NORTH CAROLINA Asthma

ASTHMA EDUCATION CURRICULUM FOR CHILD CARE PROVIDERS

August 2009

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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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 Child Care Providers. 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 involved with the planning and development of this curriculum and are proud to share this product with child care providers within the state. The ideas, expertise, and support reflected in this project are a reflection of the committee's commitment to providing a standardized curriculum for child care providers.

We sincerely thank all of those who have devoted their time and resources to this process. We look forward to the implementation this curriculum throughout the state in order to provide child care providers with accurate and up to date information on asthma control.

With highest regards,

Melinda S. Shuler
Chair of the Education and
Public Affairs Committee

Diane. W. Price
Coordinator
North Carolina Asthma Program

Preface

The Asthma Curriculum for Child Care Providers is brought to you by the North Carolina Asthma Program in the Division of Public Health 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 child care providers in North Carolina. This project was funded as a part of a grant from the Centers for Disease Control and Prevention (CDC).

According to The Burden of Asthma in North Carolina 2006 Report, asthma is a leading chronic illness among children in the United States. The prevalence of asthma is higher among children than adults. An estimated 9 million of children younger than 18 years of age (12.5%) have been diagnosed with asthma. As age increases, the percentage of children ever diagnosed with asthma increases. Rates of current asthma decreased with age, with children 17 years old or younger having a much higher rate of asthma (83 per 1,000) than adults 18 years and older (68 per 1,000).

Many people in North Carolina suffer from asthma, with more than 7 percent of adults and more than 18 percent of children affected by this chronic disease. In 2006, 123 North Carolinians died due to asthma. African Americans, Native Americans, women, the elderly and children under age 5 are among the groups most affected by asthma. This curriculum for child care providers was developed to address the need for asthma education for children under the age of 5 and those who care for them.

We trust that the information contained in the curriculum will guide asthma education to child care providers throughout our state. We invite and encourage everyone who provides asthma education to join the North Carolina Asthma Program and the AANC in working to improve the delivery of asthma education in order to improve the quality of life for those with asthma.

SOURCE:
www.asthma.ncdhhs.gov/burdenReportDocs/burdenSectionFiles/1-asthmaPrevalence.pdf

Introduction

With the help of the Education and Public Awareness Subcommittee of the Asthma Alliance of North Carolina (AANC), the North Carolina Asthma Program has developed this asthma curriculum toolkit to help meet the current needs of children under the age of 5 and of the child care providers who care for them in North Carolina. Children under the age of 5 are of high priority within North Carolina, so providing asthma education information to those who care for them is also a high priority.

The most recent version of the *Guidelines for the Diagnosis and Management of Asthma* (National Heart, Lung, and Blood Institute) states that asthma self-management education is essential to providing patients with the skills necessary to control asthma and improve outcomes. For children with asthma, teachers and caregivers must also understand the condition, how it affects children, and what can be done to manage it. To that end, the N.C. Asthma Education Curriculum for Child Care Providers modules cover the following categories of information:

What is Asthma?

How Do You Know if a Child has Asthma?

Common Asthma Triggers and Environmental Control Measures

Signs and Symptoms of Asthma Trouble

How is Asthma Treated and Managed?

Resource Section – Lesson Plan for Asthma Medicines

Appendices and Handouts

We have obtained permission from the American Lung Association; National Institutes of Health; Environmental Protection Agency; Centers for Disease Control and Prevention; NIH Heart, Lungs and Blood Institute, and the Minnesota Department of Health to use their asthma information in developing these modules. We also obtained permission from the American College of Chest Physicians to use some of their picture illustrations in the modules.

Curriculum Instruction Guide

As an instructor of the Asthma Curriculum for Child Care Providers, you are requested to follow these guidelines for administering the curriculum.

- Each module is divided into several sections:
  1. Outline
  2. Module narrative
  3. Pre- and post-assessments
  4. Handouts for participants
  5. Overall participant evaluation
  6. Instructor evaluation

  NOTE: It is 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.
- Review each module and all instructions for each module completely ahead of time.
- Several items in the appendices are included to assist you. Please review this section before teaching the modules.
- Each module outline will contain objectives, presentation outline/ content, activities, and a list of materials needed. Most materials will be included in the curriculum toolkit but the instructor might want to have some examples of items for "show and tell" (i.e. asthma triggers like candles, air fresheners, etc. and items such as peak flow meters or spacers).
- For documentation of training efforts, please have participants sign in on a sign-in sheet for each training session.
- All participants are to complete the pre/post assessments at the beginning and end of each module and the instructor should collect them when completed. Please have participants complete the overall participant evaluation at the end of each module. A summary of comments should be sent to the N.C. Asthma Program (see below).
- In order for the N.C. Asthma Program to make possible revisions to this document, please also complete the Instructor Evaluation for each module and submit to the N.C. Asthma Program (see below). Please keep a copy of these evaluations for your records.
- 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, Chronic Disease and Injury Section, North Carolina Department of Health and Human Services, 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) 870-4801.

WHAT IS ASTHMA?

"What is Asthma?"

Module 1 Outline

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
GOAL: When the module is completed, participants will be able to: ■ Provide a description of asthma and the process of breathing ■ Describe the symptoms of asthma ■ Describe what happens in an asthma episode		MATERIALS FOR SESSION: ■ Asthma Pre and Post Module Assessments and answer sheets ■ Diagram of lungs ■ Regular drinking straws and coffee stirrer straws for each participant in class ■ "What is Asthma" handout sheet at the end of Module 1 ■ Fact Sheet about Asthma
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	Provide age appropriate definition of asthma DEFINITION: Asthma is a chronic (long-term) disease of the airways in the lungs. A child with asthma may not have symptoms at all and then have a flare-up. Item to be stressed: "Asthma can be controlled".	Discuss "What is Asthma?" handout sheet. Diagram of the lungs and the process of breathing.

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Module 1 Outline, p. 2

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
3. Describe the symptoms of asthma	Asthma is a disease that affects the lungs. It is the most common long-term disease of children, but adults have asthma, too. Asthma causes repeated episodes of: ■ wheezing ■ breathlessness ■ chest tightness ■ coughing If a child has asthma, that child has it all the time. The child will have asthma flare-ups only when something bothers the lungs.	Diagram of lungs and what happens when breathing with asthma.
4. Discuss normal breathing and lung tasks	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.) The lungs perform several tasks: ■ removes wastes and toxins from the body ■ protects a person from germs which might cause infections ■ sends oxygen to the organs Discuss normal breathing rates for children – see chart.	Show pictures of lungs.

CONTINUED

Module 1 Outline, p. 3

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
Discuss breathing with asthma.	In breathing with asthma, the airways become swollen or inflamed. Because of this, they become irritated easily which in turn causes less space for the air to move in and out of the lungs. It may cause shortness of breath or make the child feel as if they can't get a full breath of air. When asthma is controlled, the airways are a little inflamed but the child can breathe easily. The muscles around the airways are relaxed and the lining inside the airways produce some mucus. This mucus helps the child to cough out the irritants.	ACTIVITY: Give a regular drinking straw to each person. Have them breathe through them normally. Then give them a coffee stirrer straw and have the try to breathe through it for 3 minutes. The breathing becomes harder. This is what it is like when a child has an asthma episode.
Describe what happens during an asthma episode	When a child with asthma comes in contact with an asthma trigger, the airways become more inflamed and muscles tighten. The cells lining the airways produce extra mucus which clogs the narrow space in the air tubes. This makes it harder to breathe due to the narrowing airways. When airways are inflamed, they are more sensitive than normal. When the child comes in contact with an asthma trigger such as smoke, dust, pollen, etc. the muscles tighten more in the lungs. The airways keep swelling, and more mucus is made. When this happens, asthma is out of control.	

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Module 1 Outline, p. 4

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	Some people call this an asthma episode, attack, or flare-up. Action must be taken at once to get medical help.	
5. Facts about asthma	A child cannot get asthma from someone else. Asthma does run in families. Asthma is a chronic condition which means the child will always have it. The child will not "out-grow" it. Asthma can be treated but cannot be cured. You can do things to help make it easier to control. The child may have long periods of time without having any problems and then all of a sudden have a flare-up. Asthma can be controlled. For mild asthma, control means asthma rarely bothers the child. For severe asthma, control means having fewer symptoms that keep the child from doing what he/she wants to do.	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.

"What is Asthma?"

Pre-Module Assessment

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. Do you think asthma is an illness that many adults and children have in the United States?		
2. Do you think people's strong emotions or feelings can trigger an asthma episode?		
3. Asthma can cause breathing problems. Do you think these problems can be really harmful or bad?		
4. Do you think asthma episodes can come on suddenly?		
5. Do you think there are many different reasons why people get asthma symptoms?		
6. Asthma cannot be cured, but do you think it can be controlled?		
7. Are there medicines to help control asthma?		
8. Are there ways people with asthma can check on how well their lungs are working?		
9. Do you think both children and adults can have asthma?		
10. Do you think cigarette smoke can make asthma symptoms worse?		
11. Do you think children with asthma can play like the rest of their friends?		

SOURCE:

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

"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. Do you think asthma is an illness that many adults and children have in the United States?	X	
2. Do you think people's strong emotions or feelings can trigger an asthma episode?	X	
3. Asthma can cause breathing problems. Do you think these problems can be really harmful or bad?	X	
4. Do you think asthma episodes can come on suddenly?	X	
5. Do you think there are many different reasons why people get asthma symptoms?	X	
6. Asthma cannot be cured, but do you think it can be controlled?	X	
7. Are there medicines to help control asthma?	X	
8. Are there ways people with asthma can check on how well their lungs are working?	X	
9. Do you think both children and adults can have asthma?	X	
10. Do you think cigarette smoke can make asthma symptoms worse?	X	
11. Do you think children with asthma can play like the rest of their friends?	X	

SOURCE:

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

"What is Asthma?"

Module 1 Narrative

Definition of asthma:
Asthma is a chronic (long-term) disease of the airways in the lungs. It is the most common long-term disease in children. A child with asthma may not have symptoms at all and then have a flare-up.

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

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

Children 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 airway. 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.

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Module 1 Narrative, p. 2

Normal breathing rates for children

Age	Breaths per minute
Newborn to 6 months	30–60
6 to 12 months	24–30
1 to 5 years	20–30
6 to 12 years	12–20

2. Discuss breathing with asthma:

In breathing with asthma, the airways become swollen or inflamed. Because of this, they become irritated easily, causing less space for the air to move in and out of the lungs. Asthma may cause shortness of breath or make the child feel as if they can't get a full breath of air.

When asthma is controlled, the airways are a little inflamed but the child can breathe easily. The muscles around the airways are relaxed and the lining inside the airways produce some mucus. This mucus helps the child to cough out the irritants.

3. Describe what happens during an asthma episode:

When a child with asthma comes in contact with an asthma trigger, the airways become more inflamed and muscles tighten. The cells lining the airways produce extra mucus which clogs the narrow space in the air tubes. This makes it harder to breathe due to the narrowing airways.

When airways are inflamed, they are more sensitive than normal. When the child with asthma comes in contact with an asthma trigger such as smoke, dust, pollen, etc. the muscles tighten in the lungs. The airways swell and make more mucus. When this happens, asthma is out of control. Some people call this an asthma episode, an attack, or a flare-up. Action must be taken at once to get medical help.

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

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

Give a regular drinking straw to each person. Have the person breathe through the straw normally.

Afterwards, give the person a coffee stirrer straw and have each person try to breathe through it for three minutes. The breathing becomes harder. This is what it is like when a child has an asthma episode.

When asthma is *under control*...

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

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Module 1 Narrative, p. 3

The status of the child's asthma control is an essential part of asthma self-management education.

You *can help* the child to learn 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 child's asthma episode(s) and helping him/her stay away from these triggers;
- giving the child's medicine as instructed;
- having the parent/caregiver talk with the health care provider to develop an asthma action plan;
- making sure the child has regular asthma check-ups and has an asthma action plan.

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, 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, Home page: www.chestnet.org

What is Asthma?

You *can help* the child 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 child's asthma episode(s) and helping him/her stay away from these triggers;
- giving the child's medicine as instructed;
- having the parent/caregiver talk with the health care provider to develop an asthma action plan; and
- making sure the child has regular asthma check-ups.

Asthma is a disease that affects the lungs. **It is the most common long-term (chronic) disease in children.** Asthma is likely to run in families. It often causes coughing, wheezing, shortness of breath, and/or chest tightness. A child 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*...

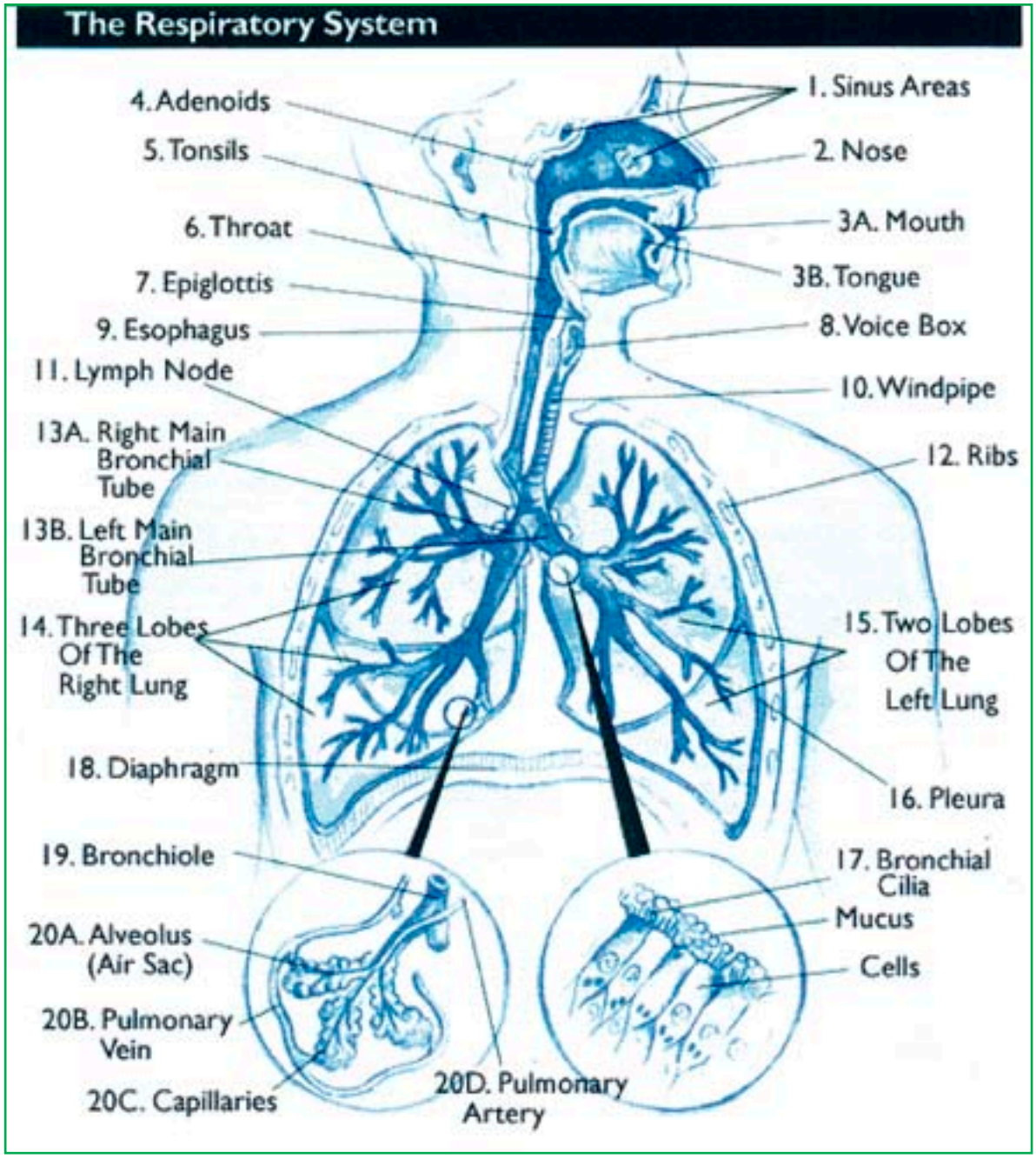
- Symptoms like wheezing or coughing will improve.
- The child will feel and sleep better.
- The child can be involved in physical activities.
- The child should not have to go to the hospital/emergency room due to an asthma episode.

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, 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

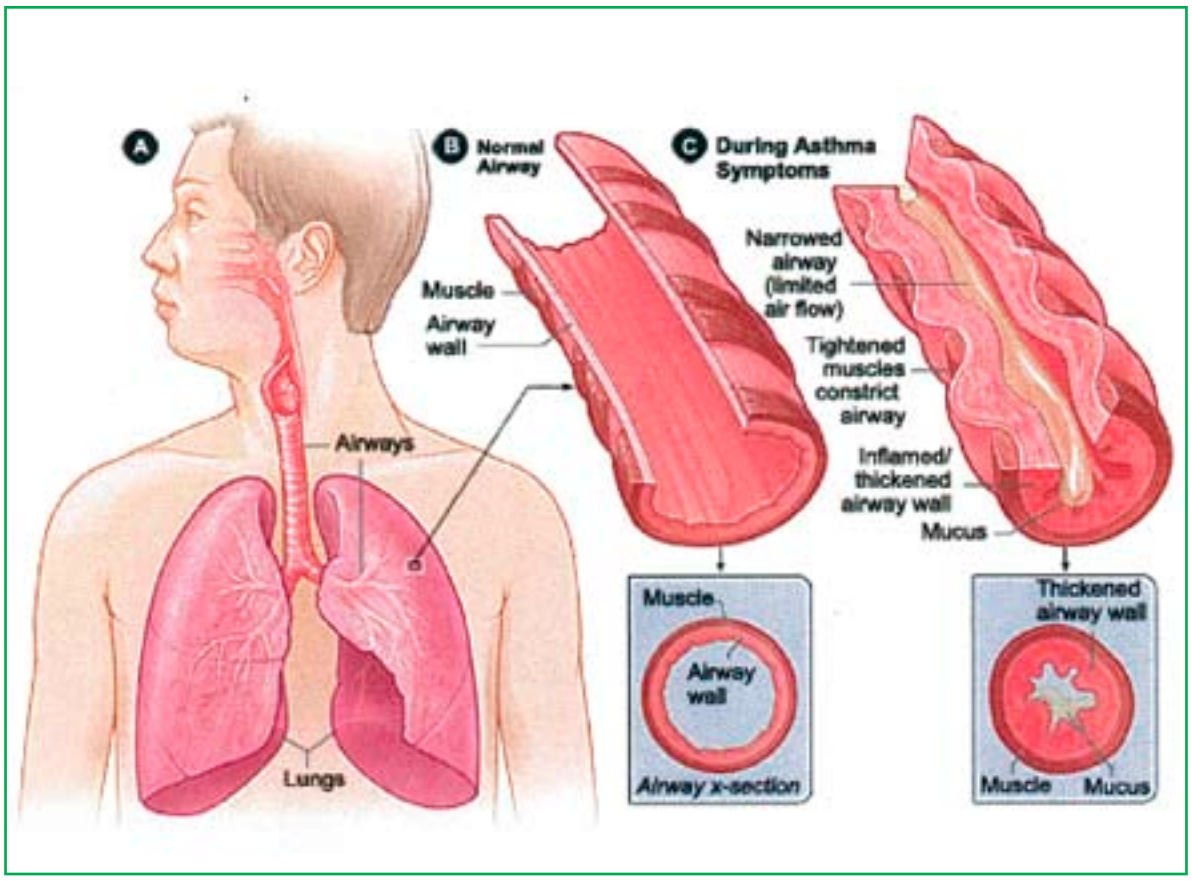


Figure A shows the location of the lungs and airways in the body. Figure B shows a cross-section of a normal airway. Figure C shows a cross-section of an airway during asthma symptoms.

