www.nhlbi.nih.gov/health/prof/lung/asthma/asth\\_sch.pdf](http://www.nhlbi.nih.gov/health/prof/lung/asthma/asth_sch.pdf)
- **Asthma Management and the School Setting (National Association of School Nurses)**  
[www.nasn.org/Default.aspx?tabid=264](http://www.nasn.org/Default.aspx?tabid=264)
- **Healthy Youth (Chronic Disease Control)**  
[www.cdc.gov/HealthyYouth](http://www.cdc.gov/HealthyYouth)
- **Childhood Asthma (American Academy of Allergy, Asthma, and Immunology)**  
[www.aaaai.org/patients/publicedmat/tips/childhoodasthma.stm](http://www.aaaai.org/patients/publicedmat/tips/childhoodasthma.stm)
- **Tools for Learning About Airborne Toxics Across the Curriculum**  
[www.intheair.org](http://www.intheair.org)
- **Healthy Kids, Healthy Care: Allergies, Asthma and Other Chronic Conditions.**  
[www.healthykids.us/chapters/allergies\\_main.htm](http://www.healthykids.us/chapters/allergies_main.htm)
- **Asthma in Children (MEDLINEplus Health Information)**  
[www.nlm.nih.gov/medlineplus/asthmainchildren.html](http://www.nlm.nih.gov/medlineplus/asthmainchildren.html)
- **Asthma and Physical Activity in School**  
[www.kidneeds.com/diagnostic\\_catagories/articles/asthmaphysicalactiv.htm](http://www.kidneeds.com/diagnostic_catagories/articles/asthmaphysicalactiv.htm)



## School Nurses and Other School Professionals Asthma Resource List

### Agencies for Asthma Information

#### **Allergy and Asthma Network/ Mothers of Asthmatics, Inc.**

2751 Prosperity Avenue, Suite 150  
Fairfax, VA 22030

Telephone: (800) 878-4403  
or (703) 641-9595

Internet: [www.breatherville.org](http://www.breatherville.org)

Materials include:

- Breathing Easy with Child Care (booklet)
- School Information Package

#### **American Academy of Allergy, Asthma and Immunology**

555 East Wells St, Suite 1100  
Milwaukee, WI 53202-3823

Telephone: (414) 272-6071

Internet: [www.aaaai.org](http://www.aaaai.org)

[www.aaaai.org/patients/gallery/childhoodasthma.asp](http://www.aaaai.org/patients/gallery/childhoodasthma.asp)

Materials include:

- Tips to Remember: Childhood Asthma
- Basic facts about asthma

#### **American Academy of Pediatrics**

141 Northwest Point Blvd  
Elk Grove, IL 60007

Telephone: (847) 434-4000  
or (847) 228-5005

Internet: [www.aap.org](http://www.aap.org)

Materials include:

- Caring for Our Children: Health and Safety Guidelines for Child Care (book)

#### **American Association for Respiratory Care**

9425 North MacArthur Boulevard, Suite 100  
Irving, TX 75063-4706

Telephone: (972) 243-2272

Internet: [www.aarc.org](http://www.aarc.org)

#### **American College of Allergy, Asthma, and Immunology**

85 West Algonquin Road, Suite 550  
Arlington Heights, IL 60005

Telephone: (800) 842-7777

or (847) 427-1200

Internet: [www.acaai.org](http://www.acaai.org)

#### **American Lung Association**

1301 Pennsylvania Ave, NW – Suite 800  
Washington, DC 20004

Telephone: (800) 586-4872

Internet: [www.lungusa.org](http://www.lungusa.org)

Materials include:

- A is for Asthma (Sesame Street video)

#### **Association of Asthma Educators**

1215 Anthony Avenue  
Columbia, SC 29201

Telephone: (888) 988-7747

Internet: [www.asthmaeducators.org](http://www.asthmaeducators.org)

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## Agencies for Asthma Information, p. 2

### **Asthma and Allergy Foundation of America**

1233 20th Street, NW, Suite 402

Washington, DC 20036

Telephone: (800) 727-8462

Internet: [www.aafa.org](http://www.aafa.org)

Materials include:

- Asthma and Allergy Essentials for Child Care Providers (training program)

### **Centers for Disease Control and Prevention**

1600 Clifton Road

Atlanta, GA 30333

Telephone: (800) 232-4636

Internet: [www.cdc.gov](http://www.cdc.gov)

### **Food Allergy & Anaphylaxis Network**

11781 Lee Jackson Highway, Suite 160

Fairfax, VA 22033

Telephone: (800) 929-4040

Internet: [www.foodallergy.org](http://www.foodallergy.org)

### **Healthy Kids: The Key to Basics Educational Planning for Students with Asthma and Other Chronic Health Conditions**

