

Asthma Management in Maine Schools

Evidence-Based Guidelines for
PreK and School-Aged Students

MAINE DEPARTMENT OF EDUCATION
OFFICE OF SCHOOL AND STUDENT SUPPORTS
COORDINATED SCHOOL HEALTH

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Asthma Management in Maine Schools

Evidence-Based Guidelines for PreK and School-Age Students

The Maine Department of Education provides this *Guide for School Health Services: Asthma Management in Maine Schools* in accordance with [Maine Revised Statutes \(MRS\) Title 20-A section 6403-A \(5\)](#) which directs the Commissioner of Education to issue guidelines on the provision of school health services and health-related activities.

Introduction

As a leading chronic illness in our youth, asthma is also one of the chief causes of school absenteeism in the United States.^{1,2,3} In 2018, 2.2 million children aged 5-17 years missed more than 7.9 million school days with 1 in 6 children seeking emergency care each year due to asthma.² The impact of chronic health conditions can be challenging, with asthma linked to social, psychological, and physical development, and can affect the health and education of students in schools.^{1,3}

An asthma-friendly environment with effective asthma management programs can reduce absenteeism as well as help students with asthma participate fully and reach academic, physical, and extracurricular goals.³ School-wide asthma management programs include asthma education and resources for staff, students, and families in addition to care coordination with medical providers in the community.³

The purpose of this resource guide is to assist school nurses, educators, and all school staff to best support students with asthma so they can be successful in school. While this document intends to summarize currently available resources for the school nurse, it does not replace clinical nursing judgment for their practice. The school nurse is responsible for complying with all federal, state, and local laws, rules, regulations, ordinances, and relevant standards of practice. Information on the most current content available from the Maine Center for Disease Control (CDC), the National Association of School Nurses (NASN), the Global Initiative for Asthma (GINA), the National Institutes of Health (NIH), the American Lung Association (ALA), and other professional sources, support the safest care practices for students with asthma in Maine schools.



[National Association of School Nurses: A Model for School Nurse-Led Case Management](#)

Legislation

Several federal and state laws govern activities specific to school health and services provided. These include, but are not limited to, laws ensuring equal access to education for all students and protection of privacy through maintaining confidentiality. Other regulations direct more specific actions such as staff training and the establishment of local policy.

Federal law mandates that all students have equal access to education in public schools and school-aged students with disabilities may receive special services to support learning and participation.^{4,5} Schools are responsible for identifying students with health conditions who may be eligible for accommodations to meet individual educational needs.⁶ A 504 plan that outlines any accommodations a student may need might be appropriate for some students with asthma.⁶ School administrative units have a legal obligation to ensure that all accommodations are provided as outlined in the plan.^{4,6}

Asthma action plans are personalized health plans provided by the physician with family collaboration and guide the development of the 504 plans. The asthma action plan can serve as the student's individualized health plan (IHP) or be utilized as a guide if additional health accommodations or goals are needed. The individual health plan and 504 plan may be included in the same document. For best outcomes in asthma management, school nurses should work together with 504 coordinators in 504 plan development.

Under [MRS Title 20-A section 254 \(5\)](#), Maine law reflects that Maine schools must have local policies that permit students with asthma the ability to carry and self-administer emergency asthma medications. This legislation outlines policy requirements to include the following conditions: the healthcare provider, and parent/guardian, must sign written approval for the student to possess and self-administer medications, as well as a statement attesting to the student's knowledge and competency in doing so. Following receipt of signed documentation, the school nurse is required to evaluate and ensure proper use of asthma medication as well as confirm that signed IHP and emergency action plans (EAPs) are in place.

School nurses must have knowledge and understanding of state and federal laws governing school health. The following resources are available for more in-depth review:

- [Rule Chapters for the Department of Education](#)
- [Americans with Disabilities Act \(ADA\)](#)
- [Individuals with Disabilities Education Act \(IDEA\)](#)
- [Family Educational Rights and Privacy Act \(FERPA\)](#)
- [Free and Appropriate Public Education \(FAPE\)](#)
- [Section 504 of the Rehabilitation Act of 1973](#)
- [U.S. Department of Education: Protecting Students With Disabilities-Frequently Asked Questions About Section 504 and the Education of Children with Disabilities](#)

Asthma Overview

Asthma is a chronic respiratory condition “defined by the history of respiratory symptoms, such as wheeze, shortness of breath, chest tightness and cough, that vary over time and in intensity, together with variable expiratory airflow limitation.”⁷ Asthma has several mechanisms of action, such as airway inflammation, bronchial hyperresponsiveness, bronchoconstriction, and airflow obstruction.^{3,7} People with asthma experience chronic mild to severe inflammation in the lungs. This chronic inflammation causes increased sensitivity to certain triggers, which can exacerbate inflammation, increase mucus production, and further constrict the airways.^{3,7} Wheezing and shortness of breath, are examples of symptoms that are caused by this constriction.³ Asthma severity is defined as mild, moderate or severe and measured by amount of treatment required to reduce/control symptoms when asthma medication is used properly.⁷ To learn more about asthma, visit [National Heart, Lung, and Blood Institute: What Is Asthma?](#)

[Allergy and Asthma Foundation of America: Asthma Facts.](#)

Several common risk factors that can heighten the chances of developing asthma include a family history of the condition, allergies, viral respiratory infections, obesity, irritants from smoke and air pollution.⁸ While asthma can be a lifelong condition, proper treatment can help manage the symptoms effectively.³

For more information about asthma triggers see [National Heart, Lung, and Blood Institute: Asthma Causes and Triggers](#)



About
138,000
people in
Maine
have asthma.

With proper treatment, people with asthma can lead full and active lives.
Learn more at nhlbi.nih.gov/breathebetter

Source: CDC Behavioral Risk Factor Surveillance System (BRFSS)
Survey Data, 2021.

  National Heart, Lung, and Blood Institute **LEARN MORE BREATHE BETTER**

Common Types of Asthma

There are many types of asthma including allergic and non-allergic, adult-onset, asthma with obesity, and asthma with persistent airflow obstruction.⁷ Based on the diagnosis and underlying inflammatory differences, the clinical features may be unique, requiring individualized treatment that aims to reduce the burden.⁹ With the help of in-class assessments, consultations with parents, and interactions with medical professionals, school nurses utilize the knowledge of the asthma type to assist in creating an effective management plan.³

Allergic

Ninety percent of children and fifty percent of adults have asthma caused by allergies, the most recognized type.^{7,10} Pets, pollen, mildew, and dust mites and other pests are examples of specific allergens that function as triggers, inducing an immunological response.^{3,8,10} Many with allergic asthma also have eczema, hay fever, or food allergies.¹⁰

Non-Allergic

This type of asthma can be triggered by environmental aspects such as air quality, smoke, exhaust, fragrances, cleaning chemicals, and pesticides and may also include medications or specific dietary additives.^{11,12,13} School considerations for asthma management include indoor air quality programs (IAQ) that include educating all staff members on how to best provide a healthy school environment and reduce asthma triggers.³ Stress, anxiety, or strong emotions can also trigger asthma symptoms.¹³ During times of increased stress, medication adherence may decrease.⁷ The school nurse can encourage patients to identify goals and strategies to deal with emotional stress such as relaxation strategies and breathing exercises.⁷ Students should receive a mental health assessment if presenting with symptoms of anxiety and depression.⁷

Cough-variant asthma is diagnosed when individuals persist with cough longer than 8 weeks, without wheezing or dyspnea, and find relief with bronchodilators.¹⁴ Cough can be triggered by viral respiratory infections, is more troublesome at night, and a dry non-productive cough may be the only symptom that persists.^{7,11}

