



**ASTHMA**

**101**



# What You Need to Know **RESOURCE BOOK**

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*Asthma 101™ What You Need to Know* was created by a collaborative effort of the mission team of the American Lung Association of the Upper Midwest.

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## Scope of Asthma

### Childhood Asthma

- Asthma is the most common chronic disorder in childhood, currently affecting an estimated 6.1 million children under 18 years; of which 3.5 million suffered from an asthma episode in 2013.<sup>1</sup>
- Secondhand smoke can cause serious harm to children. An estimated 400,000 to one million asthmatic children have their condition worsened by exposure to secondhand smoke.<sup>2</sup>
- Asthma can be a life-threatening disease if not properly managed. In 2013, 3,630 deaths were attributed to asthma. However, deaths due to asthma are rare among children. The number of deaths increases with age. In 2013, 218 children under 18 died from asthma.<sup>1</sup>
- Asthma is the third leading cause of hospitalization among children under the age of 15. Approximately 32.7% of all asthma hospital discharges in 2006 were in those under 15; however, only 20.1% of the U.S. population was less than 15 years old.<sup>4</sup>
- In 2010, there were approximately 439,000 emergency room visits due to asthma in those under 18.<sup>2</sup>
- Asthma is one of the leading causes of school absenteeism.<sup>6</sup> In 2008, asthma accounted for an estimated 14.4 million lost school days in children with an asthma episode in the previous year.<sup>6,7</sup>

### Adult Asthma

- The number and rate of hospital discharges for asthma peaked in 1995. Since that time, the number of discharges has decreased and the discharge rate has declined. During 2010, 439,000 discharges (14.1 per 10,000) were due to asthma.<sup>2</sup>
- More than 300,000 adult emergency room visits were attributed to asthma in 2010.<sup>2</sup>
- In 2008, asthma accounted for an estimated 14.2 million lost work days in adults.<sup>12</sup>
- The annual direct health care cost of asthma is approximately \$50.1 billion; indirect costs (e.g. lost productivity) add another \$5.9 billion, for a total of \$56.0 billion dollars.<sup>13</sup>

# The Lungs in Asthma

## Normal Lung Tissue



## Asthma



Asthma is a chronic inflammatory disorder of the airways that causes three primary changes in the lungs:

- Inflammation (swelling) of the lining of the airways
- Bronchoconstriction (tightening of the bands of smooth muscles surrounding the airways) which reduces the width of the airways
- Excess mucus production that further narrows the airways

Asthma is an obstructive disease that may cause permanent changes (remodeling) if not properly treated. Asthma is a disease that cannot be cured but can be controlled.

## Demonstration Activities

To get an idea of what an asthma episode feels like, try one of the following exercises.

Cautionary Note: If participants have asthma or other breathing problems, this may exacerbate their breathing difficulties. They should not participate in these activities.

## Straw Activity

You'll need a watch or clock with a second hand and a drinking straw.

- Exercise in place for 30-60 seconds.
- Place a straw in your mouth. Seal your lips around the straw. Pinch your nostrils shut.
- Breathe in and out through the straw for 15 seconds.
- Pinch the straw in the middle to restrict and narrow the size of the opening.
- Take additional breaths.
- Remove straw and breathe normally.

Imagine what it must be like to feel like this for prolonged periods during an actual asthma episode. Think how hard it must be to concentrate when you can't breathe. Imagine how difficult it would be to climb a flight of stairs, walk down a long hallway to reach the school nurse or school office or get to the locker room to obtain prescribed medications when each breath is an effort.

## Asthma Demonstration

- Make an "O" with your fingers and thumb. [Like this:](#)
- Put your fist to your mouth and breathe in and out for a few seconds. This is what it's normally like to breathe.
- Tighten your fist (make the "O" smaller) and place your fist to your mouth. [Like this:](#)
- Breathe in and out again for just a couple of seconds. This is what it can feel like when someone has asthma.



When someone has asthma three things happen that make it harder for them to get air in and out of their lungs:

- Airways swell (inflammation)
- Muscles around their airways tighten (bronchoconstriction)
- Too much mucus is produced

The above exercise demonstrates the muscle tightening and airway swelling.