Telephone: (617) 965 - 9637

Materials include:

- Including Children with Chronic Health Conditions: Nebulizers in the Classroom

### **National Asthma Education and Prevention Program**

Telephone: (301) 592 - 8573

Internet: [www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)

Materials include:

- Managing Asthma: A Guide for Schools
- Asthma Awareness Curriculum for the Elementary Classroom
- Asthma and Physical Activity in the School
- Making a Difference: Asthma Management in the School (video)

### **National Heart, Lung, and Blood Institute Health Information Center**

P.O. Box 30105

Bethesda, MD 20824-0105

Telephone: (301) 592-8573

Internet: [www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)

### **National Institute of Allergy and Infectious Diseases**

6610 Rockledge Dr

MSC 6612

Bethesda, MD 20892-6612

Telephone: (866) 284-4107

Internet: [www.niaid.nih.gov](http://www.niaid.nih.gov)

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## Agencies for Asthma Information, p. 3

### **National Jewish Medical and Research Center**

1400 Jackson Street  
Denver, CO 80206  
Telephone: (800) 423-8891  
Internet: [www.njc.org](http://www.njc.org)

### **U.S. Department of Education**

Office for Civil Rights,  
Customer Service Team  
Telephone: (800) 421 - 3481  
or (202) 205 - 5413  
Internet: [www.ed.gov/about/offices/list/ocr/index.html](http://www.ed.gov/about/offices/list/ocr/index.html)

### **U.S. Environmental Protection Agency**

P.O. Box 42419  
Cincinnati, OH 45242-0419  
Telephone: (800) 490-9198  
Internet: [www.airnow.gov](http://www.airnow.gov)

### **U.S. Environmental Protection Agency**

Office of Radiation and Indoor Air  
Indoor Environment Division  
1200 Pennsylvania Ave – NW  
Mail Code 6609J  
Washington, DC 20460  
Telephone: (202) 343-9370  
Internet: [www.epa.gov/iaq](http://www.epa.gov/iaq)

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#### SOURCE:

The above resource list was originally provided at the end of the NIH document "How Asthma-Friendly Is Your Child-Care Setting?" [www.nhlbi.nih.gov/health/public/lung/asthma/chc\\_chk.htm](http://www.nhlbi.nih.gov/health/public/lung/asthma/chc_chk.htm), July 2008.



## School Nurses and Other School Professionals Asthma Resource List

### Resources for Cultural Competency

#### **Agency for Healthcare Research and Quality**

[www.ahrq.gov](http://www.ahrq.gov)

When you arrive at this site, look under Minorities as a population for information or search under Cultural Competence for multiple resources on this site.

#### **National Center for Cultural Competence – Curricula Enhancement Module Series**

[www.ncccurrricula.info/resources.html](http://www.ncccurrricula.info/resources.html)

#### **National Network of Libraries of Medicine – Minority Health Concerns: Cultural Competency Resources**

[www.nlm.gov/mcr/resources/community/competency.html](http://www.nlm.gov/mcr/resources/community/competency.html)

#### **North Carolina Office of Minority Health and Health Disparities**

[www.ncminorityhealth.org](http://www.ncminorityhealth.org)

#### **UNC Program on Ethnicity, Culture, and Health Outcomes**

[www.echo.unc.edu](http://www.echo.unc.edu)

#### **University of Michigan Health System – Program for Multicultural Health**

[www.med.umich.edu/multicultural/ccp/culcomp.htm](http://www.med.umich.edu/multicultural/ccp/culcomp.htm)

#### **U.S. Department of Health and Human Services – Health Resources and Services Administration**

[www.hrsa.gov/culturalcompetence](http://www.hrsa.gov/culturalcompetence)

#### **U.S. Department of Health and Human Services – The Office of Minority Health**

[www.omhrc.gov/templates/browse.aspx?lvl=1&lvlID=3](http://www.omhrc.gov/templates/browse.aspx?lvl=1&lvlID=3)



# Asthma Curriculum References

**KidsHealth/Asthma/Dealing with Asthma Triggers**

[www.KidsHealth.org/Asthma](http://www.KidsHealth.org/Asthma)

**Center for Disease Control and Prevention/Asthma Basic Facts**

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**North Carolina Asthma Program**

[www.asthma.ncdhhs.gov](http://www.asthma.ncdhhs.gov)

**North Carolina Tobacco Prevention and Control Branch**

[www.nctobaccofreeschools.com](http://www.nctobaccofreeschools.com)



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## Program Website References

### **North Carolina Asthma Program**

[www.asthma.ncdhhs.gov/burdenReportDocs/burdenSectionFiles/I-asthmaPrevalence.pdf](http://www.asthma.ncdhhs.gov/burdenReportDocs/burdenSectionFiles/I-asthmaPrevalence.pdf)

### **North Carolina Tobacco Prevention and Control Branch**

[www.nctobaccofreeschools.com](http://www.nctobaccofreeschools.com), Aug 2008.

