

Supporting Students with Asthma in School

Standards of Care including Training Standards for School Personnel

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Information contained in this guide is based on the MDE Model Policy for Managing Asthma in Schools

Introduction

Asthma is a serious chronic disease of the lungs that is caused by swelling (inflammation) of the airways. There is no cure for asthma, but it can be prevented and controlled with proper care. People with asthma can live normal, active lives. Students should only miss school rarely if their asthma is under control.

For every classroom in Michigan with 30 children, two may have asthma. This chronic disease can limit activities for children with asthma and is a leading cause of school absenteeism. One large study showed that of the children who died from asthma, one third of them had **mild** disease! Asthma needs to be taken seriously, no matter how mild or severe the symptoms seem.

Michigan Children (Ages 0-17 years)

- 1 in 7 Michigan students with asthma miss more than 6 days of school each year due to asthma
- Only 40% of Michigan students with asthma have an Asthma Action Plan at school
- 91.4% of asthma hospitalizations for Michigan students occur during the school year
- 27% of Michigan students with asthma aged 10-17 say they are not allowed to carry their medication with them at school, despite [Michigan's inhaler law](#)ⁱ Michigan Youth (Grade 9-12)
- 10.6% of students reported currently having asthma.
- Students who were overweight were more likely to report having asthma than underweight or normal weight students.
- 11.9% of females and 9.1% of males reported currently having asthma.
- The United States prevalence for youth who have ever been told they have asthma was 21.8%. Michigan's prevalence was 24.2%, tenth highest in the country.
[Getastmahelp.org](#)ⁱⁱ

With asthma, there is always a little swelling inside the airways with or without symptoms. Because of this underlying inflammation, airways tend to be extra sensitive and react when they encounter an asthma trigger.

When people with asthma come into contact with a trigger, the airways swell and narrow while the muscle bands around the airways tighten and produce more mucus, making it harder to breathe. Untreated or poorly controlled asthma can cause changes in the airway that may be irreversible.

There are three changes that occur inside the airways that make it hard to breathe:

- Swelling, called inflammation. This makes the airway tissue irritated, red, and swollen. When the tissue becomes inflamed, the airway narrows, and airflow is decreased.

- Tightening of muscle bands surrounding the airways, called bronchoconstriction. This is the tightening of the muscles that surround your airways further reducing the opening.
- An increase in mucus clogs the airways.

Experts are still unsure of the exact causes of asthma, or why one person gets asthma, and another does not. Factors may include environment, genetics, obesity, exposure to childhood diseases, and inactivity. Children whose mothers smoked during pregnancy, or who were exposed to secondhand smoke are more likely to have asthma. People who smoke also have a high risk of developing asthma.

Asthma Symptoms

Asthma episodes can start suddenly, or take many days to develop. There are several possible early warning signs that may indicate an asthma episode is about to occur. These early warning signs can differ from person to person and include:

- an itchy or scratchy throat
- dark circles underneath the eyes
- restless sleep or waking up coughing

During an asthma episode, symptoms may include:

- coughing
- struggling to breathe
- hearing a whistling or wheezing sound when breathing
- feeling tightness in the chest

Not all individuals with asthma wheeze. For some, coughing, especially during the night or after exercise, may be their main symptom. A person with asthma will not necessarily have the same signs and symptoms as another person. Signs and symptoms are individualized and understanding individual signs and symptoms is a key component to proper asthma management.

Asthma Triggers

Common asthma triggers include:

- **Allergens** such as animal dander, mold, medications, dust mites, certain foods or food additives, cockroach particles, and pollen.
- **Irritants** such as cigarette smoke, wood smoke and fire, outdoor air pollution chemicals such as gases, fumes and vapors, cleaning products, strong odors and fragrance.
- **Infections** such as the flu and other respiratory infections.
- **Exercise** and **strong emotions** including laughing, crying, fear and anxiety, stress, and excitement.

People with asthma can have more than one trigger. In those cases, individuals should work with a healthcare provider to help identify their triggers. Keeping a journal or detailed diary tracking symptoms can help the healthcare provider find patterns in behavior or exposures that point to a specific trigger. If allergies cause asthma symptoms, talking with

a healthcare provider about a simple blood test or skin test for allergies can be an important step in controlling asthma.

Instructions:

Supporting Students with Asthma in School Training Toolkit

School personnel need to be prepared to provide care to students with asthma at school and at all school-sponsored activities in which they participate. In an effort to standardize the support for students with asthma in schools, the Michigan Department of Education (MDE) and the Department of Health and Human Services (DHHS) have garnered input from a multi-disciplinary team consisting of national and statewide stakeholders. The work of this team has been incorporated into the Supporting Students with Asthma at School Training Standards.

Standards of Care have been developed to guide schools in providing support to students with chronic health conditions that meet requirements of the law and ensure that best practices are followed. These general standards are outlined in the Standards of Care Document located in the Appendices. The asthma specific standards of care and training standards are included in this document.

The school nurse is the most appropriate person in the school setting to provide care for a student with asthma. Many schools, however, do not have a full-time nurse, and sometimes a single nurse must cover more than one school. Even when a nurse is assigned to a school full time, they may not always be available during the school day, during extracurricular activities, or on field trips. In circumstances where a nurse is absent or unavailable, the school remains responsible for arranging and implementing the agreed upon care that is necessary to enable the student with asthma to participate in school and school-related activities. The school nurse, or another qualified health care professional, should play a major role in training appropriate staff and providing professional supervision and consultation regarding routine and emergency care of the student with asthma.

