



MANAGEMENT OF STUDENTS WITH ASTHMA

Maryland State School Health Services Guidelines

December 2023



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FOREWORD

There is a strong relationship between academic achievement and a child's physical, emotional, and mental health. This link is the foundation for providing school health services as an important component of a school program. School health services provide primary prevention aimed at keeping students in schools through appropriate screenings; early identification of children at risk for physical, emotional, and mental health concerns; and case management of students with chronic health concerns.

The Maryland Code Annotated, Education § 7-401 (Md. Code Ann., Educ. § 7-401) requires the Maryland State Department of Education (MSDE) and the Maryland Department of Health (MDH) to jointly develop public standards and guidelines for school health programs. The following guidelines were developed in accordance with that requirement and are based on the expressed needs of the local school health services programs. The guidelines developed under Md. Code Ann., Educ. § 7-401 contain recommendations for minimum standards of care and current best practices for the health service topics addressed. It is intended that these guidelines will be used by the local education agencies (LEAs) in developing policies and procedures to assist local school health services programs in providing consistent and safe care to the students of Maryland. Specific laws and regulations that direct school nursing practice or other health services are identified in the guidelines.

To implement these guidelines, LEAs and local health departments should consult with MSDE and MDH who will:

- Assist and provide technical assistance to local school health services programs to support their efforts to plan for students with special health needs;
- Provide training to all appropriate school staff regarding issues related to students with special health needs including, but not limited to, planning, maintaining a safe environment, and medication administration issues; and
- Monitor the implementation of school health services programs including, but not limited to, programs and policies related to students with special health needs.

SECTION I: INTRODUCTION

PURPOSE

The purpose of these guidelines is to:

1. Provide guidance to school health services program staff for the management and coordination of care of students with asthma.
2. Define the roles and responsibilities of school health services staff, school administrators, other school staff, parents/guardians and students in the planning, care, and education required to support a student with asthma.

BACKGROUND

Legal Authority

Md. Code Ann., Educ. § 7-421 *Use of Asthma Drugs and Related Medication* requires public school systems to adopt policies authorizing students to possess and self-administer an asthma inhaler or other emergency medication for treatment of asthma or other airway constricting diseases. Under Md. Code Ann., Educ. § 7-426 *Guidelines for Student Emergency Medical Care*, MSDE and MDH are required to establish guidelines for providing emergency medical care to students with special health needs, and to delineate the roles and responsibilities for planning and providing services to students with special health needs. Asthma is a common condition that is included in this requirement and the most common chronic condition managed in schools.

Definition

Asthma is a controllable, chronic lung disease characterized by inflammation of the airways, reversible airway constriction, and excess mucus secretion. Narrowing of the airway results in reduced airflow that may cause symptoms of wheezing, coughing, tightness of the chest, and difficulty breathing. Asthma triggers that may lead to exacerbation or acute asthma symptoms include allergens, irritants, infections, exercise, strong expressions of feelings or emotions (e.g., laughing or crying), stress, and changes in weather or temperature.

Signs And Symptoms

Successful management of asthma includes early recognition of the signs and symptoms of an asthma exacerbation. Signs and symptoms include but are not limited to those listed in Table 1. Asthma management is specific to the individual and determined by measures of asthma risk, severity, and control as assessed by a licensed health care provider.

Table 1: Signs and Symptoms of an Asthma Exacerbation

Reaction Type	Symptoms
Mouth, throat	Hacking cough; tightening of throat; hoarseness; blue/gray color of lips; difficulty speaking or clipped speech
Nose, eyes, ears	Nasal flaring; hay fever-like symptoms (when exacerbation is triggered by an allergen in an allergic person): runny, itchy nose; redness and/or swelling of eyes; throbbing in ears
Skin	Blue/gray discoloration
GI	Vomiting
Lung	Shortness of breath; wheezing; short, frequent, shallow cough; difficulty breathing; rapid breathing; use of accessory muscles
Heart	Rapid pulse; palpitations; fainting; dizziness; pale, blue, or gray color of lips or nail beds
Mental	Uneasiness; agitation; unconsciousness
Other	Any other symptom specific to an individual's response to an asthma exacerbation

NOTE: Not all signs and symptoms need to be present in an asthma exacerbation.