# Diagnosis of Asthma

A diagnosis of asthma can be made by a health care professional through assessment of symptoms, medical history, physical examination and spirometry—a simple breathing test.

Diagnosing asthma in infants is often difficult, yet under-diagnosis and under-treatment are key problems in this age group. A detailed history of symptoms and a physical exam is a vital and important part of diagnosing asthma at any age.

## Symptoms

Although symptoms may vary for each person with asthma, the primary symptoms of an asthma episode may include:

- Wheeze
- Cough
- Shortness of breath
- Chest tightness
- Retractions

Remember, all symptoms should be taken seriously. Please note that cough may be the only symptom. Some people with asthma may never wheeze.

## Classification of Asthma

Part of managing asthma includes assessing the severity of a person's asthma. This includes assessing night and daytime symptoms, plus a breathing test (spirometry). A person with asthma may be assessed at one of several different levels. The four levels of severity are intermittent, mild persistent, moderate persistent and severe persistent.

# Common Asthma Triggers

There are many common substances that can start an asthma episode. These substances, along with environmental conditions, are commonly referred to as triggers. Triggers cause asthma symptoms to begin or get worse. Asthma triggers may differ between individuals, what affects one person may not affect another.

If known triggers are present, susceptible people should be protected from exposure to the triggering agents and whenever possible, be removed from exposure to the trigger. Travel, outdoor activities (camping), and holidays often present unique challenges for asthma management. The following chart includes common agents and conditions that might trigger an asthma episode, possible sources, and strategies that can be used to reduce or control triggers.

## Triggers and Control Strategies

### INFECTIONS

**Colds, upper respiratory tract infections, influenza, sinusitis, and respiratory syncytial virus (RSV) may aggravate asthma symptoms.**

- Diagnosing and treating upper respiratory tract infections and disease (rhinitis/sinusitis) is an integral part of managing asthma.
- Wash hands often.
- Use paper towels.
- Don't share cups, toothbrushes, towels or tissues.
- Keep hands away from face.
- Get an influenza shot yearly.

### ALLERGENS

**Pets with fur and feathers**

#### Animals

Best option is to find a new home for family pets. If removal is not acceptable,

- Keep the pet out of the child's bedroom and keep doors closed.
- Keep pets off of furniture.
- Wash the pet weekly to reduce the amount of dander.
- Vacuum with high efficiency particulate accumulator (HEPA) filter and dust weekly.
- Use a filter on air ducts in the child's room.
- Take allergy medications, as prescribed.
- Damp dust weekly

#### Cockroaches

**Infested buildings, kitchens, garbage, leaky faucets and pipes**

- Do not leave food or garbage exposed.
- Store garbage in outside trash container.
- Poison baits or traps are preferred to chemical agents.
- Fixing leaky faucets will minimize cockroaches.

## Dust Mites

Microscopic organisms found in carpeting, pillows, upholstery, stuffed animals, bedding, draperies

- Encase pillows, mattress, and box spring in an allergen impermeable cover.
- Wash bedding in hot water weekly.
- Do not sleep on upholstered furniture.
- Reduce indoor humidity to less than 50%.
- Minimize stuffed toys in child's bedroom.
- Vacuum (HEPA filter) and dust weekly.

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## Mold and Yeast Spores

Showers, restrooms, basements, materials and containers stored in damp areas, leaky roofs, old books and newspapers, exercise and athletic mats, vaporizers/room humidifiers, aquariums, plants

- Fix leaky faucets and pipes.
- Clean visible mold with a stiff brush, hot water and non-ammonia soap.
- Run a dehumidifier and empty collection bucket daily.
- Use the exhaust fan in bathroom when bathing and above the stove when cooking.
- Throw away moldy items.
- Reduce indoor humidity to less than 50%.

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## Pollens

Flowering trees and plants, cut flowers, grasses, weeds, gardens, nature walks, seasonal decorations

- Be aware of daily pollen counts in your area.
- Limit time outside during high pollen seasons.
- Keep windows closed and run air conditioner.
- Shower and wash hair before going to bed.
- Take allergy medications.
- Use an air cleaner that does not emit ozone in bedroom.