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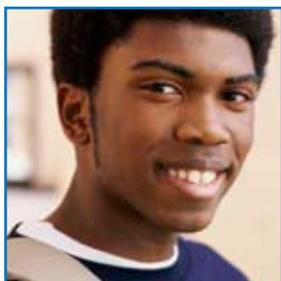
## Handout Section

Handout Section





## What is Asthma?



Asthma is a disease that affects the lungs. **It is the most common long-term (chronic) disease in students.** Asthma is likely to run in families. It often causes coughing, wheezing, shortness of breath, and/or chest tightness. A student will not outgrow asthma, but asthma can be controlled. Lungs often become sensitive to triggers, such as dust, fumes, pets, etc. When there is an asthma flare-up or episode, something is bothering the lungs.

### When asthma is under control...

- Symptoms like wheezing or coughing will improve.
- The student will feel and sleep better.
- The student can be involved in physical activities.
- The student should not have to go to the hospital/emergency room due to an asthma episode.

### You can help the student to control his/her asthma by:

- knowing the early warning signs, including coughing, wheezing, shortness of breath, and/or chest tightness;
- finding out what can trigger a student's asthma episode(s) and helping him/her stay away from these triggers;
- giving the student's medicine as instructed;
- having the parent/caregiver talk with the health care provider to develop an asthma action plan; and
- making sure the student has regular asthma check-ups.

#### SOURCES:

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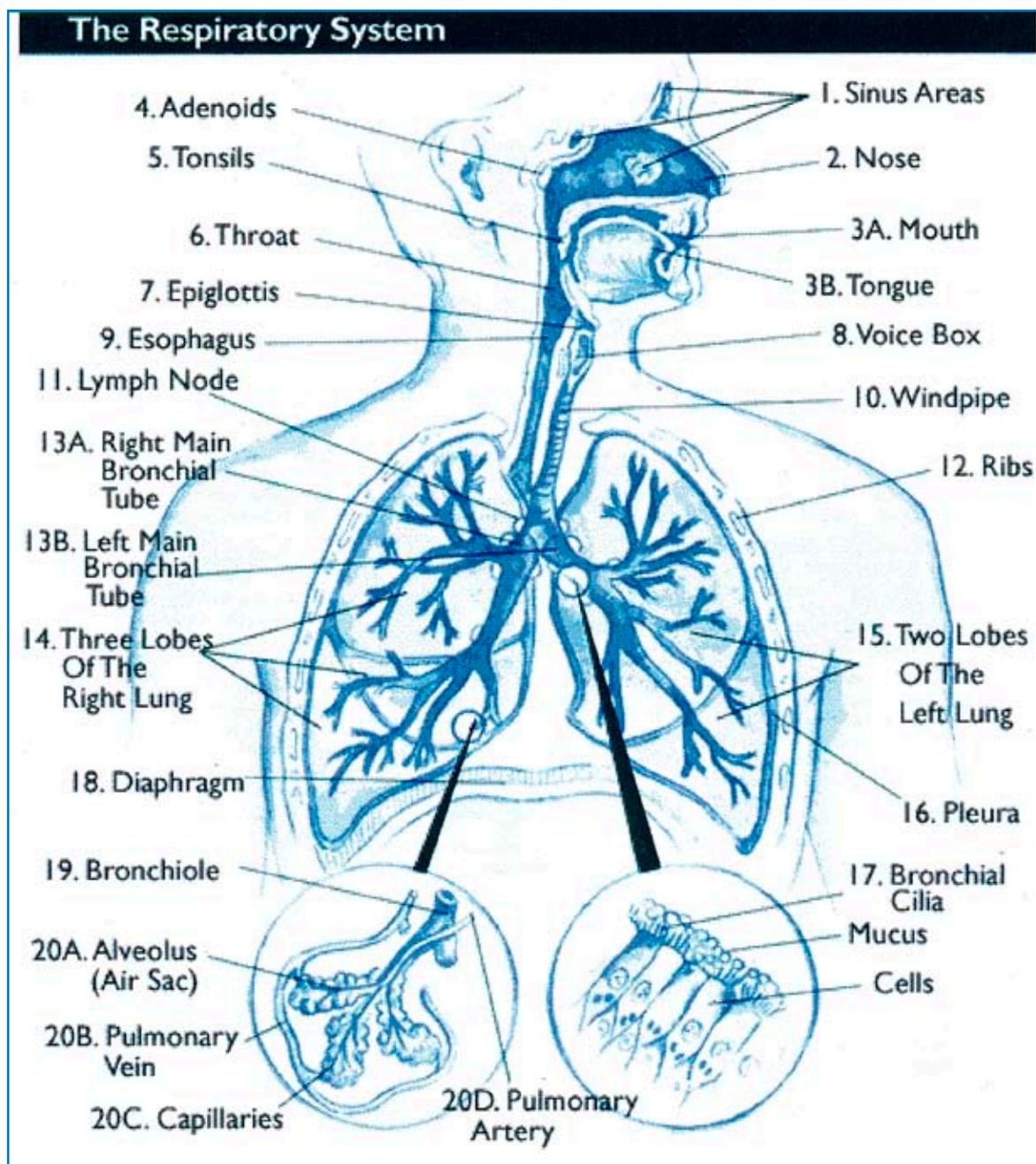
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## Normal Breathing and Human Respiratory System