In Michigan, school districts may train school personnel to provide daily care and emergency medical assistance, including the administration of quick reliever medications to students with asthma, in accordance with a health care provider's written instruction and the standards recommended by the *State of Michigan Board of Education Model Policy on the Management of Asthma in the School Setting*.

The National Institutes of Health and the American Academy of Allergy, Asthma & Immunology have developed best practices to help school staff take appropriate actions to prevent and treat asthma symptoms and flare-ups. ([S³AMPROTM_{iii}](#))

This toolkit is designed to guide the School Nurse, Certified Asthma Educator, or other medical professional to provide the most complete training according to standards set by the Supporting Students with Asthma in School Committee on Training Standards. The training standards outline the steps for supporting students with asthma in school, following the *Safe and Legal Support for Students with Health and Medication Needs in School* guidance developed by the Michigan Association of School Nurses (MASN) for medication administration training. Once **Performance Standard Steps 1-3** of this toolkit are complete, the staff training and ongoing management and support can be implemented.

All school personnel should be given training about asthma and how to manage it in ***Performance Standard Step 4***. This training should be broken down into different levels, depending on the responsibility of each staff member for the student with asthma. The training should be administered by a school nurse, certified asthma educator, or a qualified medical professional. The training should take place at the beginning of each school year and should be repeated when a current student is newly diagnosed with asthma, or a student with asthma enrolls in the school. Refresher training is done as needed to support the student as their condition or needs change, as outlined in ***Performance Standard Step 5***.

The Performance Standard Steps included in this kit outline the support that should be provided to students with asthma in school in compliance with the law and best practice. Training must be documented, and these records must be saved according to the [Michigan Records Retention and Disposal Schedule for Michigan Public Schools^{iv}](#).

Training Presentations for the 3 tiers of training are *linked*. Additional resources for training are provided in the appendices and marked in the training outline with a ►.

Performance Standard Steps to Supporting Students with Asthma in School

1. Performance Standard Step 1: Review the Legal Considerations

[Michigan School Code^v](#)

[Michigan Public Health Code^{vi}](#)

[FERPA^{vii}](#)

[Michigan's Inhaler Law](#)

2. Performance Standard Step 2: Coordination of Care: School Health

Team/Asthma Health Care Team meet with student's parent(s)/guardian(s) to review Health Care Plans and identify the support that will be provided according to the student's specific needs. **Be prepared.** Determine which students have asthma and where their medicine is kept. Be alert for students who may have asthma symptoms but are not known by the school to have asthma and have no medications on hand.

3. Performance Standard Step 3: Assemble the Student's Health Care Plans

(Samples included in the appendices)

▶ **AAP** Asthma Action Plan including the **MAA** Medical Authorization (Prepared by the Student's Personal Asthma Health Care Team)

▶ **IHP** Individualized Health Care Plan (Prepared by the School Nurse)

▶ **504 Plan** [Accommodations^{viii}](#)

4. Performance Standard Step 4: Train School Personnel

The three tiers of support build on each other:

Tier 1- General Staff Awareness (All staff members) 15-20 minutes

Tier 2- Emergency Care (Medical Emergency Response Team and Daily Support Staff) 1-3 hours

Tier 3- Daily Support Staff, 1-3 hours

5. Performance Standard Step 5: Ongoing Asthma Management and Support

The checklist on the following page is the asthma specific Standard of Care tool that can be used to ensure that all steps are completed when providing care to students with asthma in schools.

Standard of Care to Support Students with Asthma in School

Standard of Care Key:			
DSP	Designated School Personnel	PA NP	Physician's Assistant Nurse Practitioner
AAP/MMP	Asthma Action Plan/Medical Management Plan	RN	Registered Nurse
MAA	Medication Administration Authorization	SSH Team	Student-specific Health Team
MERT	Medical Emergency Response Team	*SSH Team includes: Parent(s), Student, Designated School Personnel AND Registered Nurse/Physician/Physician's Assistant/Nurse Practitioner	
POC	Plan of Care		
Please note: Timely completion of each step is an expectation for all members of SSH Team		** Based on Michigan law and current best practices	

Checklist:

- Non-Emergent Health Need Identified- **Student with asthma**
- If an Emergency is suspected, Call 9-1-1 immediately**
- Parent/legal guardian provides: AAP/MMP/MAA; includes routine/daily care and emergency action steps
- DSP/RN verifies forms are complete
- Student specific meeting with parent/legal guardian, administrator, teacher, DSP and RN/Trainer to provide input to the POC, based on the AAP/MMP, MAA, and student needs (i.e., student's daily schedule)
- Building administrator identifies and designates school personnel to be trained
- DSP determines training needs and arrange skill-based training for SSH Team*
- SSH Team participates in skill-based training**
- STOP:** Verify all forms are appropriately signed and training is complete before DSP assume responsibility for provision of care
- DSP establishes student-specific health file and medication administration record
- DSP distributes AAP/MMP to SSH Team members/other school staff per FERPA guidelines
- DSP provides care to student as outlined in AAP/MMP
- DSP documents in student health records all care provided, including student responses to care
- In the event of non-urgent unexpected response or error, follow school procedure
- Inform parent/legal guardian in a timely manner
- In a **suspected emergency, always call 9-1-1 first**, then call parent/legal guardian
- Follow AAP/MMP emergency plan
- Follow school policy for responding to emergencies (See sample Asthma/MERT protocol)
- DSP maintains regular communication with SSH Team. If appropriate, evaluate for eligibility for a Section 504 Academic Accommodations Plan
- DSP secures updated AAP/MMP/MAA, and training before the start of each school year or more frequently if student and/or school personnel needs dictate