Nocturnal asthma manifests symptoms at night and is linked to circadian rhythms.¹⁵ This non-allergic asthma can make quality sleep difficult and is believed to affect many individuals with asthma diagnoses.¹⁵ Increased asthma symptoms at night can be related to lower levels of epinephrine, hormonal changes, and cholinergic tone.¹⁵

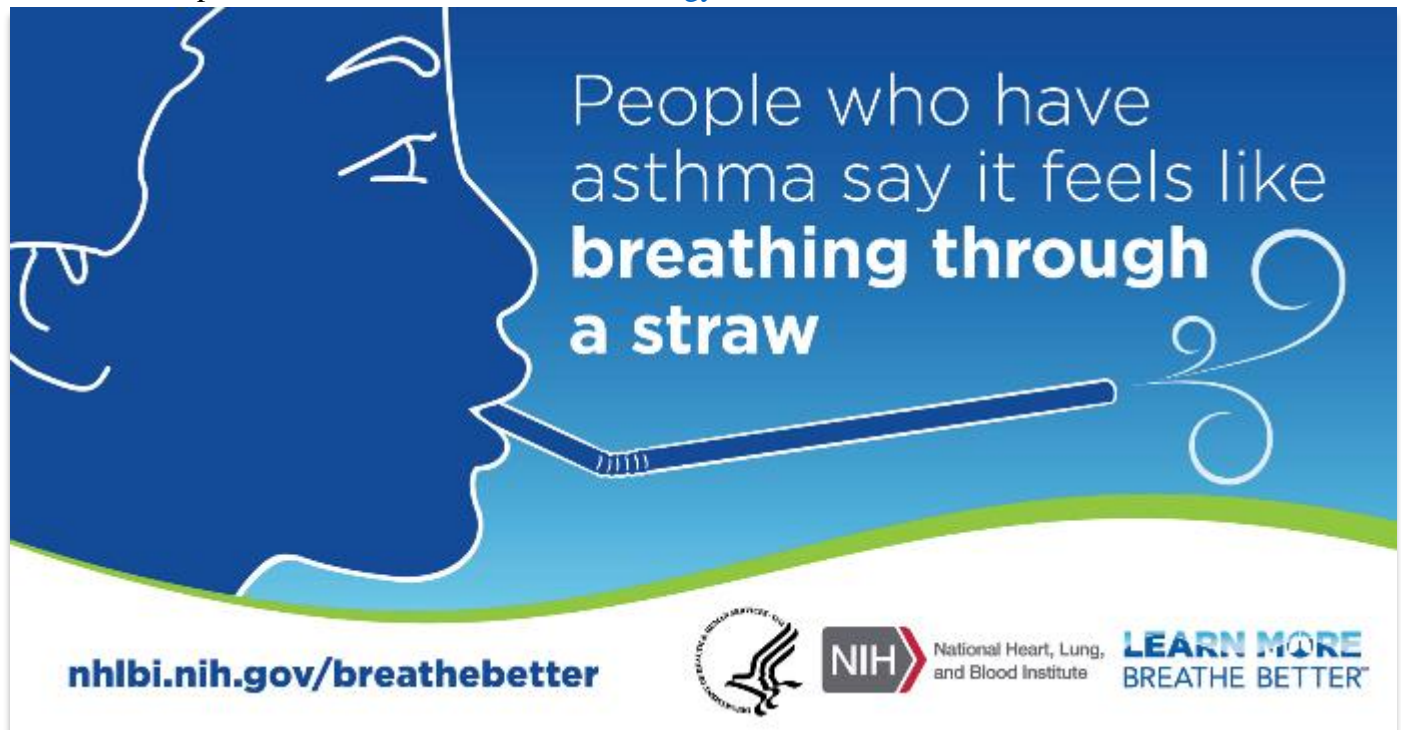


Exercise-Induced Bronchoconstriction

Exercise-induced bronchoconstriction (EIB), formally known as exercise-induced asthma, results when asthma symptoms worsen during physical activity, with cough being the most common manifestation.¹⁶ EIB affects those with, and without an asthma diagnosis, and air quality and temperature can worsen symptoms.¹⁶ Up to 90% of people with asthma experience EIB, with poorly controlled or severe asthma leading to higher prevalence.^{16,17} Exercising in cold, dry air is more likely to trigger symptoms of asthma compared to exercising in warm, humid air, and symptoms can also be exacerbated when swimming in chlorinated pools.^{16,17} The school nurse will follow the student’s asthma action plan for specific directions before and after physical activity in school.




For additional tips and information on EIB visit: [Allergy and Asthma Network: Asthma and Exercise](https://www.allergyandasthma.org/asthma-and-exercise)



People who have asthma say it feels like **breathing through a straw**

nhlbi.nih.gov/breathebetter

 **NIH** National Heart, Lung, and Blood Institute

LEARN MORE BREATHE BETTER

Signs and Symptoms

The burden of asthma is influenced by the frequency and severity of asthma symptoms with exacerbations linked to poor symptom control.⁷ The school nurse encourages participation in activities with assessment and management to prevent complications.^{7,18} Some students may avoid activity to prevent symptoms which could, in turn, lead to poor fitness.¹⁷ Exacerbations can induce psychological symptoms such as fear, embarrassment, or depression.^{3,17} When assessing symptoms and their severity, using the student’s vocabulary is important for everyone to maintain consistency and accuracy. A young student may simply describe tightness in the chest by saying, “My chest feels weird.” An increased work of breathing is indicated by use of accessory muscles, increased respiratory rate, difficulty speaking in full sentences, and is cause for concern during assessment. Please review [UpToDate: Pediatric respiratory rate and heart rate by age](#) as well as the chart provided.

<i>mild/ moderate</i>	<ul style="list-style-type: none"> • Shortness of breath • Mild wheeze with exhalation • Chest pain or tightness in the chest • Fatigue exhibited by a student who stops playing or avoids activity 	<ul style="list-style-type: none"> • Able to speak in full sentences • Oxygen saturation >92%, • Heart rate slightly elevated • Coughing, more commonly at night or in the early morning
<i>severe</i>	<ul style="list-style-type: none"> • Pain or tightness in chest • Feeling breathless, difficulty speaking • Trouble eating due to difficulty breathing • Use of accessory muscles to breathe 	<ul style="list-style-type: none"> • Wheezing that persists after treatment • Flaring nostrils, gasping for air • Ribs may have visible retractions • Oxygen saturation < 92%
<i>life- threatening</i>	<ul style="list-style-type: none"> • Poor respiratory effort • Exhaustion • Agitation and confusion • Cyanosis 	<ul style="list-style-type: none"> • Silent chest • Altered consciousness • Oxygen saturation <92% • Peak Flow <33% of predicted^{19,20,21}

Status Asthmaticus

An asthma exacerbation that does not improve with treatments prescribed by the medical provider is called [Status Asthmaticus](#) and is an emergency.^{22,23} It is important for the school nurse to continually assess a student with an asthma flare-up. Early recognition of symptoms that are not improving after rescue treatment or symptoms that are progressively getting worse, could indicate status asthmaticus.²³ Assessing for diminished lung sounds, decreased oxygen saturation rates, increased respiratory rate and pulse, decreasing peak flows that are not responding to rescue medication, inability to speak, and diaphoresis are all symptoms that warrant emergency treatment.^{22,23} Signs and symptoms of an asthma attack or respiratory distress require prompt action. All school staff must understand how to respond to an asthma emergency. Providing annual emergency action plans and staff education will foster a team approach to managing asthma safely.³



Asthma Triggers

Asthma-friendly schools consider environmental factors that can exacerbate asthma and take steps to minimize exposure to common triggers during the school day.²⁴ The school nurse can raise awareness in school administrative units, through education and collaboration across departments.