The figure above shows the Human Respiratory System and portrays normal lungs and lung function.

## Breathing with Asthma

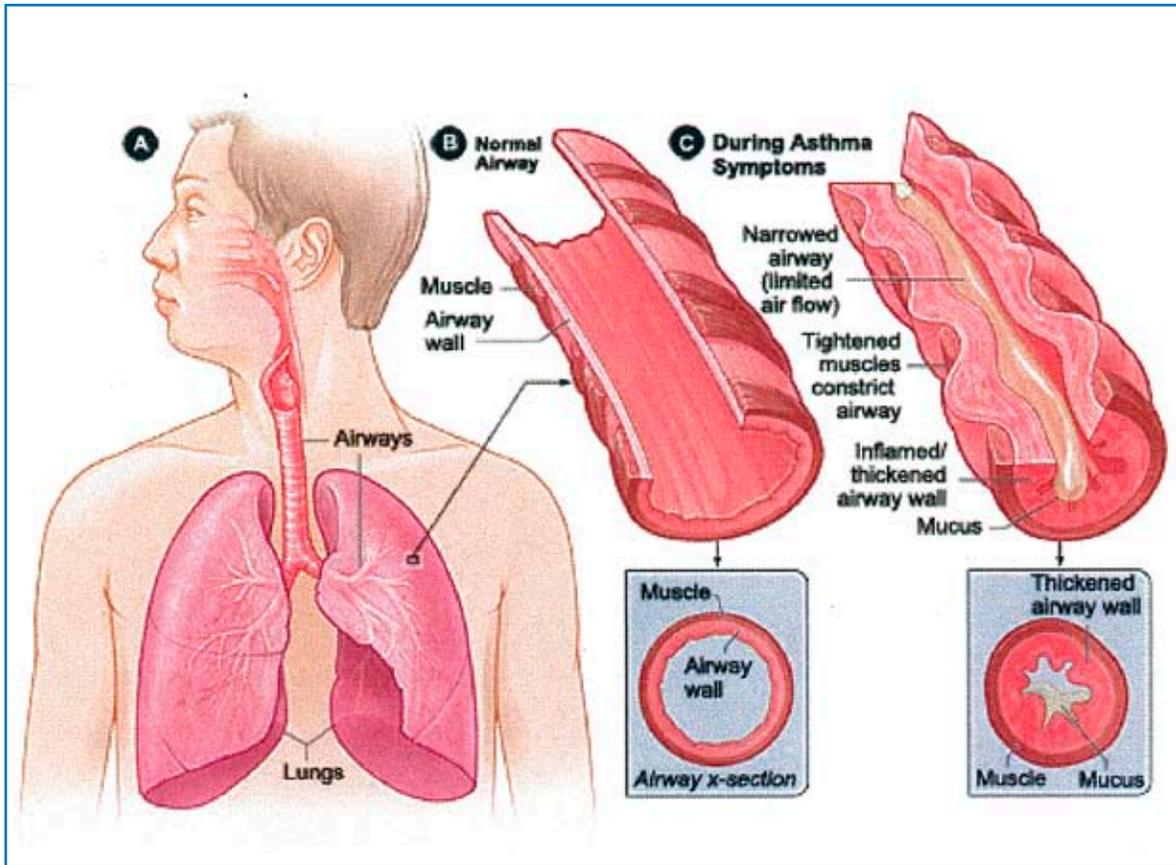
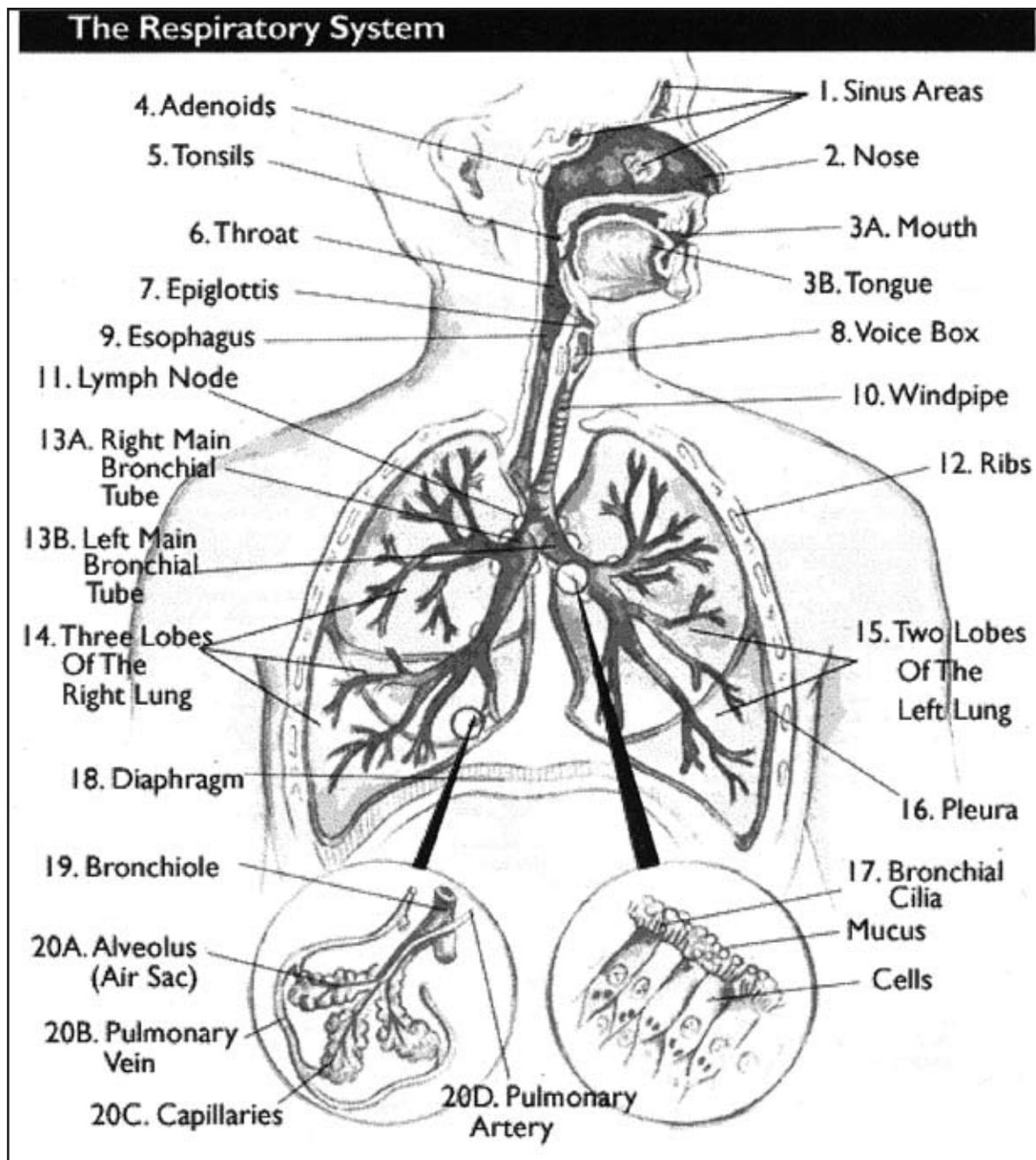


