

# Managing Asthma

A GUIDE FOR SCHOOLS



**U.S. Department of Health and Human Services**  
National Institutes of Health  
National Heart, Lung, and Blood Institute





# Managing Asthma

## A GUIDE FOR SCHOOLS



**U.S. Department of Health and Human Services**  
National Institutes of Health



National Heart, Lung,  
and Blood Institute

NIH Publication No. 14-2650  
Originally Printed 1991  
Revised December 2014

## NAEPP School Asthma Subcommittee Members

---

**Pamela J. Luna, Dr.P.H., M.S.T.**

Chair, NAEPP School Subcommittee  
American Public Health Association

**Rhonique Harris, M.D., M.H.A., F.A.A.P.**

American School Health Association

**Tonya A. Winders**

Allergy & Asthma Network Mothers of Asthmatics

**Gary S. Rachelefsky, M.D.**

American Academy of Pediatrics

**Natalie Napolitano, M.P.H., R.R.T.-N.P.S., F.A.A.R.C.**

American Association for Respiratory Care

**Kayla Jackson**

American Association of School Administrators

**Katherine Pruitt**

American Lung Association

**Paul V. Williams, M.D.**

American Medical Association

**Karen Huss, Ph.D., R.N., A.P.R.N.-B.C., F.A.A.N.,  
F.A.A.A.I.**

American Nurses Association

**Charlotte Collins, J.D.**

Asthma and Allergy Foundation of America

**Seiji Hayashi, M.D., M.P.H.**

Health Resources and Services Administration

**Andrew W. Mead, B.S., M.S.T.**

National Association for Sport and Physical Education

**Linda Davis-Alldritt, R.N., P.H.N., M.A., F.N.A.S.N.**

National Association of School Nurses

**Linda Caldart-Olson, R.N., M.S.**

National Association of State School Nurse Consultants

**Zanie Leroy, M.D., M.P.H.**

National Center for Chronic Disease Prevention and  
Health Promotion, CDC

**Pamela Collins, M.P.A., M.S.A.**

National Center for Environmental Health, CDC

**Bethe Almeras**

National Education Association Health  
Information Network

**Aubrey Miller, M.D., M.P.H.**

National Institute of Environmental Health Sciences, NIH

**Eileen Storey, M.D., M.P.H.**

National Institute for Occupational Safety and  
Health, CDC

**Shahla Ortega, M.A.**

U.S. Department of Education

**David Diaz-Sanchez**

**David Rowson, M.S.**

**Alisa Smith, Ph.D.**

U.S. Environmental Protection Agency

**Rachael L. Tracy, M.P.H.**

National Heart, Lung, and Blood Institute, NIH



## Contents

Foreword .....	1
Why Schools Should Be Concerned About Asthma .....	2
What Is Asthma? .....	3
What Effective Asthma Management at School Can Do .....	4
Developing an Asthma Management Program in Your School .....	5
<b>Action Items for School Asthma Management .....</b>	<b>8</b>
Establish a Team To Develop, Implement, and	
Monitor the Asthma Management Program.....	8
Identify and Track Students Who Have Asthma.....	8
Provide Care, Support Services, and Resources for Students Who Have Asthma.....	11
Ensure Quick and Easy Access to Prescribed Medications .....	13
Maintain a School-wide Plan for Asthma Emergencies.....	15
Provide a Healthy School Environment and Reduce Asthma Triggers.....	17
Enable Full Participation for Students Who Have Asthma .....	21
Educate Students, Staff, and Parents and Guardians About Asthma .....	23
Promote Partnerships Among School Staff, Students, Parents and Guardians,	
Health Care Providers, and the Community .....	24
<b>Asthma Management Program in the School: Roles and Responsibilities for School Staff ....</b>	<b>26</b>
Principals and Administrators.....	27
Licensed School Nurses .....	28
Health Assistants, Health Aides, Other School Health Staff.....	29
Classroom Teachers, Assistants, Aides .....	30
Physical Education Teachers, Instructors, Coaches.....	31
Guidance Counselors, Social Workers, Psychologists .....	32
Facilities, Custodial, and Maintenance Staff .....	33
Other Key Staff (such as transportation, administrative, and food service staff).....	34
<b>Tools for Connecting With the Community: Sample Letters for Physicians and Parents.....</b>	<b>35</b>
<b>Tools for Asthma Management .....</b>	<b>45</b>
How Asthma-Friendly Is Your School? .....	46
Sample Written Asthma Action Plans.....	47
Asthma Action Plan Assessment .....	51
Early Warning Signs and Symptoms of an Asthma Attack .....	53
Action Steps for Staff To Manage an Asthma Attack.....	54
How To Use a Peak Flow Meter.....	55
How To Use a Metered-Dose Inhaler.....	57
How To Use a Dry Powder Inhaler .....	58
How To Use a Nebulizer .....	59
<b>Where To Learn More About Asthma Management .....</b>	<b>60</b>



By making our schools more  
“asthma friendly,” we can ensure that  
all students who have asthma  
work to their  
full academic potential.

## Foreword

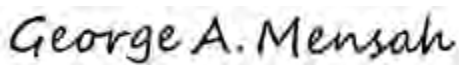
A child's health is strongly linked to social, psychological, and intellectual development. Schools—where most U.S. children spend about 6 hours a day—play an important role not only in improving students' academic performance, but also improving their health.

Asthma and its complications can affect a student's health and education. In the United States, nearly 1 in 11 children 0-17 years of age—an estimated 7 million children—have asthma. It is a leading cause of school absenteeism, resulting in 10.5 million days of missed school in 2008. Asthma symptoms and asthma attacks disrupt learning and can limit student participation in classroom activities, physical education, and school events.

Asthma cannot be cured, but it can be controlled with proper management. Schools can promote asthma control by adopting asthma-friendly policies and procedures; coordinating services among health care providers, school personnel, professionals in the community, and families to support students who have asthma; and providing asthma education for all students and staff to raise awareness and understanding of this condition.

The National Asthma Education and Prevention Program (NAEPP)—coordinated by the National Heart, Lung, and Blood Institute (NHLBI)—developed this guide to help schools address the serious threat that asthma poses to the health and education of our Nation's children. It offers practical information and tools to help guide school staff of every position in planning, implementing, and maintaining an asthma management program that connects with the community. By encouraging all school staff to recognize asthma as a chronic disease that requires ongoing care, we hope to help improve school attendance and keep students who have asthma in the classroom, where they can learn, and not in the health room because their asthma is not well controlled.

By making our schools more “asthma friendly,” we can ensure that all students who have asthma work to their full academic potential and participate fully in all school activities, while reducing needless suffering and avoidable health care costs.



**George A. Mensah, M.D., F.A.C.C., Director**

Center for Translation Research and Implementation Science  
National Heart, Lung, and Blood Institute



# Why Schools Should Be Concerned About Asthma

## ASTHMA IS COMMON AMONG STUDENTS

Approximately 7 million children younger than 18 years of age in the United States have asthma.<sup>1</sup> In a classroom of 30 students, about 3 currently have asthma.<sup>2</sup> This rate may be higher in densely populated communities or among certain population groups. For instance, among African American children, 1 in 6 has asthma, an increase of nearly 50 percent from 2001 to 2009.<sup>3</sup> Among Puerto Rican children, 1 in 5 has asthma, more than double the rate among Hispanic children overall.<sup>4</sup> Additionally, there may be students who have asthma but have not been diagnosed.

## ASTHMA IS A LEADING CAUSE OF SCHOOL ABSENTEEISM

Studies have shown that many students who have asthma miss school because of their disease. Asthma can lead to absenteeism for a variety of reasons, such as symptoms, doctor visits, hospitalizations, the need to avoid environmental triggers at school, and sleep deprivation due to nighttime asthma attacks.<sup>5</sup> Nearly half of students who have asthma miss at least one day of school each year because of their disease.<sup>6</sup> In 2008, on average, students missed 4 days of school because of asthma.<sup>7</sup>

## UNCONTROLLED ASTHMA CAN LEAD TO DECREASED ACADEMIC PERFORMANCE

When compared with students who do not have a chronic condition, students who have asthma have decreased academic performance, according to standardized test scores and parental reports. More severe asthma is associated with poorer performance.<sup>8,9</sup> Lower readiness scores were found among kindergarteners who have asthma<sup>10</sup>; and entering school with asthma was found to be linked with lower reading scores after the first year.<sup>11</sup> Effective management of asthma can eliminate potential challenges and obstacles to effective learning and academic success.<sup>12</sup>

## ASTHMA CAN BE CONTROLLED—AND SCHOOLS CAN HELP

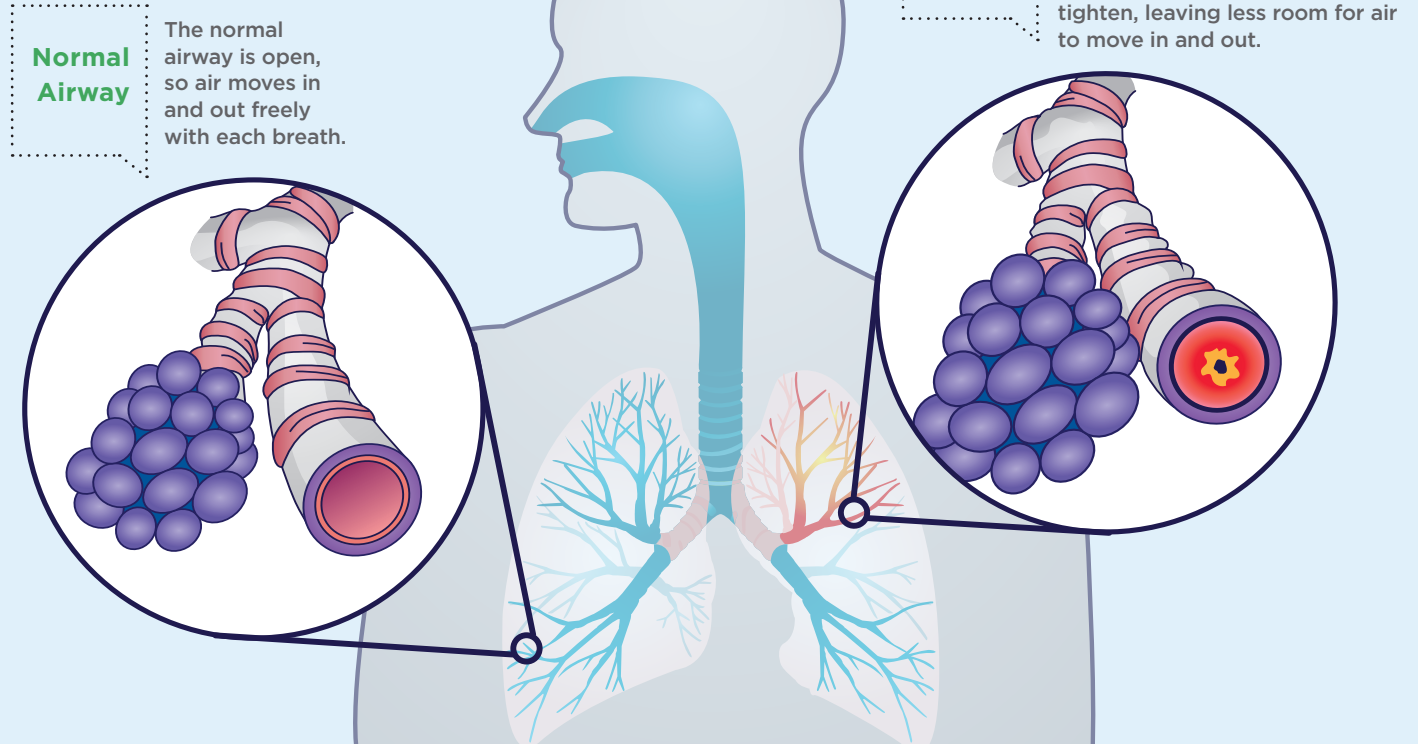
Through the use of well-coordinated asthma management programs, schools can play an effective role in helping students keep their asthma under control. Learn what your school can do to provide quality care for students who have asthma; be prepared to handle asthma emergencies; create an environment with fewer asthma triggers; and promote education and partnerships that support good asthma control.

This guide provides valuable information, strategies, and resources to help school administrators, nurses, teachers, and other school staff develop and implement an effective asthma management program. ■

1. Akinbami LJ, Moorman JE, Bailey C, Zahran HS, King M, Johnson CA, Liu X. Trends in asthma prevalence, health care use, and mortality in the United States, 2001-2010. NCHS Data Brief No. 94. Hyattsville, MD: CDC; 2012.
2. CDC. Asthma and Schools [online]. Available from [www.cdc.gov/HealthyYouth/asthma](http://www.cdc.gov/HealthyYouth/asthma). Accessed July 1, 2014.
3. CDC. Vital Signs: Asthma in the U.S. May 2011. Available from [www.cdc.gov/vitalsigns/Asthma](http://www.cdc.gov/vitalsigns/Asthma). Accessed July 1, 2014.
4. National Health Interview Survey, National Center for Health Statistics, CDC. National Health Interview Survey, 2010. Table 4-1. Available from [www.cdc.gov/asthma/nhis/2010/table4-1.htm](http://www.cdc.gov/asthma/nhis/2010/table4-1.htm). Accessed July 1, 2014.
5. Basch CE. Asthma and the achievement gap among urban minority youth. *J School Health* 2011;81(10):606-13. Available from <http://onlinelibrary.wiley.com/doi/10.1111/j.1746-1561.2011.00634.x/full>. Accessed September 9, 2014.
6. CDC. Asthma's Impact on the Nation. May 8, 2012. Available from [www.cdc.gov/asthma/impacts\\_nation/asthmafactsheet.pdf](http://www.cdc.gov/asthma/impacts_nation/asthmafactsheet.pdf). Accessed July 1, 2014.
7. CDC. Vital Signs: Asthma in the U.S. May 2011. Available from [www.cdc.gov/vitalsigns/Asthma](http://www.cdc.gov/vitalsigns/Asthma). Accessed July 1, 2014.
8. Cohen DE. Asthma and school functioning. *Health Reports* 2010;21(4). Available from [www.statcan.gc.ca/pub/82-003-x/2010004/article/11363-eng.pdf](http://www.statcan.gc.ca/pub/82-003-x/2010004/article/11363-eng.pdf). Accessed July 1, 2014.
9. Chen H, Blanc PD, Hayden ML, Bleecker ER, Chawla A, Lee JH; TENOR Study Group. Assessing productivity loss and activity impairment in severe or difficult-to-treat asthma. *Value Health* 2008;11(2):231-9. Available from <http://download.journals.elsevierhealth.com/pdfs/journals/1098-3015/PIIS1098301510605165.pdf>. Accessed September 9, 2014.
10. Taras H, Potts-Datema W. Childhood asthma and student performance at school. *J School Health* 2005;75(8):296-312. Available from <http://onlinelibrary.wiley.com/doi/10.1111/j.1746-1561.2005.00041.x/pdf>. Accessed July 1, 2014.
11. Liberty KA, Pattemore P, Reid J, Tarren-Sweeney M. Beginning school with asthma independently predicts low achievement in a prospective cohort of children. *Chest* 2010;138(6):1349-55. Epub 2010 Jun 17. Available from <http://journal.publications.chestnet.org/article.aspx?articleid=1087681>. Accessed September 9, 2014.
12. Grant R, Brito A. Chronic Illness and School Performance: A literature review focusing on asthma and mental health conditions [monograph]. New York: Children's Health Fund; 2010. Available from [www.childrenshealthfund.org/sites/default/files/chronic-illness-and-school-performance.pdf](http://www.childrenshealthfund.org/sites/default/files/chronic-illness-and-school-performance.pdf). Accessed September 9, 2014.