Performance Standard Step 1: LEGAL CONSIDERATIONS

The [Michigan School Code](#) and [Public Health Code](#) (applicable for schools with school nurses) dictate the legal requirements for support provided in schools to students with health and medication needs. Three laws apply to students with asthma: The Americans with Disabilities Act (ADA); the Individuals with Disabilities Education Act (IDEA); and Section 504 of the Rehabilitation Act of 1973. These laws require schools to provide accommodations for students if their health condition affects their education. Students with asthma may qualify for reasonable accommodations in the school setting so they are successfully supported, and their schooling is not adversely affected by their disability or perceived disability.

In addition, [Section 380.1179^x](#) of the Michigan School Code allows students to carry and self-administer prescribed inhalers, and/or epinephrine auto-injectors, for emergency use with the written order and approval of the student’s physician and written permission of the parent/legal guardian.

Performance Standard Step 2: COORDINATION OF CARE

Collaboration and cooperation are key elements in creating a Circle of Support for planning and implementing successful support for students with asthma at school. To work collaboratively, a *school health team* should be assembled to include people who are knowledgeable about asthma, the school environment, as well as federal, state, education, and nursing laws. The school health team is distinct from the *student’s personal health care team*.

The school health team members work together to implement the medical orders in the Asthma Action Plan/Medical Management Plan (AAP/MMP), developed by the student’s personal health care team, using the strategies outlined by the school nurse in the Individualized Health Care Plan (IHP).

In addition, the school health team should be part of the group that develops and implements the student’s *Section 504 Plan*, if there is a need for one.

School Health Team	Personal Health Care Team
Student with Asthma	Student with Asthma
Parent/guardian	Parent/guardian
School nurse or other qualified personnel	Medical Provider
Other school health care personnel	Nurse
Trained Asthma personnel	Registered Dietician (if available)
Principal and other administrators	Certified Asthma Educator (if available)
504/IEP Coordinator	Clinic Social Worker (if available)
Office Staff	
Teacher(s)	
Guidance counselor	
Coach(es) and other school staff members responsible for the student	

Performance Standard Step 3: STUDENT HEALTH PLANS

► **AAP /Medical Management Plan** Information in the AAP may include:

- Date of diagnosis; what type(s) of signs and symptoms, date of last episode
- Contact information (parents/guardians and student's health care provider)
- Specific medical orders for avoiding asthma triggers, administering asthma quick reliever medications
- Assessment of student's self-care skills for identifying asthma warning signs and symptoms
- Assessment of student's self-care skills for self-administration of asthma quick reliever medication
- When and how to administer quick reliever medications, post-administration actions
- How to document asthma episode and side effects, and share this information with medical providers and parents
- Activity restrictions, if any. Students with well-controlled asthma should be able to participate in sports and other physical activities.
- Field trip plan
- 72-hour disaster, lockdown, or emergency plan

► **Asthma Action Plan (AAP)** Provides information and instructions on how to manage asthma by including a list of medications, early warning signs for asthma symptoms, when to use medicines, and what to do in an emergency.

► **Medication Administration Authorization (MAA)** Provides the health care provider's orders that allow for medication to be on school property and to be administered to students according to Physician's, Physician's Assistant's (PA) or Nurse Practitioner's (NP) instructions, and written parent/guardian permission.

► **IHP Individualized Health Care Plan (Prepared by the School Nurse)** Sometimes called the nursing care plan, is based on the medical orders in the student's AAP/MMP and MAA and incorporates an assessment of the school environment as well as student-specific information (e.g., familial, psychosocial, and developmental information).

Information in the IHP may include:

- Plan for supporting the student daily (including avoidance of known triggers, adhering to the student's control plan, and promoting physical activity)
- Supplies needed and where they will be kept
- Participation in all school-sponsored activities and field trips, with coverage provided by the school nurse or trained asthma personnel
- Guidelines for communicating with the student's family and health care team
- List of trained asthma personnel
- Plan and timeline for training and supervising trained asthma personnel and other school personnel
- Timeframe for ongoing review of student outcomes
- Strategies to ensure the student is not subject to inappropriate penalties for health care appointments and to provide accommodations during the school day
- Maintenance of confidentiality and the student's right to privacy

Performance Standard Step 4: TRAINING

Asthma care must be carried out as specified in the student's Asthma Action Plan/Medical Management Plan (AAP/MMP).

Nonmedical school personnel (designated school personnel) can be trained and supervised to safely support students with asthma in the school setting. In addition to learning how to perform general asthma care tasks, trained asthma personnel should receive student-specific training and be supervised by the school nurse.

The school nurse has a critical role in training and supervising trained asthma personnel to ensure the health and safety of students with asthma. In addition, a student's health care provider or asthma specialty nurse may assist in training nonmedical personnel in asthma care. Given the rapid changes in technology, therapies, and evidence-based practice, the school nurse who provides care to students with asthma and facilitates training for school personnel has a professional responsibility to acquire, maintain knowledge and competency related to asthma.