Figure A shows the location of the lungs and airways in the body. Figure B shows a cross-section of a normal airway. Figure C shows a cross-section of an airway during asthma symptoms.



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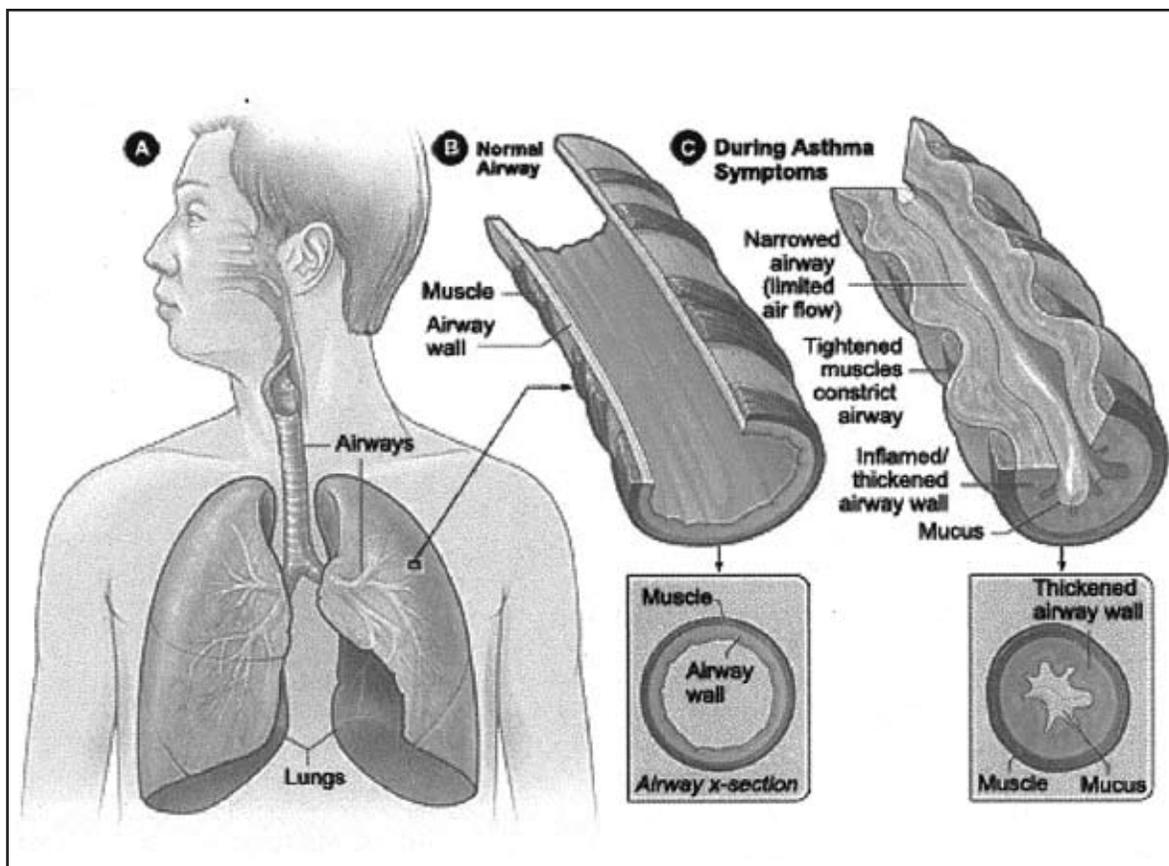


Figure A shows the location of the lungs and airways in the body. Figure B shows a cross-section of a normal airway. Figure C shows a cross-section of an airway during asthma symptoms.



## Fact Sheet about Asthma



- Asthma is a chronic disease that affects the lungs. It is the most common long term disease of students.
- Asthma is a chronic condition which means the student will always have it. The student will not “outgrow” it.
- A student cannot get asthma from someone else.
- Asthma does run in families.
- Asthma can be treated but cannot be cured. You and the student can do things to help make asthma easier to control.
- You should be aware of the warning signs of an asthma episode and help the student to learn what they are.
- You can help the student to stay away from things that trigger an episode.
- The student may have long periods of time without having any problems and then all of a sudden have a flare-up.
- You should follow the advice of the student’s health care provider as stated on the student’s asthma action plan.

As was mentioned above, asthma can be controlled. For mild cases of asthma, control means asthma rarely bothers the student. For severe cases of asthma, control means having fewer symptoms which keeps the student from doing what he/she wants to do.

---

### RESOURCES:

Lesson adapted with permission from Project Accord with the Minnesota Department of Health, 1998.

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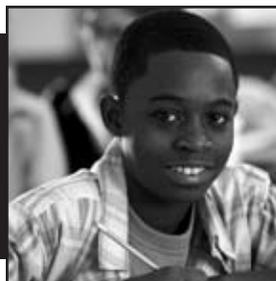
US Department of Health and Human Services; National Institutes of Health; National Heart, Lung, and Blood Institute; National Asthma Education and Prevention Program, EPR-3. *Expert panel report 3: Guidelines for the Diagnosis and Management of Asthma (EPR-3 2007)*. 2007. Information available at: [www.nhlbi.nih.gov/health/public/lung/asthma/chc\\_chk.htm](http://www.nhlbi.nih.gov/health/public/lung/asthma/chc_chk.htm), July 2008.







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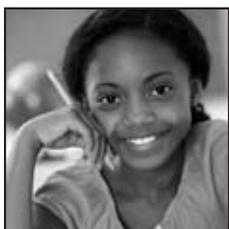
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National Asthma Education and Prevention Program

**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





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October 2008



## Common Asthma Triggers



### General Irritants

Be careful if the student is around any of these.

- Strong chemicals, aerosol sprays, cleaning products, pesticides
- Strong odors (air fresheners, scented candles, and colognes/perfumes)
- Environmental tobacco smoke (secondhand smoke)
- Smoke from burning wood (in fireplaces, wood stoves, etc.), leaves, or burning fields
- Kerosene heaters and un-vented gas stoves or heaters
- Paints, varnishes, and solvents containing volatile organic compounds (VOC)



### Allergic Triggers

Avoid if the student is allergic to these.