## HOW ASTHMA AFFECTS THE AIRWAYS



*Adapted from American College of Chest Physicians*

## What Is Asthma?

Asthma is a serious, chronic lung disease. It cannot be cured, and it does not go away. Students who have asthma will likely have it for life. However, asthma symptoms can vary from student to student and often from season to season or even hour by hour.

Asthma is caused by ongoing inflammation (swelling) that makes the airways very sensitive and narrows the airways to some extent. When a student who has asthma is exposed to things like tobacco smoke, dust, chemicals, colds or flu, pollen, or chalk dust—called asthma “triggers”—the airways react, causing one or more of the following changes in the airways:

- The inner walls of the airways get more inflamed (swollen). There is even less room for air to move through.
- The muscles around the airways become larger and contract more often, which squeezes the airways, making them even smaller.
- Glands in the airways make lots of thick mucus, which blocks the airways even more.

These changes can make it harder for the student to breathe and can cause coughing, wheezing, tightness in the chest, and shortness of breath. If the inflammation associated with asthma is not treated and kept under control, each time the airways are exposed to an asthma trigger, the inflammation increases, and the student who has asthma is likely to have symptoms that may worsen. ■

# What Effective Asthma Management at School Can Do

Effective asthma management at school can help students with asthma stay healthy, learn better, and participate fully during their school day. Although asthma cannot be cured, it can be controlled with proper medical diagnosis and management, and the student's adherence to an individualized treatment regimen.

Good asthma care and control includes assessing asthma severity, assessing and monitoring asthma control, using inhaled corticosteroids (a long-term daily control medication) to reduce inflammation in children with more persistent symptoms, using an asthma action plan (a written plan from the student's health care provider to help manage asthma and prevent asthma attacks), controlling asthma triggers, and having routine follow-up visits with a health care provider.

## **EFFECTIVE SCHOOL ASTHMA MANAGEMENT PROGRAMS CAN PRODUCE THE FOLLOWING POSITIVE RESULTS:**

- A healthier and supportive learning environment for students who have asthma.
- Reduced absences—students have fewer asthma attacks, and symptoms are treated earlier.
- Reduced disruption in the classroom—students have fewer symptoms and are more alert when their asthma is under control.
- Appropriate emergency care—school staff members know how to recognize and respond immediately to asthma emergencies.
- Improved access and adherence to appropriate asthma medications—students and parents feel comfortable asking the school for help if needed in obtaining or using prescribed medications.
- Full student participation in physical activities—physical education teachers, instructors, and coaches know how to prevent exercise-induced asthma or how to respond if symptoms appear. They also know how to help children who are having asthma symptoms and keep them involved in school activities.

With good asthma management, almost all students who have asthma should:

- Be free from troublesome symptoms day and night:
  - No coughing or wheezing
  - No difficulty breathing or chest tightness
  - No night time awakening due to asthma
- Have the best possible lung function
- Be able to participate fully in any activities of their choice
- Not miss school or work because of asthma symptoms
- Need fewer or no urgent care visits or hospitalizations for asthma
- Use medications to control asthma with as few side effects as possible
- Be satisfied with their asthma care

Keeping asthma under control is important so students can function at their maximum potential. School staff can work together with students, parents and guardians, and health care providers to provide a healthy and safe educational environment for students who have asthma—and, indeed, for all students. ■



# Developing an Asthma Management Program in Your School

An asthma management program can help your school become more responsive to the needs of students who have asthma. Such a program establishes specific policies, procedures, and activities that promote the health, development, and achievement of students who have asthma. It also outlines staff roles and provides staff training on how to help students who have asthma, especially how to recognize and respond appropriately to an asthma attack.

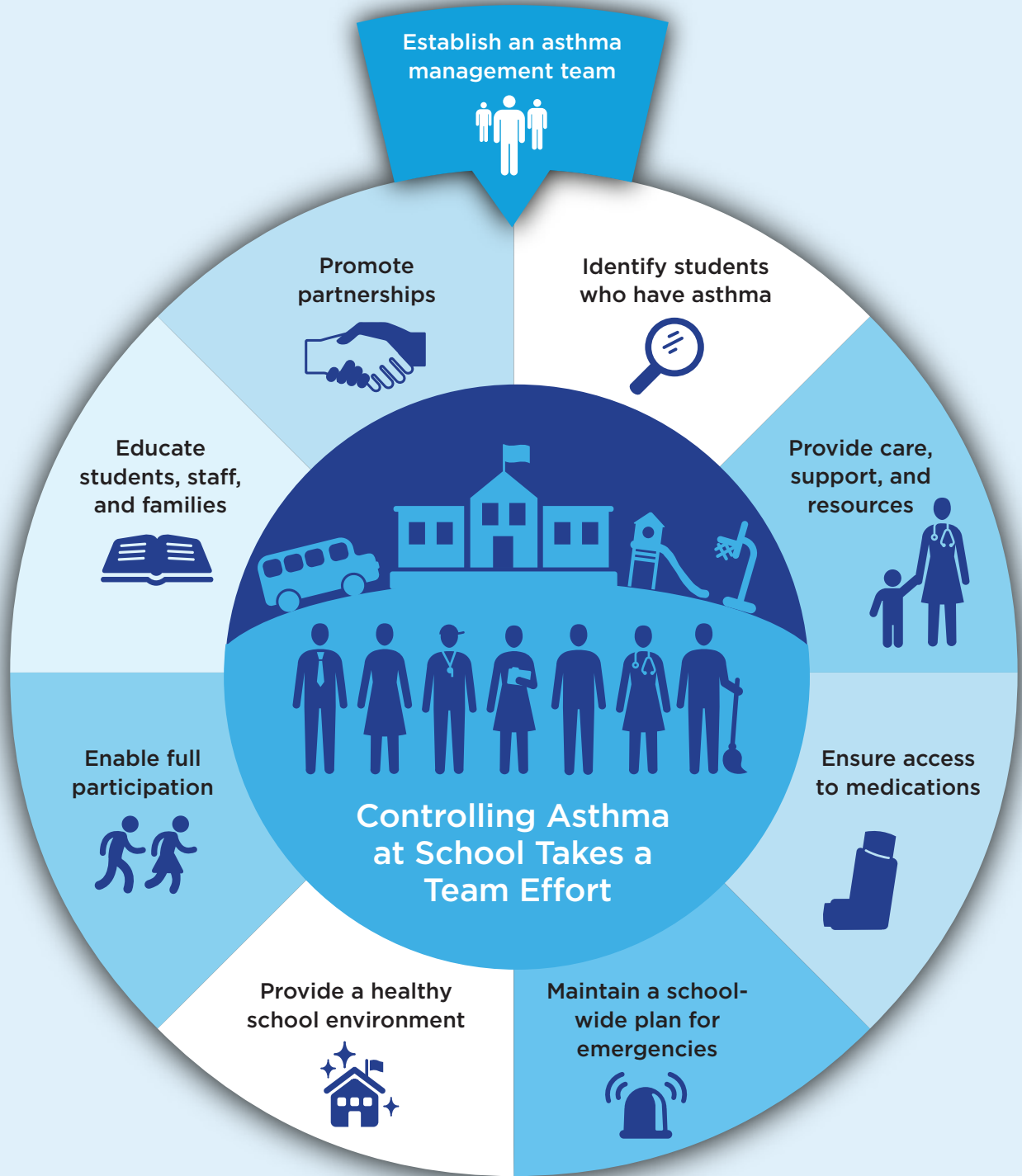
## **AN ASTHMA MANAGEMENT PROGRAM MAY ENCOMPASS THE FOLLOWING KEY ACTION ITEMS:**

- Establish a team to develop, implement, and monitor the asthma management program
- Identify and track students who have asthma
- Provide care, support services, and resources for students who have asthma

Each school is unique, and some schools may not be able to implement all of these activities at once. It's important to start where you are and make strides toward better asthma management. Schools are encouraged to review the entire list of activities and decide which ones are most practical to implement and best fit the school's own needs and circumstances. Any activities that are not possible now can be viewed as future goals for improving asthma management.



## ELEMENTS OF A SCHOOL ASTHMA MANAGEMENT PROGRAM







It's important that your asthma management program consider Federal, State, district, and local laws and requirements. All staff should be aware of and understand the school's responsibilities under these laws. Federal laws that apply to the needs and rights of students who have asthma include the Americans with Disabilities Act ([www.ada.gov](http://www.ada.gov)), Family Educational Rights and Privacy Act of 1974 (FERPA), Health Insurance Portability and Accountability Act (HIPAA), Individuals with Disabilities Education Act (<http://idea.ed.gov>), and Section 504 of the Rehabilitation Act of 1973. Additional information about these laws is available from the Office for Civil Rights at the U.S. Department of Education (see *Where to Learn More About Asthma Management*, page 60). State, district, and local laws and requirements also address issues such as medication use at school, at off-site school-sponsored events, and during school-sponsored transportation.

- Ensure quick and easy access to prescribed medications, including supporting students who carry and self-administer their asthma medication
- Maintain a school-wide plan for asthma emergencies
- Provide a healthy school environment and reduce asthma triggers
- Enable full participation by students who have asthma
- Educate students, staff, and parents and guardians about asthma
- Promote partnerships among school staff, students, parents and guardians, health care providers, and the community

Each of these action items—and the specific activities related to them, detailed in this section—can contribute to the goal of improved asthma management at school. If your school is just beginning to develop an asthma management program, compare the information in this section with your planned program policies, procedures,

and activities, before starting to implement your program. If your school is already engaged in asthma management efforts, reviewing the activities that follow can help you identify where gaps may exist and where you can strengthen your efforts. The “How Asthma-Friendly Is Your School?” checklist in the Tools for Asthma Management section (see page 46) can also help you take stock of your school’s current efforts and determine where to focus future resources.

The rest of this guide discusses in more detail the action items involved in managing asthma in the school. The guide also provides tools and resources that can help schools carry out the specific activities discussed. ■

Schools and districts are encouraged to monitor students who have asthma and to focus their asthma programs initially on students who have poorly controlled or uncontrolled asthma, as demonstrated by frequent school absences, school health office visits, worsening asthma symptoms, use of quick-relief medication more than twice a week for symptom relief, emergency department visits, hospitalizations, or other markers.

# Action Items for School Asthma Management

## **ESTABLISH A TEAM TO DEVELOP, IMPLEMENT, AND MONITOR THE ASTHMA MANAGEMENT PROGRAM**

Developing and implementing an asthma management program requires a collaborative effort that engages and facilitates effective communication and action among students; parents and guardians; teachers, coaches, and other educators; facilities and maintenance staff; administrative and other support staff; and health care providers.

### **Designate one person to coordinate and oversee asthma management activities**

- Consider staff already engaged in student health activities, such as the school nurse—the school staff person most likely to be qualified to coordinate and oversee asthma management activities. In schools without a school nurse, if your school has a health coordinator, determine if asthma management efforts can be integrated into his or her activities.

### **Involve staff from across the school to ensure coordination among all services and activities**

- Identify and enlist school staff. A school asthma management team typically includes:
  - A site administrator
  - A designated program coordinator
  - School nurse and other school health staff
  - Teachers, assistants, and aides
  - Counseling and other mental health or social services staff
  - Physical education teachers, instructors, coaches
  - Administrative staff
  - School nutrition and food service staff
  - Facilities, custodial, transportation, and maintenance staff

- Engage members of your school’s wellness committee or health advisory council, if your school has such a group.
- Expand the team, as appropriate, to include students; parents and guardians; health care providers; representatives of government agencies, asthma coalitions, and youth-serving organizations; and others.
- Provide training opportunities for team members to expand their knowledge and skills in managing asthma.

## **IDENTIFY AND TRACK STUDENTS WHO HAVE ASTHMA**

To be able to support students who have asthma, schools need to know who those students are and have access to information to help guide appropriate care and services. At a minimum, schools should have a system for identifying students who have asthma and ensuring that each student who has asthma has an up-to-date written asthma action plan on file. A student’s written asthma action plan provides instruction for daily management of asthma (including medications and control of triggers) and explains how to recognize and handle worsening asthma symptoms.

### **Identify and track students who have asthma and the services they need**

- Capture information from student health forms, asthma action plans, individualized health service plans, health office visits, and other sources to identify students who have asthma.
- Build a tracking system that provides ongoing feedback on the needs of, and services provided to, students who have asthma.

**Ensure that students who have asthma have a written asthma action plan on file**

- Ask parents or guardians to provide a copy of the student’s written asthma action plan for the school (see page 35 for sample outreach letters to families and physicians). The asthma action plan should be developed by a physician or other licensed health care provider, signed by a parent or guardian and the physician, and kept on file at school. Sample asthma action plans are provided in the Tools for Asthma Management section of this publication (see page 47).
  - Require asthma action plans to be updated yearly, or whenever there is a change in a student’s treatment plan (such as asthma severity, medications, or allergies).
- Designate one person on the school asthma team—preferably the school nurse—to be responsible for maintaining students’ asthma action plans and for educating teachers, coaches, and other staff about each student’s personal asthma action plan. Identify a backup staff member on the team in case the designee is not immediately available.

➔  
**HELPFUL  
RESOURCE**

The Department of Health and Human Services and Department of Education provide guidance about privacy laws in *Joint Guidance on the Application of the Family Educational Rights and Privacy Act (FERPA) and the Health Insurance Portability and Accountability Act of 1996 (HIPAA) to Student Health Records*.

See [www2.ed.gov/policy/gen/guid/fpco/doc/ferpa-hipaa-guidance.pdf](http://www2.ed.gov/policy/gen/guid/fpco/doc/ferpa-hipaa-guidance.pdf).



- Provide copies of asthma action plans to teachers, coaches, and other staff who provide educational and support services to students on an as needed basis and in accordance with the Health Insurance Portability and Accountability Act (HIPAA) and the Family Educational Rights and Privacy Act (FERPA). Talk with teachers, coaches, and other school staff to help them become familiar with the needs of individual students who have asthma.
- File asthma action plans in locations that ensure easy access in an emergency.



#### CONTENTS OF AN ASTHMA ACTION PLAN

##### **Daily management:**

- What medications to take daily, including the specific names and dosages of the medications
- What actions to take to control environmental factors (triggers) that worsen the student's asthma

##### **Recognizing and handling signs of worsening asthma:**

- What signs, symptoms, and peak flow readings (if peak flow monitoring is used) indicate worsening asthma
- What medications and dosages to take in response to these signs of worsening asthma
- What symptoms and/or peak flow readings indicate the need for urgent medical attention

##### **Administrative issues:**

- Emergency telephone numbers for the parent or guardian, physician, emergency department, and person or service to transport the student rapidly for medical care
- Written authorization for student to carry and self-administer asthma medication, when considered appropriate by the health care provider and the parent or guardian
- Written authorization for the school to administer the student's asthma medication





## PROVIDE CARE, SUPPORT SERVICES, AND RESOURCES FOR STUDENTS WHO HAVE ASTHMA

Students who have asthma may need health and psychological support services to keep their asthma under control and participate fully in school activities. Schools can provide important care and support by conveying clear procedures for administering medications to students and for enabling students to carry and self-administer their asthma medication, assessing asthma control and recognizing symptoms, and addressing the psychosocial challenges that come with having a chronic health condition such as asthma.

### Provide students who have asthma with access to appropriate support services, resources, and assistance from trained personnel

- Help students learn more about asthma and how to control it.
- Provide access to skilled health and mental/behavioral health staff.
  - Consult medical and State Nurse Practice Acts to determine the legal scope of practice for those providing clinical interventions and management in the school.
- Provide case management for students who have poor asthma control or increased symptoms and attacks.

