

# ASTHMA

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## OVERVIEW

Every school year, numerous school absences are attributed to asthma. In fact the Asthma and Allergy Foundation of America website notes that 36,000 kids miss school every day due to asthma.

Asthma is a lung disease that inflames and narrows the airways causing difficulty breathing.

It can be chronic and persistent or only flare up from time to time.

The purpose of this section is to give a very brief and limited overview of asthma, the signs and symptoms, possible triggers, review the most common medications, and offer resources for additional information, school management and education.

Asthma is covered in depth and well by a number of organizations evidenced by a visit to their websites (i.e. National Heart, Lung, and Blood Institute (NHLBI), Asthma and Allergy Foundation of America (AAFA), American Academy of Allergy Asthma & Immunology (AAAAI, American Lung Association (ALA), the Centers for Disease Control and Prevention (CDC)). Since there is excellent information available online, this section will be “heavy” on internet links.

## INCIDENCE

A comprehensive look at the incidence of asthma can be found at the Allergy and Asthma Foundation of America's (AAFA) website- <http://www.aafa.org/page/asthma-facts.aspx>

Here are just a few statistics from the AAFA website:

- According to the Centers for Disease Control, 1 in 14 people have asthma.
- About 24 million Americans have asthma. This is 7.4 percent of adults and 8.6 percent of children. Asthma has been increasing since the early 1980s in all age, sex and racial groups.
- Asthma is the leading chronic disease in children. It is also the top reason for missed school days.
- Asthma is more common in adult women than adult men.
- Asthma is more common in children than adults and more common in boys than girls.
- Almost 6.3 million people with asthma are under the age of 18.
- In 2011, the asthma rate for African-Americans was 47 percent higher than for whites.
- In 2008, more than half of children and one-third of adults missed school or work due to their asthma

### Disparities

- Ethnic differences in asthma prevalence, morbidity and mortality are highly correlated with poverty, urban air quality, indoor allergens, and lack of patient education and inadequate medical care.

## SIGNS & SYMPTOMS

The most common signs and symptoms of asthma include:

- Coughing (often worse at night or early in the morning)
- Wheezing (high pitched whistling sounds when breathing out-especially in children)
- Chest tightness
- Shortness of breath

These symptoms can vary greatly in severity and frequency.

## CLASSIFICATION

Based on National Heart, Blood and Lung Institute guidelines, asthma is classified into four categories depending on how severe asthma symptoms are and "degree of functional disability" (this may include degree of bronchial hyper-reactivity, number of emergency visits, number of hospitalizations, pulmonary function test, impairment of activity, and medication

use). Asthma severity is determined by current impairment (as evidenced by impact on day-to-day activities) and risk of future exacerbations

These categories help determine the treatment plan so that maximum possible relief can be provided to patients. These categories are:

- Intermittent
- Persistent-mild
- Persistent-moderate
- Persistent-severe

Classification into a category is based on a four-week review of asthma symptoms and lung function measurements.

**Intermittent:**

- Asthma symptoms less than twice a week
- No limitation of activity.
- Nighttime exacerbations occur no more than twice a month.
- Lung function FEV1 or PEFr is more than or equal to 80% of personal best as measured by spirometry or peak flow meter.
- Peak flow has less than 20% variability between high and low readings on AM-to-AM or AM-to-PM, day-to-day basis.

**Persistent-Mild:**

- Asthma symptoms more than twice a week but less than once a day.
- Nighttime exacerbations occur more than twice a month. When exacerbations occur they may affect daily activities.
- Lung function FEV1 or PEFr is less than or equal to 80% of personal best as measured by spirometry or peak flow meter.
- Your peak flow has between 20-30% variability between high and low readings on AM-to-AM or AM-to-PM, day-to-day basis.

**Persistent- Moderate:**

- Daily asthma symptoms and daily use of quick relief reliever medications (i.e. inhaled beta<sub>2</sub>-agonist medication).
- Asthma exacerbations occur more than twice a week and may last for days.
- Nighttime exacerbations occur more than once a week.
- Lung function FEV1 or PEFr is between 60-80% of personal best as measured by spirometry or peak flow meter.
- Peak flow has more than 30% variability between high and low readings on AM-to-AM or AM-to-PM, day-to-day basis.

**Persistent- Severe:**

- Almost continual asthma symptoms and limited physical activity.
- Frequent daily and nighttime exacerbations.
- Lung function FEV1 or PEFr is less than or equal to 60% or less of personal best as measured by spirometry or peak flow meter.
- Peak flow has more than 30% variability between high and low readings on AM-to-AM or AM-to-PM, day-to-day basis.