Fact Sheet about Asthma

- Asthma is a chronic disease that affects the lungs. It is the most common long term disease of children.
- Asthma is a chronic condition which means the child will always have it. The child will not "outgrow" it.
- A child cannot get asthma from someone else.
- Asthma does run in families.
- Asthma can be treated but cannot be cured. You and the child 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 child to learn what they are.
- You can help the child to stay away from things that trigger an episode.
- The child 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 child's health care provider as stated on the child's asthma action plan.

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

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, 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, July 2008.

"What is Asthma?"

Post-Module Assessment

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	AGREE	DISAGREE
1. Children with asthma can play like the rest of their friends.		
2. Asthma is an illness that many children have in the United States.		
3. Cigarette smoke can make asthma symptoms worse for children.		
4. Children's strong emotions or feelings can trigger an asthma episode.		
5. Children, as well as adults, can have asthma.		
6. Asthma can cause breathing problems which can be harmful.		
7. Children can check to see how well their lungs are working.		
8. There are asthma medicines to help control asthma.		
9. Asthma can be controlled but not cured.		
10. There are many reasons why children get asthma symptoms.		

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	AGREE	DISAGREE
1. Children with asthma can play like the rest of their friends.	X	
2. Asthma is an illness that many children have in the United States.	X	
3. Cigarette smoke can make asthma symptoms worse for children.	X	
4. Children's strong emotions or feelings can trigger an asthma episode.	X	
5. Children, as well as adults, can have asthma.	X	
6. Asthma can cause breathing problems which can be harmful.	X	
7. Children can check to see how well their lungs are working.	X	
8. There are asthma medicines to help control asthma.	X	
9. Asthma can be controlled but not cured.	X	
10. There are many reasons why children get asthma symptoms.	X	

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!

HOW DO YOU KNOW IF A CHILD HAS ASTHMA?

"How Do You Know if a Child has Asthma?"

Module 2 Outline

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
GOAL: When the class is completed, participants will be able to: ■ Describe the symptoms of asthma ■ Provide 4 examples of possible questions a health care provider will ask during the child's check-up ■ Describe spirometry and reason for use		MATERIALS FOR SESSION: ■ Handout sheet called "How Do You Know if a Child has Asthma?" located in Module 2 ■ Pre- and Post- Module Assessments and answer sheets
1. Distribute Pre-Module Assessment Discuss the symptoms of asthma	Have participants complete Pre-Module Assessment. Some of the basic symptoms a child might have are: ■ wheezing, ■ coughing, ■ shortness of breath, ■ chest tightness. Review the information on "How Do You Know if a Child has Asthma?"	Pre-Module Assessment and answer sheet "How Do You Know if a Child has Asthma" handout sheet.
2. Discuss the stages of asthma	There are two stages of asthma: ■ Intermittent ■ Persistent If the child has **intermittent asthma**, the asthma symptoms come and go, such as: ■ The child may have symptoms two times a week or less.	

CONTINUED

Module 2 Outline, p. 2

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	■ The child may also wake up at night because of asthma symptoms two times a month or less. If the child has **persistent asthma**, he/she will have some asthma symptoms all the time, even when asthma is controlled. Control means the degree to which the symptoms of asthma are reduced and the goals of therapy are met. The health care provider will tell the parent what stage of asthma the child has based on the information that the parent can give and on tests that might be performed. The child care provider can help by providing the parent with information regarding symptoms or problems observed while in their care.	
3. Discuss possible questions a health care provider might ask during a medical exam to determine if the child has asthma	It is important for the child to have a regular medical home with a health care provider. Seeing the child's health care provider for regular physical checkups will help in determining if the child has asthma. The health care provider normally will ask or do the following: ■ obtain a medical history ■ obtain a family history	

CONTINUED

Module 2 Outline, p. 3

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	■ perform a physical examination of child ■ ask about the child's symptoms or other health conditions ■ discuss if the child has any allergies For children under the age of 5, asthma is often hard to detect. So health care providers normally obtain a medical and family history, and perform a physical examination of child. The provider will listen to the lungs and possibly suggest further testing, such as a lung function and allergy tests. Often a child under 5 years will be given a bronchodilator – a drug that opens the airways – to see if it reduces the symptoms.	
4. Briefly discuss spirometry and reason for use.	Spirometry – a pulmonary test of the lungs using a spirometer. A spirometer – an instrument that measures the amount of air moved in and out of the lungs (the amount of inhaled and exhaled air).	
5. Post-Module Assessment	Administer Post-Module Assessment	Post–Module Assessment and answer sheet.

"How Do You Know if a Child has Asthma"

Pre-Module Assessment

1. Some of the basic symptoms a child might have are: **(Check all that apply)**

   ☐ Wheezing
   ☐ Coughing
   ☐ Chest tightness
   ☐ Shortness of breath

2. TRUE or FALSE **(circle one)**: Spirometry is useful in the diagnosis of asthma.

3. The health care provider normally will ask or do the following: **(Check all that apply)**

   ☐ obtain a medical history
   ☐ obtain a family history
   ☐ will perform a physical examination of child
   ☐ ask about the child's symptoms or other health conditions
   ☐ discuss if the child has any allergies

4. TRUE or FALSE **(circle one)**: Asthma can be hard to diagnose or detect, especially in children that are under the age of 5.

5. TRUE or FALSE **(circle one)**: A child under 5 will often be given a bronchodilator – a drug that opens the airways – to see if it reduces the symptoms.

6. TRUE or FALSE **(circle one)**: Certain activities can cause breathing problems for the child.

7. TRUE or FALSE **(circle one)**: The health care provider will ask if any family members have or have had asthma, allergies, or other breathing problems?

"How Do You Know if a Child has Asthma"

Pre-Module Assessment Answer Sheet

1. Some of the basic symptoms a child might have are: **(Check all that apply)**
   - ☑ Wheezing
   - ☑ Coughing
   - ☑ Chest tightness
   - ☑ Shortness of breath

2. TRUE or FALSE **(circle one)**: Spirometry is useful in the diagnosis of asthma.

3. The health care provider normally will ask or do the following: **(Check all that apply)**
   - ☑ obtain a medical history
   - ☑ obtain a family history
   - ☑ will perform a physical examination of child
   - ☑ ask about the child's symptoms or other health conditions
   - ☑ discuss if the child has any allergies

4. **TRUE** or FALSE **(circle one)**: Asthma can be hard to diagnose or detect, especially in children that are under the age of 5.

5. **TRUE** or FALSE **(circle one)**: A child under 5 will often be given a bronchodilator – a drug that opens the airways – to see if it reduces the symptoms.

6. **TRUE** or FALSE **(circle one)**: Certain activities can cause breathing problems for the child.

7. **TRUE** or FALSE **(circle one)**: The health care provider will ask if any family members have or have had asthma, allergies, or other breathing problems?

"How Do You Know if a Child has Asthma"

Module 2 Narrative

1. Discuss the symptoms of asthma

Asthma can be hard to diagnose or detect, especially in children that are under 5 years of age. If a child has times of wheezing, coughing, and shortness of breath, the health-care provider may suspect asthma. In addition to asking about symptoms, the provider will perform a physical examination of the child.

Some of the basic symptoms a child might have are:

- Wheezing
- Coughing
- Shortness of breath
- Chest tightness

2. There are two stages of asthma:

- Intermittent
- Persistent

If the child has **intermittent asthma**, the asthma symptoms come and go, such as:

- The child may have symptoms two times a week or less.
- The child may also wake up at night because of asthma symptoms two times a month or less.

If the child has **persistent asthma**, he/she will have some asthma symptoms all the time, even when asthma is controlled. Control means the degree to which the symptoms of asthma are reduced and the goals of therapy are met.

The health care provider will tell the parent what stage of asthma the child has based on the information that the parent can give and on tests that might be performed. The child care provider can help by providing the parent with information regarding symptoms or problems observed while being in their care.

Review the information on "How Do You Know if a Child has Asthma?" sheet. This sheet is located behind the narrative in Module 2.

3. Discuss possible questions a health care provider might ask during a medical exam to determine if the child has asthma.

It is important for the child to have a regular medical home with a health care provider. Seeing the child's health care provider for regular physical checkups will help in determining if he/she has asthma. The health care provider normally will ask or do the following:

- obtain a medical history
- obtain a family history
- perform a physical examination of child

CONTINUED

Module 2 Narrative, cont.

- ask about the child's symptoms or other health conditions
- discuss if the child has any allergies

During a checkup, the health care provider will ask several questions for the medical history:

- Does the child cough? If so, when and how often?
- Does the child have trouble sleeping at night due to coughing, wheezing, or other breathing problems?
- Are breathing problems worse after physical activity or during a particular time of year?
- Do certain activities cause breathing problems for the child?
- Do problems with asthma keep the child from participating in their normal activities? If so, how often?
- Does the child have other symptoms such as chest tightness, wheezing, shortness of breath, or colds which last more two or three days?
- Do any of your family members have or have had asthma, allergies, or other breathing problems?
- What are your home surroundings like – i.e. furry pets, mold, smokers in home, etc?
- Was the child premature at birth?
- Is the child exposed to secondhand smoke?
- How much and what kind of medicine does the child need or use?

4. Discuss briefly spirometry and other testing:

After gathering this type of information, the health care provider will listen to the lungs and may recommend a lung function (breathing) test, if the child is old enough to perform the test. Usually a child has to be 5 years of age or older to perform the test. A lung function test, called spirometry (spy-rom-e-tree), can be used to help diagnose someone with asthma. A spirometer (spy-rom- e-ter) measures the largest amount of air you can breathe out, after taking in a very deep breath. The spirometer can measure airflow before and after you use asthma medicine.

In some cases, other tests are needed to make the proper diagnosis. The provider will want to make sure the child's symptoms are not being caused by something else. Often a child under 5 will be given a bronchodilator - a drug that opens the airways - to see if it reduces the symptoms.

SOURCES:

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

How Do You Know if a Child has Asthma?

Asthma can be hard to detect, especially in children under the age of 5. If the child has wheezing, coughing, shortness of breath, and/or chest tightness, the health care provider may suspect asthma. Going to a health care provider for regular check-ups will help in deciding if the child has asthma.

Symptoms alone are not enough to decide if a child has asthma. After gathering the above information, the health care provider may suggest a lung function (breathing) test also called spirometry. In some cases, other tests are needed. The provider will make sure the symptoms are not being caused by something else.

NOTE: If the health care provider has decided that the child has asthma, the provider will work with the parent/caregiver to develop an asthma action plan. **Please follow this plan and the instructions on it.**

When the child goes for a check-up, the health care provider will ask several questions:

- Does the child cough? If yes, how often?
- Are breathing problems worse during play time or during a particular time of year?
- Do you notice other symptoms, such as chest tightness, wheezing, and/or shortness of breath?
- Are there certain activities which cause breathing problems for the child?
- Does asthma keep the child from going to school or to child care? If yes, how often?
- Are there any family members who have asthma, allergies, or other breathing problems?
- Are there things in the house/building which seem to bother the child – that is, furry pets, mold, smokers, etc.?

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, June 2008.

"How Do You Know if a Child has Asthma"

Post-Module Assessment

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	AGREE	DISAGREE
1. Asthma can be hard to diagnose or detect.		
2. Certain activities can cause breathing problems for the child.		
3. The health care provider will ask if any family members have asthma.		
4. Spirometry is useful in determining if a child has asthma.		
5. A basic symptom of asthma is coughing.		
6. A health care provider will never ask about the child's symptoms or health conditions.		
7. The health care provider may try a bronchodilator to open the airways in children under 5 years old to relieve the symptoms.		

"How Do You Know if a Child has 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	AGREE	DISAGREE
1. Asthma can be hard to diagnose or detect.	X	
2. Certain activities can cause breathing problems for the child.	X	
3. The health care provider will ask if any family members have asthma.	X	
4. Spirometry is useful in determining if a child has asthma.	X	
5. A basic symptom of asthma is coughing.	X	
6. A health care provider will never ask about the child's symptoms or health conditions.		X
7. The health care provider may try a bronchodilator to open the airways in children under 5 years old to relieve the symptoms.	X	

NORTH CAROLINA Asthma

Module 2: How Do You Know if a Child has 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"

Module 3 Outline

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
GOAL: When the session is completed, participants will be able to: ■ Describe asthma triggers ■ Describe how triggers affect a child with asthma ■ Describe some common triggers ■ Describe how an asthma episode can be prevented by knowing the triggers		MATERIALS FOR SESSION: ■ "How Asthma-Friendly Is Your Child Care Setting?" ■ Common Asthma Triggers handout sheet ■ Examples of common triggers (i.e. scented candle, air fresheners, strong chemicals, and cleaning products) ■ Environmental Control sheets ■ Pre- and Post-Module Assessments and answer sheets
1. Have participants complete the "How Asthma-Friendly Is Your Child Care Setting" at beginning of session. Have participants complete Pre-Module Assessment. Discuss the definition of asthma triggers	Provide the definition of asthma triggers DEFINITION: Children with asthma have airways that are super-sensitive to things which cause their asthma to become worse. These are called asthma triggers.	■ Distribute Pre-Module Assessment and have participants complete. When complete, review answers. ■ Common Asthma Triggers handout sheet. ■ "How Asthma-Friendly Is Your Child Care Setting?" handout sheet.
2. Discuss how triggers affect a child with asthma	What causes asthma symptoms? ANSWER: Asthma triggers For children 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 to swell.	

CONTINUED

Module 3 Outline, p. 2

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
3. Discuss the common asthma triggers	Since you have completed the activity sheet, look at it as we review the "Common Asthma Triggers" handout sheet.	■ The "Common Asthma Triggers" handout sheet and discuss the information contained on the sheet – describing the items listed if necessary.
4. Discuss how asthma episodes can be prevented or managed by knowing the child's asthma triggers	To prevent asthma episodes, children with asthma need to know what their asthma triggers are and plan ways to avoid or reduce them. Some questions for you to ask yourself when the child is having an asthma episode are: ■ When did their asthma start getting out of control? ■ Where was the child? ■ What conditions or triggers were present? ■ What was the child doing? ■ What mood was he/she in?	
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.	Distribute the Environmental Control sheets and discuss the triggers that the care givers have identified as problems for children.
6. Post–Module assessment	Distribute Post-Module Assessments and have participants complete.	Post-Module Assessment sheet and answer sheet

"Common Asthma Triggers"

Pre-Module Assessment

Instructions: For all responses, circle the word true or false.

1. TRUE or FALSE: Asthma triggers vary and are different for every child.
2. TRUE or FALSE: Getting rid of asthma triggers is not important.
3. TRUE or FALSE: Children with asthma need to know what triggers their asthma.
4. TRUE or FALSE: Triggers cause changes in the airways.
5. TRUE or FALSE: Strong odors do not normally cause problems with asthma.
6. TRUE or FALSE: Outdoor air pollution, especially ozone and particulate matter, can increase asthma symptoms.
7. TRUE or FALSE: The two best approaches to reducing indoor air pollution are source control and ventilation.
8. TRUE or FALSE: Asthma symptoms can be triggered by secondhand smoke.
9. TRUE or FALSE: Cover mattresses, box springs, and pillows with dust proof (allergen-resistant) zippered covers.

SOURCES:

www.epa.gov/asthma/triggers.html, Aug 2008.
www.epa.gov/asthma, June 2008.
www.atsdr.cdc.gov/csem/asthma/treatment.html, June 2008.

"Common Asthma Triggers"

Pre-Module Assessment Answer Sheet

Instructions: For all responses, circle the word true or false.

1. **TRUE** or FALSE: Asthma triggers vary and are different for every child.
2. TRUE or **FALSE**: Getting rid of asthma triggers is not important.
3. **TRUE** or FALSE: Children with asthma need to know what triggers their asthma.
4. **TRUE** or FALSE: Triggers cause changes in the airways.
5. TRUE or **FALSE**: Strong odors do not normally cause problems with asthma.
6. **TRUE** or FALSE: Outdoor air pollution, especially ozone and particulate matter, can increase asthma symptoms.
7. **TRUE** or FALSE: The two best approaches to reducing indoor air pollution are source control and ventilation.
8. **TRUE** or FALSE: Asthma symptoms can be triggered by secondhand smoke.
9. **TRUE** or FALSE: Cover mattresses, box springs, and pillows with dust proof (allergen-resistant) zippered covers.

SOURCES:
www.epa.gov/asthma/triggers.html, Aug 2008.
www.epa.gov/asthma, June 2008.
www.atsdr.cdc.gov/csem/asthma/treatment.html, June 2008.