SECTION II: MANAGEMENT OF ASTHMA

The *Maryland State School Health Services Guideline: Nursing Appraisal and Assessment of Students with Special Health Care Needs* is a comprehensive guideline that should be used to support the assessment and development of a plan of care for a student with asthma. Students with asthma may require individualized plans specific to their daily and/or emergency management, as necessary.

Staff may also refer to the *Guidelines for Emergency Care in Maryland Schools 2nd edition* containing decision making guidance for the emergency care of students who may not require individualized plans.

HEALTH APPRAISAL

The school management of students with asthma begins with a health appraisal. Students newly diagnosed with asthma and those new to a school with no previous school records should provide documentation of an asthma diagnosis from the student's licensed health care provider. Report from parent/guardian is insufficient. Parents/guardians may provide updated health information for returning students who previously provided documentation of an asthma diagnosis by the licensed health care provider. Further information may be obtained as necessary to complete a nursing assessment.

ASSESSMENT

A nursing assessment will help determine the individualized needs and reasonable accommodations that a student with asthma may require in school. The final nursing assessment should be placed in the student's health record.

COMPONENTS OF A NURSING ASSESSMENT SPECIFIC TO ASTHMA

1. Identifying information/contact information
 - Name and phone number of asthma or allergy specialist
2. Medical history
 - Date of the initial asthma diagnosis and progress of disease process;
 - History of health emergencies/hospitalizations related to asthma exacerbations;
 - Allergies, allergens; and
 - Other diagnosed health condition(s) that may impact asthma/asthma management (e.g., GERD).
3. Current health status
 - Level of asthma control and profile of typical asthma exacerbation (e.g., description of past exacerbations and their severity);
 - Current medication and treatment orders, including:

- Medication type, mechanism of action (e.g., bronchodilators, steroids);
- Medication role in therapy (e.g., quick-relief, long-acting);
- Response to treatment and side effects.
- Medication delivery devices and tools (e.g., inhaler, nebulizer, spacer);
- Other respiratory equipment needs (e.g., peak flow meter, pulse oximeter);
- Asthma triggers, asthma trigger avoidance (e.g., environment, food, weather, exercise, air quality, allergens, irritants, infection);
- Peak flow meter readings;
- Limitation of activities (e.g., physical education, recess, outdoor activities);
- Impact of asthma (e.g., quality of life, activity level, and school absenteeism); and
- Management plan for asthma exacerbation (e.g., asthma action plan developed by licensed health care provider (see Appendix A).

4. Self-management

- Student's understanding of asthma and management plan
 - Peak flow monitoring;
 - Trigger avoidance;
 - Symptoms to report.
- Level of independence with medication/treatment, including ability to self-carry and self-administer medication in accordance with Md. Code Ann., Educ. § 7-421;
- Interactions with peers and teachers in the past related to asthma and asthma management.

5. Psychosocial considerations

- Family/caregiver ability to understand and manage student's asthma.

6. Educational planning

- Educational accommodations or information necessary for revision/development of Section 504 or Individualized Education Program (IEP), as necessary;
- Participation in programs, school-sponsored activities, and field trips while maintaining access to medication or supplies;
- Transportation type and needs (e.g., length of bus ride or walk, air-conditioned bus needs to reduce environmental triggers, access to emergency medications or supplies);

- Adaptations to physical education class and/or recess;
- Removal/replacement of classroom teaching materials and other classroom items (e.g., air fresheners) that pose an exposure risk;
- Placement of student in an air-conditioned building/classroom;
- Limits on outdoor activity when exposure to triggers are likely (e.g., pollen) and/or when air quality is poor (e.g., ozone action days, pollution levels);
- Modification of school/classroom policies on food brought to the school by parent/caregiver for special events;
- Specific meal accommodations or meal modifications related to risk for anaphylactic reactions (Refer also to *Maryland State School Health Services Guideline: Management of Anaphylaxis in Schools*).