<b>CLASSIFICATION OF ASTHMA SEVERITY</b>				
	Severity Prior to Initiation of Therapy			
	Intermittent	Persistent- Mild	Persistent- Moderate	Persistent-Severe
Symptoms	< or = 2 per week	> 2 per week	daily symptoms	continual symptoms
Nighttime symptoms	< or = 2 per month	> 2 per month	> 1 per week	frequent
Lung function FEV1 or PEFr	> or = 80% predicted	< or = 80% predicted	> 60% - < or = 80%	< or = 60%
Peak flow variability	< 20%	20-30%	> 30%	> 30%

- All asthma symptoms above need not be present in all the cases. Usually one or two of these are sufficient for asthma classification.
- Asthma may fluctuate from one category to another
- In all categories, acute exacerbations or attacks of asthma may occur from time to time.
- Treatment of asthma is tailored according to the category a person is in.
- The goal of asthma treatment is to control asthma symptoms with as little medication as possible.

**Asthma in children**

Many young children who wheeze when they get colds or respiratory infections don't go on to have asthma.

A young child who has frequent wheezing with colds or respiratory infections is more likely to have asthma if:

- One or both parents have asthma
- The child has signs of allergies, including the allergic skin condition eczema
- The child has allergic reactions to pollens or other airborne allergens
- The child wheezes even when he or she doesn't have a cold or other infection

It is hard to do lung function tests in children younger than 5 years therefore doctors must rely on children's medical histories, signs and symptoms, and physical exams to make a diagnosis.

Doctors also may use a 4–6 week trial of asthma medicines to see how well a child responds.

<http://www.nhlbi.nih.gov/health-pro/guidelines/current/asthma-guidelines>  
[http://www.nhlbi.nih.gov/files/docs/guidelines/asthma\\_qrg.pdf](http://www.nhlbi.nih.gov/files/docs/guidelines/asthma_qrg.pdf)

## COMMON TRIGGERS

Triggers can cause or worsen asthma symptoms. They may include:

- Allergens – these may be from dust, animal fur, cockroaches, mold, and pollens from trees, grasses, and flowers
- Inhaled Irritants such as cigarette smoke, fumes, sprays (such as hairspray), cleaning fluids, air pollution, chemicals or dust in the workplace
- Medication such as aspirin or other non-steroidal anti-inflammatory drugs (Motrin, Advil), naproxen (Aleve) and nonselective beta-blockers (high blood pressure medication)
- Sulfites in foods and drinks
- Respiratory infections, such as colds & flu
- Exercise/Physical activity
- Stress/anxiety (can aggravate or mimic asthma)
- Foods containing sulfites, especially wine/beer and dried fruit, and some other processed foods can sometimes trigger asthma.
- Changes in weather or cold air

Centers for Disease Control & Prevention

<http://www.cdc.gov/asthma/triggers.html>

Palo Alto Medical Foundation

[http://www.pamf.org/asthma/education/handouts/adults/Asthma\\_Triggers.pdf](http://www.pamf.org/asthma/education/handouts/adults/Asthma_Triggers.pdf)

American College of Allergy, asthma & Immunology

<http://www.acaai.org/allergist/asthma/children/Pages/asthma-attacks-in-children.aspx>

No Attacks.org

<http://www.noattacks.org/triggers-in-your-home>

An asthma management goal is to avoid triggers as much as possible.

## MEDICATIONS

AAAAI (American Academy of Allergy Asthma & Immunology) Drug Guide:

<http://www.aaaai.org/conditions-and-treatments/drug-guide.aspx>

Retrieved 4/25/16

The AAAAI has created a reference guide of medications that are commonly used to treat allergies and asthma. All are prescription medications, unless otherwise noted. This guide includes:

- The FDA approved use for the medication
- The FDA approved dosing for the medication
- Generic and brand names
- Links to product website for further information about the medication

### Allergy Medications

#### Allergy Medications

- **Antihistamines:** These medications are commonly used to treat allergies such as allergic rhinitis or sometimes urticaria (hives).
- **Montelukast:** These medications are used for relief of allergic rhinitis symptoms.
- **Nasal Sprays:** This table includes the various nasal sprays approved to treat allergic rhinitis and/or non-allergic rhinitis.
- **Eye Drops:** This table lists the medications available to treat allergic conjunctivitis (allergic eye).
- **Allergic Emergency Medications:** These are the medications used to treat anaphylaxis.
- **Topical Ointments & Creams:** Here are the topical medications used to treat conditions such as atopic dermatitis and eczema.
- **Immunomodulators:** This is a class of medication that includes an immune treatment of asthma and hereditary angioedema.
- **Oral Corticosteroids:** These medications are sometimes used to treat severe allergies and can also be used as a rescue medication for asthma.
- **Sublingual Immunotherapy (SLIT) Allergy Tablets:** Allergy tablets are another form of allergy immunotherapy therapy and involves administering the allergens under the tongue generally on a daily basis.