[EPA: Asthma Triggers Infographic](#)

Clean Air

To maximize air quality, schools can ensure proper ventilation, clean with chemicals only when students are absent, or use damp cloths to wipe surfaces rather than spray cleaning products into the air.^{3,24,25} If possible, staff should avoid vacuuming during the school day and use a HEPA filter vacuum cleaner.^{3,25} Consider closing windows and limiting outdoor exposure when smog is heavy and pollen counts are high. Be mindful that lawn care may cause exacerbation of asthma symptoms and consider encouraging lawn care when school grounds are not in use.^{3,24} Promote a scent-free school discouraging perfumes, air fresheners, incense, and strong smells that could trigger an asthma attack.³



[EPA: The Indoor Air Quality Tools for Schools Approach: Providing a Framework for Success](#)

[American Lung Association: Healthy Air Walkthrough Classroom Checklist](#)

Food Sensitivities

While asthma is not typically triggered by food, the school nurse understands that food sensitivities may exacerbate asthma symptoms. For example, sulfites and histamines have been known to provoke asthma symptoms.²⁶

Anaphylaxis

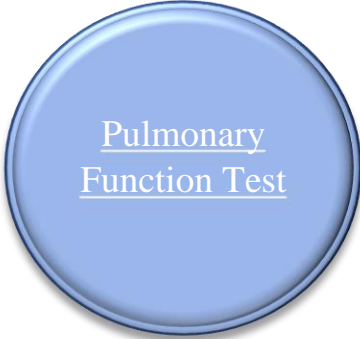
Severe allergies can cause anaphylaxis which can have symptoms similar to an asthma attack. When two or more body systems are affected, follow the anaphylaxis allergy plan.²⁶ Symptoms of anaphylaxis may include difficulty breathing, hives, inflammation of the throat or mouth, or gastrointestinal symptoms such as nausea and vomiting.²⁶

Considerations for SAUs to Reduce Triggers

- Reduce clutter
- Keep bookshelves & storage cabinets clean
- No pets with fur
- Discourage carpeting
- Mop/vacuum frequently
- Low-odor cleaning products
- Maintain ventilation systems
- Mold, dust, and moisture control
- Pest management
- Policy for no idling, no smoking, no scents
- Monitor outside air quality i.e., pollen, ozone^{3,24,25}

Diagnostic Testing

The diagnosis of asthma is crucial to begin treatment, so unnecessary treatment can be avoided, and to rule out other diagnoses.⁷ A healthcare provider evaluation will combine students' symptoms and history with family history, physical examination, and possibly some noninvasive testing.⁷ See examples below for the most common tests utilized for asthma diagnosis.




Pulmonary Function Test

Pulmonary function testing (PFT), commonly referred to as spirometry, is used to assess airflow and confirm the diagnosis of asthma.⁷ This testing is typically performed in a PFT lab or ambulatory practice setting.



Provocation Tests



Bronchial provocation tests, or trigger tests, assess the airway for hyperresponsiveness when exposed to a challenge.⁷ Some include [Irritant Challenge](#), [Exercise Challenge](#) and [Methacholine Challenge](#).



Allergy Tests

Students may undergo skin prick and/or blood testing to determine environmental allergies, with positive testing combined with students' history of exposure and consequent symptoms aiding in the diagnosis of asthma.⁷

Treatment

Monitoring, prevention, and treatment are key to asthma management.³ The annual asthma action plan update can be a time to teach the family and mentor students about current medications, triggers, self-management skills, and peak flow meter use.

New recommended guidelines for asthma management released by the National Asthma Education and Prevention Program focus on a step approach to treatment, and single maintenance and reliever therapy (SMART) also referred to as maintenance and reliever therapy (MART).^{7,27} MART is a combination therapy recommended for moderate to severe asthma with an inhaled corticosteroid (ICS) and a long-acting beta₂-agonist (LABA).²⁷ MART therapy is specific to formoterol because it has a rapid onset relief while other LABAs do not provide the same effect.²⁷ Based on the severity of the condition and the doctor's preference, each student will receive a different course of treatment. Asthma medications are available in a variety of dosage forms, including tablets, liquids, inhalers with dry powder, metered dose inhalers, breath-actuated inhalers, nebulizer solutions, and injections. Students with asthma may experience exacerbations during allergy season, or after a viral infection has resolved. Nebulizers may enable students with asthma to attend school during these times. During times of high communicable disease transmission, such as influenza, respiratory syncytial virus (RSV) and COVID-19 nurses may want to consider risks and benefits of nebulizer treatment in school.

[Operational Guidance for K-12 Schools and Early Care and Education Programs to Support Safe In-Person Learning](#)

As always, proper ventilation in the health office and personal protective equipment are nursing considerations while caring for ill students.

More detailed information is provided in the [2020 Focused Updates to the Asthma Management Guidelines](#). Or a [Summary of Updated Guidelines](#) is provided by the American Academy of Pediatrics (AAP). The Global Initiative for Asthma (GINA) provides updated resources annually, for the most up to date information see <https://ginasthma.org/>.



Podcasts discussing the Focused Updates to Asthma Management Guidelines are available at the following link:

[NIH Professional Education Opportunities. 2020 Focused Updates to the Asthma Management Guidelines](#)

Bronchodilators

Bronchodilators help to relax muscle bands around the airways opening the bronchial tubes, facilitating air exchange and mucus expectoration.^{27,29}

Beta 2 Agonists

Short-acting beta-2 adrenergic receptor agonists (SABAs)

- Used to treat sudden or severe asthma symptoms
- Onset: <5 minutes. Duration: 3-6 hours²⁹

Long-acting beta-2 agonists (LABAs)

- Often used with an inhaled corticosteroid
- Onset: >5 minutes, up to 15 minutes. Duration: 12 hours²⁹

Ultra-LABAs

- Onset: ~5 minutes. Duration: up to 24 hours
- FDA approved for use with chronic obstructive pulmonary disease (COPD), currently being researched for asthma²⁹

Anticholinergics

Acetylcholine is produced by airway epithelium, and by inflammatory cells.³⁰ Acetylcholine binds to muscarinic receptors, causing inflammation and mucus production.³⁰ Inhaled muscarinic antagonists are used in asthma to block cholinergic tone, therefore stopping inflammation, mucus production, and remodeling.²⁹ There are short-acting muscarinic antagonists (SAMA) that may be prescribed for acute asthma symptoms or used in combination with beta₂-agonists.³⁰ Long-acting muscarinic antagonists (LAMAs) are used as add-on treatments for maintenance and should not be used as monotherapy.^{27,30}

It is essential that children with asthma have access to quick-relief medications, and schools are in an opportune position to provide a safe and practical approach for those who otherwise would not have access.^{3,31,32} With 1 in 10 people in the United States without health insurance, strategies such as keeping stock emergency medications in schools provide much-needed resources.^{3,32} Disposable mouthpieces are available for schools to purchase.