"How Asthma-Friendly Is Your Child Care Setting?" Checklist

Children with asthma need proper support in child-care settings to keep their asthma under control and be fully active. Use the questions below to find out how well your child-care setting assists children with asthma:

	COMMENTS
1. Is the child-care setting free of tobacco smoke at all times? ☐ Yes ☐ No	
2. Is there good ventilation in the child-care setting? Are allergens and irritants that can make asthma worse reduced or eliminated? Check if any of the following are present: ☐ Yes ☐ No ☐ Cockroaches ☐ Dust mites (commonly found in humid climates in pillows, carpets, upholstery, and stuffed toys) ☐ Mold ☐ Pets with fur or feathers ☐ Strong odors or fumes from art and craft supplies, pesticides, paint, perfumes, air fresheners, and cleaning chemicals	
3. Is there a medical or nursing consultant available to help child-care staff write policy and guidelines for managing medications in the child-care setting, reducing allergens and irritants, promoting safe physical activities, and planning field trips for students with asthma? ☐ Yes ☐ No	
4. Are child-care staff prepared to give medications as prescribed by each child's physician and authorized by each child's parent? May children carry their own asthma medicines when appropriate? Is there someone available to supervise children while taking asthma medicines and monitor correct inhaler use? ☐ Yes ☐ No	

CONTINUED

"How Asthma-Friendly is Your Child Care Setting?" Checklist, cont.

	COMMENTS
5. Is there a written, individualized emergency plan for each child in case of a severe asthma episode (attack)? Does the plan make clear what action to take? Whom to call? When to call? ☐ Yes ☐ No	
6. Does a nurse, respiratory therapist, or other knowledgeable person teach child-care staff about asthma, asthma management plans, reducing allergens and irritants, and asthma medicines? Does someone teach all the children about asthma and how to help a classmate who has it? ☐ Yes ☐ No	
7. Does the child-care provider help children with asthma participate safely in physical activities? For example, are children encouraged to be active? Can children take or be given their medicine before exercise? Are modified or alternative activities provided for the child when medically necessary? ☐ Yes ☐ No	

If the answer to any question is "no," children in your child-care setting may be facing obstacles to controlling their asthma. Uncontrolled asthma can hinder a child's attendance, participation, and progress in school. Child-care staff, health professionals, and parents can work together to remove obstacles and promote children's health and development.

Contact the organizations listed in resource section for information about asthma and helpful ideas for making school policies and practices more asthma-friendly. Federal and State laws are in place to help children with asthma.

Asthma can be controlled; expect nothing less.

SOURCE: Reproduced with permission from U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. Information available at: www.nhlbi.nih.gov/health/public/lung/asthma/chc_chk.htm, July 2008.

Notes from the North Carolina Asthma Program Concerning "How Asthma-Friendly Is Your Child Care Setting?"

The preceeding checklist was published from National Heart, Lung, and Blood Institute (NHLBI) in the exact format that it was released. The following provides a description for some of the words used in the checklist.

Wherever the words "allergens and irritants" are used in this document, these words may also be referred to as asthma "triggers." An allergen is defined as any substance that causes an allergic reaction. An irritant is defined something which causes soreness or inflammation.

Under point #2 in the above list, the following word changes may be appropriate:

- The word "removed" may be used to replace the word "eliminated."
- The word "airing" may be used to replace the word for "ventilation."
- The word "vapors" may be used to replace the word for "fumes."
- The phrase "cleaning chemicals" may be used to replace the phrase "cleaning products or cleaning solutions."
- In question 2, the N.C. Asthma Program would also add the word "comforters" to the listing of items beside dust mites.

Throughout the document, the word "medicines" may be used to replace the word "medications."

Asthma inhalers are devices for treating asthma. They contain an asthma medication–a drug which treats the symptoms of asthma.

The term "asthma action plans" may be used in place of the words "asthma management plans."

SOURCES:

Reproduced with permission from U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. Information available at: www.nhlbi.nih.gov/health/public/lung/asthma/chc_chk.htm, July 2008.

Sheet of explanations are submitted to help clarify words in this document. Source for the explanation of terms:

- Guralnik, David B, Editor in Chief, (1974). Webster's New Word Dictionary of the American Language (2nd Edition). Cleveland & New York: William Collins-World Publishing Co, Inc.

"Common Asthma Triggers"

Module 3 Narrative

1. **Distribute the "How Asthma-Friendly Is Your Child Care Setting" questionnaire for completion in class**

2. **Discuss the definition of asthma triggers**

> **Definition:** Children with asthma have airways that are super-sensitive to things which cause their asthma to become worse. These things are called asthma triggers.

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

3. **Discuss how triggers affect the child with asthma**

   Question: What causes asthma symptoms?

   Answer: Asthma triggers

For children 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 child is sensitive.

4. **Discuss the common asthma triggers**

After completing the "How Asthma-Friendly Is Your Child Care 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 child's asthma triggers**

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

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

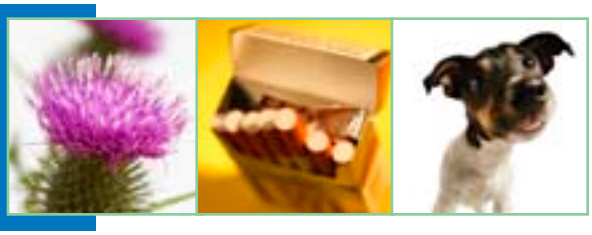
6. **Discuss the Environmental Control sheets and how to reduce the triggers.**

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

SOURCES:

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

Common Asthma Triggers



General Irritants

Be careful if the child 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 child 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, June 2008.

www.epa.gov/asthma/triggers.html, June 2008.

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 in 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 you can do?

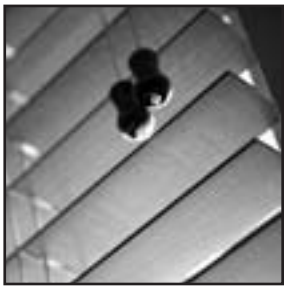
- Clean mold or mildew with a cleaning solution made up of detergent and water. Wear gloves when mixing or applying solution. After the area has been cleaned, make sure to dry it.
- Use exhaust fans or open a window in the bathroom when showering and the kitchen when cooking.
- Fix leaky plumbing or 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 the house; evaporative coolers are not recommended.
- When first turning on home or car air conditioners, leave the room or drive the car with windows open for several minutes to allow mold spores to disperse.

- Do not use a humidifier.
- Do not install carpet and/or wallpaper in rooms prone to dampness.
- After trying to correct the moisture in a closet, leaving the closet door open will improve ventilation and may solve the problem. Also consider leaving an incandescent light on in the closet to reduce the humidity level.
- Install and use exhaust fans in the kitchen, bathrooms, and damp areas.
- Vent bathrooms and clothes dryers to the outside.
- Remove decaying debris from the yard, roof, and gutters.
- Avoid raking leaves, mowing lawns, or working with peat, mulch, hay, or dead wood if you are allergic to mold spores.

SOURCES:
www.epa.gov/asthma/triggers.html, Aug 2008.
www.epa.gov/asthma, June 2008.
www.atsdr.cdc.gov/csem/asthma/treatment.html, June 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 you can do:

- Vacuum carpets, rugs and furniture often with a cleaner that has a High Efficiency Particulate Air (HEPA) filter or double-layered micro filter bags.
- Remove carpet from bedrooms.
- Cover mattresses, box springs, and pillows with dust proof (allergen-resistant) zippered covers.
- Wash bedding (sheets, blankets and bedcovers) once per week in hot water and dry completely.
- Choose washable stuffed toys; wash them often in hot water and dry them thoroughly.
- Place small stuffed toys in freezer for 24 hours once a month. You must wash anything you freeze to remove the residue which will still cause allergies.
- Keep stuffed toys off beds.
- Keep humidity low, ideally between 30-50% relative humidity. Humidity levels can be measured by hygrometers which are available at local hardware stores.
- Use an air conditioner or dehumidifier.
- Consider removing upholstered furniture if it cannot be properly cleaned.
- Replace draperies with blinds or other window coverings that can be wiped clean.
- Use a damp mop or rag to remove dust.
- Keep people with asthma or respiratory problems out of the area when cleaning.

SOURCES:
www.epa.gov/asthma/triggers.html, Aug 2008.
www.epa.gov/asthma, June 2008.
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 children from tobacco smoke.

What you can do:

- Don't let anyone smoke near the child.
- Change clothes after smoking while you are in the process of cutting down on the number of cigarettes.
- If you smoke, do not smoke near children or other nonsmokers.
- Seek support to quit smoking:
  1) Call the N.C. Tobacco Use Quit Line at 1-800-QUIT-NOW (1-800-784-8669) to talk to a trained quit coach for free and confidential assistance.
  2) Visit the website "Become an Ex" at: www.becomeanex.org
  3) Medicines that are used in an effort to quit smoking can double the chances of quitting when used with quit support like the Quitline. Talk to a health care provider about the use of nicotine gum, patch, and other medicines to help in quitting smoking.
- Choose smoke-free home child care settings and social settings. All licensed child care centers are smoke-free.
- Seek smoke-free environments in restaurants, theaters, and hotel rooms.

PARENTS:
Pledge to make your home "smoke-free."

SOURCES:
www.tobaccopreventionandcontrol.ncdhhs.gov, June 2008.
www.epa.gov/asthma, June 2008.
www.nctobaccofreeschools.com, Aug 2008.
www.smokefree.gov, Aug 2008.
www.epa.gov/asthma/triggers.html, Aug 2008.
www.atsdr.cdc.gov/csem/asthma/treatment.html, Aug 2008.

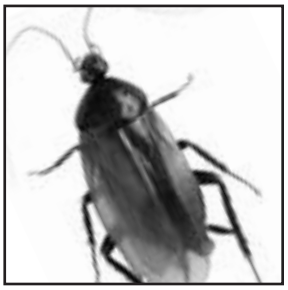
"Environmental Control Measures"

Pest Management

Use the integrated pest management (IPM) approach for extermination and lower toxic methods should be used. Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices.

What you can do:

- Keep house 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.
- Use outdoor treatments as much as possible to prevent insects from entering your house.
- If those steps are unsuccessful, seek help from a professional, licensed exterminator rather than spraying chemicals yourself.
- Stay away from house for several hours after pesticides are applied.
- Avoid using liquid sprays inside the house, especially near places where children 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 you can do

- Keep counters, sinks, tables, and floors clean and dry.
- Clean dishes, crumbs, and spills.
- Store food (including pet food) in air-tight containers.
- Cover trash cans.
- Limit spread of food around the house, especially in bedrooms.
- Restrict food consumption to the kitchen or dining room.
- Fix water leaks under sinks.
- Mop the kitchen floor and clean countertops at least once a week.
- Check for and seal/repair crevices outside the home that cockroaches may enter.
- Caulk or patch holes in walls, cupboards, and cabinets.

SOURCES:
www.epa.gov/asthma/triggers.html, Aug 2008.
www.epa.gov/asthma, June 2008.
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 you can do:

- Keep pets outside if possible, or find a new home for the pet.
- If you have a pet inside, keep it out of the bedroom and off the furniture.
- Vacuum carpets and furniture regularly using a cleaner with a HEPA filter or a double-layered micro-filter bag.
- Select low-dander pets in place of those with fur or feathers. It is not the fur, but the skin and saliva that are considered pet dander.

If those options are not possible, the following steps may help reduce exposure:

- Enclose mattresses, box springs, and pillows with zippered plastic cases.
- Remove carpets.
- Do not vacuum when the person with asthma is at home or in the room.
- Keep pets off furniture.

SOURCES:
www.epa.gov/asthma/triggers.html, Aug 2008.
www.epa.gov/asthma, June 2008.
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 house, such as cleaners, paints, varnishes, or solvents containing volatile organic compounds (VOC), adhesives, pesticides, cosmetics, or air fresheners, may make a child's asthma worse.

What you can do:

- Use these products less often, and make sure the child is not around when you use the products. Also, consider trying different products.
- Take great care to follow the instructions on the label. Open windows or doors, and use an exhaust fan.
- Use low-odor or low volatile organic compounds (VOC) in paints, zero-VOC paint, and/or non-toxic or natural paint.

- 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, June 2008.
www.atsdr.cdc.gov/csem/asthma/treatment.html, June 2008.
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 you can do:

- Limit indoor humidity and moisture.
- 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 the room in which fuel-burning appliances are used.
- Ensure that the doors of wood burning stoves fit tightly.
- Do not use un-vented space heaters or other appliances. If you have to, then open a window in the area.
- Ensure that fireplaces are properly vented so smoke escapes through the chimney.
- Never use a gas cooking appliance as a heating source.

- Open windows, especially when pollutant sources are in use (this option must be balanced against the concern of mold allergy or other plant allergens and outdoor air pollution).
- Check filters regularly, and change them when necessary.

SOURCES:
www.epa.gov/asthma/triggers.html, Aug 2008.
www.epa.gov/asthma, June 2008.
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 you can do:

- Monitor air quality and pollen levels, and keep children indoors when pollutants are high.
- Avoid contact with vehicle exhaust gases and particulates (such as student exposure to idling school buses).
- Consider upgrading to a MERV 8 or better filter. MERV, or Minimum Efficiency Reporting Value, is a number from 1 to 16 that is relative to an air filter's effectiveness. The higher the MERV, the better the air filter is at removing particles. Consult a contractor familiar with your heating, ventilation, and air conditioning system before upgrading to a more efficient filter.
- If possible, move to a less polluted location.
- Schedule outdoor activities for times when ozone levels are lowest, typically in the morning.

SOURCES:
www.epa.gov/asthma/triggers.html, Aug 2008.
www.epa.gov/asthma, June 2008.
www.atsdr.cdc.gov/csem/asthma/treatment.html, June 2008.

"Environmental Control Measures"

Nitrogen Dioxide

Nitrogen dioxide is an odorless gas that can be an asthma trigger for some people. It can irritate the eyes, nose, and throat and may cause shortness of breath. This gas can come from the use of appliances that burn fuels, such as gas, wood, and kerosene.

What you can do:

- If possible, use fuel-burning appliances that are vented outside. Always follow the manufacturer's instructions on how to use these appliances.
- Gas cooking stoves: Never use these to keep you warm or to heat the house. If you have an exhaust fan, use it when you cook.
- Un-vented kerosene or gas space heaters: Use the proper fuel and keep the heater adjusted the right way. Open a window slightly or use an exhaust fan.
- Wood stoves: Make sure the doors are tight-fitting. Follow the maker's instructions for starting, burning, and putting out the fire.

- Fireplaces: Always open the chimney smoke outlet so that the smoke can escape through the chimney.

SOURCES:
www.epa.gov/asthma/triggers.html, Aug 2008
www.epa.gov/asthma, June 2008
www.atsdr.cdc.gov/csem/asthma/treatment.html, June 2008

"Common Asthma Triggers"

Post-Module Assessment

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	AGREE	DISAGREE
1. It is best not to have furry warm blooded animals in the child care center.		
2. All children have the same asthma triggers.		
3. Triggers cause changes in the airways.		
4. Outdoor pollution does not bother a child with asthma.		
5. Asthma can be triggered by secondhand smoke.		
6. Children do not need to know their triggers.		
7. Strong odors can cause problems for children with asthma.		
8. Cover mattresses with zippered covers that are allergen resistant.		
9. Reduce indoor air pollution by controlling ventilation and source control.		
10. Outdoor air pollution can increase asthma symptoms.		

SOURCES:

www.epa.gov/asthma/triggers.html, Aug 2008.

www.epa.gov/asthma, June 2008.

www.atsdr.cdc.gov/csem/asthma/treatment.html, June 2008.

"Common Asthma Triggers"

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	AGREE	DISAGREE
1. It is best not to have furry warm blooded animals in the child care center.	X	
2. All children have the same asthma triggers.		X
3. Triggers cause changes in the airways.	X	
4. Outdoor pollution does not bother a child with asthma.		X
5. Asthma can be triggered by secondhand smoke.	X	
6. Children do not need to know their triggers.		X
7. Strong odors can cause problems for children with asthma.	X	
8. Cover mattresses with zippered covers that are allergen resistant.	X	
9. Reduce indoor air pollution by controlling ventilation and source control.	X	
10. Outdoor air pollution can increase asthma symptoms.	X	

SOURCES:

www.epa.gov/asthma/triggers.html, Aug 2008.

www.epa.gov/asthma, June 2008.

www.atsdr.cdc.gov/csem/asthma/treatment.html, June 2008.

Module 3: 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"

Module 4 Outline

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
GOAL: When the session is completed, participants will be able to: ■ State the four signs of asthma trouble. ■ State the procedures to follow in case a child is in the yellow or red area on the Asthma Action Plan. ■ State two or three general goals of asthma treatment.		MATERIALS FOR SESSION: ■ Pre- and Post-Module Assessments and answer sheets ■ Signs and Symptoms of Asthma Trouble Sheet ■ North Carolina Asthma Action Plan ■ Example of the Albemarle Asthma Action Plan for Preschool Children ■ Example of NIH Asthma Action Plan for Preschool Children ■ Example of North Carolina Child Care Health Consultants Association Asthma Action Plan
1. Distribute Pre-Module Assessment and have participants complete. Signs of asthma trouble Discuss the GREEN zone briefly then lead into the four main signs.	Distribute Pre-Module Assessment and have participants complete it. When complete, review answers. When a child is in the GREEN ZONE, their breathing will be good, no cough or wheeze, can play well, and sleeps through the night. There are FOUR main symptoms or signs of asthma: 1. COUGH 2. WHEEZE – a whistling noise heard while breathing.	Pre-Module Assessment and review answers when completed. Review signs and symptoms of asthma trouble sheet.

CONTINUED

Module 4 Outline, p. 2

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	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 child is well. 4. CHEST TIGHTNESS NOTE: If you notice any of these signs, help the child 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.	
2. Discuss the early warning signs of an asthma episode. (YELLOW ZONE on Asthma Action Plan)	EARLY WARNING SIGNS OF AN ASTHMA EPISODE (YELLOW ZONE on Asthma Action Plan) Begin treatment with rescue medicines and contact the health care provider the child has any of these: ■ Coughing or coughing to the point of vomiting ■ First sign of a cold ■ Wheezing ■ Chest tightness	Instruct on the N.C. Asthma Action Plan. (Obtain the Asthma Actions Plans from the appendices section of the curriculum.)

CONTINUED

Module 4 Outline, p. 3

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	■ Shortness of breath ■ Decrease in peak flow to yellow zone ■ Frequent nighttime awakenings	
3. Discuss the late warning signs of an asthma episode (RED ZONE on Asthma Action Plan)	LATE WARNING SIGNS OF AN ASTHMA EPISODE (RED ZONE on Asthma Action Plan) ■ Rescue medicine is not helping within 15-20 minutes after use. ■ Breathing is hard and fast. ■ 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.	
4. Discuss general goals of asthma treatment	GENERAL GOALS OF ASTHMA TREATMENT: ■ Being free from troublesome symptoms day and night, including sleeping through the night. ■ Having the best possible lung function.	