**Foods/Additives**      Peanuts, soy eggs, dairy products, fish, wheat, sulfites (found in dried fruits, shrimp, wine) food preservatives, additives such as MSG and food dyes.

- For some people’s allergies and sensitizations, exposure to ANY amount of allergic food or chemical could lead to mild to life-threatening reactions.
- Be aware of ingredients in processed and homemade foods.

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**Medical Conditions**      Acid reflux, sensitivity to aspirin, non-steroidal anti-inflammatory medications and medications (NSAIDs) and beta-blockers

- Appropriate treatment of reflux can minimize asthma episodes.
- Talk with health care provider about alternative medications.

**IRRITANTS**

**Smoke**      Exposure to any type of smoke—cigarette, cigar and secondhand smoke, wood, coal, leaf burning, industrial waste, chemistry labs, kitchen

- Permit NO smoking in the home or around the person with asthma. If caregivers must smoke, wear a smoking jacket and smoke outside.
- If caregivers must smoke, wear a smoking jacket, smoke outside and leave the jacket outside. Do not bring it back into the home. It could trigger an asthma episode (attack).
- Help parents and caregivers quit smoking.
- Avoid exposure to outdoor burning, camp fires and other smoky areas.

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**Dust/Chalk Dust**      Chalkboards, dust

- Vacuum (HEPA filter) and dust weekly.
- Do not clap chalkboard erasers.

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**Weather**      Exposure to cold air or high humidity

- Monitor local weather forecast and high ozone alert days.
- Keep windows closed and use air conditioning when pollen, smog or humidity levels are high.
- Cover face with a scarf or wear a medical mask during weather changes or on days with poor air quality.

**Aerosols, Strong Odors and Fumes**

Cleaning solutions, perfumes and colognes, paints, fumigation chemicals, room deodorizers, art supplies, roofing tars, sealants, traffic fumes, biology or chemistry labs

- Avoid or limit use of perfumes, scented deodorants, lotions, hairsprays, cleaning products, chemicals, candles and incense.
- Minimize breathing in automobile and bus fumes when waiting for public transportation. Wear a scarf or stand at the front of the stop, not at the end near fumes.
- Room should have proper ventilation.
- Clean room when person with asthma is away and ventilate before they return.
- Minimize contact.

## **BEHAVIORS**

**Emotions**

Crying, laughing, stressful situations

- Emotions are REAL triggers and can cause an asthma episode.



**Exercise-induced**

Also referred to as exercise-induced bronchospasm, it is not a separate disease. Exercise can trigger an asthma episode. It is often caused by cold, dry air that can produce a spasm in the airways.

- Warm up before and cool down after exercising.
- Follow health care provider's advice on pre-medication.
- Quick relief medications should always be available close by during physical exertion.
- Monitor air quality and only exercise outside when air quality is good.



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**101** 

The text "ASTHMA" is in red, and "101" is in black. To the right of "101" is a circular icon containing a stylized white lung with a red heart inside, set against a grey background.

**MEDICATIONS**

The word "MEDICATIONS" is written vertically in white, bold, uppercase letters on a grey background bar.

## Getting Help From the Professionals

- It is important for someone with asthma to see his/her healthcare provider regularly. A healthcare provider can help someone with asthma identify triggers and work to find the right medicines to control symptoms.
- To keep asthma controlled, someone with asthma should see their healthcare provider once every 3 to 12 months, even when they are feeling well, and more often when experiencing breathing problems.

## Goals of Medication Therapy

- Control day and nighttime symptoms.
- Maintain normal activity levels, including exercise.
- Maintain near-normal pulmonary function.
- Prevent acute episodes of asthma.
- Minimize emergency department visits and hospitalizations.
- Reduce school or work absences due to asthma.
- Avoid adverse effects of asthma medications.

## Medications

Asthma medications are essential to asthma management. They are important in both preventing an asthma episode from occurring and in treating an asthma episode already underway. A variety of medications are prescribed in the management of asthma.

Some medications reduce inflammation and prevent episodes. These are **controller medications**. They are taken on a daily basis, even when feeling well. Side effects can include a hoarse voice and yeast infection in the mouth but can be prevented by using a holding chamber and rinsing your mouth after medication use. Controller medications will not help during an asthma episode or in emergencies.