[Allergy & Asthma Network: Stock Albuterol and Stock Epinephrine in Schools](#)

[American Lung Association: Model Policy for School Districts: Stock Bronchodilators](#)

[Boston Children's Hospital: How to Clean an Inhaler and Spacer](#)



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Corticosteroids

Inhaled corticosteroids (ICS) are prescribed for exacerbation prevention, often in combination therapies.^{27,31} Combination therapy combines a corticosteroid and short-acting or long-acting bronchodilator.⁷ For the best asthma symptom control, the prescribing healthcare professional will monitor symptoms and adjust treatment.³³ The school nurse will teach and reinforce with a student using ICS to communicate symptoms, take as directed, avoid abrupt discontinuation, and rinse and perform proper oral care to avoid thrush, hoarseness, and irritation.³³ Oral corticosteroids (OCS) as maintenance therapy should be avoided wherever possible because of the risk of long-term side effects.²⁷

[NIH: The Changing Role of Inhaled Corticosteroids in Asthma Management](#)

Leukotriene Modifiers

Asthma symptoms can be caused by leukotrienes, which are produced by the body in response to an allergen.³⁴ Leukotriene modifiers, such as montelukast, are used for long-term treatment of allergic rhinitis, allergic asthma, and exercise-induced asthma.³⁴ Liver function tests should be monitored when using some leukotriene modifiers.³⁴

Immunotherapy

Subcutaneous immunotherapy (SCIT) reduces the immunoglobulin E-mediated allergic response and is used as an adjunct to standard treatment in mild to moderate asthma for individuals aged 5 and older.³⁵ SCIT is not for severe, persistent asthma, and should be administered in a clinical setting, not at home or in school.³⁵

Biologics

Biologics are adjunctive treatments for individuals with moderate to severe asthma who persist with asthma symptoms.³⁶ These medications are made from living cells, modified to target antibodies, inflammatory molecules, or cell receptors.³⁶ These medications are most often administered in the doctor's office, subcutaneously or intravenously.³⁶

Boxed Warning

Issued for montelukast in 2020 due to serious behavior and mood changes. Advise parent/guardian to seek medical consultation if student is experiencing these symptoms

[U.S. Food & Drug Administration](#)

ASTHMA MEDICATION AND SIDE EFFECTS TOOL

[Asthma and Allergy Foundation of America: Asthma Medicines](#)

Role of the School Nurse in Asthma Management

Caring for students with any chronic health condition requires a team effort. A whole-child approach includes effective and consistent collaboration with the student, family, staff, and healthcare providers.³ School nurses provide leadership to the interdisciplinary team to help students successfully manage their asthma. School nurses are an asset to the administration team in advising and development of school health policy. A review of best practices in supporting students with chronic health conditions through case management has been outlined by NASN. [National Association of School Nurses: A Model for School Nurse-Led Case Management](#)

The school nurse identifies students with asthma while reviewing annually updated student health forms, and reviews asthma action plans and health office visits to assess medication and plan compliance. Priority must be given to students with poorly managed or unmanaged asthma, missing plans, medication, and paperwork.³⁷ Focused interviews with students, families, and healthcare providers can help identify socioeconomic, cultural, language, or any other barriers to learning. Thorough understanding of diversity, equity, and inclusion (DEI) aids in propelling health equity by identifying and removing obstacles and disparities that negatively affect student health and education. [Managing Asthma in School: A Guide for Schools](#)

[Allergy & Asthma Network: Back to School Checklist for School Nurses](#)

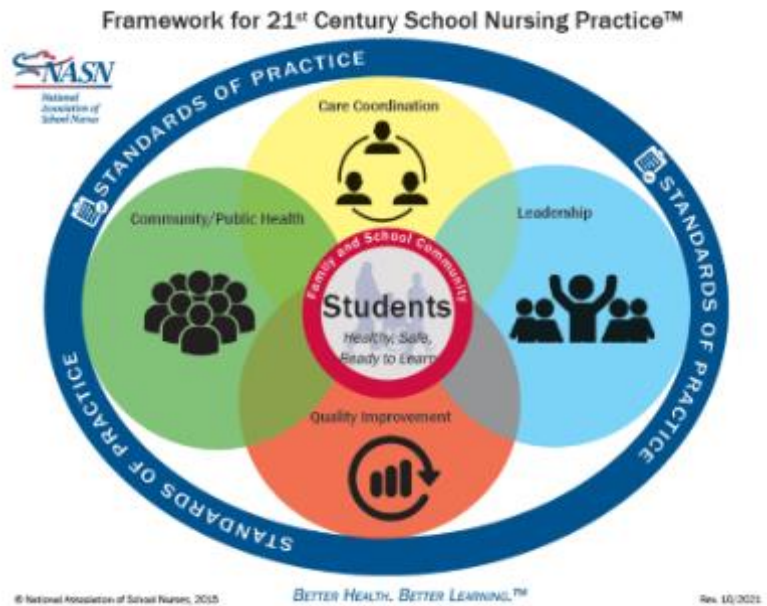
[NASN: Cultural Responsiveness and Equity](#)

[Cultural Inclusivity: Creating Health Office Impact within the District Approach \[Enduring\]](#)

The school nurse’s responsibility includes using and effectively implementing the recommendations offered in this document to improve the health and safety of school-aged children with asthma. NASN has provided a tool to prepare for a student with asthma, below.

See [Appendix A](#) for another helpful checklist to utilize while welcoming a student with asthma. Essential information for developing an individualized health plan (IHP) can be obtained using an annual health intake form. A sample has been provided in [Appendix B](#).

[National Association of School Nurses: School Nurse Asthma Care Checklist](#)
[NASN Framework for the 21st Century School Nursing Practice - Handout](#)



Data and Reporting

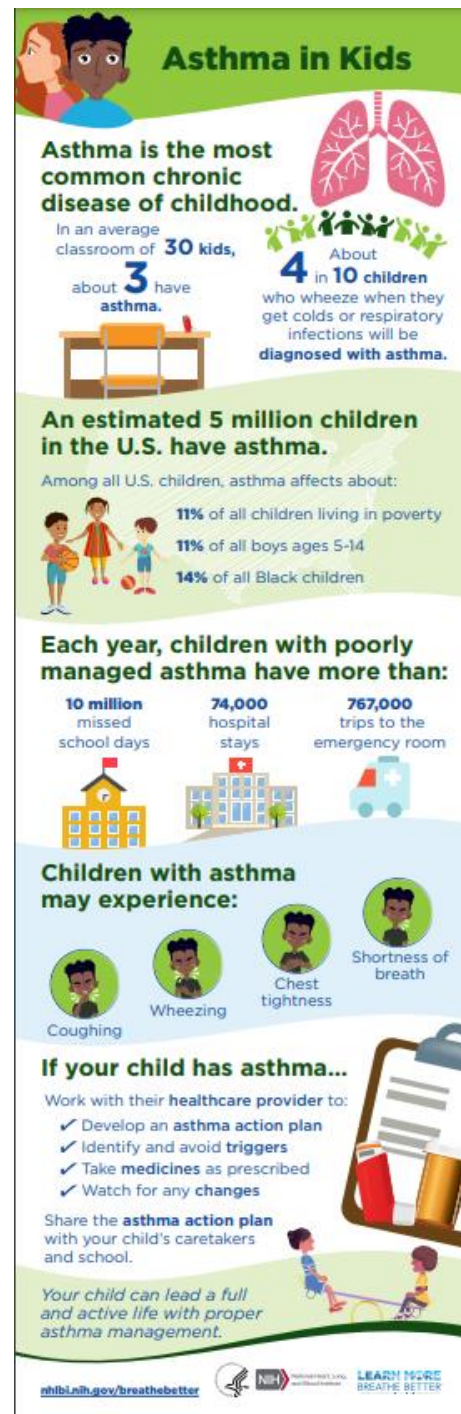
The NIH recommends building a tracking system for ongoing feedback on the needs and services provided to students with asthma.³ The electronic health record can be instrumental in establishing accurate, efficient documentation practices allowing for retrieval of detailed health data. Data collection and monitoring enable the school nurse to effectively evaluate student IHPs and interventions, supporting and enhancing student success. In addition, data can be used to advocate for legislative policy that strengthens school-based asthma management programs.³ This data is reported in the Maine DOE [School Health Annual Report](#).