All school personnel should be given training about asthma. Training should be broken down into different levels depending on the responsibility of each staff member towards the student with asthma. The training should be administered by a school nurse or qualified medical provider.

Refresher training for staff may also be beneficial after holiday breaks, before field trips and/or as needed by staff.

The trainer shall document the training.

Asthma Training Documentation should include any student specific training.

Tier 1 training outline

Administered to all school personnel at the beginning of the year. This training may be provided at a staff meeting and could consist of [Supporting Students with Asthma^x](#) EduPaths online training or providing the Tier 1 PowerPoint Presentation. SCECHS may be available.

Tier 1 training content options:

1. MDE [Supporting Students with Asthma](#) EduPaths Module 15:00 minutes
2. Potential Topics to include
 - Understand your role as school staff (example: know where asthma quick reliever medication is kept, how to assist with directing classmates or relaying information and know your school emergency protocol)
 - Be aware of the roles and names of key personnel in the school (example: Principal Jones is head of the crisis team at your school, Lead Teacher Smith is responsible for administration of asthma quick reliever medication, and Office Professional Sam will call 911)
 - Asthma: definition, signs, and symptoms (show Asthma Action Plan [AAP] that will be used in your district)
 - Prevention of asthma episode (example: avoiding triggers)
 - Treatment of asthma emergencies (refer to Asthma Action Plan [AAP])
 - Use of Metered Dose Inhaler (MDI), including practice with MDI/spacer trainers, and know to document times of actions
 - Identification of no improvement in condition
 - Call 911, report asthma emergency and stay on the line. Know your location in the building and/or the closest outside door with identification
 - Stay with the student, and calm them
 - Completion of district incident report(s)
 - Bullying: Students with chronic health conditions, like asthma, are at risk for bullying from staff and other students. Enforce school bullying prevention policy (bullying examples: student with asthma being singled out as the reason a classroom is not allowed to participate in a certain activity; or a teacher eye rolling when referring to a student with asthma; fellow student tries to expose the student with asthma to a known trigger; shaming of student with asthma).

► Handouts

[Asthma Overview^{xi}](#)

Tier 2 training outline

Designed for school personnel who have responsibility for the student with asthma throughout the school day, including but not limited to: classroom; physical education; music; and art teachers; as well as other personnel such as lunchroom staff, coaches, and bus drivers.

Tier 2 training is also meant for all unlicensed school personnel in the state of Michigan that are responsible for identifying asthma emergencies and administering quick reliever medications to students in the school setting.

Tier 2 training content options:

1. [MASN Safe and Legal Support of Students with Health and Medication Needs in School: Module 3 Asthma^{xii}](#)
2. Potential topics to include:
 - Content from Tier 1, with specific instructions for responding to an emergency, including the medical emergency response team (MERT) responsibilities.
 - Roles and responsibilities of individual staff members
 - Life skills that staff might use outside of school and long term (example: avoiding outdoor activity on ozone action days.)
 - Understand your role in recognition of asthma emergencies and treatment (example: know who the students are in your charge that have a diagnosis of asthma and how to implement their Asthma Action Plan for treatment)
 - Be aware of the roles and names of key personnel in the school that are trained to recognize asthma emergencies and use quick reliever medication to treat asthma emergencies (example: know the staff that have been designated to play a key role in the treatment of asthma emergencies and know your school emergency protocol)
 - Asthma: definition, signs, and symptoms (show Asthma Action Plan that will be used in your district)
 - Treatment of asthma emergencies (refer to Asthma Action Plan [AAP])
 - Use of MDI (practice with MDI/spacer trainers), know to document times of actions
 - Identification of no improvement in condition
 - Call 911, report asthma emergency and stay on the line. Know your location in the building and/or the closest outside door with identification
 - Stay with the student, and calm them
 - Completion of district incident report(s)
 - Bullying: Students with chronic health conditions, like asthma, are at risk for bullying from staff and other students. Enforce school bullying prevention policy.
 - Documentation
 - Record time event started
 - Record time(s) quick reliever medication was given
 - Take notes as the event occurs that may be helpful later
 - Send documentation of event, plan of care, and emergency contacts with EMT
 - Complete district incident report
 - 504 determination to be made by designated school team upon parental/guardian request and medical provider's updated documentation

- Family Educational Rights and Privacy Act (FERPA) and Health Insurance Portability and Accountability Act (HIPAA) privacy laws as they apply to the student
- Medical Emergency Response Team (MERT)
- Impact of asthma on behavior, learning, and other activities
- AAP or MMP and how to activate Emergency Medical Services in case of an asthma emergency
- Tips and planning needed for the classroom and for special events (e.g., know student-specific strategies to minimize risk of exposure to asthma triggers)
- What to do during a schoolwide emergency (e.g., lockdown or evacuation)
 - ▶ [How to use a Metered Dose Inhaler^{xiii}](#)
 - ▶ [Asthma Emergency Response Protocol^{xiv}](#)

Asthma Emergency Response Protocol

Be Prepared

Know which students have asthma and where their medicine is kept. Treating symptoms promptly is best practice. Common symptoms of asthma include:

- **Repetitive coughing/Wheezing**
- **Tight chest**
- **Shortness of breath**
- **Waking up at night with difficulty breathing**

Call 911 if:

- ❖ Student is struggling to breathe, talk, stay awake, has blue lips, or asks for an ambulance.
- ❖ There is no improvement in student symptoms after quick reliever medication is administered.
- ❖ No asthma quick reliever medication is available, the student's symptoms have not improved spontaneously, and nurse/designee or parent/guardian is not available.
- ❖ You are unsure what to do.
 - Make call from location of incident, if possible.
 - Use speaker mode on phone, if possible.
 - Be prepared to provide EMS Dispatcher with location name and address and the entrance door number nearest to the emergency situation.
 - Don't hang up the phone until instructed to do so by the EMS Dispatcher.
- ❖ Notify front office of medical emergency.