7. Physical assessment/Review of systems

- Documented per local school health services program guidelines.

PLANNING

Following the completion of the nursing assessment, the school nurse will determine what further health care plans will be necessary to manage the student's asthma at school.

Individualized Health Care Plan

Based on the nursing assessment, the development of an individualized health care plan (IHP) by the school nurse may be necessary to serve as a plan of care for the student's asthma management needs while at school. Not all students with asthma will require an IHP, but it can be used to inform appropriate school personnel regarding the student's health care need(s) and other considerations in the school setting.

The school nurse should consider the following when developing the IHP for a student with asthma:

- Level of asthma risk, severity, and control;
- Student's ability to identify need for interventions;
- Specific asthma triggers and student's knowledge of those triggers;
- Peak flow monitoring/frequency and personal best/green, yellow and red zones;
- Equipment use, including for emergency (e.g., medication, nebulizer, oxygen);
- Storage of medication and/or equipment (e.g., student's ability to self-carry, storage in multiple locations);
- Medication administration, including ability to self-carry and self-administer medication in accordance with Md. Code Ann., Educ. § 7-421;
- Identification and reduction/elimination of triggers (e.g., cleaning products, classroom materials, and art supplies);

- Use of medical alert identification (e.g., bracelet or necklace);
- Educational needs and accommodations (e.g., alternative arrangements in physical education, sports, and industrial arts classes);
- Hand-washing practices and appropriate times;
- Awareness of school policies on outside materials brought into classroom;
- Presence of service animals or pets in the school or classroom;
- Emergency care including provisions for a student in distress (e.g., adult escort to the office/health room, contacting the parent/guardian and licensed health care provider, and determination of the appropriate personnel/staff responsible for monitoring the asthma nebulizer treatments); and
- Implementation of emergency action plan (see below).

Emergency Action Plan

Students may require the development of an emergency action plan (EAP) based on the nursing assessment. An asthma action plan, developed by a licensed health care provider, could be used as the EAP if available and meets the student's emergency needs in the school setting (see Appendix A).

Training must be provided to school personnel regarding the student's EAP including the location of medication, plan for administration, and process of notification of the school nurse in the event emergency medication is needed. School personnel trained by the school nurse can administer emergency medication in accordance with the student's EAP and the licensed health care provider orders. The act of authorizing an unlicensed individual to administer emergency medication in the event of a medical emergency is based on the school nurse's judgment and the criteria for delegation set out in the Maryland Nurse Practice Act (Annotated Code of Maryland, Health Occupations Article, Title 8; COMAR 10.27.11.) Refer also to the *Maryland State School Health Services Guideline: Administration of Medication in Schools*. School personnel who have direct contact with a student with an EAP should have immediate access to the plan in a manner determined by the school nurse.

The EAP for a student with asthma should include, but is not limited to:

- Emergency contact information;
- Signs and symptoms of asthma exacerbation;
- The licensed health care provider's emergency orders and interventions;
- Provision for storage and accessibility of emergency medications, supplies, and equipment to allow immediate availability to designated school personnel;
- Student-specific indication for use and administration of emergency medications;
- Other supportive treatments as indicated (e.g., change in position, encourage fluids to reduce thickness of secretions);
- Procedure to call 911; and
- Guidance for when a school nurse is not available.

To facilitate immediate response to the student and access to emergency medication(s), the school nurse should also consider the following when developing the EAP:

- Size and layout of school building;
- Health services staffing model;
- Plan for access to and ability to provide other supportive treatments; and
- Plan to allow students who self-manage to securely self-carry emergency supplies for immediate access (e.g., fanny pack).