**HELPFUL RESOURCE** → The NAEPP, coordinated by the NHLBI, provides evidence-based guidelines for asthma care and control, including recommendations for educational interventions in school settings, along with asthma materials and tools for schools.

See [www.nhlbi.nih.gov/health/prof/lung/index.htm#asthma](http://www.nhlbi.nih.gov/health/prof/lung/index.htm#asthma).



A Healthy People 2020 goal is to increase the proportion of schools that have at least one full-time registered school nurse for every 750 students.

See [www.healthypeople.gov/2020](http://www.healthypeople.gov/2020).

- Recognize that learning to cope with asthma, as with any chronic illness, can be stressful. Teachers, coaches, and other educators may notice that some students who have asthma may show low self-esteem, hesitate or avoid physical activity, have difficulty completing schoolwork, or be irritable or have trouble staying alert. Referring these students for counseling may help identify stressors, propose solutions, and help them handle problems more effectively.

### Assess students' asthma control

- Check periodically to see if students who have asthma are achieving good asthma control, especially students who receive intensive case management services at school.
- Watch for symptoms or signs of poorly controlled asthma, such as coughing, wheezing, chest tightness, or shortness of breath. If you notice these signs or symptoms, notify the school nurse or other designated staff right away. Monitor closely students who have symptoms or signs of poorly controlled or uncontrolled asthma or who have recently had an asthma attack.

Even mild symptoms can be signs of a coming asthma attack. If you see or become aware of asthma symptoms, act quickly.

See pages 53–54.



- Watch for possible side effects of medication—such as nervousness, nausea, jitteriness, hyperactivity, and drowsiness—that may warrant referral to the student’s health care provider.
- Use a peak flow meter daily to monitor lung function for students who use this device as part of their asthma management plan as outlined by their health care provider (see How To Use a Peak Flow Meter, page 55).
  - To help these students adhere to daily peak flow monitoring, consider having peak flow meters with disposable mouthpieces in the school health office. Provide education on peak flow meter use when appropriate.

- Provide advice to parents and guardians on behavioral strategies that can help improve adherence to treatment for students who have poorly controlled asthma.



Use the NAEP’s *Is the Asthma Action Plan Working? A Tool for School Nurse Assessment* to evaluate whether a student’s asthma is under control and identify potential barriers to control.

See the Tools for Asthma Management section (page 51) or [www.nhlbi.nih.gov/health/prof/lung/asthma/asth\\_act\\_plan\\_frm.pdf](http://www.nhlbi.nih.gov/health/prof/lung/asthma/asth_act_plan_frm.pdf).

### **Encourage interaction with the student's health care provider**

- Notify parents or guardians when you suspect that a student has worsening or poorly controlled asthma, undiagnosed asthma or other respiratory difficulties, or medication side effects, and refer them to the student's health care provider or medical home for proper diagnosis and treatment.
- Encourage regular follow-up visits with the student's health care provider to assess asthma control, educate students and parents or guardians on how to manage asthma, and update the student's asthma action plan.

### **Document and evaluate services provided to students who have asthma**

- Document services provided to students who have asthma, both in individual student health records and in school-wide summary reports.
- Capture health office visits for both routine and acute asthma needs, responses to emergencies (for example, asthma attacks and calls to 9-1-1 or your local emergency service), and urgent calls to parents or guardians for medication or to send students home.
- Prepare regular reports to describe how well asthma management policies and procedures are being implemented and to identify and make the case for areas that still need attention and resources; encourage the school asthma management team to be involved in this effort.

The NAEPP asthma clinical guidelines recommend follow-up visits with a health care provider at one- to six-month intervals, depending on the level of asthma control.



### **ENSURE QUICK AND EASY ACCESS TO PRESCRIBED MEDICATIONS**

Many students who have asthma need to take both long-term control medications and quick-relief medications. Long-term control medications are usually taken daily to control asthma's underlying inflammation and prevent asthma symptoms. Quick-relief medications are taken when needed to help stop asthma symptoms and attacks by temporarily relaxing the muscles around the airways, but they are not effective for long-term asthma control.

All students who have asthma must have quick-relief medication available at school to take as needed to relieve symptoms and, if directed, to take before exposure to exercise or other physical activity. Ensuring access to quick-relief medication is essential. If accessing medication is difficult, inconvenient, or embarrassing, a student may be discouraged and fail to use his or her quick-relief medication as needed. As a result, the student's asthma may become unnecessarily worse and his or her activities limited needlessly.

### **Ensure medication access during all school and school-sponsored activities**

- Establish procedures to make sure that all students who have asthma have immediate access to their quick-relief medication at school, at all school-sponsored activities, and during transportation to and from school and school events.

All 50 States and the District of Columbia have laws allowing students to carry and take their own prescribed quick-relief asthma medications in school settings.



➔ **HELPFUL TOOL** From the NAEPP: *When Should Students With Asthma or Allergies Carry and Self-Administer Emergency Medications at School?* Although this resource was written for health care providers who prescribe quick-relief medications, it may be helpful when having a conversation about a student's self-administration of medications.

See [www.nhlbi.nih.gov/files/docs/resources/lung/emmer\\_med.pdf](http://www.nhlbi.nih.gov/files/docs/resources/lung/emmer_med.pdf).

- Ensure paperwork to allow students to be administered medication and/or to carry and self-administer medication is provided to parents and guardians at the beginning of the school year and that completed forms are kept on file.
  - Documentation may be part of the student's written asthma action plan or may be a separate medication authorization form signed by the student's physician and parent or guardian, and in some jurisdictions, the school nurse.
- Make sure that students have access to their quick-relief medication when prescribed for use before exercise or other physical activity. Students who have exercise-induced asthma (or exercise-induced bronchospasm) may be directed by their health care provider to pre-medicate 5 minutes before exercise or other physical activity to prevent asthma symptoms.
- Follow the student's asthma action plan for administering medication.

- Store all medication properly in a location that is easily accessible. Check medication expiration dates periodically.

#### **Support students who have asthma who carry and administer their own medications**

- School nurses or other school health staff can help the student follow proper technique according to manufacturer's instructions to ensure adequate delivery of medication to the airways (see pages 57–59 for general tips on how to use inhalers and nebulizers).
- Alert the school nurse, school health staff, parents or guardians, and health care provider, as appropriate, if the student needs help in using medication properly.
- Ask parents or guardians whose students carry their own medications if they would like to leave a second inhaler to keep on hand at the school in case the student needs it.



## MAINTAIN A SCHOOL-WIDE PLAN FOR ASTHMA EMERGENCIES

An asthma attack requires prompt action to stop it from becoming more serious or even life-threatening. And if a life-threatening asthma emergency does occur, fast and appropriate action is vital.

Having a plan for handling asthma emergencies and training staff in following that plan will ensure that your school is prepared to help a student during an asthma attack and to assist that student when he or she returns to the classroom.

**All** staff must know how to handle asthma emergencies, even staff who do not regularly provide direct care or instruction to students (such as bus drivers and administrative, food service, and custodial staff). They may be the only adult present when an asthma attack happens. Knowing what to do could save a life!

## Develop clear emergency procedures for responding to asthma attacks

- Be sure emergency procedures address asthma emergencies at school, during after-school hours, at off-campus events (such as fire drills, field trips, sporting events), during transportation to and from school and school-sponsored activities, and for shelter-in-place or lock-downs (for example, during a natural disaster such as tornado, hurricane, or earthquake; release of environmental toxin; or a security threat).
- Ensure staff know how to recognize an asthma emergency and follow a student's asthma action plan in case of an asthma attack. (See pages 53–54 for a list of early warning signs of an asthma attack and action steps for school staff to manage an asthma attack.)
- Include standard protocols for addressing asthma in the event that a student has no asthma action plan or individualized health service plan.





**Ensure availability of and accessibility to appropriate asthma medications and devices in case of emergency.**

- Develop clear procedures for communicating emergency health information—for example, by engaging emergency alarm systems, dialing 9-1-1 or your local emergency service, using walkie-talkies, texting, sending emails, and calling parents and guardians.
  - Make sure every student asthma action plan includes emergency telephone numbers for a parent or guardian, a physician, the emergency department, and a person or service to transport the student rapidly for medical care.
- Review emergency policies and procedures regularly with staff to ensure preparedness.

- After each emergency event, assess the response, and recommend changes to emergency plans and protocols as needed.

**Ensure availability of and accessibility to appropriate asthma medications and devices in case of emergency**

- Explore whether your school system permits or requires schools to stock asthma medications and devices under general standing medical orders for emergency use (such as for a student who has no asthma action plan on file, or when a student has an asthma action plan but has no prescribed medication available).

**HELPFUL TOOL** → The NAEPP's *Suggested Emergency Nursing Protocol for Students With Asthma Symptoms Who Don't Have a Personal Asthma Action Plan* provides general guidance for treating a student who has an asthma attack when that student does not have an up-to-date action plan or when that plan is unavailable.

See [www.nhlbi.nih.gov/health-pro/resources/lung/asthma-school-suggested-protocol-for-students-without-plan.htm](http://www.nhlbi.nih.gov/health-pro/resources/lung/asthma-school-suggested-protocol-for-students-without-plan.htm).

- Asthma medications and devices may include quick-relief metered-dose inhalers; nebulizers for delivery of aerosolized medication, including albuterol; and peak flow meters to check for signs of worsening asthma and to assess the severity of an asthma attack and response to medication during an asthma attack (follow instructions that accompany these devices/medications; pages 55–59 provide general instructions). Injectable epinephrine for severe allergic reactions may be included, too, as severe allergies and allergic reactions can also trigger an asthma attack.

### **Facilitate re-entry to school following an asthma attack**

- Provide follow-up support for a student recovering from an asthma attack, as needed, in coordination with the student's family and health care provider.
- Develop a clear procedure with the student and parents or guardians for handling missed schoolwork because of asthma.
- Work with the student and parents or guardians to facilitate a student's return to physical education and other physical activities after an

asthma attack. It may be necessary to temporarily modify physical activity in type, length, and/or frequency when the student is recovering.

### **PROVIDE A HEALTHY SCHOOL ENVIRONMENT AND REDUCE ASTHMA TRIGGERS**

All school staff can contribute to creating a healthy school environment. Reducing and eliminating allergens and irritants in the indoor and outdoor environment that can cause asthma symptoms or start asthma attacks can benefit not only students and staff who have asthma, but all students and staff.

#### **Establish an indoor air quality (IAQ) team and IAQ program**

- Recruit for your school's IAQ team facilities, custodial, and maintenance staff and environmental health specialists; transportation staff; school nurses, teachers, and other school staff; and, if possible, interested students, parents and guardians, and outside experts and community members.



The NAEPP's *Suggested Emergency Nursing Protocol for Students with Asthma Symptoms Who Don't Have a Personal Asthma Action Plan* notes that schools may also consider administering epinephrine if the student is unable to use a quick-relief inhaler because respiratory distress or agitation prevents adequate inhalation from the inhaler and nebulized albuterol is not available and the exacerbation is life-threatening. Epinephrine, however, is not first-line treatment for asthma. Albuterol is the treatment of choice. Administration of epinephrine for asthma should be rare and is intended to prevent a death at school from a severe asthma attack.





➔ **HELPFUL TOOLS** For additional information and tools for developing, implementing, and evaluating an IAQ program, check out these publications from the EPA:

- **IAQ Tools for Schools** [www.epa.gov/iaq/schools](http://www.epa.gov/iaq/schools)
  - **Managing Asthma in the School Environment** [www.epa.gov/iaq/schools/managingasthma.html](http://www.epa.gov/iaq/schools/managingasthma.html)
  - **Integrated Pest Management for Schools** [www.epa.gov/opp00001/ipm](http://www.epa.gov/opp00001/ipm)
  - **Mold Remediation in Schools and Commercial Buildings** [www.epa.gov/mold/mold\\_remediation.html](http://www.epa.gov/mold/mold_remediation.html)
- Task the IAQ team, under the direction of a designated coordinator, to develop and implement an IAQ program, such as IAQ Tools for Schools from the U.S. Environmental Protection Agency (EPA) (see above). IAQ plans typically include the following:
    - Routine cleaning and maintenance schedules
    - Moisture and mold control
    - Installation and maintenance of quality heating, ventilation, and air conditioning (HVAC) systems
    - Integrated pest management
    - Selection of low-emitting, low-toxicity materials
    - Aggressive source control (tobacco smoke, bus idling, walk-off mats, timing of repairs)
- Regularly assess environmental risks**
- Conduct ongoing monitoring and evaluation of IAQ to identify, resolve, and prevent IAQ problems. Focus on key health and safety issues and feasible solutions.
  - Provide a clear pathway for staff, parents and guardians, and students to report possible IAQ concerns. Hold staff accountable for response.
  - Encourage teachers and other staff to observe what seems to make a student's asthma better





**Reduce allergens, irritants, and other asthma triggers in the classroom and school environment.**

See tip sheet on the next page

**HELPFUL TOOL**

→ The AIRNow Web site ([www.airnow.gov](http://www.airnow.gov)), developed by EPA and other Federal, State, tribal, and local agencies, features a map showing the current and forecasted air quality conditions nationwide and by State. It also provides links to state-specific resources for air quality improvement and information.

or worse, and share those observations with the school nurse, who in turn may discuss the situation with parents or guardians as appropriate.

- Use daily monitoring of Air Quality Index (AQI) information reported by local media, air pollution control agencies, and health departments to help reduce students' exposure to unhealthy air quality during air quality alerts.

**Reduce allergens, irritants, and other asthma triggers**

- Keep classrooms free of common allergens and irritants that can make asthma worse. Be aware that most students who have asthma also have allergies. The tip sheet on the next page identifies common asthma triggers and describes ways that schools can reduce or eliminate these triggers.

- Learn students' asthma triggers, which can vary for each student who has asthma, and take special care to reduce or eliminate them.
- Use integrated pest management (IPM) practices to control pests and minimize students' exposure to potentially harmful pesticides.
- Develop and enforce smoking bans in school buildings, on school grounds, at school-sponsored events, and in vehicles used for student travel. Support smoking prevention and cessation programs for students and staff.
- Design and schedule building repairs, renovations, cleaning, and maintenance to avoid exposing students and staff to fumes, dust, chemicals, and other irritants. When possible:
  - Schedule painting and major repairs during long vacations or summer break. Be sure to thoroughly clean all affected areas to remove dust, debris, and fumes before students return.
  - Select the safest cleaning and building products available and use according to manufacturer's instructions.
  - Cut grass when students are not in school.



## COMMON ASTHMA TRIGGERS

### Allergens

- Pollen—from trees, plants, and grasses, including freshly cut grass
- Animal dander from pets with fur or hair
- Dust mites—in dust, carpeting, plush toys, pillows, and upholstery
- Cockroach droppings
- Rodent urine
- Molds

### Irritants

- Strong smells and sprays, such as perfumes, paints, cleaning solutions, talcum powder, and pesticides
- Air pollutants
- Cigarette and other tobacco smoke

### Other asthma triggers

- Upper respiratory infections—colds or flu
- Exercise—running or playing hard—especially in cold weather
- Strong emotional expressions, such as laughing or crying hard
- Changes in weather, exposure to cold air

### WHAT SCHOOL STAFF CAN DO TO REDUCE ASTHMA TRIGGERS

- Mop and damp dust often. Clean mops and dust cloths after each use.
- Reduce classroom clutter and store classroom materials in covered bins to make cleaning easier.
- Keep air vents clear of furniture, papers, books, and other items.
- Use wood, tile, or vinyl floor coverings instead of carpet. If a classroom has carpet, vacuum it frequently when students are out of the classroom.
- Keep pets with fur or hair out of the classroom.
- Use only low-odor, low-emitting products for cleaning, art, science, and other instructional use.
- Minimize eating in the classroom to reduce pests. Food stored in the classroom should be in sealed containers. Clean up spills right away. For large spills, call maintenance or custodial staff.
- Do not spray pesticides. If you see pests, call maintenance staff.
- Do not use products with strong odors, such as perfumes and cleaning products.
- If possible, on days with high pollen counts or poor air quality, keep windows closed. Provide alternative indoor activities.
- Report unusual odors, mold, moisture problems, or other environmental concerns to maintenance staff right away.
- Help enforce no-smoking policies and no-idling policies for vehicles.