For more information and tools: [National Association of School Nurses: Uniform Data Points](#)

Coordination and Oversight

<https://mainelegislature.org/legis/statutes/20-A/title20-Asec254.html> MRS Title 32 section 2102 (C-D) authorizes registered professional nurses to delegate tasks within their scope of practice to licensed practical nurses and certified nursing assistants only.³⁸ Nurses can provide coordination and oversight for unlicensed school personnel (USP) as stated in Maine statute and further described in [02-380 Ch. 6, Regulations Relating to Coordination and Oversight of Patient Care Services by Unlicensed Health Care Assistive Personnel](#)³⁸ Coordination and oversight may include medication administration, peak flow measurement, and emergency interventions³⁹ More information regarding the school nurse’s responsibility in oversight, as well as training materials to properly educate USP in schools are included in the [2022 Medication Administration in Maine Schools: Evidence-Based Guidelines](#). [02-380 Ch. 6, Regulations Relating to Coordination and Oversight of Patient Care Services by Unlicensed Health Care Assistive Personnel](#).³⁹ Coordination and oversight may include medication administration, peak flow measurement, and emergency interventions⁴⁰ More information regarding the school nurse’s responsibility in oversight, as well as training materials to properly educate USP in schools are included in the [2022 Medication Administration in Maine Schools: Evidence-Based Guidelines](#).

The [Decision Tree for Coordination and Oversight](#) outlines best practices in planning for a student who requires medication, or specific nursing tasks in school. The school nurse is responsible for developing, reviewing, and revising the [student’s action plans](#), IHP, [transportation plans](#), preparing for emergency interventions, and



utilizing the decision tree. For more information specific to coordination and oversight, see [Maine State Board of Nursing, Rules Ch. 6.](#)

Assessment

Together with the student and family the school nurse will gather a comprehensive health history, determine the level of asthma control, perform a physical assessment, and assess student’s ability to identify and treat symptoms. For students to self-carry emergency asthma medications, the school nurse must obtain written permission from parents and healthcare providers and assess student’s ability to self-administer medication.

[American Lung Association Questionnaire: Assessing Student Readiness to Self-Carry](#)

[American Lung Association: Student Readiness Assessment Tool](#)

An example of a systematic assessment can be found here: [Wisconsin Technical College: 10.3 Respiratory Assessment](#) Students in respiratory distress may present with increased breathing rate, color changes, grunting, nasal flaring, retractions, sweating, and body position.⁴¹ Leaning forward, often called tripod positioning, assists with increasing lung capacity and is considered a sign of respiratory distress.⁴¹ If a student’s work of breathing is severe, do not delay treatment while completing assessment.

Together with the physical assessment, identify obstacles to receiving medical care, such as health insurance or transportation needs. These details offer insight into the needed resources required to help students and families access healthcare.³²

The school nurse should assess four key areas periodically to gauge asthma control. Reporting yes to 1-2 of the questions listed on the right would indicate asthma is partially controlled while poorly controlled asthma would be indicated by answering yes to 3 or more questions.⁷ Consider referral for follow-up with student’s healthcare provider if any of the questions are answered yes.⁷

In the past 4 weeks has the student:

- *Had symptoms more than twice during the day?*
- *Had sleep disturbances because of asthma symptoms?*
- *Used a rescue inhaler more than twice per week?*
- *Limited activity, to avoid asthma symptoms?⁷*

Tools to facilitate connection and clear communication and between the school, family, and healthcare provider begin on page 35:

[Managing Asthma: A Guide for Schools.](#)

Individual Health Plan Development

For a student with asthma, for safety purposes, a documented and signed asthma action plan from their medical provider including triggers, symptoms, warning signs, daily and emergency medications, and contact information may be adequate. While some students may need a more complex individualized health plan (IHP), not all students need this level of support. An IHP may be indicated for students with severe or poorly controlled asthma to engage fully in all school activities and achieve academic and physical education goals. This will be determined through cooperation between the school nurse, medical provider, student, and family.³ Plans will also include the safe storage of emergency medications and devices supplied by parents or guardians.³ The school nurse should document a parent's request to forego intervention plans.

Sample Asthma Action Plans

[CDC Asthma Action Plan](#)

[American Lung Association Asthma Action Plan for Home and School](#)

[Asthma and Allergy Foundation of America Asthma Action Plan](#)

[National Heart Lung and Blood Institute Asthma Action Plan](#)

Education

The school nurse can empower students and families to overcome challenges related to this chronic condition by providing age-appropriate and culturally considerate education and resources.^{3,42} Emergency preparedness, including asthma emergencies, can be incorporated into the curriculum for the entire school population.⁴² Every student can be capable of reporting and responding to emergencies.^{3,42}



Tools for the Nurse

[American Lung Association: Courses](#)

[American Lung Association Questionnaire: Assessing Student Readiness to Self-Carry](#)

[American Lung Association: Student Readiness Assessment Tool](#)

[Maine CDC: Asthma Resources](#)

[The Breathe Initiative](#)

Training

[American Lung Association: Asthma Basics](#)

[Asthma and Allergy Foundation of America: Education Programs](#)

[American Lung Association: Build Asthma Education](#)

Early Childhood Education

[Asthma and Allergy Foundation of America: Fun Ways to Teach Children About Asthma](#)



For Students and Families

[Maine CDC: Learn to Control Your Asthma](#)

[Allergy & Asthma Network Symptom Tracker](#)

[Allergy & Asthma Network: Understanding Asthma Guide](#)

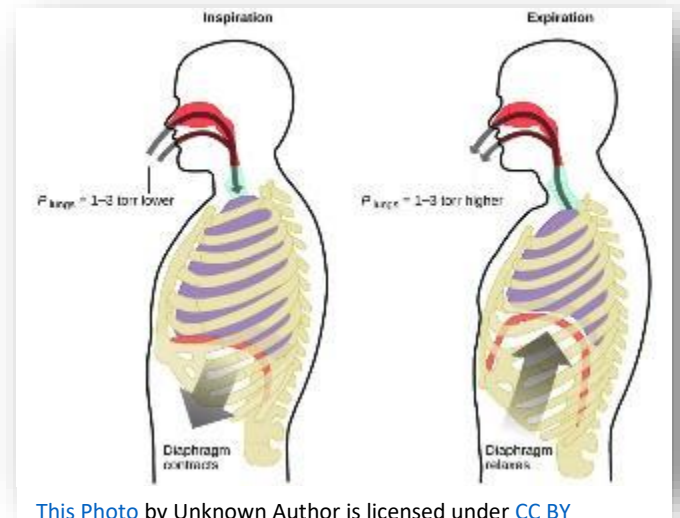
[Boston Children's Hospital: How to Clean an Inhaler and Spacer](#)

[NIH Look Out for Your Lungs: 5 Steps to Keep Your Lungs Healthy Infographic](#)

Breathing Exercises

Two exercises can be taught to students with asthma when asymptomatic that may help improve lung efficiency are pursed lip breathing and diaphragmatic or belly breathing.⁴³

Pursed lip breathing is an exercise that works by keeping the airways open longer, increasing oxygenation.⁴³ By slowing breathing and reducing the number of breaths taken, hyperventilation is prevented, each breath becomes more effective, oxygen is increased and anxiety is minimized.⁴³ To practice the exercise, have the student sit comfortably while taking a normal breath in slowly through the nose, 2 counts. Exhale through pursed lips, 4 counts, as if to blow a candle.