CONTINUED

Module 4 Outline, p. 4

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	■ Being able to participate fully in any activities. ■ Needing fewer or no urgent care visits or hospitalizations for asthma. ■ Using medications to control asthma with as few side effects as possible. ■ Being satisfied with the asthma care that the child is receiving from his/her health care provider.	
5. Post-Module Assessment – distribute to participants and complete.	Distribute Post-Module Assessments and have participants complete.	Post-Module Assessment sheet and when completed, review answer sheet.

"Signs and Symptoms of Asthma Trouble"

Pre-Module Assessment

The four main symptoms or signs of asthma trouble are: **(Check the correct ones)**

_____1. Cough

_____2. Wheeze

_____3. Shortness of breath or breathing much faster or slower than usual

_____4. Drooling

_____5. Sneezing

_____6. Can't talk easily

_____7. Chest tightness

For all responses below, circle the word "True" or "False":

8. TRUE or FALSE: Using asthma medicines to control asthma with as few side effects as possible is important.

9. TRUE or FALSE: All caregivers should know where the action plan is kept in case of emergency.

10. TRUE or FALSE: To prevent an asthma episode, identify the asthma triggers for the child.

11. TRUE or FALSE: When a child is in the green zone, he/she can breathe well, play well, and sleep through the night.

"Signs and Symptoms of Asthma Trouble"

Pre-Module Assessment Answer Sheet

The four main symptoms or signs of asthma trouble are: **(Check the correct ones)**

__✔__1. Cough

__✔__2. Wheeze

__✔__3. Shortness of breath or breathing much faster or slower than usual

_____4. Drooling

_____5. Sneezing

_____6. Can't talk easily

__✔__7. Chest tightness

For all responses below, circle the word "True" or "False":

8. **TRUE** or FALSE: Using asthma medicines to control asthma with as few side effects as possible is important.

9. **TRUE** or FALSE: All caregivers should know where the action plan is kept in case of emergency.

10. **TRUE** or FALSE: To prevent an asthma episode, identify the asthma triggers for the child.

11. **TRUE** or FALSE: When a child is in the green zone, he/she can breathe well, play well, and sleep through the night.

"Signs and Symptoms of Asthma Trouble"

Module 4 Narrative

When a child 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 child is well.
4. **Chest tightness or pain.**

NOTE: If you notice any of these signs, help the child 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 child 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 children are:

- Trouble eating.
- Being cranky and tired.
- Change in sleep pattern.
- Not playing as usual.
- Reaction to asthma trigger.

NOTE: If a child is in the YELLOW ZONE,

- Call the parent.
- Stay with the child.

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

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

Continue rescue medicines and seek immediate medical help if the child's asthma is getting worse 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.

CONTINUED

Module 4 Narrative, cont.

- 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.
- Child looks very sick.

Call 911 if you are unable to reach the health care provider or parent/guardian.

After the action plan is completed, you should: (These points should be expressed now and reviewed again with treatment lesson).

- 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 child.
- Know when to **call 911** and what procedures to follow until help arrives.
- **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.

General Goals of Asthma Treatment

- Being free from troublesome symptoms day and night, including sleeping through the night.
- Having the best possible lung function.
- Being able to participate fully in any activities.
- Needing fewer or no urgent care visits or hospitalizations for asthma.
- Using asthma medicines to control asthma with as few side effects as possible.
- Being satisfied with the asthma care that the child is receiving from their health care provider.

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, June 2008.

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.*

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 child is well.
4. **Chest tightness or pain**

NOTE: If you notice any of these signs, help the child 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, 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 child 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 child'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 "Agree" or "Disagree" to the questions by putting an X in the "Agree" or "Disagree" box to the right of each question.

QUESTION	AGREE	DISAGREE
1. Using asthma medicines to control asthma is important.		
2. Identify the asthma triggers for the child with asthma.		
3. When a child is in the green zone, he/she cannot breathe well or sleep well.		
4. All caregivers should know where the action plan is kept and how to use it.		
5. It is important to know the early warning signs of asthma trouble.		

Name two symptoms or signs of asthma trouble:

A. _____

B. _____

"Signs and Symptoms of Asthma Trouble"

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	AGREE	DISAGREE
1. Using asthma medicines to control asthma is important.	X	
2. Identify the asthma triggers for the child with asthma.	X	
3. When a child is in the green zone, he/she cannot breathe well or sleep well.		X
4. All caregivers should know where the action plan is kept and how to use it.	X	
5. It is important to know the early warning signs of asthma trouble.	X	

Name two symptoms or signs of asthma trouble:

A. _**Coughing or Chest Tightness**_____

B. _**Wheezing or Shortness of Breath**__

NORTH CAROLINA Asthma

Module 4: 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?

"How is Asthma Treated and Managed?"

Module 5 Outline

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
GOAL: When the class is completed, participants will be able to: ■ Name the two categories of medication and provide a brief description ■ Provide definition of a peak flow meter and how to measure peak flow ■ Provide two facts about the use of an Asthma Action Plan ■ Complete an asthma diary form		MATERIALS FOR SESSION: ■ How is Asthma Treated handout sheet ■ Peak flow meter ■ Asthma Action Plan examples ■ Asthma diary form ■ Lists of medications ■ Pre- and Post-Module Assessments and answer sheets
1. Pre-Module Assessment Control of Asthma	Have participants complete Pre-Module Assessment and review answer sheet. YOU can help control the child's asthma by… ■ giving their medicine exactly as instructed ■ helping the child to avoid triggers (things which can cause an asthma episode)	Pre-Module Assessment and answer sheet.
2. Asthma medicines and types	Children 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. Asthma medicines come in three types— 1. QUICK-RELIEF 2. CONTROLLER	Discuss asthma medicine names, types, and use of asthma medicines. NOTE: If you have pictures available of asthma medicines to show the class, please bring them to the session.

CONTINUED

Module 5 Outline, p. 2

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	3. ORAL STEROIDS INFORMATION ABOUT EACH OF THESE TYPES: 1. QUICK-RELIEF: ■ Quick-relief medicines help relieve the symptoms of an asthma episode. ■ If the child 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 child's health care provider to see if a different medicine is needed. ■ If a child 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 child have fewer and milder asthma episodes and should be taken every day. ■ Give the child their controller medicine even when you do not notice any symptoms.	

CONTINUED

Module 5 Outline, p. 3

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	3. ORAL STEROIDS: ■ 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. ■ They may also be used to treat people with severe persistent asthma whose symptoms cannot be controlled any other way.	
3. Discussion of peak flow and how to measure using a peak flow meter.	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 5 years old or older child 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 people with asthma can use to monitor themselves. However, you have to be able to perform the test correctly. NOTE: Usually a child must be 5 years of age or older to perform the test. B. HOW DO YOU MEASURE PEAK FLOW? ■ Slide the little marker down as far as it will go. This sets the meter to zero.	Discuss the following: ■ the definition of peak flow. ■ use of peak flow meters. ■ how to obtain a measure. Demonstrate the use of a peak flow meter.

CONTINUED

Module 5 Outline, p. 4

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	■ Have the child to stand up, take a big breath with their mouth open. Hold the meter in one hand and keep your fingers away from the numbers. ■ Place the peak flow meter in the mouth, sealing the lips around the mouthpiece. Tell him/her to take a deep breath in and blow out as hard and as fast as he/she can. ■ The marker will go up and stay up. Find the number where it stopped. Write the number down on a paper or chart. ■ Have the child blow 2 more times. Push the bottom down each time and write the down the highest number of the three readings in the asthma diary.	
4. Discussion of asthma diary form	An asthma diary is necessary in order for the child's health care provider to determine the care necessary. INSTRUCTIONS FOR USE: 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. 2. Fill in date(s).	Review the asthma diary sheet and provide the instructions for use.

CONTINUED

Module 5 Outline, p. 5

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	3. Measure the child's peak flow reading in the AM and PM. Compare the reading with their asthma zones after the peak flow meter personal best has been recorded. 4. Follow the asthma action plan for the asthma zone the child is currently in. 5. Identify and avoid any triggers. 6. Rank the child's asthma symptoms using the ranking list at the bottom of the diary form. 7. Write down any medicine that the child takes and any concerns you have. 8. Make a note of any activity which the child cannot do.	
5. Discussion of Asthma Action Plan	Review and instruct on the newly adopted N.C. Asthma Action Plan. Pediatric examples are also provided in the appendices section of this curriculum. 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.	■ N.C. Asthma Action Plan. ■ Albemarle Pediatric Asthma Action Plan. ■ NIH copy of Asthma Action Plan. ■ North Carolina Child Care Health Consultants Association Asthma Action Plan.

CONTINUED

Module 5 Outline, p. 6

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	■ Call the parent or health care provider if you have concerns about the child. ■ 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.	
6. Post-Module Assessment	Have participants complete the Post-Module Assessment and when completed, review answer sheet.	Post-Module Assessment and answer sheet.

"How is Asthma Treated and Managed?"

Pre-Module Assessment

Instructions: For all responses, circle the word true or false.

1. TRUE or FALSE: All caregivers should know where the asthma action plan is kept in case of emergency.

2. TRUE or FALSE: An asthma diary will provide the parent or child care provider information about how asthma triggers affect the child.

3. TRUE or FALSE: It is not necessary to know the child's asthma triggers.

4. TRUE or FALSE: When completing the asthma diary, measure the child's peak flow reading only one time per day.

5. TRUE or FALSE: When a child is having asthma problems, it is important to know when to call 911.

6. TRUE or FALSE: A peak flow meter is a small, hand held tool that is used to measure air flow.

7. TRUE or FALSE: Asthma can never be controlled.

8. TRUE or FALSE: If a child is having an asthma episode, controller medicines will relieve the asthma symptoms.

"How is Asthma Treated and Managed?"

Pre-Module Assessment Answer Sheet

Instructions: For all responses, circle the word true or false.

1. **TRUE** or FALSE: All caregivers should know where the asthma action plan is kept in case of emergency.

2. **TRUE** or FALSE: An asthma diary will provide the parent or child care provider information about how asthma triggers affect the child.

3. TRUE or **FALSE**: It is not necessary to know the child's asthma triggers.

4. TRUE or **FALSE**: When completing the asthma diary, measure the child's peak flow reading only one time per day.

5. **TRUE** or FALSE: When a child is having asthma problems, it is important to know when to call 911.

6. **TRUE** or FALSE: A peak flow meter is a small, hand held tool that is used to measure air flow.

7. TRUE or **FALSE**: Asthma can never be controlled.

8. TRUE or **FALSE**: If a child is having an asthma episode, controller medicines will relieve the asthma symptoms.

"How is Asthma Treated and Managed?"

Module 5 Narrative

***YOU* can help control the child's asthma by...**

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

Question: **Can you provide me the names of the types or groups of asthma medicines used for treating asthma?**

Answer: **There are three major groups of asthma medicines:**

- Quick-relief
- Controller
- Oral steroids

Medicines:

Children 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.

1. Quick Relief:

- Quick-relief (rescue) medicines help relieve the symptoms of an asthma episode or to prevent symptoms caused by exercise.
- If the child 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 child's health care provider to see if a different medicine is needed.
- If a child is having an asthma episode, controller medicines **will not** relieve the symptoms, such as coughing, shortness of breath, wheezing, and/or chest tightness. This is the time to give him/her the quick-relief medicine.
- Quick-relief medicines come in two types:
  1. Beta2-agonists – These relax the muscles around the airways within 5-10 minutes.
  2. Ipratropium – This relaxes the muscles around the airways. It does not act as quickly as the Beta2-agonists.

2. Controller:

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

CONTINUED

Module 5 Narrative, p. 2

3. Oral steroids:

- Oral steroids are often used for a short period of time to reduce the swelling and mucus in the airways during a moderate or severe asthma episode.
- They may also be used more often to treat people with severe persistent asthma whose symptoms cannot be controlled any other way.

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 child who is 5 years old or older and who has asthma, the reading can indicate if there is a narrowing in the airways even before his or her symptoms start. It is a simple test that people with asthma can use to monitor themselves. However, you have to be able to perform the test correctly.

NOTE: Usually a child must be 5 years of age or older to perform the test.

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 child to stand up, place the peak flow meter in the mouth, sealing the lips around the mouth piece. Have the child take a deep breath in and blow out as hard and as fast as he/she can.
- The marker will go up and stay up. Find the number where it stopped.
- Repeat two more times pushing the bottom down after each time. Write down the highest number of the three times in the asthma diary. This number will be the child's personal best.

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.

The important thing to remember is: **asthma can be controlled**. Make sure that the parent/guardian talks with the child'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***.

If the health care provider has determined that the child has asthma, the provider will work with the parent to develop an **"asthma action plan"** to be followed. This plan will teach parents and caregivers how to give the medicines and when to adjust them accordingly as asthma conditions change. Following this plan is important

CONTINUED

Module 5 Narrative, p. 3

in order to help keep asthma under control. Review the plan and discuss it with the parent/guardian.

Asthma Daily Diary:

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

The diary can help you:

- determine what triggers cause a problem for the child.
- keep track of the asthma medicines and when to use them.
- know when to seek medical help when problems arise.

Asthma Action Plan:

Review and instruct on the newly adopted North Carolina Asthma Action Plan. For an asthma action plan designed more specifically for young children, examples are provided for you in the Appendices Section of this curriculum.

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 child.
- 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.

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 child's asthma by...**

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

Children 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 child 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 child's health care provider to see if a different medication is needed.
- If a child 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 child have fewer and milder asthma episodes and should be taken every day.
- Give the child 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 child'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 child.
- 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.

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, June 2008.

Daily Asthma Diary

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

The diary can help determine:

- the triggers which cause a problem for the child.
- how to keep track of the asthma medicines 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
EXAMPLE 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 breeath ___ Chest tightness ___ Other:		
				___ Cough ___ Wheeze ___ Short of breeath ___ Chest tightness ___ Other:		
				___ Cough ___ Wheeze ___ Short of breeath ___ Chest tightness ___ Other:		
				___ Cough ___ Wheeze ___ Short of breeath ___ Chest tightness ___ Other:		

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

CONTINUED

Daily Asthma 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
				____ Cough ____ Wheeze ____ Short of breeath ____ Chest tightness ____ Other:		
				____ Cough ____ Wheeze ____ Short of breeath ____ Chest tightness ____ Other:		
				____ Cough ____ Wheeze ____ Short of breeath ____ Chest tightness ____ Other:		
				____ Cough ____ Wheeze ____ Short of breeath ____ Chest tightness ____ Other:		
				____ Cough ____ Wheeze ____ Short of breeath ____ Chest tightness ____ Other:		
				____ Cough ____ Wheeze ____ Short of breeath ____ Chest tightness ____ Other:		
				____ Cough ____ Wheeze ____ Short of breeath ____ Chest tightness ____ Other:		

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

Instructions for Use of Daily Asthma Diary

1. This diary is designed for recording two (2) weeks of information. Continue to use the same format every day for two weeks to assess the personal best. Give this information to the health care provider.
2. Fill in the date.
3. Measure the child's peak flow reading in the AM and PM.
4. After the personal best peak flow meter reading has been recorded, follow the asthma action plan for the asthma zone the child is currently in.
5. Identify and avoid any triggers which are causing the child problems.
6. Rank the child's asthma symptoms using the list provided above (rank from 0 to 3).
7. Write down any medicine that the child takes and any concerns you have.
8. Make a note of any activity which the child cannot do.

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 "Agree" or "Disagree" to the questions by putting an X in the "Agree" or "Disagree" box to the right of each question.

QUESTION	AGREE	DISAGREE
1. Asthma can never be controlled.		
2. It is necessary to know the child's asthma triggers.		
3. It is important to have an asthma diary completed to assess the proper care for the child.		
4. Quick relief medicines are used when a child is having asthma trouble.		
5. When a child is having asthma problems, it is important to know when to call 911.		
6. A peak flow meter is used to measure air flow.		
7. When completing the asthma diary, measure the child's peak flow several times a day.		

"How is Asthma Treated and Managed?"

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	AGREE	DISAGREE
1. Asthma can never be controlled.		X
2. It is necessary to know the child's asthma triggers.	X	
3. It is important to have an asthma diary completed to assess the proper care for the child.	X	
4. Quick relief medicines are used when a child is having asthma trouble.	X	
5. When a child is having asthma problems, it is important to know when to call 911.	X	
6. A peak flow meter is used to measure air flow.	X	
7. When completing the asthma diary, measure the child's peak flow several times a day.	X	

NORTH CAROLINA Asthma

Module 5: 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!

RESOURCE SECTION

The Lesson Plan for Asthma Medicines is located in the Resource Section. This lesson plan is to be used when instructing a child care provider who is caring for a child with asthma.

"Asthma Medicines"

Resource Section Outline

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
GOAL: When module is completed, participants will be able to: ■ State the three types of asthma medicines ■ State the purpose and use of asthma medicines ■ Provide general facts about asthma medicines		MATERIALS FOR SESSION: ■ Asthma medicine sheets ■ Pre and Post-Module Assessments and answer sheets
1. Pre-Module Assessment sheet Information for beginning of lesson	Have the participant complete the Pre-Module Assessment sheet and review answers. QUESTION: Can you provide me the names of the types or groups of medicines used for treating asthma?	Completion of Pre-Module Assessment sheet and review answers. ANSWER: There are three major groups of asthma medicines – ■ quick-relief. ■ controller (prevention). ■ oral steroids.
2. QUICK-RELIEF (RESCUE) MEDICINES State the action of quick-relief (rescue) medicines and the proper use	GENERAL COMMENTS ABOUT QUICK-RELIEF (RESCUE) MEDICATIONS: Quick-relief (rescue) meds are used to treat an asthma problem or to prevent symptoms caused by hard exercise. They are also called rescue meds. Describe how quick-relief (rescue) medicines work, why they are used, and when to use them.	Quick-relief (rescue) medicines which list the medicines and possible side effects.