IMPLEMENTATION

Implementation of the student's care plans will require local school health services programs to develop procedures to communicate and share school-wide asthma awareness, asthma trigger avoidance education, and student-specific information when appropriate to manage the health and safety of the student with asthma. The school nurse should apprise appropriate school staff of the student's asthma management plan(s) and provide, or arrange for, all appropriate school staff to receive training.

The school nurse should document the provision and the receipt of training for each staff member who attended. Training may include but is not limited to:

- Definition of asthma;
- Signs and symptoms of asthma exacerbations to report to the school nurse;
- Specific intervention(s) appropriate for school staff (e.g., cleaning routines, cleaning products);
- Classroom accommodations;
- Cafeteria accommodations;
- Transportation accommodations;
- School-sponsored activity and field trip accommodations;
- Contents of the student's management plans (e.g., EAP), as necessary;
- Medication information related to storage, access, location, administration; and
- Education for school visitors or volunteers with student contact, as needed per local policy.

EVALUATION

The school nurse will assess and evaluate the student's health status and response to their asthma management plan(s) on an ongoing basis. The student's school health services care plans should be reviewed at least annually and updated as necessary to reflect changes in the student's health care needs, nursing interventions, and goals. The school nurse should provide input to the school administrator regarding the evaluation of the school's asthma exacerbation prevention and management activities.

SECTION III: CARE COORDINATION AND CASE MANAGEMENT

ROLES AND RESPONSIBILITIES

Effective case management requires coordination between all persons involved in the care of the student. The school nurse is often the case manager for students with asthma and can serve as the liaison for all persons involved in the student's care. Another student services staff member, Individualized Education Program (IEP), or 504 team member may be designated as the educational case manager.

In accordance with Md. Code Ann., Educ. § 7-426, the student, parent/guardian, and school each have specific responsibilities integral to the health and safety of the student with asthma.

PARENT/GUARDIAN RESPONSIBILITIES

School nurses should seek to fully involve the student's parent/guardian and work collaboratively to plan and provide for the student's care. The parent/guardian is responsible for:

- Providing accurate emergency contact information;
- Providing complete and accurate medical information related to the student's asthma, including but not limited to:
 - Written documentation of the student's asthma from a licensed health care provider;
 - Licensed health care provider medication and treatment orders;
 - Current history of asthma exacerbations and hospitalizations; and
 - A written list of asthma triggers and respiratory or other allergens (e.g., foods, pollen).
- Collaborating with the school nurse to develop the plan of care for the student with asthma;
- Supplying at least one non-expired asthma medication(s) ordered by the licensed health care provider;
- Working with the school nurse and licensed health care provider to obtain additional metered dose inhalers based on need;
- Monitoring the proper storage (e.g., away from light and high temperatures) and routinely checking the expiration dates of medication delivery devices for students who self-carry; and
- Providing the recommended and preferred medical identification bracelet/necklace indicating asthma and/or allergic conditions, if applicable.

STUDENT RESPONSIBILITIES

Student participation in planning and health management responsibilities must be age, condition, and developmentally appropriate. The student is responsible for:

- Avoiding known allergens and asthma triggers;
- Informing school staff immediately in the event of symptoms after an exposure to an allergen;
- Informing the school nurse or designated school health services personnel when the rescue inhaler is used according to the plan developed with the school nurse; and
- Responsibly self-carrying and self-administering medication when appropriate and in accordance with Md. Code Ann., Educ. § 7-421.

SCHOOL ADMINISTRATOR RESPONSIBILITIES

The school administrator must be aware of students with asthma as documented by the healthcare provider and work with the school nurse to support the effective implementation of health care plans. Implementation of these plans includes supporting reasonable accommodations based on the school nurse's assessment, healthcare provider orders, and the unique needs of each individual student.