Staff can reduce asthma triggers by helping to enforce no-idling policies for vehicles.



## ENABLE FULL PARTICIPATION FOR STUDENTS WHO HAVE ASTHMA

Asthma can limit a child’s ability to play, learn, and sleep—all critical to his or her development and learning. With the appropriate care, however, most children with asthma can achieve and maintain asthma control, enabling them to participate fully and safely in all school activities, even vigorous physical activity. Schools can help by creating a supportive environment for students who have asthma.

### Encourage and support full participation

- Provide opportunities for all students to engage in active learning and to participate fully in diverse activities.
- Encourage students who have asthma to participate as much as possible in physical education classes and activities such as music, art, industrial arts, and field trips.
- Understand that some students who have asthma may have limitations despite medical attempts at controlling their asthma. Encourage these students to do what they can, and assess students on the basis of their effort, not just performance.

Routinely excusing students who have asthma from activities may do more harm than good.

- Follow the student’s asthma action plan, including pre-medication before physical activity, if prescribed.
- Have students do warm-up and cool-down activities, an appropriate part of any exercise program, to help students who have asthma prevent exercise-induced asthma symptoms.
- Help make sure that students who have asthma are treated no differently from students who do not have asthma, except to address asthma needs. Do not tolerate bullying of students who have asthma.

➔ **HELPFUL TOOL** Updated in 2012 by the NHLBI, *Asthma & Physical Activity in the School: Making a Difference* provides guidance for teachers, coaches, and school staff to empower students who have asthma to participate fully in exercise and other physical activity.

Available at [www.nhlbi.nih.gov/health/public/lung/asthma/phy\\_asth.pdf](http://www.nhlbi.nih.gov/health/public/lung/asthma/phy_asth.pdf).





Modify classroom activities, recess, and field trips to accommodate students who have asthma.

### **Modify activities when necessary**

- Recognize and respect any limits a student may have because of asthma. Modify a student's physical activity when he or she is recovering from a recent asthma attack or has a cold or flu, allergy symptoms (such as an itchy or runny nose), or a peak flow number below the student's normal range. Adhere to any activity limitations indicated in a student's asthma action plan or individualized health services plan.
- Modify classroom activities, recess, and field trips to accommodate students who have asthma. For instance, change the location of activities or adjust the type, pace, or intensity of activities during extreme weather, high pollen counts, or poor air quality.

### **Watch for reluctance or inability to participate in activities**

- Notify the school nurse or school health staff and the student's parents or guardians if a student who has asthma frequently expresses a desire to sit out or says he or she is unable to do an activity. This could indicate his or her asthma is not well controlled.
- Watch for sleepiness or inability to focus on activities, which could indicate a student who has asthma is not getting enough sleep; waking during the night is a sign that asthma is not well controlled.
- Provide counseling services for students who have asthma who may be embarrassed or self-conscious about activity limitations.





*So You Have Asthma: A Guide for Patients and Their Families*, updated in 2013 by the NHLBI, provides a wealth of information about asthma, including how it affects the lungs, how to control it, and what to expect from treatment.

Available at [www.nhlbi.nih.gov/health/resources/lung/asthma-guide.htm](http://www.nhlbi.nih.gov/health/resources/lung/asthma-guide.htm).

## EDUCATE STUDENTS, STAFF, AND PARENTS AND GUARDIANS ABOUT ASTHMA

The saying goes, “Knowledge is power.” Educating students, their families, and school staff about asthma and its related needs and challenges will empower everyone to address this chronic disease more effectively in the school setting. Training and educational programs can help students and families improve self-management skills, better equip staff to support students who have asthma and their families, and raise awareness about the disease among the student body, thus creating a more accepting social climate.

### Conduct in-service programs for all staff about managing asthma and allergies

- Seek assistance from the school nurse; a local pediatrician, family practitioner, or asthma specialist; a local hospital or medical society; and your State or local asthma coalition to conduct an in-service asthma program. Training that is more comprehensive may be required for school personnel who have frequent contact with students who have asthma. Training should include:
  - Basic background information about asthma and symptom recognition
  - Roles and responsibilities of individual staff members in daily asthma management and response to asthma attacks
  - What to do in case of an asthma emergency
- Provide for more advanced training for school nurses, health assistants, health aides, and other health staff in the school, including:
  - Advanced training on asthma control and treatment of asthma attacks

- Asthma monitoring and treatment skills, including how to use common asthma medications and devices
- Relevant school district policies, procedures, and forms
- Asthma self-management support for students who have asthma and their families

### Provide asthma education to students who have asthma and their families to help improve their asthma self-management skills

- Collaborate with parent-teacher organizations to offer a family asthma education program in school.
- Develop a resource file for students and parents and guardians to facilitate access to asthma education and other supportive services, such as smoking cessation, through school or community programs.

### Provide asthma education for the general student body

- Incorporate information about asthma in health, science, first aid, and other classes as appropriate.
- Educate students on how to report and respond to emergencies, including potential asthma emergencies.
- Provide a safe and emotionally healthy learning environment in which all students feel valued, have a sense of belonging, and feel confident expressing their thoughts and opinions.



### PROMOTE PARTNERSHIPS AMONG SCHOOL STAFF, STUDENTS, PARENTS AND GUARDIANS, HEALTH CARE PROVIDERS, AND THE COMMUNITY

A strong partnership among school personnel, family members, health care providers, and other professionals in the community is important for helping students who have asthma manage their condition. Moreover, it has the potential to improve their school attendance and academic performance. One hallmark of an effective partnership is good communication, including an ongoing exchange of information, agreement on goals and strategies, and sharing of responsibilities among health care providers, school staff, and families.

#### **Facilitate open and cooperative exchange of information among school staff, parents and guardians, students, and health care providers**

- Communicate policies, procedures, and other information related to asthma management to staff, parents and guardians, students, and health care providers and listen to their concerns and feedback.

Schools may disclose personally identifiable information only if the school gets written consent from a student's parent or guardian. However, privacy laws allow schools to share such information among school officials, including teachers, without parental consent when it is in the legitimate educational interests of the student.

- Use your school's Web site to share how your school team works to control students' asthma during school hours as well as during after-hours or off-site school activities.
- Post information on your Web site to help families file the appropriate documentation to allow students to be administered asthma medication and/or to carry and self-administer medication.
- Inform staff on what to do and whom to summon for help as soon as they observe, or a student reports, any warning signs or symptoms of an asthma attack. By acting quickly, they can help the student avoid a more serious asthma attack.

- Communicate with parents or guardians and health care providers (with parental permission) about asthma attacks; changes in students' health status, including use of quick-relief asthma medication; and frequent absences.
- Follow school policies for sharing individual student health information. Include proactive permissions to share information in a way that is compliant with privacy laws (HIPAA, FERPA).

**Coordinate school asthma activities as much as possible with other school services and programs and with community service organizations that can provide additional resources**

- Encourage collaboration to build support and maintenance of school asthma management activities.

- Coordinate services with parents and guardians, school nurses, health care providers, and others who provide care for students who have asthma. Suggest referral to student's physician if undiagnosed or worsening asthma is suspected (see sample outreach letters to families and physicians, page 35).
- Coordinate school-based counseling, behavioral, psychological, and social services for students who have asthma, as appropriate to help them and their families identify and address psychosocial stressors that impede the student's asthma control and success in school. Coordinate with community services.



One partnership to consider is with other schools and school districts. As your school develops, implements, or expands its asthma management program, consider consulting with other schools in the district, county, or State to learn about their programs. You may find that your school can build off existing successful strategies or collaborate with other schools that are also starting or refining their school asthma management programs.







## Asthma Management Program in the School: Roles and Responsibilities for School Staff

As noted previously, all school staff have a role to play in an asthma management program. The pages that follow summarize the roles and responsibilities that individuals in various staff positions may have in developing and implementing such a program. Some of the actions outlined suggest that a lead staff person be identified and assume the role; other actions may require supportive roles related to preparedness and increasing awareness about the program.

Schools may notice overlap among various staff roles. This is to be expected, as an effective asthma management program requires a coordinated team approach where each staff member shares in the overall responsibility. Ideally, a school nurse should be part of the team that supervises or provides health care in the school setting.



Photocopy the summary pages that follow, or download them for printing at <https://www.nhlbi.nih.gov/health-pro/resources/lung/asthma-management-school-guide>. Use the pages as handouts during staff trainings, or distribute them to staff as a reminder of how they can help students manage their asthma.



**Establish a team to develop, implement, and monitor the asthma management program**

- Designate one person to coordinate and oversee asthma management activities.
- Engage staff from across the school, including school health staff and members of your school's wellness committee or health advisory council, if your school has such a group.
- Involve, as appropriate, students, parents and guardians, health care providers, and representatives of local agencies and organizations.

**Identify and track students who have asthma**

- Institute a process to identify every student who has asthma and to have on file an asthma action plan for each, signed by the student's health care provider and parent or guardian, and updated at least yearly.
- Assign the school nurse or other designee responsibility for maintaining students' asthma action plans.
- Maintain the confidentiality of students who have asthma.

**Provide care, support services, and resources for students who have asthma**

- Know the laws pertaining to students who have asthma and be proactive in following them.
- Provide access to skilled health, mental health, and support staff. Review services and identify school and community resources to fill gaps.
- Ensure systems are in place to provide feedback on asthma-related student health and quality-of-life measures.

**Ensure quick and easy access to prescribed medications**

- Convey clear procedures for administering prescribed medication by a school nurse, and by other staff if permitted, and for students' carrying and self-administering their asthma inhaler per their asthma action plan or medication authorization form.
- Store medication properly in an easily accessible location.

**Maintain a school-wide plan for asthma emergencies**

- Institute a plan for responding to asthma attacks.

- Include protocols for students with no asthma action plan or without their prescribed medication, such as a standing protocol signed by the public health or school physician authorizing medication use, and a district policy permitting stock inhalers, nebulizers, albuterol, peak flow meters, and/or epinephrine for emergency use.

**Provide a healthy school environment and reduce asthma triggers**

- Set standards for maintenance, humidity, mold and dust control, and ventilation.
- Identify staff to lead an indoor air quality (IAQ) program to identify, assess, and resolve IAQ issues that can worsen asthma.
- Set and enforce rules for outdoor asthma triggers, including no-smoking and no-idling policies and integrated pest management to reduce pesticide use.

**Enable full participation by students who have asthma**

- Provide opportunities for all students to engage in active learning and to participate fully in diverse activities.
- Ensure policies are in place and enforced that allow students to pre-medicate before activities.
- Support efforts to promote inclusiveness and prevent bullying.

**Educate students, staff, and parents and guardians about asthma**

- Provide in-service programs for all staff on managing asthma, including your school's policies and procedures for responding to asthma attacks.
- Support more advanced training for school nurses and other staff as warranted, particularly for staff designated to administer medication.

**Promote partnerships among school staff, students, parents and guardians, health care providers, and the community**

- Facilitate the open and cooperative exchange of information among school staff, parents and guardians, students, and health care providers to promote agreement on goals and strategies and sharing of responsibilities.

**Participate on a team to develop, implement, and monitor the asthma management program**

- Provide leadership and technical expertise to school asthma management team.

**Identify and track students who have asthma**

- Facilitate the development, communication, and use of asthma action plans with students, parents and guardians, staff, and health care providers.
- File asthma action plans in a secure location with easy access in an emergency, and share copies with relevant staff in accordance with privacy laws.

**Provide care, support services, and resources for students who have asthma**

- Oversee, deliver, and document care: Administer medication, monitor asthma control, develop individualized health service plans, coordinate care, and maintain records.
- Delegate care to staff only in accordance with your State Nurse Practice Act and other prevailing laws, rules, and regulations.

**Ensure quick and easy access to prescribed medications**

- Provide safe storage and easy access to prescribed medication when needed.
- For students who carry their own asthma inhalers, ask parents or guardians if they would like to provide a second inhaler to store at school.
- Provide feedback to parents and health care providers about a student's readiness to carry and self-administer medication.
- Periodically review students' technique to ensure proper use of inhalers.
- Train designated back-up staff to provide quick and easy access to students' medications when you are unavailable.

**Maintain a school-wide plan for asthma emergencies**

- Help establish a school-wide plan for asthma emergencies.
- Train staff to follow the plan, including whom to contact and how when a student has an asthma attack.
- Track and report asthma attacks, calls to 9-1-1, and related emergency events.

- Assess the response after each event, and recommend changes to the emergency plan and protocols as needed.

**Provide a healthy school environment and reduce asthma triggers**

- Train teachers, coaches, and other staff to help students avoid or reduce exposure to their asthma triggers in line with students' asthma action plans.
- Help the school's indoor air quality team prioritize key health and safety issues to tackle.
- Refer student to his or her health care provider to identify or test for asthma triggers if student's asthma is not controlled.
- Use the student's asthma action plan to guide individual recommendations.

**Enable full participation by students who have asthma**

- Advise teachers, instructors, and coaches on modifying activities to match students' current asthma status or based on students' asthma action plans.
- Teach staff how to use metered-dose inhalers to assist students, as appropriate, to pre-medicate before exercise.

**Educate students, staff, and parents and guardians about asthma**

- Obtain continuing education in asthma and consider becoming a certified asthma educator.
- Provide asthma education to students who have asthma and their families to help them improve asthma self-management skills.

**Promote partnerships among school staff, students, parents and guardians, health care providers, and the community**

- Communicate policies, procedures, and other information related to asthma management to staff, parents and guardians, students, and health care providers and listen to their concerns and feedback.
- Coordinate with community organizations that can provide additional resources and support to school staff, students, and families.

**Participate on a team to develop, implement, and monitor the asthma management program**

**Identify and track students who have asthma**

- Review student health forms, asthma action plans, health office visits, and other sources to identify students who have, or may have, asthma.
- Assist with outreach letters and follow up with families and health care providers to obtain asthma action plans and medications, and to determine any additional needs.
- Maintain the confidentiality of students who have asthma.

**Provide care, support services, and resources for students who have asthma**

- Support and assist students, families, and staff in managing students' asthma under the supervision of a school nurse (if on staff) and per Federal, States, district, and school policies.
- Monitor students' asthma control and refer for medical evaluation and other services as indicated.

**Ensure quick and easy access to prescribed medications**

- Assist in storing and providing quick and easy access to prescribed medications for students who have asthma.
- Check expiration dates periodically and follow up with students, families, and health care providers to ask them to supply or replace students' prescribed asthma medication.
- Become familiar with proper techniques for the use of metered-dose inhalers, spacers, dry powder inhalers, nebulizers, and peak flow meters to assist students, their families, and staff, as appropriate.

**Maintain a school-wide plan for asthma emergencies**

- Help implement all aspects of the school's asthma emergency plan.
- Be proactive: Let staff know you are a resource; learn proper techniques for treating and monitoring asthma attacks, if permitted; and make sure all student asthma action plans have

emergency telephone numbers for parents or guardians, a physician, the emergency department, and rapid transport for medical care.