CONTINUED

Resource Section Outline, p. 2

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
	Types of quick-relief (rescue) meds are: ■ Beta2-agonists – These relax the muscles around the airways within 5-10 minutes. ■ Ipratropium – This relaxes the muscles around the airways. It does not act as quickly as beta2-agonist medicine.	
3. LONG-TERM MEDICINES (CONTROLLER) State the action of long term medicines and their purpose	GENERAL COMMENTS ABOUT LONG TERM MEDICINES (CONTROLLER): Some control meds block the asthma reaction before it affects the airways. They are: ■ Inhaled steroids ■ Leukotriene modifier meds ■ Cromolyn ■ Nedocromil Other control medicines can be taken along with inhaled steroids.	REVIEW: Controller medicines which list the medicines and possible side effects.
4. ORAL STEROIDS State the action of oral steroids	GENERAL COMMENTS ABOUT ORAL STEROIDS: Oral steroids are a class of their own. They are often used to reduce the swelling in the airways during a moderate or severe asthma problem. They also can be used to treat people with severe persistent asthma whose symptoms cannot be controlled any other way.	REVIEW: Oral steroids medicines which list medicines and possible side effects.

Resource Section Outline, p. 3

CLASS OBJECTIVE	PRESENTATION OUTLINE/CONTENT	ACTIVITIES AND MATERIALS
5. Post-Module Assessment	Have participants to complete the Post-Module Assessment and when completed, review answer sheet.	Post-Module Assessment and answer sheet.

SOURCE:

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

"Asthma Medicines"

Pre-Module Assessment (Resource Section)

Instructions: For all responses, circle the word true or false.

1. TRUE or FALSE: There are different kinds of asthma medicines.
2. TRUE or FALSE: If a child is having an asthma episode, controller medicines will not relieve the symptoms.
3. TRUE or FALSE: Some asthma medicines are used daily.
4. TRUE or FALSE: Controller medicines are known as prevention medicines.
5. TRUE or FALSE: There are three major groups of asthma medicines.
6. TRUE or FALSE: Quick-relief (rescue) medicines help relieve the symptoms of an asthma episode.
7. TRUE or FALSE: The child should take the controller medicine even when you do not notice any symptoms.

"Asthma Medicines"

Pre-Module Assessment Answer Sheet (Resource Section)

Instructions: For all responses, circle the word true or false.

1. **TRUE** or FALSE: There are different kinds of asthma medicines.
2. **TRUE** or FALSE: If a child is having an asthma episode, controller medicines will not relieve the symptoms.
3. **TRUE** or FALSE: Some asthma medicines are used daily.
4. **TRUE** or FALSE: Controller medicines are known as prevention medicines.
5. **TRUE** or FALSE: There are three major groups of asthma medicines.
6. **TRUE** or FALSE: Quick-relief (rescue) medicines help relieve the symptoms of an asthma episode.
7. **TRUE** or FALSE: The child should take the controller medicine even when you do not notice any symptoms.

"Asthma Medicines"

Resource Section Narrative

Question: Can you provide me the names of the types or groups of medicines used for treating asthma?

Answer: There are three major groups of asthma medicines:

- quick-relief
- controller (prevention)
- oral steroids

A. Quick-relief (Rescue) Medicines

Quick-relief (rescue) meds are used to treat an asthma problem or to prevent symptoms caused by hard exercise. They are also called rescue medicines. Describe how quick-relief (rescue) medicines work, why they are used, and when to use them.

Quick-relief (rescue) medicines come in two types:

- Beta2-agonists – These relax the muscles around the airways within 5-10 minutes.
- Ipratropium – This relaxes the muscles around the airways. It does not act as quickly as beta2-agonist medicine. This is not used as a beta2-agonist.

Why quick-relief medicines are used:

- Quick-relief (rescue) medicines help relieve the symptoms of an asthma episode or to prevent symptoms caused by exercise.
- If the child 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 child's health care provider to see if a different medication is needed.
- If a child is having an asthma episode, controller medicines **will not** relieve the symptoms, such as coughing, shortness of breath, wheezing, and/or chest tightness. This is the time to give him/her the quick-relief medicine.

B. Long-Term Medicines (Controller or prevention)

a. Controller medicines help the child have fewer and milder asthma episodes and should be taken every day.

b. Give the child their controller medicine even when you do not notice any symptoms.

c. Controller medicines are prevention medicines and are one way to help reduce or prevent asthma symptoms.

CONTINUED

Resource Section Narrative, cont.

Some controller medicines block the asthma reaction before it affects the airways. They are:

- Inhaled steroids and combination medicines
- Leukotriene-modifier medicines
- Cromolyn/Nedocromil

Other controller medicines can be taken along with inhaled steroids.

C. Oral steroids

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. They may also be used:

- to treat people with severe persistent asthma whose symptoms cannot be controlled any other way.
- as either rescue or controller medicines.

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

"Asthma Medicines"

TYPE OF MEDICINE	GENERIC NAME	BRAND NAME	POSSIBLE SIDE EFFECTS TO REPORT TO YOUR HEALTH CARE PROVIDER (NOT A COMPLETE LIST)
SHORT-ACTING BETA2-AGONISTS (SABA): INHALED OR ORAL BRONCHODILATOR (Quick-relief medicines)	Albuterol Albuterol sulfate Pirbuterol acetate Terbutaline sulfate Levalbuterol hydrochloride Levalbuterol tartrate	Accuneb® Proventil HFA® Ventolin HFA ® ProAir HFA ® Proventil Repetabs® (tablet) VoSpire ER® Maxair® Autohaler Brethine® (tabs only) Xopenex® Xopenex HFA®	■ increased heart rate ■ palpitations ■ nausea ■ vomiting ■ nervousness ■ headache ■ sleeplessness ■ tremor, shaking feeling
ANTICHOLINERGICS: INHALED BRONCHODILATOR (Quick-relief medicines)	Ipratropium bromide	Atrovent® Combivent® (This medication is a combination of Atrovent and Albuterol)	■ dry mouth ■ rapid heart rate
INHALED CORTICOSTEROIDS: POTENT ANTI-INFLAMMATORY (Control and prevention medicines)	Beclomethasone Diaproprionate Budesonide Flunisolide	QVAR® 40mcg QVAR® 80mcg Pulmicort Respules® Pulmicort Flexhaler® AeroBid® Aerospan HFA	■ cough ■ oral thrush Side effects that usually do not require medical attention unless they persist: ■ dry mouth ■ cough ■ hoarseness

CONTINUED

"Asthma Medicines", p. 2

TYPE OF MEDICINE	GENERIC NAME	BRAND NAME	POSSIBLE SIDE EFFECTS TO REPORT TO YOUR HEALTH CARE PROVIDER (NOT A COMPLETE LIST)
	Fluticasone proprionate Mometasone furoate Triamcinolone	Flovent® Flovent DPI® (50 mcg; 100 mcg; 250mcg) Flovent HFA® (44 mcg; 110 mcg; 220 mcg) Asmanex® Azmacort®	■ headache ■ nose bleeds (when use nasal steroids only) ■ throat irritation ■ ¼-inch growth delay in first year of corticosteroid use
LONG-ACTING BETA2-AGONISTS (LABA): INHALED OR ORAL BRONCHODILATOR To be used only with inhaled corticosteroids (Control and prevention medicines)	Formoterol fumarate Salmeterol xinofate	Foradil Aerolizer® Serevent Diskus®	■ increased heart rate ■ palpitations ■ nervousness ■ sleeplessness ■ headache ■ nausea ■ vomiting ■ tremor, shaking feeling
COMBINED MEDICATION: INHALED LONG ACTING BRONCHODILATOR AND INHALED CORTICOSTEROID (Control and prevention medicines)	Budesonide + formoterol fumerate Flucticasone propionate + salmeterol xinofate	Symbicort® Advair Diskus® Advair HFA®	Refer to side effects of each component
LEUKOTRIENE MODIFIERS: ORAL ANTI-INFLAMMATORY (Control and prevention medicines)	Zafirlukast Zileuton Montelukast	Accolate® Zyflo® Singulair®	■ headache ■ nausea ■ diarrhea ■ infection ■ drowsiness

CONTINUED

"Asthma Medicines", p. 3

TYPE OF MEDICINE	GENERIC NAME	BRAND NAME	POSSIBLE SIDE EFFECTS TO REPORT TO YOUR HEALTH CARE PROVIDER (NOT A COMPLETE LIST)
METHYLXANTHINE: ORAL BRONCHODILATORS Relax and open airways; stimulate diaphragm and breathing (Control and prevention medicines as well as quick-relief medicines)	Theophylline	Aerolate® III Aerolate® JR Aerolate® SR Choledyl® SA Elixophyllin® Quibron® - T Quibron® - T/SR Slo-bid® Slo-Phyllin® Theo-24® Theochron® Theo-Dur® Theolair® Theolair® SR T-Phyl® Uni-Dur® Uniphyl®	■ stomach upset ■ nausea & vomiting ■ restlessness ■ rapid heart rate ■ wakefulness ■ irritability ■ dizziness ■ palpitations
MAST CELL STABILIZERS: INHALED ANTI-INFLAMMATORY May be used before exposure to known trigger (Control and prevention medicines)	Cromolyn sodium Nedocromil sodium	Intal® Tilade®	■ increased coughing ■ wheezing or shortness of breath Side effects that usually do not require medical attention unless they persist: ■ coughing ■ skin rash/itching ■ headache ■ sore throat ■ nausea ■ abdominal pain

CONTINUED

"Asthma Medicines", p. 4

TYPE OF MEDICINE	GENERIC NAME	BRAND NAME	POSSIBLE SIDE EFFECTS TO REPORT TO YOUR HEALTH CARE PROVIDER (NOT A COMPLETE LIST)
CORTICOSTEROIDS: ORAL ANTI-INFLAMMATORY MOST POTENT (Quick-relief medicines used along with short acting beta-agonist inhalers)	Dexamethasone Prednisone Prednisolone Methylprednisolone	Decadron® Deltasone® Orasone® Orapred® Prelone® Pediapred® Medrol®	■ decreased or blurred vision ■ frequent urination ■ skin rash ■ increased thirst ■ mood changes ■ poorly controlled hypertension and diabetes ■ long-term use predisposes to fractures, cataracts, and GI ulcers Side effects that usually do not require medical attention unless they persist (may appear and then go away during treatment): ■ increase in appetite ■ insomnia ■ nervousness ■ restlessness
SUBCUTANEOUS INJECTION Monoclonal Antibody Blocks IgE, a major mediator of allergic reactions (Control and prevention medicines)	Omalizumab	Xolair®	The most common side effects in patients who received XOLAIR in clinical studies are listed below. This is not a complete list of all side effects reported with XOLAIR. ■ Injection-site reaction ■ Viral infections ■ Upper respiratory tract infection ■ Sinusitis ■ Headache ■ Sore throat

CONTINUED

"Asthma Medicines", p. 5

TYPE OF MEDICINE	GENERIC NAME	BRAND NAME	POSSIBLE SIDE EFFECTS TO REPORT TO YOUR HEALTH CARE PROVIDER (NOT A COMPLETE LIST)
			When using this medicine, a rare but serious side effect is anaphylaxis.

NOTE: The list of possible side effects for each medicine is not complete (i.e., does not list every possible side effect). If you have questions about other possible side effects, check with the health care provider or pharmacist.

In the chart above, we have noted the medicines in red or in green for each category. The "Quick-relief" medicines are noted in red and the "Control and Prevention" medicines are in noted in green. An easy way to remember the type of medicine is:

- **Red** means **"stop"** and to seek help quickly for relief of the asthma episode.
- **Green** means **"go"** and allows the child to do their normal activities.

Asthma can be controlled; expect nothing less.

SOURCES:

Obtained by permission from www.niehs.nih.gov, June 2008

Obtained by permission from The N.C. American Lung Association (www.lungnc.org), August 2008

"Asthma Medicines"

Post-Module Assessment (Resource Section)

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	AGREE	DISAGREE
1. Some asthma medicines are used daily.		
2. There are different kinds of asthma medicines.		
3. There are three major groups of asthma medicines.		
4. Quick-relief medicines help relieve symptoms of an asthma episode.		
5. The child should take the controller medicine whenever he/she wants to take it.		
6. The controller medicine is known as a quick-relief medicine.		
7. The controller medicine should be taken even when there are no symptoms.		

"Asthma Medicines"

Post-Module Assessment Answer Sheet (Resource Section)

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	AGREE	DISAGREE
1. Some asthma medicines are used daily.	X	
2. There are different kinds of asthma medicines.	X	
3. There are three major groups of asthma medicines.	X	
4. Quick-relief medicines help relieve symptoms of an asthma episode.	X	
5. The child should take the controller medicine whenever he/she wants to take it.		X
6. The controller medicine is known as a quick-relief medicine.		X
7. The controller medicine should be taken even when there are no symptoms.	X	

NORTH CAROLINA Asthma

Resource Section: Asthma Medicines

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

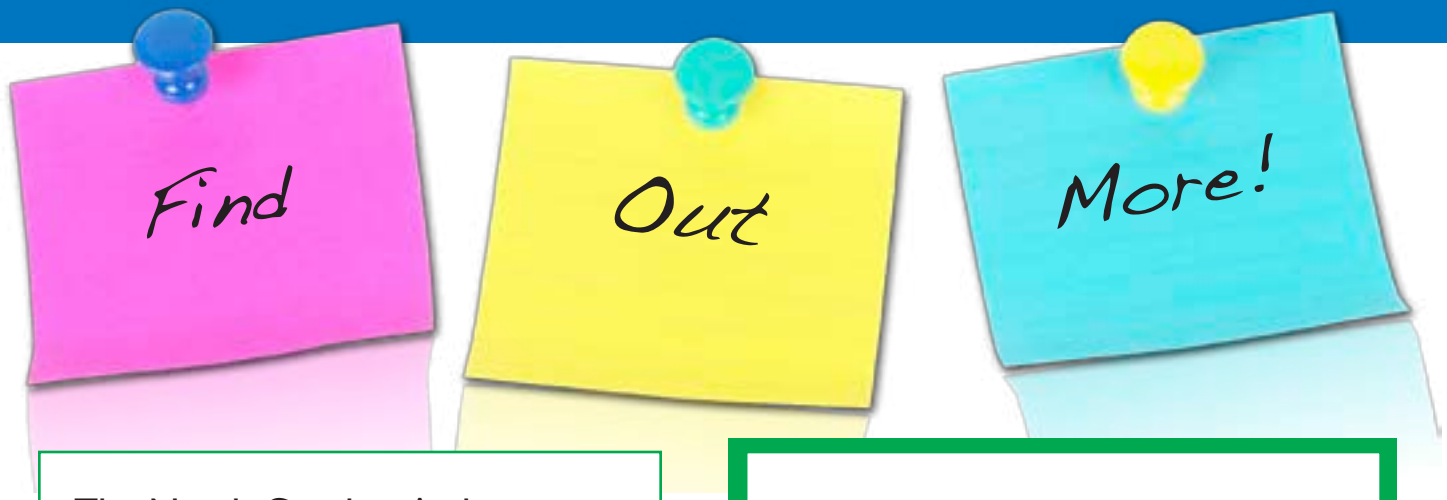
Mail: N.C. Asthma Program – Division of Public Health
1915 Mail Service Center
Raleigh NC 27699-1915

Thank You!

CURRICULUM APPENDICES

Asthma Education for Child Care Providers

Asthma Education for Child Care Providers



The North Carolina Asthma Program is working to reduce the burden of childhood asthma across the state by providing asthma education to child care providers. Asthma is a chronic disease that affects many North Carolina children and adults.

We invite you to join other childcare providers in this region in receiving training in using the new North Carolina Asthma Curriculum for Child Care Providers.

Date:_____

Time:_____

2007 NC Asthma Prevalence

- **<18 years old**:
  lifetime asthma – **15.7%**
  current asthma – **9.8%**
- **18+ years old**:
  lifetime asthma – **12.1%**
  current asthma – **7.8%**

2006 NC Hospitalizations Due to Asthma

- **< 5 years old**:
  298.5/100,000 population
- **5-14 yrs old**:
  122.2/100,000 population
- **15-34 yrs old**:
  47.7/100,000 population

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

_____

_____

NORTH CAROLINA Asthma

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?

_____

_____

_____

How could this training or the curriculum be improved?

_____

_____

_____

Thank You!

NORTH CAROLINA Asthma

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:

- □ Exercise
- □ Mold
- □ Chalk dust/dust
- □ Pollen
- □ Animals
- □ Tobacco smoke
- □ Food _____
- □ Smoke, strong odors or spray
- □ Colds/Respiratory infections
- □ Carpet
- □ Change in temperature
- □ Dust mites
- □ Cockroaches
- □ 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:

Medicine: How much to take: When to take it: □ Home □ 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:**

Medicine	How much to take	When to take it
Albuterol or _____	□ 2 puffs by inhaler □ 4 puffs by inhaler □ with spacer, if available □ by nebulizer	□ May repeat every 20 min up to 3 doses in first hour, if needed

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 or _____	□ 2 puffs by inhaler □ 4 puffs by inhaler □ with spacer, if available □ by nebulizer	□ Every 4 - 8 hours for _____ days

_____, _____times a day for _____days □ Home □ School
(oral corticosteroid) *(how much)*

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:**

Medicine:	How much to take:	When to take it:
Albuterol or _____	□ 2 puffs by inhaler □ 4 puffs by inhaler □ with spacer, if available □ by nebulizer	□ May repeat every 20 minutes until you get help

_____, _____times a day for _____days □ Home □ School
(oral corticosteroid) *(how much)*

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 tp 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:

Coughing	**Tightness in chest**	**Stops playing**
Wheezing	**Gasping for air**	**Blue nails or lips**

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 uneffective,
d. Once foil pouch is opened – protect vials from heat and light and use within one week.

3. **Inhailed 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 chonic 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.**

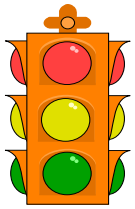
_____ _____
Child Care Health Consultant Signature Parent/ Guardian Signature

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)

_____’s Asthma Action Plan

Child’s Name



Avoid Triggers: (Check all that apply)

☐ Illness	☐ Cigarette/other smoke	☐ Food:
☐ Emotions	☐ Exercise	☐ Allergies:
☐ Weather Changes	☐ Chemical odors	☐ 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.