- ❖ **Announcement** (OVER-HEAD; WALKIE-TALKIE) to alert trained MERT members: "Attention staff and students. We are now going into Lock-in (verbiage for all to stay in place) for a medical emergency in Room _____. MERT team please respond."

- ❖ Available MERT members immediately carry out assigned tasks.
 - Take AED, student medication, stock epinephrine auto-injector and any emergency medical supplies and medication to location.
 - Inform Central Administration of Emergency.
 - Contact parents/guardians. Meet them in the parking lot.
 - Meet the ambulance.
 - Unlock the gate/door/direct traffic
 - Copy the medical records of the student. Provide to EMS.
 - Control the scene. Clear the area by directing uninvolved students to alternate location
 - Document emergency situation and response on Emergency Response Incident Report
 - Conduct debriefing session of incident and response following the event.

- ❖ MERT members immediately initiate the student's specific AAP– if no AAP on file, employ Basic First Aid/CPR/AED training.
 - NEVER LEAVE THE STUDENT ALONE.
 - Help the student be calm and in a comfortable position.
 - Help the student locate and take their prescribed asthma quick reliever medication.
 - Repeat quick reliever medication in 15 minutes if student is still having trouble breathing.
- ❖ **If breathing stops or becomes ineffective, start CPR, and use AED**

- ❖ **Ensure that 9-1-1 has been called.**

When logical and possible, initiate actions simultaneously.

Tier 3 training

Designed for school personnel who have responsibility for the student with asthma throughout the school day, including but not limited to school personnel who will administer quick reliever medication as a control measure prior to physical activity.

Tier 3 training content:

- Tier 3 Daily Support [Asthma Basics^{xv}](#) (1-3 hours)
- Content from Tier 1 and Tier 2
- Understand the role of prevention of trigger exposure, asthma control, and treatment.
 - ▶ [Asthma Triggers and How to Reduce Them^{xvi}](#)
 - ▶ [Asthma Control Test for Children^{xvii}](#)
 - ▶ [Asthma medication instruction for use and cleaning^{xviii}](#)
 - ▶ [Environmental Policies or Best Practices to Reduce Asthma Triggers^{xix}](#)
- Be aware of the roles and names of key personnel in the school who are also trained in asthma emergency recognition and quick reliever medication administration
- Overview of asthma:
 - Definition, triggers, symptoms, and recognition
 - ▶ [Asthma Action Plans^{xx}](#)
 - ▶ [Single Maintenance and Reliever Therapy \(SMART\)^{xxi}](#)
- Michigan Department of Education Model Policy for Supporting Students with Asthma at School
- Demonstration on how to use an MDI with trainer device
- Procedure steps
- MERT
- Follow-Up & Documentation
- District incident report
- Follow up with parent/guardian
- How to document all care tasks provided
- Plan for ongoing evaluation

All supplies for treatment, including the materials necessary to administer quick reliever medications, are provided by the parent/guardian.

TRAINING: Content and Resources for School Nurses

Understanding Asthma

Asthma is a chronic (long-term) condition that affects the airways in the lungs. The airways are tubes that carry air in and out of your lungs. If you have asthma, the airways can become inflamed and narrowed at times.

Asthma affects people of all ages and often starts during childhood. You may wheeze, cough, or feel tightness in your chest. These symptoms can range from mild to severe and can happen every day or only once in a while. Certain things can set off or worsen asthma symptoms, such as cold air. These are called asthma triggers. When symptoms get worse, it is called an asthma attack. ([NHLBI^{xxii}](#))

Prevalence and Incidence

According to a Centers for Disease Control and Prevention (CDC) [Morbidity and Mortality Weekly Report^{xxiii}](#), approximately six million children in the US currently have asthma, one of the most common chronic diseases among children. It is the leading health contributor to missed school days, resulting in about 14 million absences each year. [CDC^{xxiv}](#)

Among Michigan children with asthma, 14% miss six or more days of school each year because of their asthma. Less than half (40%) of those children had an Asthma Action Plan on file at their school, and 27% ages 10-17 years reported that they were not allowed to carry their asthma medication with them at school.

Asthma prevalence by county can be found on the [Getastmahelp^{xxv}](#) website.

Risk factors for asthma include environment or occupation, family history or genes, other medical conditions, race or ethnicity, or your sex may raise risk for developing asthma. Asthma affects people of all ages, but it often starts during childhood. Sometimes asthma develops in adults, particularly women. This type of asthma is called adult-onset or late-onset asthma.

Environment or occupation

Things in the environment, including at work or home, may raise the risk of developing asthma or make asthma symptoms worse. Exposure to cigarette smoke in the womb or in a child's first few years raises the risk of developing asthma symptoms early in life. This exposure may also affect lung growth and development. Exposure to different microbes in the environment, especially early in life, can affect how the immune system develops. These effects on the immune system may either increase or protect against the risk of developing asthma. Exposures that occur in the workplace, such as chemical irritants or industrial dusts, may also raise the risk of developing asthma in susceptible people. This type of asthma is called occupational asthma. It may develop over a period of years, and it often lasts even after you are no longer exposed.