Other medications relieve bronchoconstriction (narrowing of the airways) and are designed for quick relief during an asthma episode. These are called **quick relief medications**. Quick relief medications relax the airway muscles and should be used when asthma symptoms first appear and/or before exercise, as indicated by a health care provider. Quick relief medications are taken on an as-needed basis to relieve symptoms.

**Oral steroids** (taken in pill or liquid form by mouth) are taken short-term (3 to 10 days) to treat severe asthma episodes. An oral steroid (like prednisone) begins to work in 6 to 24 hours to decrease swelling in the lungs. This oral steroid is safe when taken short-term. It is not the same medication that athletes take to increase their muscle mass.

Many asthma medications are in the form of sprays or powders that are breathed in through the mouth. They work best when they can get deep down into the lungs. Medications may be supplied as metered dose inhalers (MDIs), dry powder inhalers (DPIs), liquid solutions for nebulizer administration, or in tablet form.

The medication chart on these two pages are provided to familiarize people with many medications commonly prescribed in asthma management. The list is not intended to include every available medication.

## Asthma Medications Chart<sup>14,15</sup>

Asthma Medications			
Type of Medicine	Generic Name	Brand Name	Possible Side Effects to Report to Your Health Care Provider <i>(not a complete list)</i>
<b>Short-acting Beta<sub>2</sub>-Agonists (SABA): Inhaled or Oral Bronchodilator</b>	albuterol	Accuneb® Proventil HFA® Ventolin HFA®	<ul style="list-style-type: none"> <li>• increased heart rate</li> <li>• palpitations (rapid heart beat)</li> <li>• nausea</li> <li>• vomiting</li> <li>• nervousness</li> <li>• headache</li> <li>• sleeplessness</li> <li>• tremor, shaking feeling</li> </ul>
	albuterol sulfate	ProAir HFA® Proventil Repetabs® (tablet) VoSpire ER® (tablet)	
	pirbuterol acetate		
	levalbuterol hydrochloride levalbuterol tartrate	Xopenex Nebs® Xopenex HFA®	
<b>Inhaled Corticosteroids: Potent anti-inflammatory</b>	beclomethasone dipropionate		<ul style="list-style-type: none"> <li>• Thrush; creamy, white, curd-like patches that can form in the mouth</li> <li>• cough</li> </ul> <p><b>Side Effects</b> that usually do not require medical attention unless they persist:</p> <ul style="list-style-type: none"> <li>• dry mouth</li> <li>• cough</li> <li>• hoarseness</li> <li>• headache</li> <li>• nose bleeds (nasal steroids only)</li> <li>• throat irritation</li> </ul>
	budesonide	QVAR® Pulmicort Respules®	
	fluticasone propionate	Pulmicort Flexhaler® Flovent Diskus®	
	mometasone furoate	Flovent HFA® Asmanex Twisthaler®	
<b>Long-acting Beta<sub>2</sub>-Agonists (LABA): Inhaled Bronchodilator</b> To be used only with inhaled corticosteroids	formoterol fumarate	Foradil Aerolizer DPI®	<ul style="list-style-type: none"> <li>• increased heart rate</li> <li>• palpitations (rapid heart beat)</li> <li>• nervousness</li> <li>• sleeplessness</li> <li>• headache</li> <li>• nausea</li> <li>• vomiting</li> <li>• tremor, shaking feeling</li> </ul>
	ciclesonide	Alvesco®	
	salmeterol xinafoate	Serevent Diskus®	
<b>Combined Medication: Inhaled Bronchodilator and Steroid</b>	budesonide + formeterol fumerate	Symbicort®	Refer to <b>Side Effects</b> of each component
	fluticasone propionate + salmeterol xinafoate	Advair Diskus® Advair HFA®	
	mometasone + formoterol	Dulera®	
<b>Leukotriene Modifiers: Lung Tissue Stabilizer and Anti-allergy Medicine</b>	zafirlukast	Accolate®	<ul style="list-style-type: none"> <li>• headache</li> <li>• nausea</li> <li>• diarrhea</li> <li>• infection</li> </ul>
	montelukast	Singulair®	
	zileuton	Zyflo CR®	