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As with pursed lip breathing, diaphragmatic, or belly breathing also slows your breathing. To practice this technique, have the student sit comfortably with their hands over their belly while taking a slow deep breath through the nose, visualizing their belly blowing up like a balloon and feeling the abdomen expanding. Exhalation is done through pursed lips as above while gently pressing on the belly, concentrating on the air filling and emptying. [American Lung Association: Breathing Exercises](#)

Peak Flow Meters

A peak flow meter is a hand-held device that measures how much air can be quickly exhaled during a forceful expiration after a full, deep inhalation.⁴⁴ With narrowing of the airways from inflammation, air exchange becomes more difficult and peak flow numbers decrease.⁴⁴ A change from baseline can help identify a narrowing of the airways and prompt communication with providers for a possible adjustment to treatment. The school nurse is aware that less effort and decreasing skills may cause peak flow rates to decrease over time, and the correct technique should be reinforced or re-taught regularly to maintain peak flow accuracy.⁴⁴

School nurses should rely on physical assessment, reported asthma symptoms and measure peak flow when ordered by the physician, to monitor students with asthma. Treatment should never be delayed by obtaining a peak flow measurement during an asthma event. Resource: American Lung Association - [Measuring Your Peak Flow Rate](#). Here is a helpful [Peak Flow Technique Checklist](#) for nurses.

Spacers & Valved Holding Chambers

Spacers and valved holding chambers (VHC) are tools that maximize the delivery of medication to the lower respiratory tract.⁴⁵ Correct use slows the aerosolized particles in a reservoir, with VHC containing the addition of a one way valve prohibiting airflow back into the patients mouth.⁴⁵ Spacers and VHC's can aid individuals with poor coordination and reduce the amount of medication in the mouth and throat.⁴⁵ Every student that is prescribed an MDI should use a spacer/VHC unless medication contraindicates.⁴⁵ The school nurse can teach and reinforce the correct use and care of spacers for students. [CDC: Know How to Use Your Asthma Inhaler](#)

Staff Education

Health literacy and cultural considerations must be acknowledged when providing staff education. The school nurse ensures that all staff is prepared to identify

- Signs and symptoms of asthma
- Common triggers
- Prevention measures
- How to recognize an emergency, and when to call 911
- Where to find rescue medications and asthma action plans
- How rescue medication works, [How to Use a metered-Dose Inhaler](#), [How to Use a Dry Powder Inhaler](#), and [How to use a Nebulizer](#)^{3,46}



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Managing an Asthma Attack – for School Staff

Recognize the warning signs

- Coughing, wheezing, shortness of breath, or chest tightness

Call 911 right away if

- Unable to say more than a few words
- Nasal flaring, use of shoulders or accessory chest muscles to breathe
- Bluish discoloration of the skin, especially around the lips and fingernails

Call/notify the school nurse

- Never leave the student alone, an adult should stay with student
- Stop any activity
- Remove the student from the area if exposed to an irritant or allergen
- Follow asthma action plan, including student using rescue inhaler as prescribed
- Repeat use of the rescue inhaler according to asthma action plan

Call 911 if there is no school nurse, you are unsure of what to do, or there is no improvement after using rescue medicine.

- Notify the principal who will contact the parent/guardian.³

Asthma-Friendly Schools

Asthma-friendly schools can play a significant role in decreasing asthma exacerbations, by implementing policies and procedures that create an environment with fewer asthma triggers.^{3,24,41} School administrative units that provide staff education annually, coordinate services with area healthcare providers, and communicate openly with families can create a better partnership to support students with asthma in school.^{41 3,24,42} School administrative units that provide staff education annually, coordinate services with area healthcare providers, and communicate openly with families can create a better partnership to support students with asthma in school.⁴²

The National Heart, Lung and Blood Institute provides this [Digital Toolkit](#) with resources and fact sheets for provision to families. For a comprehensive framework review [Managing Asthma: A Guide for Schools](#) or the [Asthma-Friendly Schools Initiative Toolkit](#) for tools, templates, and resources for a long-term asthma management plan.

How Asthma Friendly is Your School?

1. Do you have a school-wide plan for asthma emergencies?
2. Do all your students with asthma have a written asthma action plan on file at school?
3. Is there a school nurse or school health staff in your school building during the school day?
4. Do you have standing orders and quick relief medicines available for emergencies?
5. Does your school educate parents, staff, and students about asthma?
6. Do you have a policy to allow students to carry and use their own asthma medication?
7. Are students able to quickly access rescue medication when needed during school and after school activities?
8. Do you provide support and case management for students?
9. Do you coordinate access of care for those in need and send referrals for services?
10. Do you communicate with medical providers and parents when asthma symptoms flare?
11. Are the school buildings and grounds free of tobacco smoke?
12. Can students safely join in physical education sports, recess, and field trips?
13. Does the school have [healthy indoor air quality](#)?
14. Does your school help to reduce or prevent contact with allergens?
(Pest management policy, scent-free policy, discourage classroom pets with fur)
15. Does your school participate in the CDC's [School Health Index](#)?²⁴

[Maine Department of Agriculture, Conservation & Forestry: Integrated Pest Management.](#)

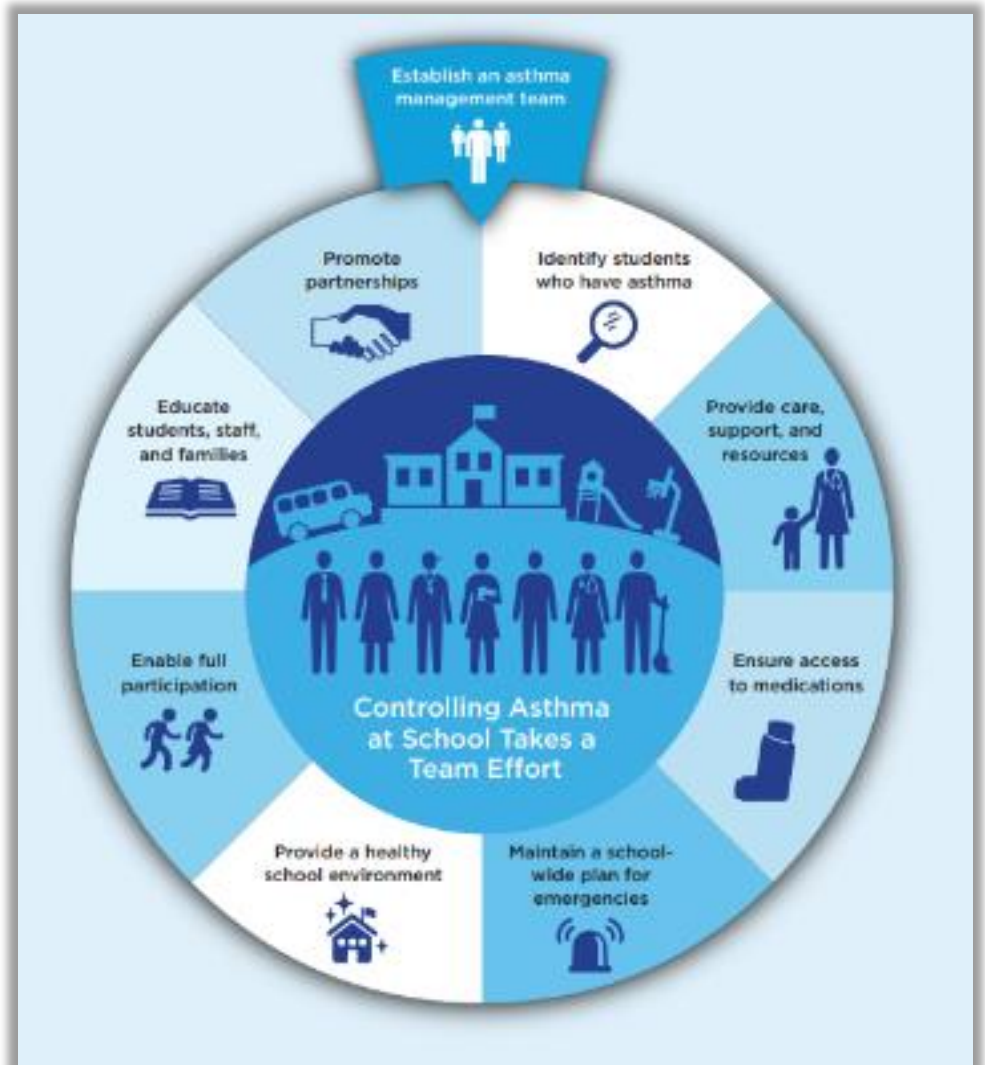
[Maine CDC Prevention Services: Tobacco-Free School Toolkit](#)