Poor air quality from pollution or allergens may make asthma worse. Pollutants may include traffic-related air pollution. Allergens in the air may include pollen, dust, or other particles.

Family history and genes

Genes may play a role in the development of asthma because they affect how the immune system develops. More than one gene is likely involved. Genes are inherited from parents. Having a parent who has asthma, especially if the mother has asthma, increases the risk that a child will develop asthma.

Other medical conditions

Asthma is often linked to other medical conditions, such as:

Allergies. Asthma is usually a type of allergic reaction. People who have asthma often have other types of allergies. They may have food allergies or get a runny or stuffy nose from pollen. An individual may be at higher risk for developing asthma if they had allergic reactions in early childhood to substances in the air, such as pollen, dander, mold, or dust. The more things one is allergic to, the higher the risk of asthma.

Obesity can increase the chances of developing asthma or worsen asthma symptoms. This may be because people who have obesity can have inflammation or changes in the immune system.

Respiratory infections and wheezing. Young children who often have respiratory infections caused by viruses are at highest risk of developing asthma symptoms early in life.

Race or ethnicity

African Americans and Puerto Ricans are at higher risk of asthma than people of other races or ethnicities. African American and Hispanic children are more likely to die from asthma-related causes than non-Hispanic white Americans.

Sex

Among children, more boys than girls have asthma. Among teens and adults, asthma is more common among women than men.

[NHLBI](#)

What Happens During an Asthma Episode?

Asthma attacks, or exacerbations, are episodes that occur when symptoms get much worse and require a change in typical treatment. These can come on gradually or suddenly and may be life-threatening. People who have severe asthma often get asthma attacks more often.

During an asthma attack, the airways become swollen and inflamed. The muscles around the airways contract and the airways produce extra mucus, causing the breathing (bronchial) tubes to narrow. The individual may cough, wheeze and have trouble breathing. Symptoms of a minor asthma attack get better with prompt home treatment. A severe asthma attack that does not improve with home treatment can become a life-threatening emergency. The key to stopping an asthma attack is recognizing and treating an asthma flare-up early. [MayoClinic^{xxvi}](#)

Triggers And Strategies to Avoid Them

Tobacco Smoke

Tobacco smoke is unhealthy for everyone, especially people with asthma. “Secondhand smoke” is smoke created by a smoker and inhaled by a second person. Secondhand smoke can trigger an asthma attack.

Avoidance:

Make the student’s environment a smoke-free zone.

- Encourage household members who smoke to quit.
- People should never smoke around anyone with asthma; in the home, in the car, or wherever they may spend a lot of time.

Dust Mites

Dust mites are microscopic bugs that are in many homes and schools.

Avoidance:

- Use allergen-proof mattress and pillowcase covers to make a barrier between dust mites and the individual with asthma.
- Do not use down-filled pillows, quilts, or comforters.
- Wash bedding weekly and dry it completely.
- Vacuum carpets, area rugs, and floors regularly, using a vacuum equipped with a HEPA filter.
- Keep relative humidity levels in the home low, around 30- 50%.

Outdoor Air Pollution

Outdoor air comes from many sources, including factories, cars, or wildfire smoke.

Avoidance:

- Follow air quality forecasts on radio, television, and the internet.
- Check air quality to plan activities for when air pollution levels will be low.

Pests (e.g., cockroaches, mice)

Cockroaches and other pests are often found where food is eaten and crumbs are left behind.

Avoidance:

To control pests in your home:

- Remove as many water and food sources as possible.
- Clean dishes, crumbs, and spills right away.
- Store food in airtight containers.
- Keep trash in a closed container.
- Vacuum or sweep areas that might attract cockroaches or mice every 2 to 3 days.
- Keep counters, sinks, tables, and floors clean and free of clutter.
- Seal cracks or openings in cabinets, walls, baseboards, and around plumbing.
- Use pesticide baits and traps in areas away from children and pets, following manufacturers’ instructions.
- Avoid using sprays and foggers as these can cause asthma attacks.

Pets

Furry pets can trigger an asthma attack if there are allergies to them.

Avoidance:

Decrease your exposure by:

- Keeping pets out of bedrooms,
- Washing furry pets,
- Using an air cleaner with HEPA filter
- Using allergen-proof mattress and pillow covers

Note: People with asthma are not allergic to their pet's fur, so trimming a pet's fur will not help asthma.

Mold

Breathing in mold can trigger an asthma attack whether or not the individual with asthma is allergic to mold. Indoor mold growth is often found in damp areas such as kitchens, bathrooms, and basements, or in areas where water damage has occurred. There are many types of molds which can be found in any climate. Get rid of mold to help control your attacks.

Avoidance:

To reduce mold exposure in your home:

- Dry damp or wet items within 24 to 48 hours to prevent mold growth.
- Fix water leaks, such as leaky plumbing, which let mold grow behind walls and under floors as soon as you can.
- Replace absorbent materials, such as ceiling tiles and carpet, if mold is present.
- Use an air conditioner or dehumidifier to maintain low indoor humidity.
- Get a hygrometer to check humidity levels and keep them as low as possible—no higher than 50%. Humidity levels change over the course of a day, so check the humidity levels more than once a day.
- Scrub mold off hard surfaces with detergent and water. Dry completely.
- Empty and clean refrigerator and air conditioner drip pans regularly.
- Run the bathroom exhaust fan or open the window when showering.