The school administrator supports the school nurse's training, education and awareness activities, which include, but not limited to:

- Working collaboratively with school health services staff to provide staff training on the signs/symptoms of asthma exacerbation and use of inhaler;
- Planning for implementation of a student's EAP during field-trips and school-sponsored events; and
- Working collaboratively to make asthma inhalers as accessible as possible to avoid treatment delay.

SCHOOL STAFF RESPONSIBILITIES

Based on the needs of the individual student, school nurses should train, and document training of all school staff involved in the implementation of a student's licensed health care provider orders and/or EAP. Other school staff may contribute to the management of students with asthma in ways that include but are not limited to the tasks detailed below:

Transportation personnel: Respond to the student with an asthma exacerbation as trained by the school nurse; communicate concerns to the transportation office, school nurse, and school administrator as instructed or trained.

Coaches, athletic trainers, and advisors for school-sponsored activities: Respond to the student with an asthma exacerbation as trained by the school nurse; communicate to the school nurse those students with asthma indicated on a pre-participation sports physical; communicate concerns to school nurse and school administrator as instructed or trained.

School registered dietician and food services staff: Read and understand all pertinent health care information provided by the school nurse regarding the student's health care management related to student's meal plan; communicate ingredient list and menu choices with school nurse as appropriate; identify food ingredients or menu items that should be avoided, plan for meal substitutions or modifications for school meals according to USDA requirements; review sanitation procedures in cafeteria or other food service areas (e.g., food handling and distribution, hand washing practices to prevent exposure of students to food allergens or additives).

School counselor: Participate in disability awareness activities, assist with support groups/counseling; assist with educational planning (e.g., Section 504 or IEP).

Pupil personnel worker/school social worker: Assist the school nurse working with families to address transportation concerns, home teaching, and attendance issues.

School psychologist: Assist students with psychological support for coping, adjustment, and any behavioral strategies to support the student.

Teachers (including substitute teachers), paraeducators and personal assistants: Respond to a student with an asthma exacerbation in an emergency as trained by the school nurse; maintain and review substitute folder; be aware of classroom needs (e.g., routine and emergency care); and communicate concerns to the school nurse and school administrator as instructed or trained.

PARENT/GUARDIAN OUTREACH

School nurses should provide the parent/guardian with information and resources for asthma education (e.g., understanding the disease, medications used to treat it, techniques for administration, and what to expect from treatment). The school nurse can also refer the student and/or parent/guardian for counseling and additional support.

In accordance with Md. Code Ann., Educ. § 7-426, the school also has the responsibility to provide outreach and education for parents/guardians and other caregivers regarding emergency care of students with asthma.

SCHOOL-SPONSORED ACTIVITIES

School personnel should provide sufficient notice to the school nurse when planning a school-sponsored activity. A plan will need to be developed by the school nurse, in collaboration with the school administrator, parent/guardian, and student. Refer also to the *Maryland State School Health Services Guideline: Administration of Medication in Schools* addressing the administration of medication during school-sponsored activities. Prior to the school-sponsored activity, the school nurse should verify the school personnel in charge has a copy of a student's EAP and has been trained to implement and respond to the plan.

SECTION IV: GLOSSARY

Accommodations: Individualized changes or adjustments in a school setting that provide a student with a disability equal opportunity to participate in school programs and activities.

Allergen: A substance that causes an allergic reaction. For some persons with asthma, an allergen can cause an asthma exacerbation.

Asthma Action Plan: An individualized plan initiated by a licensed health care provider, which includes routine and emergency medication and protocols.

Asthma Control: The degree to which the manifestations of asthma (symptoms, functional impairments, and risks of untoward events) are minimized, and the goals of therapy are met. Control is classified as well controlled, not well controlled, and very poorly controlled.

Asthma Severity: The intrinsic intensity of the disease process. Asthma is typically classified as intermittent or persistent. Persistent asthma is then classified as mild, moderate or severe.