**Provide a healthy school environment and reduce asthma triggers**

- Partner with the school's indoor air quality (IAQ) team, students who have asthma, parents and guardians, and staff to facilitate the sharing and resolution of environmental concerns.
- Participate in walk-through inspections with the IAQ team to look for common asthma triggers and other risks.
- Advise staff on what they can do to reduce asthma triggers.

**Enable full participation by students who have asthma**

- Assist teachers, instructors, and coaches in addressing any concerns that are limiting students' full participation in activities and in modifying activities for students who have asthma when needed.
- Provide help, if permitted, to students with prescribed pre-medication before exercise.

**Educate students, staff, and parents and guardians about asthma**

- Coordinate staff, student, and family asthma education programs.

**Promote partnerships among school staff, students, parents and guardians, health care providers, and the community**

- Coordinate services with parents and guardians, the school nurse, health care providers, and others who serve students who have asthma.
- Suggest referral to student's health care provider if poorly controlled, uncontrolled, worsening, or undiagnosed asthma is suspected.

**Participate on a team to develop, implement, and monitor the asthma management program**

**Identify and track students who have asthma**

- Ask the school nurse or school health staff to inform you of the health needs of students who have asthma in your classroom.
- Learn the signs or symptoms of poorly controlled, uncontrolled, worsening, or undiagnosed asthma and how to respond quickly to keep an asthma attack from becoming more severe.

**Provide care, support services, and resources for students who have asthma**

- Provide care and support to students who have asthma in consultation with school nurse.
- Follow students' asthma action plans pertaining to medications and asthma triggers.
- Adhere to school policies, rules, and procedures for preventing, addressing, and reporting asthma-related problems.

**Ensure quick and easy access to prescribed medications**

- Team with the school nurse and health staff to ensure students have quick and easy access to their prescribed medications in class, on field trips, or at other school activities.
- Assist, if allowed, students with their medications, as directed by their asthma action plan or medical authorization form.
- Be alert to possible medication side effects—such as nervousness, nausea, jitteriness, hyperactivity, and drowsiness—that may affect behavior and warrant further evaluation.

**Maintain a school-wide plan for asthma emergencies**

- Know the school's procedures for handling an asthma attack, and act fast to stop the attack from becoming more serious or even life-threatening.
- Seek medical help right away, but never send a student to the health room alone or leave a student alone.
- Be watchful when a student self-administers an asthma inhaler. Follow school protocols for reporting the incident and for follow-up.

**Provide a healthy school environment and reduce asthma triggers**

- Ask about your students' asthma triggers. Observe what seems to make their asthma better or worse, and inform the school nurse or school health staff to follow up with parents or guardians.
- Use practical strategies to reduce allergens and irritants in the classroom: For example, avoid strong odors, maintain clutter-free vents, and keep furry pets out of the classroom.

**Enable full participation by students who have asthma**

- Follow students' asthma action plans to help them participate fully and safely in all activities.
- Encourage students who have limitations to do what they can, and assess based on effort, not just performance.
- Alert school nurse or health staff if a student is often sleepy or inattentive or has other potential signs of poorly controlled asthma or medication side effects.

**Educate students, staff, and parents and guardians about asthma**

- Work with the school nurse and school health staff to provide asthma education for all students and to encourage them to be supportive of classmates who have asthma.
- Ask for coaching as needed, such as how to support students who carry their own asthma medication.

**Promote partnerships among school staff, students, parents and guardians, health care providers, and the community**

- Participate in your school's indoor air quality team and/or local or State asthma coalition.
- Promote collaboration to build support and maintenance of school asthma activities and coordination with community services and resources.



**Participate on a team to develop, implement, and monitor the asthma management program**

**Identify and track students who have asthma**

- Find out which students you instruct have asthma and how to access and use their asthma action plan.
- Learn the signs and symptoms of poorly controlled, uncontrolled, worsening, or undiagnosed asthma, and how to respond quickly to keep an asthma attack from becoming more severe.

**Provide care, support services, and resources for students who have asthma**

- Review students' asthma action plans for guidance on medications, asthma triggers, and any other support required.
- Work with the school nurse or health staff to care for students who have signs or symptoms of poorly controlled or uncontrolled asthma or who have recently had an asthma attack.
- Encourage students to let you know if they are having any difficulty with their asthma or if they have had a recent asthma attack.

**Ensure quick and easy access to prescribed medications**

- Plan ahead to ensure students' prescribed medications are available at all times.
- Remind and be prepared to assist a student, as appropriate, to follow pre-medication procedures before exercise, or to help a student who has worsening asthma. Physical activity is an asthma trigger for some students.

**Maintain a school-wide plan for asthma emergencies**

- Use the school's emergency procedures as a guide for working with the school nurse, health staff, students, and parents and guardians to establish a plan for responding and communicating in case of an asthma emergency.
- Ensure access to the students' asthma medications and asthma action plans at all times, including during school activities away from school or after school hours. Remind students

who are authorized to carry and self-administer their quick-relief medication to bring their asthma inhalers for activities away from school.

- Summon help for a student who is having an asthma attack; never leave the student alone.

**Provide a healthy school environment and reduce asthma triggers**

- Avoid exposing students to their known asthma triggers.
- Check the Air Quality Index and consider moving an outdoor activity indoors when air pollution or pollen levels are high or the weather is cold (or ask students to use a scarf to cover their nose and mouth in cold weather).
- Remind students about pre-medicating before exercise, if prescribed.

**Enable full participation by students who have asthma**

- Help students who have asthma participate fully and safely in physical activity: Follow asthma action plans; include warm-up and cool-down periods; and limit, modify, relocate, or stop activity as indicated by student's current asthma status, asthma action plan, or environmental factors.
- Alert the school nurse or health staff if a student is frequently unable or reluctant to participate.

**Educate students, staff, and parents and guardians about asthma**

- Participate in asthma education to know how to help students keep their asthma under control so they can function at their maximum potential.
- Learn how to use a metered-dose inhaler to assist students with pre-medication before exercise or with worsening asthma, as permitted.

**Promote partnerships among school staff, students, parents and guardians, health care providers, and the community**

- Work with the student and parents or guardians to facilitate a student's return to physical education and other physical activities after an asthma attack or period of absence.

**Participate on a team to develop, implement, and monitor the asthma management program****Identify and track students who have asthma**

- Talk with the school nurse and staff, students, and families to identify and address psychosocial, behavioral, financial, and other issues that can interfere with a student's asthma control, school attendance, academic performance, sleep, self-esteem, physical activity, and peer relationships.

**Provide care, support services, and resources for students who have asthma**

- Provide counseling, psychological, and social services for students who have asthma and their families.
- Encourage students and staff to be supportive of students who have asthma.
- Create a resource list for referrals to other school, medical, and community resources.

**Ensure quick and easy access to prescribed medications**

- Empower students and their families to advocate for quick and easy access to the student's prescribed medication.
- Be alert to possible medication side effects—such as nervousness, nausea, jitteriness, hyperactivity, and drowsiness—that may affect behavior and warrant further evaluation.

**Maintain a school-wide plan for asthma emergencies**

- Encourage students and their families to work with the school and the student's health care provider to prepare for a potential asthma emergency.
- Assist students to feel comfortable promptly reporting to the school nurse, school health staff, teacher, or other staff any breathing difficulties or other asthma problems.

**Provide a healthy school environment and reduce asthma triggers**

- Help students resolve issues related to their asthma triggers and the school environment, such as avoiding physical activity due to fear of an asthma attack or embarrassment about pre-medicating, or concerns about strong smells, such as perfume worn by staff.
- Support smoking cessation programs for students, families, and staff.

**Enable full participation by students who have asthma**

- Help ensure that students who have asthma are treated no differently from students who do not have asthma, except to address asthma needs.
- Work with teachers and other staff to address bullying of students who have asthma.
- Provide counseling services for students who may be embarrassed or self-conscious about activity limitations or medication use.

**Educate students, staff, and parents and guardians about asthma**

- Help staff understand that asthma is caused by inflammation and is not an emotional or psychological disease, although strong emotions, like laughing or crying, can trigger an asthma attack.
- Promote independence and self-care consistent with the student's knowledge, skills, and behaviors.

**Promote partnerships among school staff, students, parents and guardians, health care providers, and the community**

- Work with administrators, teachers, and the school nurse to raise awareness about asthma and to create an asthma-friendly environment that respects and supports the needs of students who have asthma.

**Participate on a team to develop, implement, and monitor the asthma management program**

**Identify and track students who have asthma**

- Learn common asthma triggers for students who have asthma. Work with the school nurse, teachers, and other staff to identify and reduce the students' exposure to environmental triggers at school.

**Provide care, support services, and resources for students who have asthma**

- Maintain a healthy school environment to reduce exposure to indoor and outdoor asthma triggers.
- Provide a contact person to work with the school body to identify and address air quality issues and other environmental concerns for students who have asthma.

**Ensure quick and easy access to prescribed medications**

- Work with the administrator and school nurse to establish a safe but easily accessible location for the proper storage of prescribed medications.
- Conduct regular reviews of asthma medication and other health and safety policies and procedures with facilities, custodial, and maintenance staff.

**Maintain a school-wide plan for asthma emergencies**

- Ensure that the school-wide plan for asthma emergencies addresses environmental factors that can trigger potentially life-threatening asthma attacks.
- Include protocols for promptly reporting and resolving cases of hazardous chemical exposure and air and water quality problems.

**Provide a healthy school environment and reduce asthma triggers**

- Conduct regular maintenance and educate staff to support a healthy environment and to reduce asthma triggers.
- Design and schedule building repairs, renovations, or cleaning to avoid exposing students and staff to fumes, dust, and other irritants.
- Schedule painting and major repairs during long vacations or summer break when possible.

**Enable full participation by students who have asthma**

- Alert teachers, coaches, and other staff about upcoming maintenance, cleaning, or construction activities so they can be proactive in modifying or relocating activities to avoid students' asthma triggers.

**Educate students, staff, and parents and guardians about asthma**

- Provide information to school staff, parents and guardians, and students about air quality, and involve them in plans to reduce asthma triggers, such as mold, tobacco smoke, cockroach droppings, dust mites, and animal dander from classroom pets.

**Promote partnerships among school staff, students, parents and guardians, health care providers, and the community**

- Partner with the school nurse, staff, administrators, students, families, health care providers, and community members on a school indoor air quality (IAQ) team to develop and implement a comprehensive IAQ program, such as EPA's IAQ Tools for Schools.



**OTHER KEY STAFF (SUCH AS TRANSPORTATION, ADMINISTRATIVE, AND FOOD SERVICE STAFF)****Asthma Management Program in the School****Participate on a team to develop, implement, and monitor the asthma management program****Identify and track students who have asthma**

- Know which students under your watch have asthma.
- Protect the health and safety of students who have asthma: Keep them away from asthma triggers (such as vehicle exhaust, cold temperatures, and foods or insects to which they are allergic), and learn how to recognize asthma signs and symptoms and how to respond before they become emergencies.

**Provide care, support services, and resources for students who have asthma**

- Know the school's policies and procedures for what to do when you see, or a student reports, asthma signs and symptoms or uses his or her asthma inhaler.
- Learn how to respond quickly in case of an asthma attack.
- Report any concerns about a student who has asthma promptly to administrator, school nurse, and parents or guardians.

**Ensure quick and easy access to prescribed medications**

- Know the school's policies and procedures for helping students gain access to their prescribed medication when needed or requested.
- Do not send a student who is having asthma signs or symptoms to the health room or leave the student alone. Send for help to come to the student.

**Maintain a school-wide plan for asthma emergencies**

- Follow the school procedures for asthma emergencies, whether they occur in the bus, cafeteria, playground, or classroom.
- Be alert to asthma signs, symptoms, or complaints and do not hesitate to call for help (such as dialing 9-1-1 or using walkie-talkies). Even mild symptoms can lead rapidly to severe, life-threatening asthma attacks.

**Provide a healthy school environment and reduce asthma triggers**

- Ask what precautions to take to protect the health and safety of students in your care. Allergies to things such as pollen, food, insect stings, and latex (in latex gloves, rubber mats, and balls) can trigger an asthma attack (or severe allergic reaction), as can exposure to irritants such as tobacco smoke, vehicle exhaust, and strong odors such as cleaners or pesticides.

**Enable full participation by students who have asthma**

- Watch for signs of bullying or exclusion of students who have asthma and report to administrator, guidance counselor, or parents or guardians.

**Educate students, staff, and parents and guardians about asthma**

- Request training on your school's emergency plan for handling asthma attacks, including procedures for accessing asthma action plans and procedures for students who don't have one. You may be the only adult available to give immediate assistance to a student.

**Promote partnerships among school staff, students, parents and guardians, health care providers, and the community**

- Work with school nurse, administrators, and staff to promote a safe environment for students who have asthma and coordinate emergency response efforts.



# Tools for Connecting With the Community

## SAMPLE LETTERS FOR PHYSICIANS AND PARENTS

The letter templates on the following pages will help facilitate communication and cooperation among schools, parents and guardians, and health care providers to foster coordination of asthma care and control and to build asthma management partnerships.

The sample letters can be sent as is, after filling in the blanks, or modified to meet the particular needs of your school.

- Letters to Parents or Guardians (English and Spanish)
- Letters to Physicians and Other Health Care Providers

LETTER TO PARENTS OR GUARDIANS  
[SCHOOL DISTRICT LETTERHEAD TO GO HERE]

Date    /    /  
..... / ..... / .....

Dear .....

The school team at ..... school  
is looking forward to an excellent year for your child,.....

As part of our school's asthma management program, your child will work with the school nurse and other staff to follow his or her asthma action plan and learn how to reduce asthma symptoms and asthma attacks.

In order to provide the best possible asthma management for your child at school, we ask for your help with the following. Please:

- **Get a written asthma action plan** from your child's doctor or other health care provider and give a copy to your child's classroom teacher or the school health office. This asthma action plan states your child's treatment goals, medications and peak flow plan, and steps to reduce your child's asthma triggers. Please be sure the asthma action plan includes instructions for managing symptoms during special activities at school or away from school. Activities and events can include recess, gym, outdoor play, field trips, parties, and art and music class. You may use the enclosed form or a form from your child's health care provider. If your child does not have a primary care provider, please talk with our school health team to work out a plan to support your child's asthma needs.
- **Fill out the enclosed medication administration form(s)** for any medication to be given at school or during school-sponsored activities away from school and submit it to your child's teacher or the school health office. Provide the health care provider's signature and the enclosed form if your child is to carry and take his or her own medication at school and school-sponsored activities. Please bring in medications in original containers with pharmacy labels; do not send medication in with your child. Keep medications refilled as needed, and check for expiration dates that may occur during the school year. If your child carries his or her own medication, and you would like to leave a second inhaler to store at school, you are welcome to do so.



- **Meet with the school nurse**—before school starts and as needed through the school year—to discuss your child’s condition, medications, devices, and asthma triggers.
- **Meet with teachers** and other staff to develop a plan for communication and handling any work or tests your child might miss during school absences due to asthma. Also meet with physical education teachers and coaches to discuss any special needs related to exercised-induced asthma.
- **Prepare your child.** Be sure your child understands his or her medication plan and how to handle symptoms, triggers, and food restrictions. Discuss school policies that relate to your child’s asthma management (such as rules about medication use).
- **Tell school staff about any changes** in your child’s condition or asthma action plan.
- **Tell your child’s doctor or other health care provider about school services** and supports for helping your child manage his or her asthma.