To learn more about mold cleanup in the home after a flood, see [Homeowner's and Renter's Guide to Mold Cleanup After Disasters^{xxvii}](#)

Cleaning and Disinfection

Disinfectants can trigger an asthma attack. People with asthma should try to stay away when cleaners or disinfectants are being used and right after their use. Follow these precautions when cleaning or disinfecting places where people with asthma may spend time, such as homes, schools, or workplaces:

Avoidance:

- Avoid overuse of products.
- To help limit exposure to asthma triggers, follow a schedule for cleaning and disinfecting to prevent overuse of products.
- Use safer products.

Any disinfectant can trigger an asthma attack, but steps can be taken to reduce the chances of that happening:

- Use soap and water or cleaners certified by the [EPA Safer Choice program^{xxviii}](#) to clean surfaces.
- Clean visibly dirty surfaces before disinfecting.

- Never mix disinfectant products.
- Choose products for disinfecting that are less likely to cause an asthma attack, such as products with hydrogen peroxide (no stronger than 3%) or ethanol (ethyl alcohol).
 - Ensure that products with hydrogen peroxide or ethanol do not contain other chemicals that can cause an asthma attack, such as peroxyacetic acid or peracetic acid.
- Avoid using bleach (sodium hypochlorite) or quaternary ammonium compounds in enclosed spaces and limit their use.
- Avoid products with fragrances.
- Use products safely and correctly.
- Always follow the instructions on the product label. Do not mix chemical products together.
- Wear protective gear such as gloves and goggles.
- Spray or pour spray products onto a cleaning cloth or paper towel instead of spraying the product directly onto the cleaning surface (if the product label allows) to help limit exposure.
- Follow [EPA's 6 steps for Safe and Effective Disinfectant Use^{xxix}](#).
- Avoid disturbing dust because it can be an asthma trigger.
- Move away from the trigger (such as the area that was cleaned) if an asthma attack is experienced and follow the Asthma Action Plan. Call 911 for medical emergencies.
- Improve Ventilation
 - Make sure there is enough air flow (ventilation).
 - Open doors and windows to bring in fresh air if it is safe to do so.
 - Turn on exhaust fans. Exhausting the air (blowing it outside) is the most effective way to remove disinfectant vapors.
 - For buildings with heating or cooling systems that have fresh (outdoor) air intakes, turn on the fresh air intake to bring in fresh air.
 - Using a high efficiency filter (MERV 13 or higher) with the heating and cooling system can help keep air clean by removing particles such as smoke, pollen, and traffic pollution from the air. Most air filters will not remove disinfectant vapors, though.
 - Make sure to follow the manufacturer's instructions and to replace the filter as needed. Some systems cannot accept high efficiency filters. In this case, using the highest MERV rating possible will provide the most effective air cleaning.

To learn more about cleaning to prevent illness in your home, including which products are effective, see [Cleaning and Disinfecting your Home^{xxx}](#).

Other Triggers

Infections linked to influenza (flu), colds, and respiratory syncytial virus (RSV) can trigger an asthma attack. Sinus infections, allergies, pollen, breathing in some chemicals, and acid reflux can also trigger attacks.

Physical exercise; some medicines; bad weather, such as thunderstorms or high humidity; breathing in cold, dry air; and some foods, food additives, and fragrances can also trigger an asthma attack.

Strong emotions can lead to very fast breathing, called hyperventilation, that can also cause an asthma attack. ([CDC^{xxxi}](#))

Common Symptoms of Asthma

How often signs and symptoms of asthma occur may depend on how severe, or intense, the asthma is and whether you are exposed to allergens. Some people have symptoms every day, while others have symptoms only a few days of the year. For some people, asthma may cause discomfort but does not interfere with daily activities. If you have more severe asthma, however, your asthma may limit what you are able to do.

When asthma is well controlled, a person shows few symptoms. When symptoms worsen, a person can have what is called an asthma attack, or an exacerbation. Over time, uncontrolled asthma can damage the airways in the lungs.

Signs and symptoms

Signs and symptoms of asthma may include:

- Chest tightness
- Coughing, especially at night or early morning
- Shortness of breath
- Wheezing, which causes a whistling sound when you exhale

While other conditions can cause the same symptoms as asthma, the pattern of symptoms in people who have asthma usually has some of the following characteristics.

- They come and go over time or within the same day.
- They start or get worse with viral infections, such as a cold.
- They are triggered by exercise, allergies, cold air, or hyperventilation from laughing or crying.
- They are worse at night or in the morning

[NHLBI](#)

Asthma and School Performance

Children with asthma may be at risk for decreased school functioning due to acute exacerbations, increased absenteeism, iatrogenic effects of their asthma medication, and the stress associated with a chronic illness. [NHLBI^{xxxii}](#)

Asthma Action Plan

A written Asthma Action Plan detailing for the individual patient the daily management (medications and environmental control strategies) and how to recognize and handle worsening asthma is recommended for all patients. A written [Asthma Action Plan^{xxxiii}](#), developed jointly by the health care provider and the patient, will help the patient manage their asthma. There are many different Asthma Action Plan formats.