[American Lung Association: How Asthma-Friendly Is Your School?](#)

Team Approach to Asthma Management

Working with students with chronic health conditions requires a team approach.^{3,46} Collaboration between departments in school fosters efficient communication and allows coordination of services for everyone engaged with students who have asthma.^{3,46}

In the school setting, this team should be comprised of the school administrators, school health staff, teachers, aides, and coaches.³ Other team members can include school counselors, social workers, and psychologists as students with asthma have varying degrees of acceptance or compliance with their treatment and plan.³ This team can identify and respond to psychosocial challenges that come from having a health condition. Custodial and maintenance staff can be valuable team members ensuring indoor air quality measures are being monitored and followed. Lastly, transportation and food service staff all play vital roles to help identify when a student with asthma is having respiratory difficulties. The Maine CDC offers many resources that can assist with asthma management in schools. [Maine CDC: Asthma Prevention & Control](#)



[Image Credit NIH Managing Asthma: A Guide for Schools](#)

Field Trips

Planning for a field trip involves considering the needs of students with health concerns, including those with chronic health conditions like asthma, and those who take daily medications at school. A student's quick-relief asthma medication should always be available to them at any location. The school nurse must be involved in field trip planning and assure that there is an identified staff member who has had annual training. Detailed guidelines for field trip medications can be found on page 31 of the [Medication Administration in Maine Schools](#) document.



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Improving Access to Care

School nurses work towards health equity within the community by helping students and families navigate the public healthcare system. School nurse assessment can quickly expose challenging barriers to health or access to appropriate care for students and families. Maine provides multiple resources that can assist the school nurse in [coordination of care](#).

[Department of Health and Human Services: Health Care Assistance](#)

[Maine Asthma Self-Management Education Program](#)

[Maine Community Care Referral Form](#)

[Maine DOE: Family Engagement and Cultural Responsiveness](#)

[Maine DOE: Interpretation & Translation](#)

[Maine DOE: McKinney-Vento Education](#)

[NIH Asthma Resources for Patients and Caregivers](#)

[School Nursing & School-Based Health Centers in the United States. Working Together for Student Success](#)



Appendices

Appendix A

Actions for School Nurse

A checklist that may assist the school nurse in welcoming a student with asthma.

Gather data

- Obtain and review student's current asthma plan from provider. Sample [asthma plans](#) can be found within this document.
- Arrange conference with student and parents/guardians.
- Utilize an intake assessment. A sample [intake assessment](#) is within this document.
- Refer to the Maine Department of Education [Decision Tree for Coordination and Oversight](#).
- Review [U.S. Department of Education: Protecting Students with Disabilities](#).

Plan and implement training

- Coordinate [staff training](#) (teachers, coaches, physical education teacher, lunchroom staff, and bus driver).
- Include those involved in the 504, IEP, and other education plans.
- After training has been completed, review roles in carrying out the plan, how roles relate, and when/where to seek help.
- [American Lung Association: Asthma Basics](#)
- [Asthma and Allergy Foundation of America: Education Programs](#)

Conduct assessment and develop plans for student

- Perform a nursing assessment. [NASN: School Nurse Asthma Care Checklist](#)
- Determine students' educational needs. Consider using [American Lung Association Questionnaire: Assessing Student Readiness to Self-Carry](#) and [American Lung Association: Student Readiness Assessment Tool](#).
- Create IHP/504 Asthma Action Plan to identify functional needs, establish goals, and delineate interventions for goals.
- Create emergency plans to share with all staff, including substitute staff.
- Create a transportation plan. A sample [transportation plan](#) is within this document.
- Consider stocking emergency medication [American Lung Association: Model Policy for School Districts: Stock Bronchodilators](#).

Facilitate school health team meeting

- Review individual plan of care.
- Review emergency plan with all staff, including substitute staff.
- Monitor compliance and understanding of plan.
- Facilitate follow-up meetings to discuss concerns and updates and evaluate for potential changes to plan of care.

Appendix B

Sample Asthma Health Intake Form

NOTE: The student's Individualized Health Plan must be updated annually including medication orders.

Student's Name _____ DOB _____ Grade _____ Today's Date _____

Parent/Guardian 1 _____ Contact Information _____

Parent/Guardian 2 _____ Contact Information _____

Name of healthcare provider _____ Last visit _____ Phone Number _____

Name of pulmonologist _____ Last visit _____ Phone Number _____

Health Insurance Private MaineCare Currently without insurance Would like more information

Current 504 Plan Yes No IEP Yes No

Transportation to school _____ home _____

After-school activity participation Yes No Activities _____

Other medical conditions _____

Age at onset of asthma _____ Date of student's last flare-up _____

Any known triggers		
<input type="checkbox"/> Illness	<input type="checkbox"/> Smoke	Allergies: <input type="checkbox"/> Cat <input type="checkbox"/> Dog <input type="checkbox"/> Dust <input type="checkbox"/> Mold <input type="checkbox"/> Pollen <input type="checkbox"/> Food:
<input type="checkbox"/> Emotions (crying, laughing, stress)	<input type="checkbox"/> Physical activity	
<input type="checkbox"/> Weather changes	<input type="checkbox"/> Strong odors	Other:

Emergency actions has the student previously needed

Please answer the following questions, related to asthma:

In the past 12 months, how many times has your child

- visited the ER/Urgent Care or had an urgent doctor's appt
- been hospitalized overnight
- used oral steroids
- missed school

notes:

In the past 4-weeks, how often has your child

- had coughing, trouble breathing, or wheezing
- used a rescue inhaler
- awakened at night
- had interruptions to their normal activities

notes:

Daily Medication	Dose	Route of Administration	Prescribed Time

Emergency Medication	Dose	Route of Administration	Prescribed Time

Special considerations and precautions: Check all that apply and describe any considerations, precautions, or strategies that should be taken:

General

P.E./athletic activity

Learning

Recess

Behavior

Bus/transportation

Other

Describe student's response and current coping/adaptation to having asthma:

Please share any goals the student, or parent/guardian would like assistance with:

Please share concerns the student, or parent/guardian would like assistance with:

Please share knowledge or skill deficit that the student, or parent/guardian would like assistance with:

Other important information for school staff to know:

Parent/Guardian Signature: _____ Date: _____

Appendix C

Sample Emergency Asthma Action Plan for Transportation
School Year ____

Name _____ Date of Birth _____ Grade _____ Nurse _____
 Parent/Gaurdian _____ Phone _____ Work _____
 School _____ Phone _____ Transportation Phone _____
 Emergency Contact _____ Relationship _____ Phone _____

EMERGENCY PLAN

1. STOP the bus.
2. Stay with student. Observe for wheezing and shortness of breath
3. **CALL 911** if you are unsure what to do, if the person is struggling to breathe, talk, or stay awake or if their lips or fingernails are bluish.
4. Ask the student if they have their inhaler and help student take their inhaler as directed. (see procedure below)
5. Report incident to school and parent.