Our asthma management program also includes the following components, which will help support your child’s asthma control while at school:

- Asthma training for all school staff so they are prepared to follow students’ asthma action plans, to identify asthma symptoms and warning signs of asthma attacks, and to handle emergencies related to asthma
- An indoor air quality (IAQ) program to promote a healthy environment and reduce asthma triggers
- A supportive environment that encourages respect for others

Thank you for working with us to help your child. If you have questions or concerns about keeping your child’s asthma well controlled while at school, please contact us at

.....

Sincerely,

\_\_\_\_\_  
Principal (signature)

\_\_\_\_\_  
School Nurse (signature)

LETTER FOR PARENTS OR GUARDIANS — SPANISH  
[SCHOOL DISTRICT LETTERHEAD TO GO HERE]

Fecha ..... / ..... / .....

Estimado/a .....

El personal de la escuela ..... desea que su niño/a,  
..... tenga un año escolar excelente.

Dentro del programa de control del asma de la escuela, su niño/a colaborará con la enfermera de la escuela y otros miembros del personal para seguir su plan de acción para el control del asma y aprender formas de reducir los síntomas y los ataques de asma.

Para poder brindarle el mejor programa posible de control del asma, le pedimos que por favor nos ayude con lo siguiente:

- **Obtenga un plan de acción para controlar el asma**, escrito por el médico de su niño/a o por otro profesional de la salud, y deje una copia con el maestro del salón de clase de su niño/a o en la enfermería de la escuela. Este plan de acción para el control del asma indica las metas de tratamiento de su niño/a, el plan de medicamentos y de flujo máximo, y lo que debe hacerse para reducir los factores desencadenantes del asma de su niño/a. Verifique que el plan de acción para controlar el asma contenga instrucciones para controlar los síntomas durante actividades especiales en la escuela o fuera de ella. Estas actividades y eventos pueden ser el recreo, la educación física, los juegos al aire libre, los paseos escolares, las fiestas y las clases de arte y música. Puede usar el formulario adjunto o un formulario del profesional de la salud de su niño/a. Si su niño/a no tiene un proveedor de atención primaria, hable con nuestro equipo de salud escolar para elaborar un plan en el que se atiendan las necesidades de su niño/a para mantener el asma bajo control.
- **Llene los formularios adjuntos de administración de medicamentos** para cada medicamento que se debe administrar en la escuela o durante actividades escolares fuera de la escuela y entréguelos al maestro de su niño/a o déjelos en la enfermería de la escuela. Si su niño/a debe llevar sus propios medicamentos y tomarlos en la escuela y en las actividades escolares, entregue el formulario adjunto firmado por el profesional de la salud de su niño/a. Lleve los medicamentos a la escuela en sus envases originales con las etiquetas de la farmacia; no envíe medicamentos con su niño/a. Obtenga una nueva receta o más medicamentos cuando sea necesario, y lleve el control de las fechas de vencimiento de

los medicamentos que puedan ocurrir durante el año escolar. Si su niño/a lleva y toma sus propios medicamentos, puede dejar un segundo inhalador en la escuela, si usted lo desea.

- **Reúnase con la enfermera de la escuela** antes de que empiecen las clases y cuando sea necesario durante el año escolar, para hablar sobre los problemas de salud de su niño/a, los medicamentos, los aparatos para administrar los medicamentos y los factores que le desencadenan el asma.
- **Reúnase con los maestros** y otros miembros del personal escolar para crear un plan de comunicación que facilite el manejo de cualquier tarea o prueba escolar que su hijo no pueda realizar si falta a la escuela debido al asma. Reúnase también con los maestros de educación física y los entrenadores de deportes para hablar sobre las necesidades especiales que su niño/a pueda tener en relación con el asma inducida por el ejercicio.
- **Prepare a su niño/a:** Asegúrese de que su niño/a entienda su plan de medicamentos y cómo debe manejar los síntomas, los factores desencadenantes y las restricciones alimentarias. Explíquelo los reglamentos escolares relacionados con el control del asma, como las reglas sobre el uso de medicamentos.
- **Informe al personal de la escuela sobre cualquier cambio** que haya en el estado de salud de su niño/a o en su plan de acción para controlar el asma.
- **Hable con el médico o con otro profesional de la salud de su niño/a sobre los servicios** y el apoyo que ofrece la escuela para ayudar a su niño/a a controlar el asma.

En nuestro programa de control del asma también se incluyen los siguientes componentes que apoyarán a su niño/a en el control de la enfermedad cuando esté en la escuela:

- Capacitación sobre el asma de todos los miembros del personal de la escuela para que estén preparados para cumplir con los planes de acción para controlar el asma de los estudiantes, identificar los síntomas y los signos que indican el inicio de un ataque de asma, y manejar emergencias relacionadas con el asma.
- Un programa de calidad del aire interior (*Indoor Air Quality*, en inglés) para promover un ambiente saludable y reducir los factores desencadenantes del asma.
- Un ambiente escolar que apoya y alienta el respeto hacia los demás.

Muchas gracias por colaborar con nosotros para ayudar a su niño/a. Si tiene alguna pregunta o inquietud sobre cómo mantener el asma de su niño/a bajo control mientras está en la escuela, comuníquese con nosotros al: .....

Atentamente,

\_\_\_\_\_  
Firma del Director o la Directora

\_\_\_\_\_  
Firma de la Enfermera Escolar



LETTER TO PHYSICIANS AND OTHER HEALTH CARE PROVIDERS  
[SCHOOL DISTRICT LETTERHEAD TO GO HERE]

Date ..... / ..... / .....

Dear .....

The teachers and administrators at ..... school  
are looking forward to an excellent year for your patient: .....

Date of birth: ..... / ..... / .....

Our school asthma management program will provide the following health services:

- Access to the school nurse
- Help for students who have asthma in following their asthma action plans
- An indoor air quality (IAQ) program to promote a healthy environment

In order to provide the best possible asthma management for your patient during school, we request your assistance with the following. Please:

- Complete and sign the enclosed **asthma action plan** (or an asthma action plan used by your practice) and enclosed **medication administration form** for any medications that your patient may need to take in school and at school-sponsored activities away from school. Please indicate whether the student is to be administered quick-relief medication by the school nurse or designated school staff and/or is to carry and take his or her own quick-relief medication at school and school-sponsored activities.
- Be sure to ask the parent and/or guardian to sign the asthma action plan and medication administration form and to indicate whether the patient is to carry and take his or her own quick-relief medications at school and school-sponsored activities. Work with the parent and/or guardian to return signed copies to the school health office.
- Discuss with the parent and/or guardian how many inhalers are needed at home or school so that one is always available to the student when needed.

Throughout the school year, as permitted by the patient's parents or guardians, we will provide you with information about your patient's asthma status, including notification of any asthma attacks, frequent absences, limitations in participation caused by poorly controlled asthma, or suspected medication side effects (see sample letter enclosed). Please let us know of additional patient needs and changes in asthma status and medications, and submit an updated asthma action plan if needed.

Also, if you need information on educational rights and responsibilities (Individuals with Disabilities Education Act [IDEA] and Section 504 of the Rehabilitation Act of 1973) pertaining to your patients who have asthma, please let us know.

We look forward to working with you. If you wish to discuss this student's asthma care, or you have any questions, please call the school health office at

.....

Thank you for your help.

Sincerely,

\_\_\_\_\_  
Principal (signature)

\_\_\_\_\_  
School Nurse (signature)

**SCHOOL ADDRESS:** .....  
.....

**BEST DAYS/TIMES TO CALL:** .....

**PHONE:** ..... **FAX:** .....

LETTER TO PHYSICIANS AND OTHER HEALTH CARE PROVIDERS  
 [SCHOOL DISTRICT LETTERHEAD TO GO HERE]

Date    /    /  
 ..... / ..... / .....

Dear ..... :

Asthma may be affecting your patient’s school performance.

We are writing about your patient:.....

Date of birth:    /    /  
 ..... / ..... / .....

The following information is provided for your information and records.

- Missed ..... days in ..... [period of time], possibly due to asthma
- Needs updated asthma action plan fitting student’s current asthma status
- Has no prescribed quick-relief medication available at school (has not provided to school health office and does not self-carry)
- Is not participating in physical education because of symptoms related to asthma
- Visits the school health office frequently because of symptoms related to asthma
- Has required emergency management of asthma (9-1-1, ER referral)
- Has the following suspected medication side effects:.....
- We have observed the following components of asthma control (circled):

Symptoms	≤2x per week	>2x per week	Throughout the day
Peak Flow, % normal (personal best)	>80%	60-80%	<60%
Interference with normal activity	None	Some limitation	Extremely limited

The family was asked to schedule an appointment with you. Parents or guardians have provided permission for us to exchange the student’s health information with you (enclosed or shown below). Please contact us at ..... if you have questions or concerns. Thank you!

So that we can support your efforts to help your patient's asthma stay well controlled while at school, please help us with the following:

- Send an asthma action plan (enclosed form).
- Student has no prescribed quick-relief medication available at school or student's quick-relief medication is past its expiration date.
- Discuss with the parent or guardian the possibility of sending a second inhaler to school if student carries own medication, so that one is always available when needed.
- Student has no peak flow meter. Prescribing one for this student may help us better assist with monitoring his/her asthma.
- The student has difficulty using his/her metered-dose inhaler and is using it improperly. Prescribing a spacer or valved holding chamber may help this student use the inhaler properly.
- The student's asthma is not well controlled at school. Please reassess this student for asthma and his/her current medications (see components of asthma control noted above).
- Other .....

Sincerely,

\_\_\_\_\_  
Principal (Signature)

\_\_\_\_\_  
School Nurse (Signature)

**SCHOOL ADDRESS:** .....

.....

**BEST DAYS/TIMES TO CALL:** .....

**PHONE:** ..... **FAX:** .....

I permit my child's doctor (named above) to communicate with school staff regarding my child's asthma and to provide specific medical information.

Parent's Signature .....

Parent's Name (printed) .....

Date    /    / .....







# Tools for Asthma Management

- How Asthma-Friendly Is Your School?
- Sample Asthma Action Plans
- Asthma Action Plan Assessment
- Early Warning Signs of Asthma Symptoms or an Asthma Attack
- Action Steps for Staff To Manage an Asthma Attack
- How To Use a Peak Flow Meter
- How To Use a Metered-Dose Inhaler
- How To Use a Dry Powder Inhaler
- How To Use a Nebulizer



## HOW ASTHMA-FRIENDLY IS YOUR SCHOOL?

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

YES	NO	Are the school buildings and grounds <b>free of tobacco smoke</b> at all times?
YES	NO	Are all school buses, vans, and trucks free of tobacco smoke?
YES	NO	Are all school events, like field trips and athletic events (both “at home” and “away”) free from tobacco smoke?
YES	NO	Does your school have a policy or rule that allows <b>students to carry and use their own asthma medicines</b> ?
YES	NO	If some students do not carry their asthma medicines, do they have quick and easy access to their medicines?
YES	NO	Does your school have a <b>written emergency plan</b> for teachers and other staff to follow to take care of a student who has an asthma attack?
YES	NO	In an emergency, such as a fire, weather event, or lockdown, or if a student forgets his or her medicine, does your school have standing orders and quick-relief medicines for students to use?
YES	NO	Do all students who have asthma have <b>updated asthma action plans</b> on file at the school? (An asthma action plan is a written plan from the student’s doctor to help manage asthma and prevent asthma attacks.)
YES	NO	Is there a <b>school nurse or other school health staff</b> in your school building during the school day?
YES	NO	Does a school nurse or other school health staff identify, assess, and monitor students who have asthma at your school?
YES	NO	Does a school nurse or other school health staff help students with their medicines and help them to participate fully in exercise and other physical activity, including physical education, sports, recess, and field trips?
YES	NO	If a school nurse or other school health staff is not full-time in your school, is a nurse readily and routinely available to write and review plans and give the school guidance?
YES	NO	Does an asthma education expert <b>teach all school staff about asthma</b> , asthma action plans, and asthma medicines?
YES	NO	Is asthma information incorporated into health, science, first aid, and other classes as appropriate?
YES	NO	Can students who have asthma <b>participate fully and safely in a range of exercise and other physical activity</b> , including physical education, sports, recess, and field trips?
YES	NO	Are students’ quick-relief medicines nearby before, during, and after exercise and other physical activity?
YES	NO	Can students who have asthma choose a physical activity that is different from others in the class when it is medically necessary?
YES	NO	Can students who have asthma choose another activity without fear of being ridiculed or receiving reduced grades?
YES	NO	Does the school help to <b>reduce or prevent students’ contact with allergens or irritants—indoors and outdoors</b> —that can make their asthma worse? Are any of the following are present? <input type="checkbox"/> Cockroach droppings <input type="checkbox"/> Excessive dust and/or carpets, pillows, cloth-covered or upholstered furniture, or stuffed toys that harbor dust mites (tiny bugs too small to see) <input type="checkbox"/> Mold or persistent moisture <input type="checkbox"/> Pets with fur or hair <input type="checkbox"/> Strong odors or sprays, such as paint, perfume, bug spray, and cleaning products
YES	NO	Does your school have a no-idling policy for vehicles on school grounds, such as school buses and carpools?
YES	NO	Does your school monitor daily local Air Quality Index (AQI) information to help reduce students’ exposure to unhealthy air quality?
YES	NO	Does your school partner with parents and health care providers to address students’ asthma needs?
YES	NO	Does your school work with an asthma specialist in the community?

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



The School Health Index (SHI) is a free self-assessment and planning guide from the Centers for Disease Control and Prevention (CDC). Asthma is one of the health topics addressed in the SHI. To begin, a team of parents and guardians, teachers, students, administrators, staff, and community members completes the self-assessment modules. Responses to items are scored to help you identify your school’s strengths and weaknesses so that you can develop and carry out an action plan for improving student health. The strength of the process comes from having individuals from different parts of the school community sit down together and plan ways to work toward improving school policies and programs. Visit [www.cdc.gov/healthyyouth/shi](http://www.cdc.gov/healthyyouth/shi).

# SAMPLE ASTHMA ACTION PLANS

## Asthma Action Plan

For: \_\_\_\_\_ Doctor: \_\_\_\_\_ Date: \_\_\_\_\_  
 Doctor's Phone Number \_\_\_\_\_ Hospital/Emergency Department Phone Number \_\_\_\_\_

### GREEN ZONE

#### Doing Well

- No cough, wheeze, chest tightness, or shortness of breath during the day or night
- Can do usual activities

And, if a peak flow meter is used,

Peak flow: more than \_\_\_\_\_  
 (80 percent or more of my best peak flow)

My best peak flow is: \_\_\_\_\_  
 Before exercise \_\_\_\_\_

Take these long-term control medicines each day (include an anti-inflammatory).  
**Medicine** \_\_\_\_\_ **How much to take** \_\_\_\_\_ **When to take it** \_\_\_\_\_



\_\_\_\_\_  2 or  4 puffs \_\_\_\_\_ 5 minutes before exercise

### YELLOW ZONE

#### Asthma is Getting Worse

- Cough, wheeze, chest tightness, or shortness of breath, or
- Waking at night due to asthma, or
- Can do some, but not all, usual activities

-Or-

Peak flow: \_\_\_\_\_ to \_\_\_\_\_  
 (50 to 79 percent of my best peak flow)

**First**

Add: quick-relief medicine—and keep taking your GREEN ZONE medicine.

\_\_\_\_\_  2 or  4 puffs, every 20 minutes for up to 1 hour  
(short-acting beta<sub>2</sub>-agonist)  Nebulizer, once

**Second**

if your symptoms (and peak flow, if used) return to GREEN ZONE after 1 hour of above treatment:  
 Continue monitoring to be sure you stay in the green zone.