- _____
- _____

Parent: _____

Telephone:_____

Physician: _____

Telephone:_____

Adapted by the NC Child Care Health Consultants Association

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

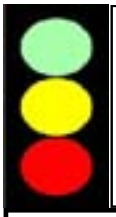
- nails or lips are blue
- is having trouble walking or talking
- cannot stop coughing

_____

Physician Signature

Date:_____

ASTHMA ACTION PLAN FOR PRESCHOOL CHILDREN YEAR 20__ - 20__



Name _____ DOB _____

Parent/Guardian _____

Ph (Home) _____ Ph (Cell) _____

Doctor Ph

CATEGORY OF SEVERITY ☐ MILD ☐ MODERATE ☐ SEVERE ☐ EXERCISE-INDUCED ASTHMA

GO — Use Controller Medicines at Home Every Day

Green Zone

Child is feeling well
- Breathing is good
- No cough or wheeze
- Sleeps through the night
- Can play

MEDICINE/ROUTE	HOW MUCH	HOW OFTEN/WHEN

CAUTION — Rescue Medicine

Yellow Zone

Child is not feeling well
- COUGHING day or night
- Wheezing–hard or noisy breathing
- Vomiting after coughing

Other symptoms
- Trouble breathing
- Trouble eating
- Cranky and tired

Other Signs
- Change in sleep pattern
- Not playing as usual
- Reaction to asthma trigger

MEDICINE/ROUTE	HOW MUCH	HOW OFTEN/WHEN
Rescue medicine: _____ ☐ Nebulizer ☐ Mask ☐ Spacer ☐ Inhaler	☐ Give a nebulizer treatment ☐ Give ____ puffs of metered dose inhaler	Stay with child and keep child quiet for 15 minutes Encourage child to drink fluids If symptoms not improved, may repeat rescue medicine ONCE Call parent to report child had breathing problem **IF STILL HAVING TROUBLE, FOLLOW RED ZONE**

NOTE: Parent should contact the doctor if child needs rescue med >2 times/wk to see if a medication change is necessary.

STOP — Get Help from a Doctor

Red Zone

Child is very sick
Danger-Get Help!
- Medicine is not helping
- Constant cough
- Working hard to breathe
- Trouble walking or talking
- Child looks very sick

MEDICINE/ROUTE	HOW MUCH	HOW OFTEN/WHEN
Rescue medicine: _____ ☐ Nebulizer ☐ Mask ☐ Spacer ☐ Inhaler	☐ Give a nebulizer treatment ☐ Give_____ puffs of metered dose inhaler	Give rescue medicine NOW Watch child closely Repeat rescue medicine in 15 minutes if still in distress
Call parent. If not better, call doctor. IF IN SEVERE DISTRESS, CALL 911.		

Doctor signature: _____ Date_____

I hereby release the local School Board and their agents and employees and the child care providers from any liability that may result from my child taking the prescribed medication. I give permission for my child to receive medications and for health care providers to exchange information regarding the care of my child. I agree to provide rescue medication to be kept at the child care center in case of emergency.

Parent/Guardian: _____ Date_____

WHITE—CHILD CARE PROVIDER YELLOW—PATIENT/PARENT PINK—DOCTOR

ORIGINAL 03/08 REV 06/09

Albemarle Pediatric Asthma Coalition

FIGURE 3–10b. SAMPLE ASTHMA ACTION PLAN

Child Asthma Action Plan

0–5 years of age

Patient Name: _____

Medical Record #: _____

Health Care Provider's Name: _____ DOB: _____

Health Care Provider's Phone #: _____ Completed by: _____ Date: _____

Long-Term-Control Medicines (Use Every Day To Stay Healthy)	How Much To Take	How Often	Other Instructions (such as spacers/masks, nebulizers)
		_____ times per day EVERY DAY!	
		_____ times per day EVERY DAY!	
		_____ times per day EVERY DAY!	
		_____ times per day EVERY DAY!	

Quick-Relief Medicines	How Much To Take	How Often	Other Instructions
		Give ONLY as needed	NOTE: If this medicine is needed often (_____ times per week), call physician.

GREEN ZONE

Child is ***well*** and has no asthma symptoms, even during active play.

PREVENT asthma symptoms every day:

- **Give the above long-term-control medicines every day.**
- Avoid things that make the child's asthma worse:

☑ Avoid tobacco smoke; ask people to smoke outside.

☐ _____

☐ _____

YELLOW ZONE

Child is ***not well*** and has **asthma symptoms that may include:**

- Coughing
- Wheezing
- Runny nose or other cold symptoms
- Breathing harder or faster
- Awakening due to coughing or difficulty breathing
- Playing less than usual
- _____
- _____

Other symptoms that could indicate that your child is having trouble breathing may include: difficulty feeding (grunting sounds, poor sucking), changes in sleep patterns, cranky and tired, decreased appetite.

CAUTION. Take action by continuing to give regular asthma medicines **every day** AND:

☐ Give _____

(include dose and frequency)

If the child is not in the ***Green Zone*** and still has symptoms after 1 hour, then:

☐ Give more _____

(include dose and frequency)

☐ _____

(include dose and frequency)

☐ Call _____

RED ZONE

Child ***feels awful!*** **Warning signs may include:**

- Child's wheeze, cough, or difficulty breathing continues or worsens, even after giving yellow zone medicines.
- Child's breathing is so hard that he/she is having trouble walking/talking/eating/playing.
- Child is drowsy or less alert than normal.

Danger! Get help immediately!

MEDICAL ALERT! Get help!

☐ Take the child to the hospital or call 9–1–1 immediately!

☐ Give more _____ (include dose and frequency) until you get help.

☐ Give _____ (include dose and frequency)

Call 9–1–1 if:

- **The child's skin is sucked in around neck and ribs, or**
- **Lips and/or fingernails are grey or blue, or**
- **Child doesn't respond to you.**

Adapted and reprinted with permission from the Regional Asthma Management and Prevention (RAMP) Initiative, a program of the Public Health Institute.

Source: http://www.calasthma.org/uploads/resources/actionplanpdf.pdf; San Francisco Bay Area Regional Asthma Management Plan, http://www.rampasthma.org

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.) 5. Keep breathing in slowly, as deeply as you can.
Hold your breath	6. Hold your breath as you count to 10 slowly, if you can. 7. For inhaled quick-relief medicine (beta$_2$-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 $beta_2$-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 $beta_2$-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 $beta_2$-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 $beta_2$-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 $beta_2$-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

American College of Chest Physicians
3300 Dundee Road, Northbrook, IL 60062
(847) 498-1400 phone
(847) 498-5460 fax
www.chestnet.org

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.

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

Attach MDI to spacer.

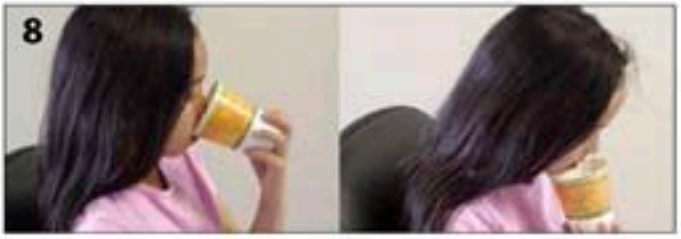
Have the child sit up straight or stand. Place the mask over the child's nose and mouth. The mask should be held on the face firmly enough so none of the medicine can escape.

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

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.

Remove the mask from the child's face.

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



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®, Beclovent®, Vanceril®, 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)
Corticosteroids (Glucocorticoids) ***Inhaled (ICS):*** Beclomethasone dipropionate Budesonide Flunisolide Fluticasone propionate Mometasone furoate Triamcinolone acetonide	*Indications* ■ Long-term prevention of symptoms; suppression, control, and reversal of inflammation. ■ Reduce need for oral corticosteroid. *Mechanisms* ■ **Anti-inflammatory.** Block late reaction to allergen and reduce airway hyperresponsiveness. Inhibit cytokine production, adhesion protein activation, and inflammatory cell migration and activation. ■ Reverse beta$_2$-receptor downregulation. Inhibit microvascular leakage.	■ Cough, dysphonia, oral thrush (candidiasis). ■ 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).	■ Spacer/holding chamber devices with nonbreath-activated MDIs and mouth washing after inhalation decrease local side effects. ■ 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. ■ 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.) ■ "Adjustable dose" approach to treatment may enable reduction in cumulative dose of ICS treatment over time without sacrificing maintenance of asthma control. ■ Dexamethasone is not included as an ICS for long-term control because it is highly absorbed and has long-term suppressive side effects.
Systemic: Methylprednisolone Prednisolone Prednisone	*Indications* ■ For short-term (3–10 days) "burst": to gain prompt control of inadequately controlled persistent asthma. ■ For long-term prevention of symptoms in severe persistent asthma: suppression, control, and reversal of inflammation. *Mechanisms* ■ Same as inhaled.	■ Short-term use: reversible abnormalities in glucose metabolism, increased appetite, fluid retention, weight gain, mood alteration, hypertension, peptic ulcer, and rarely aseptic necrosis. ■ 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. ■ 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 *Strongyloides*.	■ 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).

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

Name/Products (Listed Alphabetically)	Indications/Mechanisms	Potential Adverse Effects	Therapeutic Issues (Not All Inclusive)
Cromolyn Sodium and Nedocromil	*Indications* ■ Long-term prevention of symptoms in mild persistent asthma; may modify inflammation. ■ Preventive treatment prior to exposure to exercise or known allergen. *Mechanisms* ■ **Anti-inflammatory.** 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. ■ Inhibits acute response to exercise, cold dry air, and SO_2.	■ Cough and irritation. ■ 15–20 percent of patients complain of an unpleasant taste from nedocromil.	■ 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. ■ 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. ■ Safety is the primary advantage of these agents.
Immunomodulators			
Omalizumab (Anti-IgE) For subcutaneous use	*Indications* ■ Long-term control and prevention of symptoms in adults (≥12 years old) who have moderate or severe persistent allergic asthma inadequately controlled with ICS. *Mechanisms* ■ Binds to circulating IgE, preventing it from binding to the high-affinity (FcεRI) receptors on basophils and mast cells. ■ Decreases mast cell mediator release from allergen exposure. ■ Decreases the number of FcεRIs in basophils and submucosal cells.	■ Pain and bruising of injection sites has been reported in 5–20 percent of patients. ■ Anaphylaxis has been reported in 0.2 percent of treated patients. ■ Malignant neoplasms were reported in 0.5 percent of patients compared to 0.2 percent receiving placebo; relationship to drug is unclear.	■ Monitor patients following injection. Be prepared and equipped to identify and treat anaphylaxis that may occur. ■ The dose is administered either every 2 or 4 weeks and is dependent on the patient's body weight and IgE level before therapy. ■ A maximum of 150 mg can be administered in one injection. ■ Needs to be stored under refrigeration at 2–8 °C. ■ Whether patients will develop significant antibody titers to the drug with long-term administration is unknown.

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

Name/Products (Listed Alphabetically)	Indications/Mechanisms	Potential Adverse Effects	Therapeutic Issues (Not All Inclusive)
Leukotriene Receptor Antagonists (LTRAs)	*Mechanisms* ■ **Leukotriene receptor antagonist;** selective competitive inhibitor of $CysLT_1$ receptor.		■ May attenuate EIB in some patients, but less effective than ICS therapy (Vidal et al. 2001). ■ Do not use LTRA + LABA as a substitute for ICS + LABA.
Montelukast tablets and granules	*Indications* ■ 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.	■ No specific adverse effects have been identified. ■ Rare cases of Churg-Strauss have occurred, but the association is unclear.	■ A flat dose-response curve, without further benefit, if dose is increased above those recommended.
Zafirlukast tablets	■ 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.	■ Postmarketing surveillance has reported cases of reversible hepatitis and, rarely, irreversible hepatic failure resulting in death and liver transplantation.	■ Administration with meals decreases bioavailability; take at least 1 hour before or 2 hours after meals. ■ Zafirlukast is a microsomal P450 enzyme inhibitor that can inhibit the metabolism of warfarin. INRs should be monitored during coadministration. ■ 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.
5-Lipoxygenase Inhibitor	*Mechanisms* ■ Inhibits the production of leukotrienes from arachidonic acid, both LTB_4 and the cysteinyl leukotrienes.		
Zileuton tablets	*Indications* ■ Long-term control and prevention of symptoms in mild persistent asthma for patients ≥12 years of age. ■ May be used with ICS as combination therapy in moderate persistent asthma in patients ≥12 years of age.	■ Elevation of liver enzymes has been reported. Limited case reports of reversible hepatitis and hyperbilirubinemia.	■ Zileuton is microsomal P450 enzyme inhibitor that can inhibit the metabolism of warfarin and theophylline. Doses of these drugs should be monitored accordingly. ■ Monitor hepatic enzymes (ALT).

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

Name/Products (Listed Alphabetically)	Indications/Mechanisms	Potential Adverse Effects	Therapeutic Issues (Not All Inclusive)
Long-Acting Beta$_2$-Agonists (LABA) *Inhaled LABA:* Formoterol Salmeterol	*Indications* ■ Long-term prevention of symptoms, added to ICS ■ Prevention of EIB. ■ *Not to be used to treat acute symptoms or exacerbations.* *Mechanisms* ■ **Bronchodilation.** Smooth muscle relaxation following adenylate cyclase activation and increase in cyclic AMP, producing functional antagonism of bronchoconstriction. ■ Compared to SABA, salmeterol (but not formoterol) has slower onset of action (15–30 minutes). Both salmeterol and formoterol have longer duration (>12 hours) compared to SABA.	■ Tachycardia, skeletal muscle tremor, hypokalemia, prolongation of QTc interval in overdose. ■ A diminished bronchoprotective effect may occur within 1 week of chronic therapy. Clinical significance has not been established. ■ Potential risk of uncommon, severe, life-threatening or fatal exacerbation; see text for additional discussion regarding safety of LABAs.	■ Not to be used to treat acute symptoms or exacerbations. ■ Should not be used as monotherapy for long-term control of asthma or as anti-inflammatory therapy. ■ May provide more effective symptom control when added to standard doses of ICS compared to increasing the ICS dosage. ■ Clinical significance of potentially developing tolerance is uncertain, because studies show symptom control and bronchodilation are maintained. ■ Decreased duration of protection against EIB may occur with regular use.
Oral: Albuterol, sustained-release			■ Inhaled route is preferred because LABAs are longer acting and have fewer side effects than oral sustained-release agents. Oral agents have not been adequately studied as adjunctive therapy with ICS.
Methylxanthines Theophylline, sustained-release tablets and capsules	*Indications* ■ Long-term control and prevention of symptoms in mild persistent asthma or as adjunctive with ICS, in moderate or persistent asthma. *Mechanisms* ■ **Bronchodilation.** Smooth muscle relaxation from phosphodiesterase inhibition and possibly adenosine antagonism. ■ May affect eosinophilic infiltration into bronchial mucosa as well as decreases T-lymphocyte numbers in epithelium. ■ Increases diaphragm contractility and mucociliary clearance.	■ Dose-related acute toxicities include tachycardia, nausea and vomiting, tachyarrhythmias (SVT), central nervous system stimulation, headache, seizures, hematemesis, hyperglycemia, and hypokalemia. ■ Adverse effects at usual therapeutic doses include insomnia, gastric upset, aggravation of ulcer or reflux, increase in hyperactivity in some children, difficulty in urination in elderly males who have prostatism.	■ Maintain steady-state serum concentrations between 5 and 15 mcg/mL. Routine serum concentration monitoring is essential due to significant toxicities, narrow therapeutic range, and individual differences in metabolic clearance. Absorption and metabolism may be affected by numerous factors which can produce significant changes in steady-state serum theophylline concentrations. ■ Patients should be told to discontinue if they experience toxicity. ■ Not generally recommended for exacerbations. There is minimal evidence for added benefit to optimal doses of SABA. Serum concentration monitoring is mandatory.

Key: anti-IgE, anti-immunoglobulin E, EIB, exercise-induced bronchospasm; INR, International Normalized Ratio; LABA, long-acting beta$_2$-agonist; MDI, metered-dose inhaler; SABA, inhaled short-acting beta$_2$-agonist

FIGURE 3–23. QUICK-RELIEF MEDICATIONS

Name/Products	Indications/Mechanisms	Potential Adverse Effects	Therapeutic Issues
Short-Acting Beta$_2$-Agonists (SABA) *Inhaled SABA:* Albuterol Levalbuterol Pirbuterol	*Indications* ■ Relief of acute symptoms; quick-relief medication. ■ Preventive treatment for EIB prior to exercise. *Mechanisms* ■ **Bronchodilation.** Binds to the beta$_2$-adrenergic receptor, producing smooth muscle relaxation following adenylate cyclase activation and increase in cyclic AMP producing functional antagonism of bronchoconstriction.	■ 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.	■ Drugs of choice for acute bronchospasm. Inhaled route has faster onset, fewer adverse effects, and is more effective than systemic routes. The less beta$_2$-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$_2$-agonists are not recommended. ■ 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. ■ Regular use >2 days/week for symptom control (not prevention of EIB), increasing use, or lack of expected effect indicates inadequate asthma control. ■ For patients frequently using SABA, anti-inflammatory medication should be initiated or intensified. ■ Levalbuterol at one-half the mcg dose produces clinically comparable bronchodilation and systemic side effects as racemic albuterol.

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

Name/Products	Indications/Mechanisms	Potential Adverse Effects	Therapeutic Issues
Anticholinergics Ipratropium bromide	*Indications* ■ Relief of acute bronchospasm (See Therapeutic Issues column.). *Mechanisms* ■ **Bronchodilation.** Competitive inhibition of muscarinic cholinergic receptors. ■ Reduces intrinsic vagal tone of the airways. May block reflex bronchoconstriction secondary to irritants or to reflux esophagitis. ■ May decrease mucous gland secretion.	■ 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.	■ Reverses only cholinergically mediated bronchospasm; does not modify reaction to antigen. Does not block EIB. ■ Multiple doses of ipratropium in the ED provide additive effects to SABA. ■ May be alternative for patients who do not tolerate SABA. ■ Treatment of choice for bronchospasm due to beta-blocker medication. ■ Has not proven to be efficacious as long-term control therapy for asthma.
Corticosteroids *Systemic:* Methylprednisolone Prednisolone Prednisone	*Indications* ■ For moderate or severe exacerbations to prevent progression of exacerbation, reverse inflammation, speed recovery, and reduce rate of relapse. *Mechanisms* ■ **Anti-inflammatory.** See figure 3–22.	■ 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. ■ 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 *Strongyloides*.	■ Short-term therapy should continue until patient's symptoms resolve. This usually requires 3–10 days but may require longer. — Action may begin within an hour. ■ There is no evidence that tapering the dose following improvement is useful in preventing a relapse in asthma exacerbations. ■ Other systemic corticosteroids such as hydrocortisone and dexamethasone given in equipotent daily doses are likely to be as effective as prednisolone.