Procedure:

1. Remove cap, shake, and prime by pressing down on canister.
2. If spacer is being used, insert inhaler into end of spacer.
3. Have student exhale, and then place mouth over mouthpiece of inhaler, or spacer.
4. As student breaths in, press down on canister to release medicine.
5. Ask student to breathe in slowly as deeply as possible.
6. Ask student to hold breath for a count to 10.
7. Remove spacer/inhaler, student may exhale.
8. If another dose is needed, wait 1 minute, shake inhaler and repeat steps 3-7



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Appendix D

Sample Asthma Self-Carry Contract

Student

Date of Birth

School Year

- I agree to always keep my rescue inhaler with me
- I will use my inhaler as directed, responsibly
- I will not allow anyone else to use it
- I will ask for help, and notify the health office if I am having difficulty with my asthma

Student Signature _____ Date _____

- I agree to supply my child with prescribed medication, unexpired
- I understand it is recommended to provide health office medication for emergencies
- I have reviewed, and will continue to review the asthma action plan
- I will provide a signed medication authorization form for medication provided
- The school nurse may provide information to school staff that need to know about my child's asthma and rescue medication for safety

Parent/Guardian _____ Signature _____ Date _____

- [American Lung Association Questionnaire: Assessing Student Readiness to Self-Carry](#)
[American Lung Association: Student Readiness Assessment Tool](#)
- The above student demonstrates correct rescue inhaler use
- The above student competently used teach back on how this medication works, what the symptoms of asthma are, and when to use this medication
- The above student verbalized when to ask for help, and identifies who to ask
- School staff who need to know will be notified and trained on the use of this medication

School Nurse _____ Signature _____ Date _____

Adapted utilizing https://www.cde.state.co.us/healthandwellness/snh_healthissues#asthma

Appendix E
Training Record – Using a Metered Dose Inhaler

School nurse checks each step as USP demonstrates competency and signs at end of document.

This checklist may be used in conjunction with training materials found within the
[Maine Department of Education: Medication Administration in Maine Schools](#)
[Medication Administration Procedure](#)

Procedure	School Nurse Initials
1. Review the 6 rights of medication administration: right student, right medication, right dose, right route, right time, right documentation. Six Rights Poster	
2. Remove cap, shake inhaler, and prime according to manufacturer’s instructions.	
3. Remove spacer cap (if one is being used) and make sure spacer is clean. Place inhaler into end of spacer.	
4. Have student take a deep breath in, tilt head slightly back, and empty lungs fully.	
5. Have the student place mouth over mouthpiece of spacer or inhaler and close lips to form a tight seal.	
6. As the student starts to breathe in, assist or observe pressing down on the top of the medicine canister once to release 1 “puff”. Encourage a slow, deep breath, 3-5 sec.	
7. Breath should be held for 10 seconds.	
8. Remove spacer/inhaler from mouth and exhale.	
9. If 2 puffs are prescribed, wait 1 minute, shake inhaler and repeat steps 3-7.	
10. If medication is an inhaled corticosteroid, rinse with water and spit after last dose.	
11. Complete documentation per local procedure.	
12. Review common side effects of medication .	
13. Review when to call 911 . ³	

Competency Statement

USP Name _____ can describe the procedure to administer a metered dose inhaler and what to do in an emergency.

Signature of RN _____ Initials _____ Date _____

Training Affirmation

I have read the asthma action plan for _____. I have been trained and demonstrated competency in administering and cleaning an inhaler and when to call 911. I have had the opportunity to ask questions and received answers to my satisfaction.

Signature of USP _____ Date _____

Appendix F

Training Record – Using a Dry-Powder Inhaler

School nurse checks each step as USP demonstrates competency and signs at end of document.

This checklist may be used in conjunction with training materials found within the [Maine Department of Education: Medication Administration in Maine Schools Medication Administration Procedure](#)

Procedure	School Nurse Initials
1. Review the 6 rights of medication administration: right student, right medication, right dose, right route, right time, right documentation. Six Rights Poster	
2. Open medication, load a dose of medicine, and prime according to manufacturer’s instructions.	
3. Have the student stand or sit up straight to allow the lungs to fully expand when breathing the medication.	
4. Have student take a deep breath in, tilt head slightly back, and empty lungs fully.	
5. Have the student place mouth over mouthpiece of inhaler and close lips to form a tight seal.	
6. Encourage a fast, deep breath.	
7. Breath should be held for 10 seconds.	
8. Remove spacer/inhaler from mouth and exhale.	
9. If 2 puffs are prescribed, wait 1 minute, and repeat steps 3-7.	
10. If medication is an inhaled corticosteroid, rinse with water and spit after last dose.	
11. Wipe off the mouthpiece with dry cloth and replace the cover.	
12. Complete documentation per local procedure.	
13. Review common side effects of medication .	
14. Review when to call 911 . ³	

Competency Statement

USP Name _____ can describe the procedure to administer a dry powder inhaler and what to do in an emergency.

Signature of RN _____ Initials _____ Date _____

Training Affirmation

I have read the asthma action plan for _____. I have been trained and demonstrated competency in administering and cleaning an inhaler and when to call 911. I have had the opportunity to ask questions and received answers to my satisfaction.

Signature of USP _____ Date _____

Appendix G

Training Record - Using a Nebulizer

School nurse checks each step as USP demonstrates competency and signs at end of document.

This checklist may be used in conjunction with training materials found within the [Maine Department of Education: Medication Administration in Maine Schools Medication Administration Procedure](#)

Procedure	School Nurse Initials
1. Review the 6 rights of medication administration: right student, right medication, right dose, right route, right time, right documentation. Six Rights Poster	
2. Attach the tubing, mouthpiece or mask, and medicine cup to the machine according to the manufacturer’s instructions.	
3. Check to make sure the medication is not discolored, damaged, or expired, then twist off the top of the unit dose medication and empty the pre-measured medicine into the medicine cup.	
4. Student will use a mask, or mouthpiece. Encourage a proper seal with mask, or mouthpiece to insure effective delivery of medication.	
5. Turn on machine, ensuring there is a light mist of medication emitted.	
6. Instruct the student to breathe in normally until the medication is fully administered.	
7. Stop the treatment if you see foaming or bubbles in the medicine cup. The equipment may be defective, or the medicine may be contaminated.	
8. Turn off machine and remove the mouthpiece (or mask). Wash face if using a mask.	
9. If medication is an inhaled corticosteroid, rinse with water and spit after last dose, never swallow.	
10. Complete documentation per local procedure.	
11. Review common side effects of medication .	
12. Review when to call 911 .	
13. Wash medicine cup, mouthpiece or mask with mild soap and water, do not wash tubing, and air dry on paper towels.	
14. Store parts in clean, dry plastic storage bag labeled with the student’s name. ³	

Competency Statement

USP Name _____ can describe the procedure to administer a nebulizer treatment and what to do in an emergency.

Signature of RN _____ Initials _____ Date _____

Training Affirmation

I have read the asthma action plan for _____. I have been trained and demonstrated competency in administering nebulized treatment and cleaning nebulizer parts and when to call 911. I have had the opportunity to ask questions and received answers to my satisfaction.

Signature of USP _____ Date _____

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