-Or-

if your symptoms (and peak flow, if used) do not return to GREEN ZONE after 1 hour of above treatment:

Take: \_\_\_\_\_  2 or  4 puffs or  Nebulizer  
 Add: \_\_\_\_\_ mg per day For \_\_\_\_\_ (3–10) days  
(short-acting beta<sub>2</sub>-agonist)  
(oral steroid)  
 Call the doctor  before/  within \_\_\_\_\_ hours after taking the oral steroid.

### RED ZONE

#### Medical Alert!

- Very short of breath, or
- Quick-relief medicines have not helped, or
- Cannot do usual activities, or
- Symptoms are same or get worse after 24 hours in Yellow Zone

-Or-

Peak flow: less than \_\_\_\_\_  
 (50 percent of my best peak flow)

Take this medicine:

\_\_\_\_\_  4 or  6 puffs or  Nebulizer  
(short-acting beta<sub>2</sub>-agonist)  
 \_\_\_\_\_ mg  
(oral steroid)

Then call your doctor NOW. Go to the hospital or call an ambulance if:

- You are still in the red zone after 15 minutes AND
- You have not reached your doctor.

**DANGER SIGNS** ■ Trouble walking and talking due to shortness of breath

■ Lips or fingernails are blue

■ Take  4 or  6 puffs of your quick-relief medicine AND

■ Go to the hospital or call for an ambulance \_\_\_\_\_ (phone) **NOW!**

Source: National Heart, Lung, and Blood Institute, National Institutes of Health, U.S. Department of Health and Human Services, NIH Publication No. 07-5251, April 2007.



## SAMPLE ASTHMA ACTION PLANS (CONTINUED)



Asthma and Allergy  
Foundation of America

### STUDENT ASTHMA ACTION CARD



Name: \_\_\_\_\_ Grade: \_\_\_\_\_ Age: \_\_\_\_\_

Homeroom Teacher: \_\_\_\_\_ Room: \_\_\_\_\_

Parent/Guardian Name: \_\_\_\_\_ Ph: (h): \_\_\_\_\_

Address: \_\_\_\_\_ Ph: (w): \_\_\_\_\_

Parent/Guardian Name: \_\_\_\_\_ Ph: (h): \_\_\_\_\_

Address: \_\_\_\_\_ Ph: (w): \_\_\_\_\_

*ID Photo*

Emergency Phone Contact #1 \_\_\_\_\_

	Name	Relationship	Phone
--	------	--------------	-------

Emergency Phone Contact #2 \_\_\_\_\_

	Name	Relationship	Phone
--	------	--------------	-------

Physician Treating Student for Asthma: \_\_\_\_\_ Ph: \_\_\_\_\_

Other Physician: \_\_\_\_\_ Ph: \_\_\_\_\_

#### **EMERGENCY PLAN**

Emergency action is necessary when the student has symptoms such as \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ or has a peak flow reading of \_\_\_\_\_.

#### • Steps to take during an asthma episode:

1. Check peak flow.
2. Give medications as listed below. Student should respond to treatment in 15-20 minutes.
3. Contact parent/guardian if \_\_\_\_\_
4. Re-check peak flow.
5. Seek emergency medical care if the student has any of the following:
  - ✓ Coughs constantly
  - ✓ No improvement 15-20 minutes after initial treatment with medication and a relative cannot be reached.
  - ✓ Peak flow of \_\_\_\_\_
  - ✓ Hard time breathing with:
    - Chest and neck pulled in with breathing
    - Stooped body posture
    - Struggling or gasping
  - ✓ Trouble walking or talking
  - ✓ Stops playing and can't start activity again
  - ✓ Lips or fingernails are grey or blue



**IF THIS HAPPENS, GET  
EMERGENCY HELP NOW!**

#### • Emergency Asthma Medications

	Amount	When to Use
1. _____		
2. _____		
3. _____		
4. _____		

*See reverse for more instructions*

## SAMPLE ASTHMA ACTION PLANS (CONTINUED)

### DAILY ASTHMA MANAGEMENT PLAN

• **Identify the things which start an asthma episode (Check each that applies to the student.)**

- |   |  |                                      |
|---|--|--------------------------------------|
| <input type="checkbox"/> Exercise               | <input type="checkbox"/> Strong odors or fumes | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Respiratory infections | <input type="checkbox"/> Chalk dust / dust     | _____                                |
| <input type="checkbox"/> Change in temperature  | <input type="checkbox"/> Carpets in the room   |                                      |
| <input type="checkbox"/> Animals                | <input type="checkbox"/> Pollens               |                                      |
| <input type="checkbox"/> Food _____             | <input type="checkbox"/> Molds                 |                                      |

Comments \_\_\_\_\_

• **Control of School Environment**

(List any environmental control measures, pre-medications, and/or dietary restrictions that the student needs to prevent an asthma episode.) \_\_\_\_\_

• **Peak Flow Monitoring**

Personal Best Peak Flow number: \_\_\_\_\_

Monitoring Times: \_\_\_\_\_

• **Daily Medication Plan**

	Name	Amount	When to Use
1.	_____		
2.	_____		
3.	_____		
4.	_____		

**COMMENTS / SPECIAL INSTRUCTIONS**

**FOR INHALED MEDICATIONS**

- I have instructed \_\_\_\_\_ in the proper way to use his/her medications. It is my professional opinion that \_\_\_\_\_ should be allowed to carry and use that medication by him/herself.
- It is my professional opinion that \_\_\_\_\_ should not carry his/her inhaled medication by him/herself.

\_\_\_\_\_  
Physician Signature

\_\_\_\_\_  
Date

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

\_\_\_\_\_  
Date

# SAMPLE ASTHMA ACTION PLANS (CONTINUED)

## My Asthma Plan

ENGLISH

Patient Name: \_\_\_\_\_

Medical Record #: \_\_\_\_\_

Provider's Name: \_\_\_\_\_ DOB: \_\_\_\_\_

Provider's Phone #: \_\_\_\_\_ Completed by: \_\_\_\_\_ Date: \_\_\_\_\_

Controller Medicines	How Much to Take	How Often	Other Instructions
		_____ times per day <b>EVERY DAY!</b>	<input type="checkbox"/> Gargle or rinse mouth after use
		_____ times per day <b>EVERY DAY!</b>	
		_____ times per day <b>EVERY DAY!</b>	
		_____ times per day <b>EVERY DAY!</b>	
Quick-Relief Medicines	How Much to Take	How Often	Other Instructions
<input type="checkbox"/> Albuterol (ProAir, Ventolin, Proventil) <input type="checkbox"/> Levalbuterol (Xopenex)	<input type="checkbox"/> 2 puffs <input type="checkbox"/> 4 puffs <input type="checkbox"/> 1 nebulizer treatment	Take <b>ONLY</b> as needed (see below — starting in Yellow Zone or before exercise)	NOTE: If you need this medicine more than two days a week, call physician to consider increasing controller medications and discuss your treatment plan.

Special instructions when I am ● *doing well*, ● *getting worse*, ● *having a medical alert*.


**GREEN ZONE**

**Doing well.**

- No cough, wheeze, chest tightness, or shortness of breath during the day or night.
- Can do usual activities.

Peak Flow (for ages 5 and up):  
is \_\_\_\_\_ or more. (80% or more of personal best)

Personal Best Peak Flow (for ages 5 and up): \_\_\_\_\_

 **PREVENT** asthma symptoms every day:


- Take my controller medicines (above) every day.
- Before exercise, take \_\_\_\_\_ puff(s) of \_\_\_\_\_
- Avoid things that make my asthma worse. (See back of form.)

**YELLOW ZONE**

**Getting worse.**

- Cough, wheeze, chest tightness, shortness of breath, or
- Waking at night due to asthma symptoms, or
- Can do some, but not all, usual activities.

Peak Flow (for ages 5 and up):  
\_\_\_\_\_ to \_\_\_\_\_ (50 to 79% of personal best)

 **CAUTION.** Continue taking every day controller medicines, AND:


- Take \_\_\_\_\_ puffs or \_\_\_\_\_ one nebulizer treatment of quick relief medicine. If I am not back in the **Green Zone** within 20-30 minutes take \_\_\_\_\_ more puffs or nebulizer treatments. If I am not back in the **Green Zone** within one hour, then I should:
- Increase \_\_\_\_\_
- Add \_\_\_\_\_
- Call \_\_\_\_\_
- Continue using quick relief medicine every 4 hours as needed. Call provider if not improving in \_\_\_\_\_ days.

**RED ZONE**

**Medical Alert**

- Very short of breath, or
- Quick-relief medicines have not helped, or
- Cannot do usual activities, or
- Symptoms are same or get worse after 24 hours in Yellow Zone.

Peak Flow (for ages 5 and up):  
less than \_\_\_\_\_ (50% of personal best)

 **MEDICAL ALERT! Get help!**

- Take quick relief medicine: \_\_\_\_\_ puffs every \_\_\_\_\_ minutes and get help immediately.
- Take \_\_\_\_\_
- Call \_\_\_\_\_

**Danger! Get help immediately!** Call 911 if trouble walking or talking due to shortness of breath or if lips or fingernails are gray or blue. For child, call 911 if skin is sucked in around neck and ribs during breaths or child doesn't respond normally.

**Health Care Provider:** My signature provides authorization for the above written orders. I understand that all procedures will be implemented in accordance with state laws and regulations. Student may self carry asthma medications:  Yes  No self administer asthma medications:  Yes  No (This authorization is for a maximum of one year from signature date.)

Healthcare Provider Signature \_\_\_\_\_

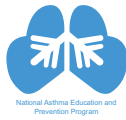
Date \_\_\_\_\_

ORIGINAL (Patient) / CANARY (School/Child Care/Work/Other Support Systems) / PINK (Chart)

©2008, Public Health Institute (RAMP)

Used with permission from Regional Asthma Management and Prevention (RAMP), a program of the Public Health Institute. The RAMP Asthma Action Plan was supported by Cooperative Agreement Number 1U58DP001016-01 from the Centers for Disease Control and Prevention. The contents of the RAMP Asthma Action Plan are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.

# ASTHMA ACTION PLAN ASSESSMENT



National Asthma Education and Prevention Program  
NAEPP School Asthma Education Subcommittee

## Is the Asthma Action Plan Working? A Tool for School Nurse Assessment

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

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

### With good asthma management, students should:

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

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

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

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

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

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



## ASTHMA ACTION PLAN ASSESSMENT (CONTINUED)

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

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

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

## EARLY WARNING SIGNS AND SYMPTOMS OF AN ASTHMA ATTACK

Early warning signs and symptoms usually happen before more serious asthma symptoms occur. These signs can be different for each student who has asthma. Each student's early warning signs should be documented in his or her asthma action plan. Teachers, assistants, aides, and other educators should be aware of each student's early warning signs and watch for those signs.

Encourage students to speak up if they experience **any** of their early warning signs and symptoms. When you see those signs or a student reports them, act fast to stop symptoms and improve the chances of avoiding an asthma attack. Even mild asthma symptoms can get worse quickly and lead to a serious asthma attack.

The box below lists some common early warning signs.



### COMMON EARLY WARNING SIGNS OF AN ASTHMA ATTACK

- Mild cough
- Mild difficulty breathing
- Mild wheezing
- Chest starts to hurt or feel tight
- Waking up at night
- Cannot do all usual activities
- Itchy, scratchy, or sore throat
- Itchy, watery, or glassy eyes
- Itchy or runny nose
- Need more quick-relief medication than usual
- Low peak flow readings

It's best to be prepared **before** asthma symptoms get worse or an asthma attack happens. Review students' asthma action plans so you know what to watch for and what to do in case of symptoms or an asthma attack. Keep asthma action plans where you can easily access them. In case of an asthma attack, follow the student's asthma action plan and call the school nurse or other school health staff to help the student right away.

The following page contains a handy, concise reference to help school staff manage an asthma attack.

## ACTION STEPS FOR STAFF TO MANAGE AN ASTHMA ATTACK

**Act fast!** Warning signs and symptoms—such as coughing, wheezing, difficulty breathing, chest tightness or pressure, and low or falling peak flow readings—can worsen quickly and even become life-threatening. They require quick action.

### 1. Quickly assess the situation.

- **Call 911 or your local emergency service right away** if the student is struggling to breathe, talk, or stay awake; has blue lips or fingernails; or asks for an ambulance.
- If accessible, use a peak flow meter to measure the student’s lung function.

### 2. Get help, but never leave the student alone.

Have an adult accompany the student to the health room or send for help from the school nurse or designee. Do not wait.

### 3. Stop activity.

Help the student stay calm and comfortable.

- If the asthma attack began after exposure to an allergen or irritant (such as furry animals, fresh cut grass, strong odors, or pollen) remove the student from the allergen or irritant, if possible.

### 4. Treat symptoms.

Help the student locate and use his or her **quick-relief medication (inhaler)** with a spacer or holding chamber (if available).

- Many students carry their medicine and can self-manage asthma attacks. They should follow the school protocol. Provide support as needed.

### 5. Call the parent or guardian.

### 6. Repeat use of quick-relief inhaler in 20 minutes if—

- Symptoms continue or return;
- Student still has trouble breathing; or
- Peak flow reading is below 80% of student’s personal best peak flow number on asthma action plan.



#### **Call 9-1-1 or your local emergency service if any of the following occur:**

- The student is struggling to breathe, talk, or stay awake; has blue lips or fingernails; or asks for an ambulance.
- The student doesn’t improve or the student has a peak flow reading below 50% of the student’s personal best peak flow number after two doses of quick-relief medication, and the nurse (or designee) or parent or guardian is not available.
- No quick-relief medicine is available, the student’s symptoms have not improved spontaneously, and the nurse (or designee) or parent or guardian is not available.
- You are unsure what to do.

## HOW TO USE A PEAK FLOW METER

A peak flow meter is a small handheld device that measures how hard and fast the student can blow air out of the lungs. As airways narrow from inflammation or tightening muscles, and it becomes harder for air to move through the lungs, peak flow numbers get lower.

Monitoring peak flow can detect worsening asthma early—sometimes hours or even days before the student has any asthma symptoms. Peak flow monitoring can also be used to assess the student's response to medication during an asthma attack. Not all students who have asthma monitor their peak flow. Peak flow monitoring may be particularly helpful for students who have difficulty recognizing signs and symptoms of worsening asthma and students who have more severe asthma.

The student's personal best peak flow number represents the student's highest measured reading determined when the student is feeling well and has no asthma symptoms. The student's personal best peak flow number should be noted on his or her asthma action plan. A decrease in peak flow compared with the student's personal best peak flow number may signal a need to adjust treatment to prevent or stop an asthma attack.

Based on the student's personal best peak flow number, the health care provider can establish ranges that coincide with the green, yellow, and red "traffic light" zones on the student's asthma action plan. Generally, a peak flow number between 80 and 100 percent of the student's personal best peak flow number is in the green zone and means that the student is doing well and can continue his or her usual treatment and level of activity.



A peak flow number of less than 80 percent of the student's personal best, however, indicates the need for action according to the student's asthma action plan. Symptoms such as coughing, wheezing, and chest tightness are also indicators of worsening asthma. Until the student's peak flow number equals or exceeds 80 percent of his or her personal best and symptoms improve, the student should avoid running and playing.

Getting an accurate peak flow reading requires maximum effort and good technique. To improve the accuracy of peak flow monitoring, guide the student through the proper technique using the instructions that came with his or her peak flow meter. General instructions are provided here. Pay attention to symptoms, too, such as coughing, wheezing, chest tightness, or other breathing difficulties, that indicate the student is having an asthma attack and requires prompt treatment.