## Asthma Medications

Type of Medicine	Generic Name	Brand Name	Possible Side Effects to Report to Your Health Care Provider <i>(not a complete list)</i>
<b>Methylxanthine: Oral Bronchodilators</b> Relax and open airways; stimulate diaphragm and breathing	theophylline	Elixophyllin® Theo-24® Theochron®	<ul style="list-style-type: none"> <li>• stomach upset</li> <li>• nausea and vomiting</li> <li>• restlessness</li> <li>• rapid heart rate</li> <li>• wakefulness</li> <li>• irritability</li> <li>• dizziness</li> <li>• palpitations (rapid heart beat)</li> <li>• headache</li> </ul>
<b>Mast Cell Stabilizers: Inhaled Lung Tissue Stabilizer</b> May be used before exposure to known asthma trigger	cromolyn sodium		<ul style="list-style-type: none"> <li>• increased coughing</li> <li>• wheezing or shortness of breath</li> </ul> <p><b>Side Effects</b> that usually do not require medical attention unless they persist:</p> <ul style="list-style-type: none"> <li>• coughing</li> <li>• skin rash/itching</li> <li>• headache</li> <li>• sore throat</li> <li>• nausea</li> <li>• abdominal pain</li> </ul>
	nedocromil sodium		
<b>Corticosteroids: Oral Anti-inflammatory</b>	dexamethasone	Decadron®	<ul style="list-style-type: none"> <li>• decreased or blurred vision</li> <li>• frequent urination</li> <li>• skin rash</li> <li>• increased thirst</li> <li>• mood changes</li> <li>• poorly controlled hypertension and diabetes</li> <li>• long-term use predisposes to fractures, cataracts, and GI ulcers</li> </ul> <p><b>Side Effects</b> that usually do not require medical attention unless they persist (may appear and then go away during treatment):</p> <ul style="list-style-type: none"> <li>• increase in appetite</li> <li>• insomnia</li> <li>• nervousness</li> <li>• restlessness</li> </ul>
	prednisone	Prednisone Intersol® Orapred®	
	hydrocortisone	Cortef®	
	methylprednisolone	Medrol®	
<b>Immunomodulators: Monoclonal Antibody Blocks IgE, a major mediator of allergic reactions</b>	omalizumab	Xolair®	The most common <b>Side Effects</b> in patients who received Xolair® in clinical studies are listed below. This is not a complete list of all side effects reported with Xolair®. <ul style="list-style-type: none"> <li>• injection-site reaction</li> <li>• viral infections</li> <li>• upper respiratory tract infection</li> <li>• sinusitis</li> <li>• headache</li> <li>• sore throat</li> <li>• delayed anaphylaxis</li> </ul>

Possible Side Effects listed for each medication is not complete (i.e., does not list every possible side effect). Check with your health care provider or pharmacist.

## Medication Delivery Devices

Medication delivery devices assist in distributing asthma medications to the lungs. Equipment used in the administration of asthma management medications varies. People with asthma should be familiar with their delivery devices and administration. Metered dose inhalers (MDIs) and dry powder inhalers (DPIs) deliver a prescribed dose of medication from the unit with each activation. The medication can only reach the lungs if the person uses proper breathing techniques. Spacers or holding chambers attach directly to MDIs and should be used to assist medication delivery.

For optimal therapy, it is important to know when the medication expires and how many doses have been used in an inhaler. Some inhalers have dose counters built in and others require manually counting the doses by making hash marks on the inhaler.

### Metered Dose Inhaler with Spacer/Holding Chamber and Mask<sup>16</sup>



1. Remove cap to the inhaler.
2. Shake the inhaler for at least 10 seconds.



7. Keep the mask tight against the child's face for 6 breaths.



3. Insert the inhaler into the back of the holding chamber with mask.
4. If necessary, attach mask to holding chamber.



8. Wait 1 minute before repeating these steps, if a second dose is prescribed.
9. Repeat these steps, as prescribed.



5. Put mask up to the child's face and make sure there is a good seal over the nose and mouth. Some adults may need to use a mask.