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

FIGURE 3–24. AEROSOL DELIVERY DEVICES

Device/Drugs	Population	Optimal Technique*	Therapeutic Issues
Metered-dose inhaler (MDI) Beta$_2$-agonists Corticosteroids Cromolyn sodium Anticholinergics	≥5 years old (<5 with spacer or valved holding chamber (VHC) mask)	Actuation during a slow (30 L/min or 3–5 seconds) deep inhalation, followed by 10-second breathhold. 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).	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). 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).
Breath-actuated MDI Beta$_2$-agonist	≥5 years old	Tight seal around mouthpiece and slightly more rapid inhalation than standard MDI (see above) followed by 10-second breathhold.	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.
Dry powder inhaler (DPI) Beta$_2$-agonists Corticosteroids Anticholinergics	≥4 years old	Rapid (60 L/min or 1–2 seconds), deep inhalation. Minimally effective inspiratory flow is device dependent. Most children <4 years of age may not generate sufficient inspiratory flow to activate the inhaler.	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).

FIGURE 3–24. AEROSOL DELIVERY DEVICES (CONTINUED)

Device/Drugs	Population	Optimal Technique*	Therapeutic Issues
Spacer or valved holding chamber (VHC)	≥4 years old	Slow (30 L/min or 3–5 seconds) deep inhalation, followed by 10-second breathhold immediately following actuation. Actuate only once into spacer/VHC per inhalation (O'Callaghan et al. 1994).	Indicated for patients who have difficulty performing adequate MDI technique. May be bulky. Simple tubes do not obviate coordinating actuation and inhalation. The VHCs are preferred.
	<4 years old VHC with face mask	If face mask is used, it should have a tight fit and allow 3–5 inhalations per actuation (Amirav and Newhouse 2001; Everard et al. 1992). Rinse plastic VHCs once a month with low concentration of liquid household dishwashing detergent (1:5,000 or 1–2 drops per cup of water) and let drip dry (Pierart et al. 1999; Wildhaber et al. 2000).	Face mask allows MDIs to be used with small children. However, use of a face mask reduces delivery to lungs by 50 percent (Wildhaber et al. 1999). The VHC improves lung delivery and response in patients who have poor MDI technique. The effect of a spacer or VHC on output from an MDI depends on both the MDI and device type; thus data from one combination should not be extrapolated to all others (Ahrens et al. 1995; Dolovich 2000). Spacers and/or VHCs decrease oropharyngeal deposition and thus decrease risk of topical side effects (e.g., thrush) (Salzman and Pyszczynski 1988; Toogood et al. 1984). Spacers will also reduce the potential systemic availability of ICSs with higher oral absorption (Brown et al. 1990; Selroos and Halme 1991). However, spacer/VHCs may increase systemic availability of ICSs that are poorly absorbed orally by enhancing delivery to lungs (Dempsey et al. 1999; Kelly 2003). No clinical data are available on use of spacers or VHCs with ultrafine-particle-generated HFA MDIs. Use antistatic VHCs or rinse plastic nonantistatic VHCs with dilute household detergents to enhance delivery to lungs and efficacy (Lipworth et al. 2002; Pierart et al. 1999; Wildhaber et al. 2000). This effect is less pronounced for albuterol MDIs with HFA propellant than for albuterol MDIs with CFC propellant (Chuffart et al. 2001). As effective as nebulizer for delivering SABAs and anticholinergics in mild to moderate exacerbations; data in severe exacerbations are limited.

FIGURE 3–24. AEROSOL DELIVERY DEVICES (CONTINUED)

Device/Drugs	Population	Optimal Technique*	Therapeutic Issues
Nebulizer Beta$_2$-agonists Corticosteroids Cromolyn sodium Anticholinergics	Patients of any age who cannot use MDI with VHC and face mask.	Slow tidal breathing with occasional deep breaths. Tightly fitting face mask for those unable to use mouthpiece. Using the "blow by" technique (i.e., holding the mask or open tube near the infant's nose and mouth) is not appropriate.	Less dependent on patient's coordination and cooperation. Delivery method of choice for cromolyn sodium in young children. 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). Potential for bacterial infections if not cleaned properly.

Key: ED, emergency department; SABAs, inhaled short-acting beta$_2$-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
Inhaled Short-Acting Beta$_2$-Agonists				
	MDI			
Albuterol CFC	90 mcg/puff, 200 puffs/canister	1–2 puffs 5 minutes before exercise	2 puffs 5 minutes before exercise	▪ Differences in potencies exist, but all products are essentially comparable on a per puff basis. ▪ An increasing use or lack of expected effect indicates diminished control of asthma. ▪ 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. ▪ May double usual dose for mild exacerbations.
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	▪ Should prime the inhaler by releasing 4 actuations prior to use. ▪ Periodically clean HFA actuator, as drug may plug orifice.
Pirbuterol CFC Autohaler	200 mcg/puff, 400 puffs/canister	Safety and efficacy not established	Safety and efficacy not established	▪ Children <4 years may not generate sufficient inspiratory flow to activate an auto-inhaler. ▪ Nonselective agents (i.e., epinephrine, isoproterenol, metaproterenol) are not recommended due to their potential for excessive cardiac stimulation, especially in high doses.
	Nebulizer solution			
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	▪ May mix with cromolyn solution, budesonide inhalant suspension, or ipratropium solution for nebulization. May double dose for severe exacerbations.
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	▪ Does not have FDA-approved labeling for children <6 years of age. ▪ The product is a sterile-filled preservative-free unit dose vial. ▪ Compatible with budesonide inhalant suspension.

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

Medication	Dosage Form	0–4 Years	5–11 Years	Comments
Anticholinergics				
	MDI			
Ipratropium HFA	17 mcg/puff, 200 puffs/ canister	Safety and efficacy not established	Safety and efficacy not established	▪ Evidence is lacking for anticholinergics producing added benefit to beta$_2$-agonists in long-term control asthma therapy. ▪ See "Management of Acute Asthma" for dosing in ED.
	Nebulizer solution			
	0.25 mg/mL (0.025%)	Safety and efficacy not established	Safety and efficacy not established	
Systemic Corticosteroids				***Applies to the first three corticosteroids***
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	▪ Short courses or "bursts" are effective for establishing control when initiating therapy or during a period of gradual deterioration. ▪ 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.
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			
	Repository injection			
(Methylprednisolone acetate)	40 mg/mL 80 mg/mL	7.5 mg/kg IM once	240 mg IM once	▪ May be used in place of a short burst of oral steroids in patients who are vomiting or if adherence is a problem.

Key: CFC, chlorofluorocarbon; ED, emergency department; EIB, exercise-induced bronchospasm; HFA, hydrofluoroalkane; IM, intramuscular; MDI, metered-dose inhaler; PEF, peak expiratory flow

*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.

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-inflamatory 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.

CONTINUED

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.

Excercise-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 (Immunoglobin 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.

CONTINUED

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.

CONTINUED

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.

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

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

3) "Glossary". Thrive Online: Medical-Asthma. San Francisco, CA: 2001. www.thriveonline.com/medical/asthma/seek/info.glossary.html

Child Care Providers Asthma Resource List

Specific Agency Web Sites

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

Child Care Providers Asthma Resource List

Childhood Asthma-Specific Information

- **Asthma and Children** (American Lung Association)
  www.lungusa.org/site/c.dvLUK9O0E/b.22691/k.A12D/Asthma__Children.htm
- **Asthma in Children** (MEDLINEplus Health Information)
  www.nlm.nih.gov/medlineplus/asthmainchildren.html
- **Asthma in Infants and Children** (Asthma and Allergy Foundation of America)
  www.aafa.org
- **Asthma Information Packet for Early Care and Education Providers** in English and Spanish (California Childcare Health Program)
  www.ucsfchildcarehealth.org/html/pandr/trainingcurrmain.htm#asthma
- **Breathing Easy: Solutions in Pediatric Asthma** (Maternal and Child Health Library)
  www.mchlibrary.info/documents/asthma.html
- **Childhood Asthma** (American Academy of Allergy, Asthma, and Immunology)
  www.aaaai.org/patients/publicedmat/tips/childhoodasthma.stm
- **Healthy Kids, Healthy Care: Allergies, Asthma and Other Chronic Conditions**
  www.healthykids.us/chapters/allergies_main.htm
- **How Asthma Friendly Is Your Child-Care Setting? Checklist** available in English and Spanish. (National Heart, Lung, and Blood Institute)
  www.nhlbi.nih.gov/health/public/lung/index.htm#asthma
- **Recognizing Asthma In Your Young Child: Making Sure You Both Can Breathe Easy** (American College of Allergy, Asthma and Immunology)
  www.acaai.org/NASPublic/pdfs/BREATHE_EASY.PDF
- **Tools for Learning About Airborne Toxics Across the Curriculum**
  www.intheair.org

Child Care Providers 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
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
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
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

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

American Lung Association
1301 Pennsylvania Ave, NW – Suite 800
Washington, DC 20004
Telephone: (800) 586-4872
Internet: 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

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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
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

Food Allergy & Anaphylaxis Network
11781 Lee Jackson Highway, Suite 160
Fairfax, VA 22033
Telephone: (800) 929-4040
Internet: 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
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

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

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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

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

U.S. Environmental Protection Agency
P.O. Box 42419
Cincinnati, OH 45242-0419
Telephone: (800) 490-9198
Internet: 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

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, July 2008.

Child Care Providers Asthma Resource List

Resources for Cultural Competency

Agency for Healthcare Research and Quality

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.nccccurricula.info/resources.html

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

www.nnlm.gov/mcr/resources/community/competency.html

North Carolina Office of Minority Health and Health Disparities

www.ncminorityhealth.org

UNC Program on Ethnicity, Culture, and Health Outcomes

www.echo.unc.edu

University of Michigan Health System – Program for Multicultural Health

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

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

www.omhrc.gov/templates/browse.aspx?lvl=1&lvlID=3

Asthma Curriculum References

American College of Chest Physicians. *Controlling Your Asthma: A Patient Guide*. www.chestnet.org/downloads/patients/guides/controllingYourAsthma_eng.pdf, October 2008. Information available at: www.chestnet.org

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.atsdr.cdc.gov/csem/asthma/treatment.html, June 2008; www.cdc.gov/asthma/faqs.htm#triggers, June 2008.

Environmental Protection Agency. *Asthma Facts*. Indoor Environments Division, Office of Air and Radiation, May 2007. www.epa.gov/asthma, June 2008; www.epa.gov/asthma/triggers.html, June and August 2008.

Guralnik, David B, Editor in Chief, (1974). Webster's New Word Dictionary of the American Language (2nd Edition). Cleveland & New York: William Collins-World Publishing Co, Inc. www.wikipedia.org/wiki/Asthma_inhaler, August 2008.

Minnesota Department of Health. "Asthma Education: An Integrated Approach". Project Accord, Minnesota Department of Health, 1998.

National Institutes of Health Heart, Lungs and Blood Institute publication, "Asthma I.Q."

North Carolina American Lung Association (www.lungnc.org), August 2008.

U.S. 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.niehs.nih.gov/health/topics/conditions/asthma/allergens.cfm. June 2008.

Asthma Curriculum References

Program Website References

North Carolina Asthma Program

www.asthma.ncdhhs.gov/burdenReportDocs/burdenSectionFiles/1-asthmaPrevalence.pdf

North Carolina Tobacco Prevention and Control Branch

www.nctobaccofreeschools.com, Aug 2008.

www.tobaccopreventionandcontrol.ncdhhs.gov, June 2008.

www.smokefree.gov, Aug 2008.

HANDOUT SECTION

What is Asthma?

You *can help* the child 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 child's asthma episode(s) and helping him/her stay away from these triggers;
- giving the child's medicine as instructed;
- having the parent/caregiver talk with the health care provider to develop an asthma action plan; and
- making sure the child has regular asthma check-ups.

Asthma is a disease that affects the lungs. **It is the most common long-term (chronic) disease in children.** Asthma is likely to run in families. It often causes coughing, wheezing, shortness of breath, and/or chest tightness. A child 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 child will feel and sleep better.
- The child can be involved in physical activities.
- The child 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, 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.

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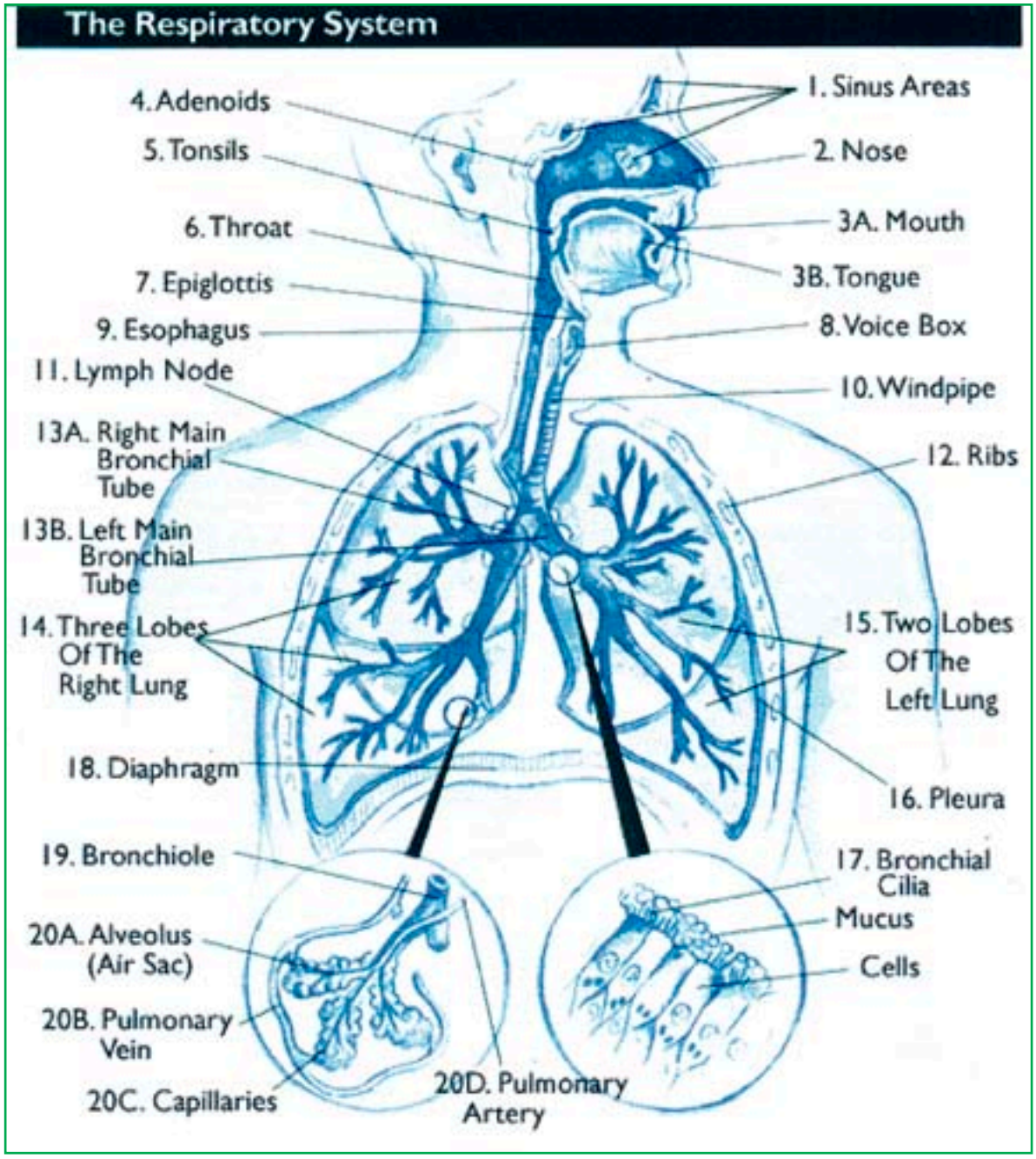
Normal Breathing and Human Respiratory System



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

Breathing with Asthma

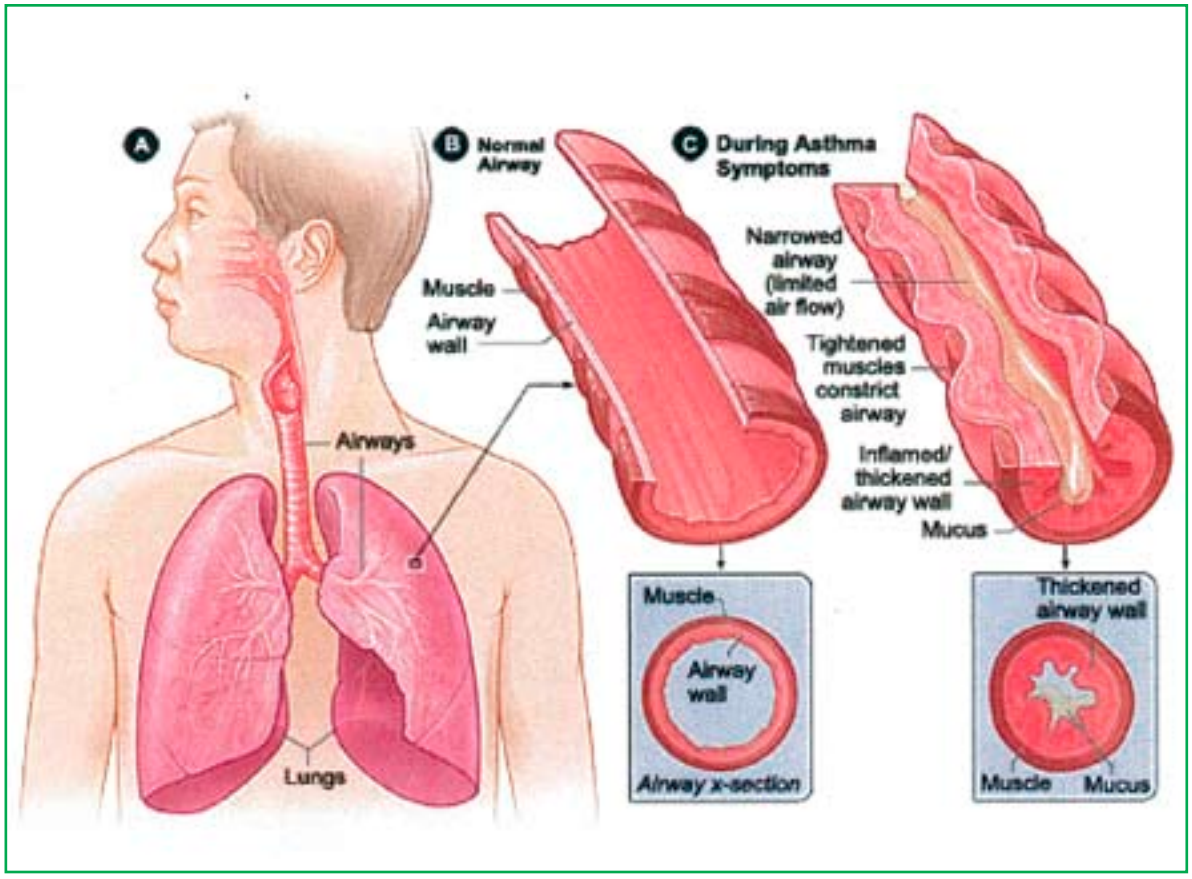


Figure A shows the location of the lungs and airways in the body. Figure B shows a cross-section of a normal airway. Figure C shows a cross-section of an airway during asthma symptoms.