Asthma Triggers: A broad range of factors that can cause or exacerbate asthma symptoms. Common asthma triggers include respiratory infections, allergens, irritants, exercise, and emotions.

Asthma Trigger Avoidance: Actions or activities documented in an individualized health care plan that specifically address the interventions needed to reduce the risk that a person with asthma will be exposed to a trigger.

Bronchodilator: Medication that relaxes smooth muscles around the bronchioles and allows them to open more completely.

Delegation: The act of authorizing an unlicensed individual, a certified nursing assistant, or a medication technician to perform tasks typically performed by registered nurses or licensed practical nurses (COMAR 10.27.11.02(B)(6)).

Emergency Action Plan (EAP): A document that specifies the actions needed to manage a student's specific medical condition in the event of a medical emergency.

Health Appraisal: The process by which a designated school health services professional identifies health problems that may interfere with learning.

Individualized Health Care Plan: A type of nursing care plan developed by the school nurse utilizing data from a nursing appraisal or assessment. It is specific for a student with a chronic health condition and designed to meet the student's unique health care needs.

Nebulizer: A device used to produce a fine spray of liquid or mist for inhalation of a medication.

Nurse Practice Act: A statute enacted by the legislature of any state or by the appropriate officers of the district that delineates the legal scope of the practice of nursing within the geographical boundaries of the jurisdiction. The Maryland Nurse Practice Act is codified in the Maryland Code Annotated, Health Occupations Article, Title 8. The accompanying regulations are found in the Code of Maryland Regulations Title 10, Subtitle 27.

Nursing Assessment: The act of gathering and identifying data that assists the nurse, the client (e.g., student in the school setting), and the client's parent/caregiver to identify the client's health concerns and needs (Nurse Practice Act, Maryland Code Annotated, Health Occupations Article, Title 8; COMAR Title 10, Subtitle 27).

Peak Flow Meter: A device which measures flow rate of air breathed out during forced expiration.

School Nurse: A registered professional nurse currently licensed by the Maryland Board of Nursing who works in a school setting.

Self-Administration: The application or consumption of medication by an individual in a manner directed by the health practitioner without additional assistance or direction (Md. Code Ann., Educ. § 7-421).

Self-Carry: The possession of a medication on an individual's person to allow quick access to and administration of the medication and to allow self-administration when specified.

Spacer: A device to assist with effective inhalation of the bronchodilator administered via metered dose inhaler.

SECTION V: RESOURCES/REFERENCES/APPENDIX

RESOURCES

Allergy and Asthma Network

<https://allergyasthmanetwork.org/>

Works with national and local partners to train healthcare professionals, raise awareness, and educate millions each year with easy-to-understand, medically reviewed resources in English and Spanish. Offers an “Allergies and Asthma at School” section for parents and school staff.

American Academy of Allergy, Asthma, & Immunology (AAAAI)

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

The leading membership organization of more than 7,000 allergists/ immunologists and patients' trusted resource for allergies, asthma and immune deficiency disorders. Offers a “School Tools” resource section.

Asthma & Allergy Foundation of America (AAFA)

<http://www.aafa.org>

The leading not-for-profit organization for people with asthma and allergies, and the oldest asthma and allergy patient group in the world. Offers an “Asthma in schools” resource section.

American Association of Asthma Educators (AAE)

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

A non-profit organization dedicated to providing quality education to a multidisciplinary group of asthma educators. Offers educational resources including videos, presentations, handouts, and other information for patients, schools, and asthma educators.

American Lung Association

<https://www.lung.org/>

A pioneering model of education, advocacy and research. Offers a “Back to School with Asthma Toolkit” and “Asthma Medication in Schools” resource section.

Centers for Disease Control and prevention (CDC)

<https://www.cdc.gov/healthyschools/asthma/index.htm>

CDC Healthy Schools works with states, school systems, communities, and national partners to prevent chronic disease and promote the health and well-being of children and adolescents in school.