### Asthma Medications

The AAAAI follows the National Institutes of Health publication "[Guidelines for the Diagnosis and Management of Asthma \(EPR-3\)](#)" to list the medications.

*Long-term control medications:* Prevent symptoms and are taken daily

- **Inhaled Corticosteroids:** The most consistently effective long-term control medication.
- **Long-Acting Beta-Agonists (LABAs):** These are used in combination with inhaled corticosteroids.

Last updated April 2016

- **Cromolyn and Theophylline:** Used as alternative controller medications (not preferred).
- **Leukotriene Modifiers:** Used as alternative controller medications.
- **Immunomodulators:** Omalizumab modifies the allergic immune response.

*Quick-relief medications:* Take only as needed for symptom relief

- **Short-Acting Beta-Agonists (SABAs):** relax airway muscles to give prompt relief of symptoms.

Note- medications change from time to time. Check website for the most up to date information as this information may (will) become outdated.

## SCHOOL MANAGEMENT

### 7 Goals for Creating Asthma Friendly Schools:

1. Establish a process to identify students with asthma.
2. Allow students with asthma easy access to (fast-acting) inhalers.
3. Establish a school-wide process for handling worsening asthma.
4. Identify and reduce exposure to common asthma triggers within the school environment.
5. Encourage students with asthma to participate in school activities, especially physical activities, to the best of their abilities.
6. Provide school personnel, parents and the student body opportunities to learn about asthma.
7. Collaborate with families, health care professionals, and school personnel to create asthma friendly schools.

Note- the above is taken from Asthma Plan of Action – Schools section

<http://asthmainchools.com/> Although this is a Canadian partnership (Province of Ontario, University of Toronto, several health departments, the Lung Association of Canada and others) the list of goals is quite comprehensive.

A number of organizations offer a wealth of information and resources on asthma and school management of asthma. Listed below are some of the most relevant to schools.

*California Department of Public Health Guidelines for the Management of Asthma in California Schools (2004)* (Note -although some of the information may be out of date, this document is an excellent resource with sample forms, school staff responsibilities, related CA Education Codes and much more)

<http://www.cdph.ca.gov/programs/caphi/Documents/dhsASTHMAguidelinesFINAL.pdf>

*National Asthma Education & Prevention Program – Managing Asthma- A Guide for Schools*  
[http://www.nhlbi.nih.gov/health/prof/lung/asthma/asth\\_sch.pdf](http://www.nhlbi.nih.gov/health/prof/lung/asthma/asth_sch.pdf)

*American School Health Association- Asthma Resource Portal*  
<http://www.ashaweb.org/i4a/pages/index.cfm?pageid=3420>

*National Association of School Nurses (NASN)*  
<http://www.nasn.org/ToolsResources/Asthma>

Some of the offerings are available only to NASN members. Others are free.

*Centers for Disease Control & Prevention*  
<http://www.cdc.gov/asthma/schools.html>

Offers CDC tools and documents along with links to outside resources

*Asthma Plan of Action – Schools section*  
<http://asthmainschools.com/> As mentioned above, this is a Canadian partnership. However it has wealth of ideas and resources listed under each of the seven goals listed above.

## ADDITIONAL INFORMATION/RESOURCES

**National Heart, Lung, and Blood Institute (NHLBI) Resources** <http://www.nhlbi.nih.gov/health/health-topics/topics/asthma/links>

- ["Asthma Action Plan"](#)
- ["Asthma and Physical Activity in the School"](#)
- ["At-A-Glance: Asthma"](#)
- [Cough](#) (Health Topics)
- ["How Asthma-Friendly Is Your Child-Care Setting?"](#) (also available in [Spanish](#))
- ["How Asthma-Friendly Is Your School?"](#) (also available in [Spanish](#))
- [How the Lungs Work](#) (Health Topics)
- ["My Asthma Wallet Card"](#)
- ["National Asthma Control Initiative: Keeping Airways Open—Fact Sheet"](#)
- ["National Asthma Control Initiative: Keeping Airways Open—Take Action: Stop Asthma Today! What You Can Do, NOW"](#)
- [National Asthma Control Initiative Web Site](#)
- ["National Asthma Education and Prevention Program Resolution on Asthma Management at School"](#)
- ["So You Have Asthma"](#)

### Non-NHLBI Resources

- [Asthma](#) (MedlinePlus)
  - [Asthma in Children](#) (MedlinePlus)