- Mold and mildew (in bathroom, refrigerators, basements, water leaks, soil of house plants, etc)
- Warm-blooded animals (gerbils, cats, dogs, birds, etc)
- Pests (cockroaches, mice, and lady bugs)
- Dust mites present in stuffed animals, pillows, mattresses, comforters, and carpets
- Pollens (flowers, grasses, trees, weeds)



**NOTE:** These are just some of the known triggers. If you have concerns about other items that could cause an asthma episode, please discuss this with the parent, caregiver, or healthcare provider.

#### SOURCES:

- [www.cdc.gov/asthma/faqs.htm#triggers](http://www.cdc.gov/asthma/faqs.htm#triggers), June 2008.
- [www.epa.gov/asthma/triggers.html](http://www.epa.gov/asthma/triggers.html), June 2008.
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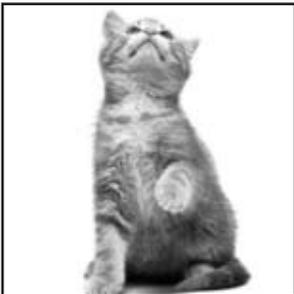
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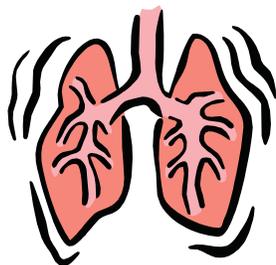
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## What are the Signs and Symptoms of Asthma Trouble?



There are **four main symptoms or signs of asthma**:

1. **Cough**
2. **Wheeze** – a whistling noise heard while breathing
3. **Shortness of breath or breathing much faster or slower than usual** – count the number of breaths for 30 seconds. Compare this to the number of breaths for 30 seconds when the student is well.
4. **Chest tightness or pain**

**NOTE:** If you notice any of these signs, help the student avoid his/her asthma triggers. Start or increase his/her asthma medicine as instructed on their [asthma action plan](#). If the [condition worsens](#), seek medical help from his/her health care provider or the closest emergency room.

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### Early Warning Signs of an Asthma Episode (YELLOW ZONE on Asthma Action Plan)

**Begin treatment with rescue medicines and contact the health care provider if the student has any of these:**

- Coughing or coughing to the point of vomiting.
- First sign of a cold.
- Wheezing.
- Chest tightness.
- Shortness of breath.
- Decrease in peak flow to yellow zone.
- Frequent night-time awakenings.

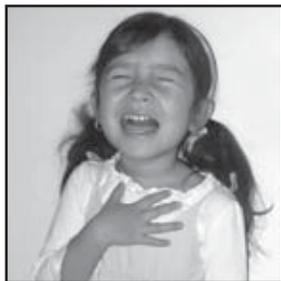
### Late Warning Signs of an Asthma Episode (RED ZONE on Asthma Action Plan)

**Continue rescue medicines and seek immediate medical help if the student's asthma is getting worse and for any of the following:**

- Rescue medicine is not helping within 15-20 minutes after use.
- Nostrils open wide when breathing through the nose.
- Trouble walking and/or talking in complete sentences.
- Lips or fingernails blue.
- Not able to blow peak flow and/or peak flow is in red zone.
- Chest retraction (tightening of chest muscles) - you see this between the ribs and at the front of the neck.
- Unable to perform regular activities.



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## How is Asthma Treated and Managed?



### YOU can help control the student's asthma by...

- giving the student's medicine exactly as instructed; and
- helping the student to avoid triggers (things which can cause an asthma episode).

**Students with asthma do not always take the same brand or type of asthma medicine. Some medicines can be inhaled (breathed in) and others can be taken as a pill by mouth. Asthma medicines come in two types—**

**1. quick-relief and 2. controller.**

#### 1. Quick Relief:

- Quick-relief medicines help relieve the symptoms of an asthma episode.
- If the student uses the quick-relief medicine more than twice a week, other than for exercise-induced asthma (that

is, from physical activities), the parent or guardian should contact the student's health care provider to see if a different medication is needed.

- If a student is having an asthma episode, controller medicines **will not** relieve the symptoms, such as coughing, shortness of breath, wheezing, and/or chest pain. This is the time to give him/her the quick-relief medicine.

#### 2. Controller:

- Controller medicines help the student have fewer and milder asthma episodes and should be taken every day.
- Give the student their controller medicine even when you do not notice any symptoms.