National Association of School Nurses (NASN)

<https://www.nasn.org/nasn-resources/resources-by-topic/allergies-anaphylaxis>

Optimizing student health and learning by advancing the practice of school nursing. Offers a variety of links to national resources and additional resources.

National Heart, Lung, & Blood Institute (NHLBI)

<http://www.nhlbi.nih.gov/>

The nation’s leader in prevention and treatment of heart, lung, blood and sleep disorders.

Asthma Action Plan (See Appendix)

<https://www.nhlbi.nih.gov/resources/asthma-action-plan-2020>

Managing Asthma- A Guide for Schools

https://www.nhlbi.nih.gov/files/docs/resources/lung/NACI_ManagingAsthma-508%20FINAL.pdf

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- School Health Program, Md. Code Ann., Educ. § 7–401. <https://mgaleg.maryland.gov/mgawebsite/Laws/StatuteText?article=ged§ion=7-401&enactments=false>
- Use of Asthma Drugs and Related Medication, Md. Code Ann., Educ. § 7–421. <https://mgaleg.maryland.gov/mgawebsite/Laws/StatuteText?article=ged§ion=7-421&enactments=false>

APPENDIX

National Heart, Lung, and Blood Institute
Asthma Action Plan (2020)

ASTHMA ACTION PLAN

For: _____ Doctor: _____ Date: _____

Doctor's Phone Number: _____ Hospital/Emergency Department Phone Number: _____

GREEN ZONE	DOING WELL	Daily Medications		
	<ul style="list-style-type: none"> No cough, wheeze, chest tightness, or shortness of breath during the day or night Can do usual activities <p>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: _____</p>	Medicine	How much to take	When to take it
		_____	_____	_____
		_____	_____	_____
		_____	_____	_____
		_____	_____	_____
	Before exercise	<input type="checkbox"/> _____	<input type="checkbox"/> 2 or <input type="checkbox"/> 4 puffs	5 minutes before exercise
YELLOW ZONE	ASTHMA IS GETTING WORSE	1st → Add: quick-relief medicine—and keep taking your GREEN ZONE medicine.		
	<ul style="list-style-type: none"> Cough, wheeze, chest tightness, or shortness of breath, or Waking at night due to asthma, or Can do some, but not all, usual activities <p>–Or– Peak flow: _____ to _____ (50 to 79 percent of my best peak flow)</p>	_____	_____ Number of puffs	Can repeat every _____ minutes up to maximum of _____ doses
		(quick-relief medicine)	or <input type="checkbox"/> Nebulizer, once	
		2nd → If your symptoms (and peak flow, if used) return to GREEN ZONE after 1 hour of above treatment:		
		<input type="checkbox"/> 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:		
		<input type="checkbox"/> Take: _____ Number of puffs or <input type="checkbox"/> Nebulizer		
		(quick-relief medicine)		
		<input type="checkbox"/> Add: _____ mg per day For _____ (3-10) days		
		(oral steroid)		
		<input type="checkbox"/> Call the doctor <input type="checkbox"/> before/ <input type="checkbox"/> within _____ hours after taking the oral steroid.		
RED ZONE	MEDICAL ALERT!	Take this medicine:		
	<ul style="list-style-type: none"> Very short of breath, or Quick-relief medicines have not helped, Cannot do usual activities, or Symptoms are same or get worse after 24 hours in Yellow Zone <p>–Or– Peak flow: less than _____ (50 percent of my best peak flow)</p>	_____	_____ Number of puffs or <input type="checkbox"/> Nebulizer	
		(quick-relief medicine)		
		_____ mg		
		(oral steroid)		
		Then call your doctor NOW. Go to the hospital or call an ambulance if:		
		<ul style="list-style-type: none"> You are still in the red zone after 15 minutes AND You have not reached your doctor. 		
	DANGER SIGNS	→		
	<ul style="list-style-type: none"> Trouble walking and talking due to shortness of breath Lips or fingernails are blue 	<ul style="list-style-type: none"> Take _____ puffs of _____ (quick relief medicine) AND Go to the hospital or call for an ambulance _____ NOW! (phone) 		

See the reverse side for things you can do to avoid your asthma triggers.