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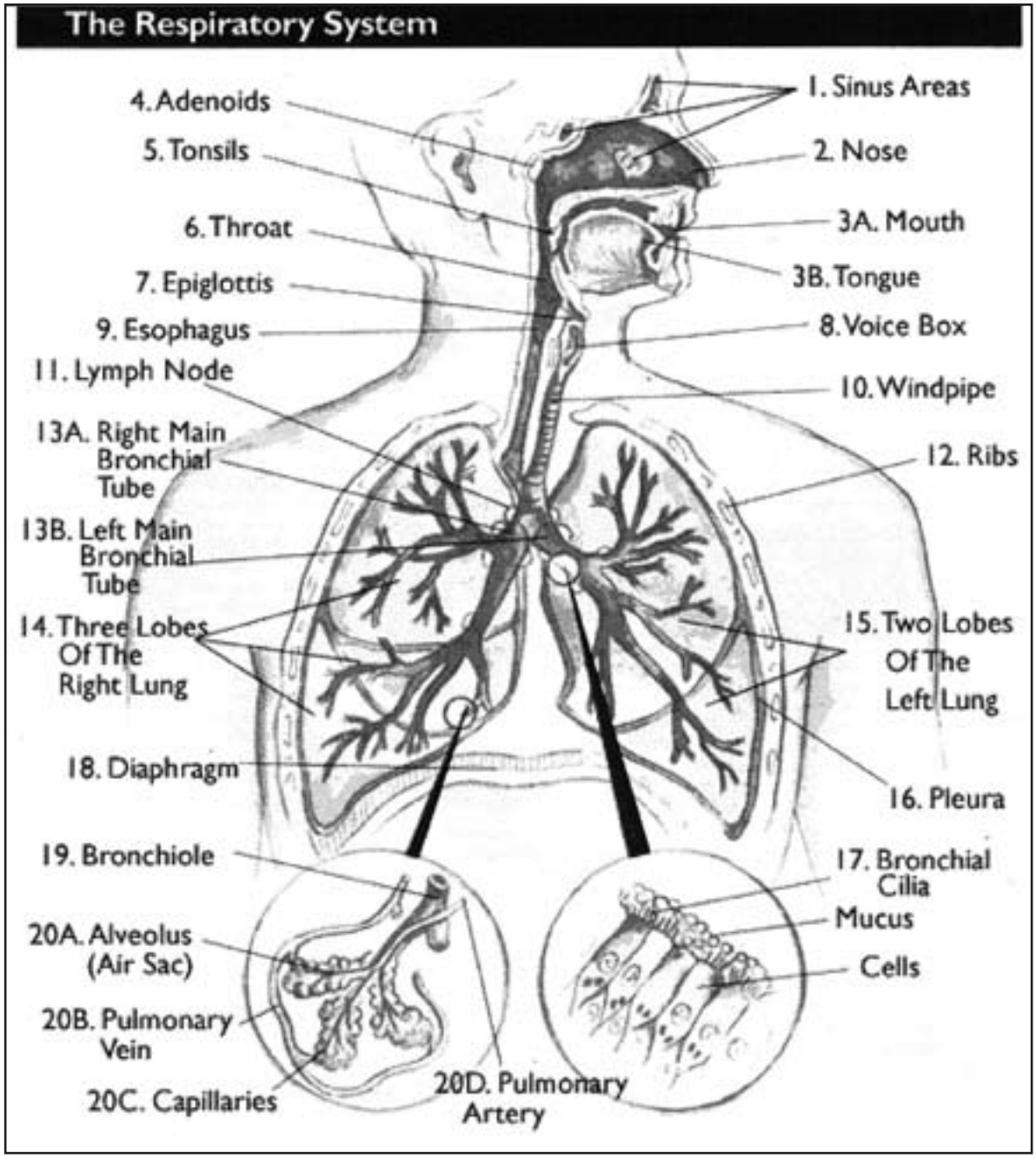

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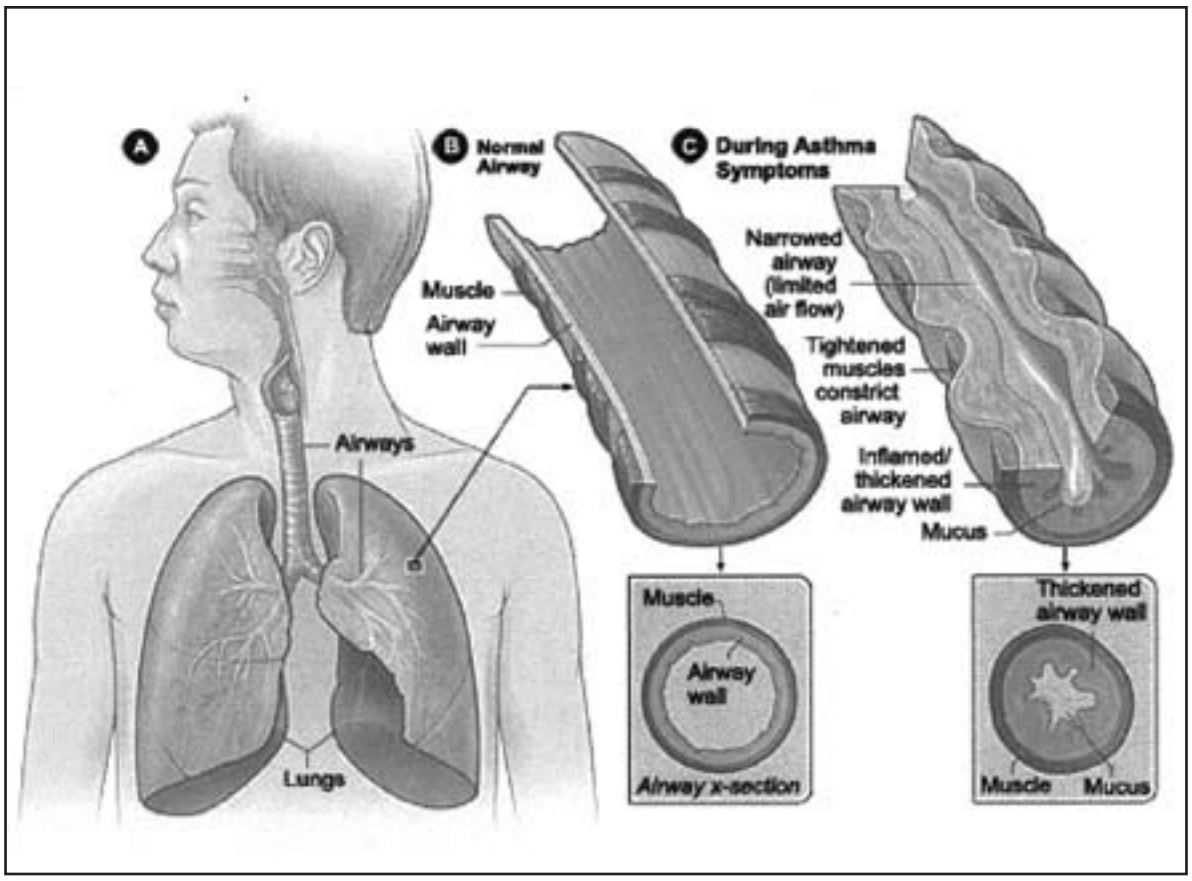

Figure A shows the location of the lungs and airways in the body. Figure B shows a cross-section of a normal airway. Figure C shows a cross-section of an airway during asthma symptoms.

Fact Sheet about Asthma

- Asthma is a chronic disease that affects the lungs. It is the most common long term disease of children.
- Asthma is a chronic condition which means the child will always have it. The child will not "outgrow" it.
- A child cannot get asthma from someone else.
- Asthma does run in families.
- Asthma can be treated but cannot be cured. You and the child 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 child to learn what they are.
- You can help the child to stay away from things that trigger an episode.
- The child 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 child's health care provider as stated on the child's asthma action plan.

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

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, 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, July 2008.

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How Do You Know if a Child has Asthma?

Asthma can be hard to detect, especially in children under the age of 5. If the child has wheezing, coughing, shortness of breath, and/or chest tightness, the health care provider may suspect asthma. Going to a health care provider for regular check-ups will help in deciding if the child has asthma.

Symptoms alone are not enough to decide if a child has asthma. After gathering the above information, the health care provider may suggest a lung function (breathing) test also called spirometry. In some cases, other tests are needed. The provider will make sure the symptoms are not being caused by something else.

NOTE: If the health care provider has decided that the child has asthma, the provider will work with the parent/caregiver to develop an asthma action plan. **Please follow this plan and the instructions on it.**

When the child goes for a check-up, the health care provider will ask several questions:

- Does the child cough? If yes, how often?
- Are breathing problems worse during play time or during a particular time of year?
- Do you notice other symptoms, such as chest tightness, wheezing, and/or shortness of breath?
- Are there certain activities which cause breathing problems for the child?
- Does asthma keep the child from going to school or to child care? If yes, how often?
- Are there any family members who have asthma, allergies, or other breathing problems?
- Are there things in the house/building which seem to bother the child – that is, furry pets, mold, smokers, etc.?

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, June 2008.

How Do You Know if a Child has Asthma?

Asthma can be hard to detect, especially in children under the age of 5. If the child has wheezing, coughing, shortness of breath, and/or chest tightness, the health care provider may suspect asthma. Going to a health care provider for regular check-ups will help in deciding if the child has asthma.

Symptoms alone are not enough to decide if a child has asthma. After gathering the above information, the health care provider may suggest a lung function (breathing) test also called spirometry. In some cases, other tests are needed. The provider will make sure the symptoms are not being caused by something else.

NOTE: If the health care provider has decided that the child has asthma, the provider will work with the parent/caregiver to develop an asthma action plan. **Please follow this plan and the instructions on it.**

When the child goes for a check-up, the health care provider will ask several questions:

- Does the child cough? If yes, how often?
- Are breathing problems worse during play time or during a particular time of year?
- Do you notice other symptoms, such as chest tightness, wheezing, and/or shortness of breath?
- Are there certain activities which cause breathing problems for the child?
- Does asthma keep the child from going to school or to child care? If yes, how often?
- Are there any family members who have asthma, allergies, or other breathing problems?
- Are there things in the house/building which seem to bother the child – that is, furry pets, mold, smokers, etc.?

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"How Asthma-Friendly Is Your Child Care Setting?" Checklist

Children with asthma need proper support in child-care settings to keep their asthma under control and be fully active. Use the questions below to find out how well your child-care setting assists children with asthma:

	COMMENTS
1. Is the child-care setting free of tobacco smoke at all times? ☐ Yes ☐ No	
2. Is there good ventilation in the child-care setting? Are allergens and irritants that can make asthma worse reduced or eliminated? Check if any of the following are present: ☐ Yes ☐ No ☐ Cockroaches ☐ Dust mites (commonly found in humid climates in pillows, carpets, upholstery, and stuffed toys) ☐ Mold ☐ Pets with fur or feathers ☐ Strong odors or fumes from art and craft supplies, pesticides, paint, perfumes, air fresheners, and cleaning chemicals	
3. Is there a medical or nursing consultant available to help child-care staff write policy and guidelines for managing medications in the child-care setting, reducing allergens and irritants, promoting safe physical activities, and planning field trips for students with asthma? ☐ Yes ☐ No	
4. Are child-care staff prepared to give medications as prescribed by each child's physician and authorized by each child's parent? May children carry their own asthma medicines when appropriate? Is there someone available to supervise children while taking asthma medicines and monitor correct inhaler use? ☐ Yes ☐ No	

CONTINUED

"How Asthma-Friendly is Your Child Care Setting?" Checklist, cont.

	COMMENTS
5. Is there a written, individualized emergency plan for each child in case of a severe asthma episode (attack)? Does the plan make clear what action to take? Whom to call? When to call? ☐ Yes ☐ No	
6. Does a nurse, respiratory therapist, or other knowledgeable person teach child-care staff about asthma, asthma management plans, reducing allergens and irritants, and asthma medicines? Does someone teach all the children about asthma and how to help a classmate who has it? ☐ Yes ☐ No	
7. Does the child-care provider help children with asthma participate safely in physical activities? For example, are children encouraged to be active? Can children take or be given their medicine before exercise? Are modified or alternative activities provided for the child when medically necessary? ☐ Yes ☐ No	

If the answer to any question is "no," children in your child-care setting may be facing obstacles to controlling their asthma. Uncontrolled asthma can hinder a child's attendance, participation, and progress in school. Child-care staff, health professionals, and parents can work together to remove obstacles and promote children's health and development.

Contact the organizations listed in resource section for information about asthma and helpful ideas for making school policies and practices more asthma-friendly. Federal and State laws are in place to help children with asthma.

Asthma can be controlled; expect nothing less.

SOURCE: Reproduced with permission from U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute. Information available at: www.nhlbi.nih.gov/health/public/lung/asthma/chc_chk.htm, July 2008.

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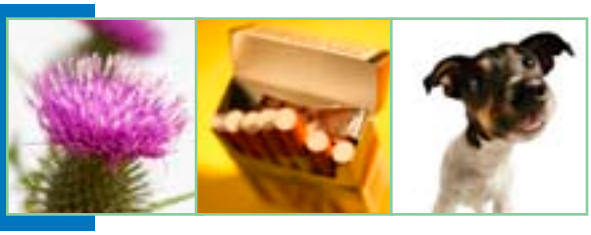
Common Asthma Triggers



General Irritants

Be careful if the child 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 child 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, June 2008.

www.epa.gov/asthma/triggers.html, June 2008.

www.niehs.nih.gov/health/topics/conditions/asthma/allergens.cfm. June 2008.

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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 child is well.
4. **Chest tightness or pain**

NOTE: If you notice any of these signs, help the child 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:

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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 child 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 child'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 child's asthma by...**

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

Children 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 child 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 child's health care provider to see if a different medication is needed.
- If a child 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 child have fewer and milder asthma episodes and should be taken every day.
- Give the child 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 child'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 child.
- 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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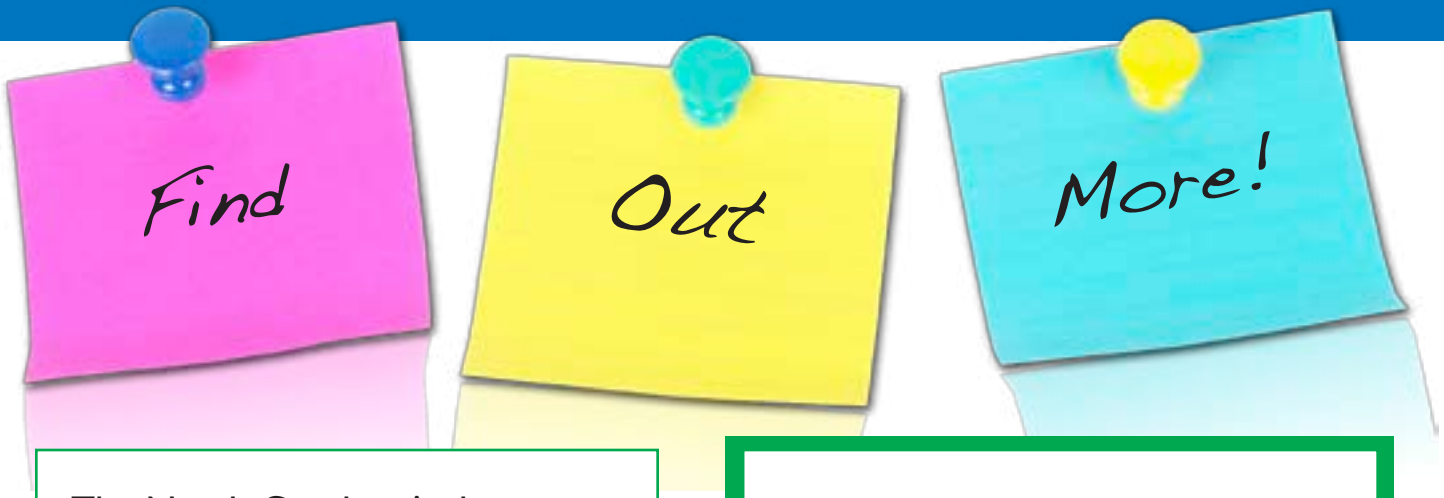
Asthma Education for Child Care Providers



The North Carolina Asthma Program is working to reduce the burden of childhood asthma across the state by providing asthma education to child care providers. Asthma is a chronic disease that affects many North Carolina children and adults.

We invite you to join other childcare providers in this region in receiving training in using the new North Carolina Asthma Curriculum for Child Care Providers.

Date:_____

Time:_____

2007 NC Asthma Prevalence

- **<18 years old**:
  lifetime asthma – **15.7%**
  current asthma – **9.8%**
- **18+ years old**:
  lifetime asthma – **12.1%**
  current asthma – **7.8%**

2006 NC Hospitalizations Due to Asthma

- **< 5 years old**:
  298.5/100,000 population
- **5-14 yrs old**:
  122.2/100,000 population
- **15-34 yrs old**:
  47.7/100,000 population

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

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NORTH CAROLINA Asthma

Certificate of Participation

This is to certify that

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has successfully completed the
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