## HOW TO USE A PEAK FLOW METER (CONTINUED)

### TO HELP STUDENTS USE A PEAK FLOW METER, GIVE THE FOLLOWING INSTRUCTIONS:

1. Always stand up. Remove any food or gum from your mouth.
2. Make sure the marker on the peak flow meter is at the bottom of the scale.
3. Breathe in slowly and deeply. Hold that breath.
4. Place mouthpiece on your tongue and close lips around it to form a tight seal (do not put tongue in the hole).
5. Blow out as hard and fast as possible.
6. Write down the number next to the marker. (If you cough or make a mistake, do not write down that number. Do it over again.)
7. Repeat steps 3 through 6 two more times.
8. Record the highest of these three numbers in a notebook, calendar, or asthma diary.

Compare the highest number with the peak flow numbers on the student's written asthma action plan. Check to see which zone the number falls under and follow the plan's instructions for that zone.



#### **GREEN ZONE**

**80%-100% of personal best →**

Take daily long-term control medication, if prescribed.



#### **YELLOW ZONE**

**50%-79% of personal best →**

Add quick-relief medication(s) as directed and continue daily long-term control medication, if prescribed. Continue to monitor.



#### **RED ZONE**

**less than 50% of personal best →**

Add quick-relief medication(s) as directed. Get medical help now.

Encourage students with asthma and their parents or guardians to ask their doctor, pharmacist, or other health care professional (such as nurse practitioner, physician assistant, nurse, respiratory therapist, or asthma educator) to show students how to use their peak flow meter and to review technique at each follow-up visit.

## HOW TO USE A METERED-DOSE INHALER

A metered-dose inhaler is a device that sprays a pre-set amount of medicine through the mouth to the airways. To keep asthma under control, it is important that students take their medicine as prescribed by their doctor or other health care professional and use the proper technique to deliver the medicine to the lungs. If students don't use their inhaler correctly, they won't get the medicine they need.

Here are general steps for how to use and clean a metered-dose inhaler. Be sure to read the instructions that come with each student's inhaler. Encourage students to ask their doctor, pharmacist, or other health care professional (such as nurse practitioner, physician assistant, nurse, respiratory therapist, or asthma educator) to show them how to use their inhaler and to review their technique at each follow-up visit.

### TO HELP STUDENTS USE A METERED-DOSE INHALER, GIVE THE FOLLOWING INSTRUCTIONS:

1. Take off cap. Shake the inhaler. Prime (spray or pump) the inhaler as needed according to manufacturer's instructions (each brand is different).
2. If you use a spacer or valved holding chamber (VHC), remove the cap and look into the mouthpiece to make sure nothing is in it. Place the inhaler in the rubber ring on the end of the spacer/VHC.
3. Stand up or sit up straight.
4. Take a deep breath in. Tilt head back slightly and blow out completely to empty your lungs.
5. Place the mouthpiece of the inhaler or spacer/VHC in your mouth and close your lips around it to form a tight seal.
6. As you start to breathe in, press down firmly on the top of the medicine canister to release one "puff" of medicine. Breathe in slowly (gently) and as deeply as you can for 3 to 5 seconds.
7. Hold your breath and count to 10.
8. Take the inhaler or spacer/VHC out of your mouth. Breathe out slowly.
9. If you are supposed to take 2 puffs of medicine per dose, wait 1 minute and repeat steps 3 through 8.
10. If using an inhaled corticosteroid, rinse out your mouth with water and spit it out. Rinsing will help to prevent an infection in the mouth.

### HELP STUDENTS CLEAN THEIR METERED-DOSE INHALER AND SPACER/VHC

Keep inhalers and spacers/VHCs clean so they can work properly. Read the manufacturer's instructions that come with each inhaler and spacer/VHC. Encourage students to talk to their doctor, pharmacist, or other health care professional about how to clean their inhaler and spacer/VHC (each brand is different). When cleaning inhalers and spacers/VHCs, remember:

- Never put the medicine canister in water.
- Never brush or wipe inside the spacer/VHC.

## HOW TO USE A DRY POWDER INHALER

A dry powder inhaler delivers pre-set doses of medicine in powder form. The medicine gets to the airways when the student takes a deep, fast breath in from the inhaler. To keep asthma under control, it is important that students take their medicine as prescribed by their doctor or other health care professional and to use the proper technique to deliver the medicine to the lungs. If students don't use their inhaler correctly, they won't get the medicine they need.

Here are general steps for how to use and clean a dry powder inhaler. Be sure to read the instructions that come with each student's inhaler. Encourage students to ask their doctor, pharmacist, or other health care professional (such as nurse practitioner, physician assistant, nurse, respiratory therapist, or asthma educator) to show them how to use their inhaler and to review their technique at each follow-up visit.

### TO HELP STUDENTS USE A DRY POWDER INHALER, GIVE THE FOLLOWING INSTRUCTIONS:

1. Remove cap and hold inhaler upright (like a rocket). If the inhaler is a Diskus®, hold it flat (like a flying saucer).
2. Load a dose of medicine according to manufacturer's instructions (each brand of inhaler is different; you may have to prime the inhaler the first time you use it). Do not shake the inhaler.
3. Stand up or sit up straight.
4. Take a deep breath in and blow out completely to empty your lungs. Do not blow into the inhaler.
5. Place the mouthpiece of the inhaler in your mouth and close your lips around it to form a tight seal.



6. Take a fast, deep, forceful breath in through your mouth.
7. Hold your breath and count to 10.
8. Take the inhaler out of your mouth. Breathe out slowly, facing away from the inhaler.
9. If you are supposed to take more than 1 inhalation of medicine per dose, wait 1 minute and repeat steps 2 through 8.
10. When you finish, put the cover back on the inhaler or slide the cover closed. Store the inhaler in a cool, dry place (not in the bathroom).
11. If using an inhaled corticosteroid, rinse out your mouth with water and spit it out. Rinsing helps to prevent an infection in the mouth.

### HELP STUDENTS CLEAN THEIR DRY POWDER INHALER

- Wipe the mouthpiece at least once a week with a dry cloth.
- Do NOT use water to clean the dry powder inhaler.

## HOW TO USE A NEBULIZER

A nebulizer is a machine that delivers medicine in a fine, steady mist. To keep asthma under control, it is important that students take their medicine as prescribed by their doctor or other health care professional and to use the proper technique to deliver the medicine to the lungs. If students don't use their nebulizer correctly, they won't get the medicine they need.

Here are general steps for how to use and clean a nebulizer. Be sure to read the instructions that come with each student's nebulizer. Encourage students to ask their doctor, pharmacist, or other health care professional (such as nurse practitioner, physician assistant, nurse, respiratory therapist, or asthma educator) to show them how to use their nebulizer and to review their technique at each follow-up visit.

### TO HELP STUDENTS USE A NEBULIZER, FOLLOW THESE INSTRUCTIONS:

1. Wash hands well.
2. Put together the nebulizer machine, tubing, medicine cup, and mouthpiece or mask according to manufacturer's instructions.
3. Put the prescribed amount of medicine into the medicine cup. If the student's medicine comes in a pre-measured capsule or vial, empty it into the cup.
4. Have the student place the mouthpiece in his or her mouth and close the lips around it to form a tight seal. If the student uses a mask, make sure it fits snugly over the student's nose and mouth. Make sure the student does not hold the mouthpiece or mask away from the face.
5. Turn on the nebulizer machine. You should see a light mist coming from the back of the tube opposite the mouthpiece or from the mask.
6. Instruct the student to take normal breaths through the mouth while the machine is on. Continue treatment until the medicine cup is empty or the mist stops, about 10 minutes.
7. Have the student take the mouthpiece out of his or her mouth (or remove mask). Turn off the machine.
8. If using an inhaled corticosteroid, have the student rinse his or her mouth with water and spit it out. If using a mask, also wash the face.

## HOW TO CLEAN AND STORE A NEBULIZER

### After each treatment:

- Wash hands well.
- Wash the medicine cup and mouthpiece or mask with warm water and mild soap. Do not wash the tubing.
- Rinse well and shake off excess water.
- Air dry parts on a paper towel.

### Once a week:

Disinfect nebulizer parts to help kill any germs. Follow instructions for each nebulizer part listed in the package insert. Always remember:

- Do **not** wash or boil the tubing.
- Air dry parts on a paper towel.

### Between uses:

- Store nebulizer parts in a dry, clean plastic storage bag. If the nebulizer is used by more than one student, keep each student's medicine cup, mouthpiece or mask, and tubing in a separate, labeled bag to prevent the spread of germs.
- Wipe surface with a clean, damp cloth as needed. Cover nebulizer machine with a clean, dry cloth and store as manufacturer instructs.
- Replace medicine cup, mouthpiece, mask, tubing, filter, and other parts according to manufacturer's instructions or when they appear worn or damaged.



## Where To Learn More About Asthma Management

The National Heart, Lung, and Blood Institute (NHLBI) Health Information Center provides information to health professionals, patients, and the public about the treatment, diagnosis, and prevention of heart, lung, and blood diseases and sleep disorders.

### Publications on asthma in the school:

- Suggested Emergency Nursing Protocol for Students with Asthma Symptoms Who Don't Have a Personal Asthma Action Plan [www.nhlbi.nih.gov/health-pro/resources/lung/asthma-school-suggested-protocol-for-students-without-plan-html.htm](http://www.nhlbi.nih.gov/health-pro/resources/lung/asthma-school-suggested-protocol-for-students-without-plan-html.htm)
- When Should Students With Asthma or Allergies Carry and Self-Administer Emergency Medications at School? [www.nhlbi.nih.gov/health/prof/lung/asthma/emergency\\_medi.htm](http://www.nhlbi.nih.gov/health/prof/lung/asthma/emergency_medi.htm)
- Asthma and Physical Activity in the School: Making a Difference [www.nhlbi.nih.gov/health/public/lung/asthma/phy\\_asth.htm](http://www.nhlbi.nih.gov/health/public/lung/asthma/phy_asth.htm)

For more information, contact:

**NHLBI Health Information Center**  
P.O. Box 30105  
Bethesda, MD 20824-0105  
301-592-8573  
Fax: 301-592-8563  
Web site: [www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)

### OTHER AGENCIES AND ORGANIZATIONS

The following organizations have information that may help school staff in developing and implementing an asthma management program and in educating students and families about asthma.

#### Allergy and Asthma Network Mothers of Asthmatics

8201 Greensboro Drive, Suite 300  
McLean, VA 22102  
800-878-4403  
703-288-5271

Web site: [www.aanma.org](http://www.aanma.org)

- Medications at School (find your State's law) [www.aanma.org/advocacy/meds-at-school/](http://www.aanma.org/advocacy/meds-at-school/)

- Indoor AirRepair at School: Helping Parents, Student, and Teachers Breathe Easier [www.aanma.org/pdf/AIRRepairSchoolNL.pdf](http://www.aanma.org/pdf/AIRRepairSchoolNL.pdf)

#### American Association for Respiratory Care

9425 North MacArthur Boulevard, Suite 100  
Irving, TX 75063  
972-243-2272

Web site: [www.aarc.org](http://www.aarc.org)

- Peak Performance USA Program [www.peakperformanceusa.info/\[AARC\]](http://www.peakperformanceusa.info/[AARC])

#### American Lung Association

1301 Pennsylvania Avenue, NW, Suite 800  
Washington, DC 20004  
800-586-4872 (800-LUNG-USA)  
202-785-3355

Web site: [www.lungusa.org](http://www.lungusa.org)

- Asthma-Friendly Schools Initiative [www.lung.org/lung-disease/asthma/creating-asthma-friendly-environments/asthma-in-schools/asthma-friendly-schools-initiative/](http://www.lung.org/lung-disease/asthma/creating-asthma-friendly-environments/asthma-in-schools/asthma-friendly-schools-initiative/)

#### American School Health Association

4340 East West Highway, Suite 403  
Bethesda, MD 20814  
800-445-2742  
301-652-8072

Web site: [www.ashaweb.org](http://www.ashaweb.org)

#### Asthma and Allergy Foundation of America

8201 Corporate Drive, Suite 1000  
Landover, MD 20785  
800-727-8462

Web site: [www.aafa.org](http://www.aafa.org)

#### Centers for Disease Control and Prevention

1600 Clifton Road, NE  
Atlanta, GA 30333  
800-232-4636 (800-CDC-INFO)  
TTY: 888-232-6348

Web site: [www.cdc.gov/healthyyouth](http://www.cdc.gov/healthyyouth)

- Initiating Change: Creating an Asthma-Friendly School [www.cdc.gov/HealthyYouth/asthma/creatingaifs/index.htm](http://www.cdc.gov/HealthyYouth/asthma/creatingaifs/index.htm)
- School Health Index [www.cdc.gov/healthyyouth/shi](http://www.cdc.gov/healthyyouth/shi)

#### National Association of School Boards of Education

2121 Crystal Drive, Suite 350  
Arlington, VA 22202  
800-368-5023

Web site: [www.nasbe.org](http://www.nasbe.org)

- State School Health Policy Database [www.nasbe.org/healthy\\_schools/hs/map.php](http://www.nasbe.org/healthy_schools/hs/map.php)

#### National Association of School Nurses

1100 Wayne Avenue, Suite 925  
Silver Spring, MD 20910  
[www.nasn.org](http://www.nasn.org)  
866-627-6767

#### The Law Library of Congress

101 Independence Avenue, SE  
Washington, DC 20540-4860  
202-707-5079

Web site: [www.loc.gov/law/help/guide/states.php](http://www.loc.gov/law/help/guide/states.php)

#### U.S. Department of Education

Office for Civil Rights  
Lyndon Baines Johnson  
Department of Education Building  
400 Maryland Avenue, SW  
Washington, DC 20202-1100  
800-421-3481TDD: 877-521-2172  
Web site: [www.ed.gov/ocr](http://www.ed.gov/ocr)

#### U.S. Environmental Protection Agency

Indoor Environments Division, MC 6609J  
1200 Pennsylvania Ave, NW  
Washington, DC 20640

Web sites: [www.epa.gov/schools](http://www.epa.gov/schools); [www.epa.gov/asthma](http://www.epa.gov/asthma); and [www.asthmacommunitynetwork.org](http://www.asthmacommunitynetwork.org)

- IAQ Tools for Schools [www.epa.gov/iaq/schools/](http://www.epa.gov/iaq/schools/)
- Managing Asthma in the School Environment [www.epa.gov/iaq/schools/managingasthma.html](http://www.epa.gov/iaq/schools/managingasthma.html)
- Integrated Pest Management for Schools [www.epa.gov/opp00001/ipm/](http://www.epa.gov/opp00001/ipm/)
- Mold Remediation in Schools and Commercial Buildings [www.epa.gov/mold/mold\\_remediation.html](http://www.epa.gov/mold/mold_remediation.html)

**Discrimination Prohibited:** Under provisions of applicable public laws enacted by Congress since 1964, no person in the United States shall, on the grounds of race, color, national origin, handicap, or age, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity (or, on the basis of sex, with respect to any education program or activity) receiving Federal financial assistance. In addition, Executive Order 11141 prohibits discrimination on the basis of age by contractors and subcontractors in the performance of Federal contracts, and Executive Order 11246 states that no Federally funded contractor may discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. Therefore, the National Heart, Lung, and Blood Institute must be operated in compliance with these laws and Executive Orders.



**U.S. Department of Health and Human Services**  
National Institutes of Health



National Heart, Lung,  
and Blood Institute

NIH Publication No. 14-2650  
Originally Printed 1991  
Revised December 2014