HOW TO CONTROL THINGS THAT MAKE YOUR ASTHMA WORSE

This guide suggests things you can do to avoid your asthma triggers. Put a check next to the triggers that you know make your asthma worse and ask your doctor to help you find out if you have other triggers as well. Keep in mind that controlling any allergen usually requires a combination of approaches, and reducing allergens is just one part of a comprehensive asthma management plan. Here are some tips to get started. These tips tend to work better when you use several of them together. Your health care provider can help you decide which ones may be right for you.

ALLERGENS

Dust Mites

These tiny bugs, too small to see, can be found in every home—in dust, mattresses, pillows, carpets, cloth furniture, sheets and blankets, clothes, stuffed toys, and other cloth-covered items. If you are sensitive:

- Mattress and pillow covers that prevent dust mites from going through them should be used along with high efficiency particulate air (HEPA) filtration vacuum cleaners.
- Consider reducing indoor humidity to below 60 percent. Dehumidifiers or central air conditioning systems can do this.

Cockroaches and Rodents

Pests like these leave droppings that may trigger your asthma. If you are sensitive:

- Consider an integrated pest management plan.
- Keep food and garbage in closed containers to decrease the chances for attracting roaches and rodents.
- Use poison baits, powders, gels, or paste (for example, boric acid) or traps to catch and kill the pests.
- If you use a spray to kill roaches, stay out of the room until the odor goes away.

Animal Dander

Some people are allergic to the flakes of skin or dried saliva from animals with fur or hair. If you are sensitive and have a pet:

- Consider keeping the pet outdoors.
- Try limiting to your pet to commonly used areas indoors.

Indoor Mold

If mold is a trigger for you, you may want to:

- Explore professional mold removal or cleaning to support complete removal.
- Wear gloves to avoid touching mold with your bare hands if you must remove it yourself.
- Always ventilate the area if you use a cleaner with bleach or a strong smell.

Pollen and Outdoor Mold

When pollen or mold spore counts are high you should try to:

- Keep your windows closed.
- If you can, stay indoors with windows closed from late morning to afternoon, when pollen and some mold spore counts are at their highest.
- If you do go outside, change your clothes as soon as you get inside, and put dirty clothes in a covered hamper or container to avoid spreading allergens inside your home.
- Ask your health care provider if you need to take or increase your anti-inflammatory medicine before the allergy season starts.

IRRITANTS

Tobacco Smoke

- If you smoke, visit smokefree.gov or ask your health care provider for ways to help you quit.
- Ask family members to quit smoking.
- Do not allow smoking in your home or car.

Smoke, Strong Odors, and Sprays

- If possible, avoid using a wood-burning stove, kerosene heater, or fireplace. Vent gas stoves to outside the house.
- Try to stay away from strong odors and sprays, such as perfume, talcum powder, hair spray, and paints.

Vacuum Cleaning

- Try to get someone else to vacuum for you once or twice a week, if you can. Stay out of rooms while they are being vacuumed and for a short while afterward.
- If you must vacuum yourself, using HEPA filtration vacuum cleaners may be helpful.

Other Things That Can Make Asthma Worse

- Sulfites in foods and beverages: Do not drink beer or wine or eat dried fruit, processed potatoes, or shrimp if they cause asthma symptoms.
- Cold air: Cover your nose and mouth with a scarf on cold or windy days.
- Other medicines: Tell your doctor about all the medicines you take. Include cold medicines, aspirin, vitamins and other supplements, and nonselective beta-blockers (including those in eye drops).



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



National Heart, Lung,
and Blood Institute

NIH Publication No. 20-HL-5251
February 2021

For more information and resources on asthma,
visit nhlbi.nih.gov/BreatheBetter.

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