It is particularly recommended for patients who have moderate or severe asthma, a history of severe exacerbations, or poorly controlled asthma. The written Asthma Action Plan can be either symptom or peak-flow based; evidence shows similar benefits for each (EPR-3, p. 278).

Michigan School Inhaler Law

[Legislation^{xxxiv}](#) allowing Michigan public and nonpublic school children, under certain conditions, to carry and self-administer prescribed asthma and allergy medications on school grounds and during school sponsored activities was amended to the Michigan School Code in 2000 and 2004. This ensures that students with asthma and allergies have immediate access to life-saving medications.

Quick reliever Medication/Treatment of Asthma

Treatment usually depends on your age, asthma severity, and response to a given treatment option. Your doctor may adjust your treatment until asthma symptoms are controlled.

Most people are treated long-term with daily controller(s), along with another inhaler for short-term relief, when they have symptoms or to prevent symptoms. An inhaler allows the medicine to go through the mouth and into the airways. [NHLBI^{xxxv}](#)

What is Asthma Control?

The Rules of Two™ can be used to Check Asthma Control Do You or Your Child...

- Miss school or work because of asthma?
- Have trouble being active or exercising because of asthma?
- Sometimes need to go to an urgent care facility or to the emergency room because of asthma?
- Take your "quick-relief inhaler" more than two times a week?
- Awaken at night with asthma more than two times a month?
- Refill your "quick-relief inhaler" more than two times a year?

If you answered "Yes" to any of these questions, your (or your child's) asthma is NOT UNDER CONTROL. Talk to your doctor about your (or your child's) asthma!

If asthma is not under control for a long period of time, there can be [airway remodeling^{xxxvi}](#), permanent changes to the lungs. Additional information can be found at

[Getastmahelp.org^{xxxvii}](#)

The *Rules of Two*™ is a registered trademark of the Baylor Health Care System

Single Maintenance and Reliever Therapy (SMART)

SMART Therapy will deviate from the Rules of Two™ because the same medication is being used for both control and quick relief.

[SMART^{xxxviii}](#) may be used on individuals 4 years and older with a severe exacerbation in the prior year to reduce exacerbations.

SMART Therapy is the use of a combination inhaler, which contains a certain type of inhaled corticosteroid and a long-acting beta agonist (ICS/LABA) as both maintenance and quick relief therapy.

This [SMART Asthma Action Plan](#) provides information on dosing and frequency during normal mode, asthma flare-up and asthma emergencies.

Asthma Episode

An asthma "attack" or episode is a time of increased asthma symptoms. The symptoms can be [mild](#) or [severe](#). Anyone can have a severe attack, even a person with mild asthma. The attack can start suddenly or slowly. Sometimes a mild attack will seem to go away, but will come back a few hours later, and the second attack will be much worse than the first. Severe asthma symptoms need medical care right away.

During an asthma attack, the lining of the airways in the lungs swells. The muscles around the airways tighten and make the airways narrower. All of these changes in the lungs block the flow of air, making it hard to breathe. Knowing what is happening in the lungs during an asthma attack will help you to know why it often takes more than one medicine to treat the disease.

What to do During a Time of Increased Symptoms

The best time to plan for increased asthma symptoms is long before this happens, at the doctor's office. There the doctor, the person with asthma, and their family can develop an [Asthma Action Plan](#) that will tell them what to do if asthma symptoms start.

Along with following the Asthma Action Plan, here are some other helpful hints:

1. Stay calm and try to relax. The more you panic, the worse your breathing will get.
2. Tell someone that you are having asthma symptoms. Get help if you need it. Do not try to tough it out alone! Have the person stay with you.
3. Take the quick-relief medication as your Asthma Action Plan tells you to. Not sure which medication is the [quick-relief^{xxxxix}](#) one? Ask your doctor, [asthma educator](#), or pharmacist about it before you need it in an emergency!
4. If the [quick-relief medicine](#) hasn't helped in 5-10 minutes, call the doctor or 911.
5. Keep taking the quick-relief medicine, or as directed by doctor, every 5-10 minutes until the ambulance arrives.

Never adjust your asthma medications or change how much you take unless your doctor has written it in your Asthma Action Plan or told you to do so over the phone.

How Long Does Asthma Quick Reliever Medication Take to Work?

If the quick-relief medicine hasn't helped in 5-10 minutes, call the doctor or 911.

Common Side Effects of Asthma Quick Reliever Medication

Quick-relief asthma medicines may cause these side effects:

- Anxiety
- Tremors (your hand or another part of your body may shake)
- Restlessness
- Headache
- Fast and irregular heartbeat. Call your doctor right away if you have this side effect. [Medline^{xl}](#)

Is Special Monitoring Needed?

Students should be monitored for up to 15 minutes for any return of asthma symptoms after the administration of a quick reliever medication.

Impact on Daily Life

People with under-treated asthma can suffer sleep disturbance, tiredness during the day, and poor concentration. Asthma sufferers and their families may miss school and work, with financial impact on the family and wider community. If symptoms are severe, people with asthma may need to receive emergency health care and they may be admitted to the hospital for treatment and monitoring. In the most severe cases, asthma can lead to death.

[WHO](#)^{xli}

Resources

[AAAA-I SA³MPRO™ School Tools](#)

[Getastmahelp.org](#)

[What is Asthma? | Allergy & Asthma Network \(allergyasthmanetwork.org\)](#)

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