#### Items to Note:

- As with all medicines, asthma medicines can have possible side effects but most are mild and should soon go away or are easy to control.
- Do not stop the asthma medicine before contacting the health care provider.
- Talk with the parent or guardian about any concerns you have.

CONTINUED



## How is Asthma Treated and Managed?, cont.

The important thing to remember is: **asthma can be controlled**. Make sure that the parent/guardian talks with their student's health care provider to **develop an asthma action plan**. After the plan is completed, **go over the action plan** with the parent/guardian and **follow the instructions**.



### After the action plan is completed, you should:

- Let all caregivers **know where** the action plan is kept in case of emergency.
- **Read and understand** what the early and late warning signs are and what steps to follow.
- **Call** the parent or health care provider if you have concerns about the student.
- Know when to **call 911** and what procedures to follow until they arrive.
- **Know** how to use a peak flow meter, and **understand** the changes in peak flow meter scores/readings.

- **Learn and understand** what medicines to give and how often to give them. Follow the doctor's orders.
- **Identify and avoid** asthma triggers.

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#### SOURCES:

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- Quick-relief medicines help relieve the symptoms of an asthma episode.
- If the student uses the quick-relief medicine more than twice a week, other than for exercise-induced asthma (that

is, from physical activities), the parent or guardian should contact the student's health care provider to see if a different medication is needed.

- If a student is having an asthma episode, controller medicines **will not** relieve the symptoms, such as coughing, shortness of breath, wheezing, and/or chest pain. This is the time to give him/her the quick-relief medicine.

#### **2. Controller:**

- Controller medicines help the student have fewer and milder asthma episodes and should be taken every day.
- Give the student their controller medicine even when you do not notice any symptoms.

#### **Items to Note:**

- As with all medicines, asthma medicines can have possible side effects but most are mild and should soon go away or are easy to control.
- Do not stop the asthma medicine before contacting the health care provider.
- Talk with the parent or guardian about any concerns you have.

CONTINUED



## How is Asthma Treated and Managed?, cont.

The important thing to remember is: **asthma can be controlled.** Make sure that the parent/guardian talks with their student's health care provider to **develop an asthma action plan.** After the plan is completed, **go over the action plan** with the parent/guardian and **follow the instructions.**



### After the action plan is completed, you should:

- Let all caregivers **know where** the action plan is kept in case of emergency.
- **Read and understand** what the early and late warning signs are and what steps to follow.
- **Call** the parent or health care provider if you have concerns about the student.
- Know when to **call 911** and what procedures to follow until they arrive.
- **Know** how to use a peak flow meter, and **understand** the changes in peak flow meter scores/readings.

- **Learn and understand** what medicines to give and how often to give them. Follow the doctor's orders.
- **Identify and avoid** asthma triggers.

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#### SOURCES:

U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma*, 2007.

Centers for Disease Control and Prevention. *Asthma: Basic Facts*. Environmental Hazards and Health Effects Program, Air Pollution and Respiratory Health Branch. Information available at: [www.cdc.gov/asthma/basics.htm](http://www.cdc.gov/asthma/basics.htm), June 2008.

# Asthma Education Curriculum for School Nurses and other Elementary-Middle School Professionals



The North Carolina Asthma Program is working to reduce the burden of asthma across the state by providing asthma education to Elementary-Middle School Professionals. Asthma is a chronic disease that affects many North Carolina children and adults.

We invite you to join other school professionals in this region in receiving training in using the new North Carolina Asthma Education Curriculum for School Nurses and Other Elementary-Middle School Professionals.

**Training:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Time:** \_\_\_\_\_

**Location:** \_\_\_\_\_

**2009 NC Asthma Prevalence (includes pop. estimates)**

- **<18 years old:**  
 lifetime asthma – **15.5%** (estimated pop. 343,518)  
 current asthma – **10.1%** (estimated pop. 223,841)
- **18+ years old:**  
 lifetime asthma – **12.9%** (estimated pop. 924,460)  
 current asthma – **7.8%** (estimated pop. 558,976)

**NC Hospitalizations Due to Asthma**

	2008	2009
■ <b>&lt; 5 years old:</b> 251.7/100,000 pop.		270/100,000 pop.
■ <b>5-14 yrs old:</b> 100.3/100,000 pop.		125/100,000 pop.
■ <b>15-34 yrs old:</b> 39.4/100,000 pop.		43/100,000 pop.

*For more information about this asthma training and the educational sessions, please contact:* \_\_\_\_\_

\_\_\_\_\_



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Find

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More!

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# *Certificate of Participation*

*This is to certify that*

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*has successfully completed the  
NC Asthma Program Curriculum Training.*

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Signature

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Date





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State of North Carolina • Beverly Eaves Perdue, Governor  
Department of Health and Human Services  
Lanier M. Cansler, Secretary  
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