6. Press down on the inhaler as the child begins to take a deep breath in. Release only one puff of medicine.

## Nebulizer<sup>16</sup>



1. Sit upright in a comfortable chair. An infant or small child may be held upright on lap or in arms.



2. Add medicine to nebulizer cup, as directed.
3. Turn switch on compressor to the “on” position.



4. Place mouthpiece in mouth or place mask on infant or child, making sure there is a good seal over the nose and mouth.



5. Breathe normally through the mouthpiece or mask, taking a deep breath every minute or so. Continue until nebulizer cup begins to sputter.

## Nebulizer Cleaning<sup>17</sup>

1. Disconnect nebulizer from tubing, disassemble, and briefly wash in warm soapy water.
2. Briefly wash nebulizer parts in warm soapy water. Do not submerge nebulizer tubing under water. Wipe with cloth, if soiled.
3. Place nebulizer parts on a towel or dish rack, and allow to air dry. Keep parts out of the reach of children. Reassemble the clean nebulizer, and place in a cool, dry place.



## Metered Dose Inhaler (MDI) with Holding Chamber<sup>16</sup>



1. Remove cap to the inhaler.
2. Shake the inhaler for at least 10 seconds.



6. Press down once on the inhaler canister.



3. Insert inhaler into spacer (*technique will vary with type of spacer; refer to manufacturer's instructions*).



4. Tilt your head back slightly and breathe out until lungs are completely empty.



5. Put the mouthpiece into your mouth between your teeth and close your lips around it. Do not block opening with your tongue.



7. Breathe in deeply and slowly through your mouth for about 5 to 7 seconds. You may have a holding chamber/spacer that has a built whistle, which will alert you if you are breathing in too fast.

8. Hold your breath as you count slowly to 10, if you can.



9. Wait at least 1 minute between puffs, and repeat as prescribed.

## Advair/Serevent Diskus™ <sup>16</sup>



1. Hold the Diskus in left hand and place the thumb of your right hand on the thumb grip.
2. Push away until the mouthpiece appears and snaps into position.



7. Place the mouthpiece between your lips, making sure your tongue is not blocking the opening and breath in quickly.



3. Hold the Diskus in a level, horizontal position. You do not need to shake your Diskus like other devices.
4. Slide the lever away from you as far as it will go until it clicks. The Diskus is now ready to use.



8. Hold your breath for 10 seconds, and then exhale slowly.
9. To close the Diskus, put your right thumb on the thumb grip and slide it back towards you as far as it will go. The Diskus will click shut. The dose counter will now display the number of doses remaining.

5. Every time the lever is pushed back, a dose is made available for inhaling. The dose counter shows this.

You never want to breathe into your Diskus. Before inhaling your medication, turn your head away from the Diskus breathe out fully to empty your lungs.



10. Rinse your mouth with water and spit. Do not swallow.

Do not submerge your Diskus in water, wipe the mouthpiece exterior with a damp cloth.



6. Before inhaling your dose of medication, turn to the side and breathe out all the way, while holding the Diskus level. Remember, never breathe out into the Diskus mouthpiece.

## Pulmicort Flexhaler™<sup>16</sup>



1. The Flexhaler must be held in the upright position (mouthpiece up) when the dose is being loaded.



2. Unscrew the cover and lift off.



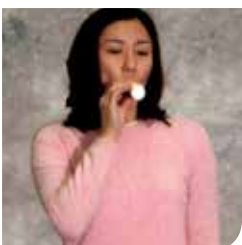
3. To load a dose, twist the brown grip fully to the right as far as it will go. Twist it back again fully to the left until you hear a click. The dose is now loaded.



4. Face away from the Flexhaler and breathe out all the way. Do not blow into or shake the Flexhaler.



5. Place the mouthpiece between your lips and tilt head back slightly. Keep in a horizontal position.



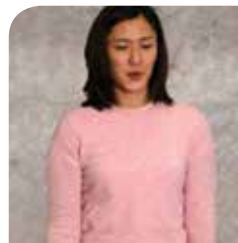
6. Breathe in deeply and forcefully through your mouth.



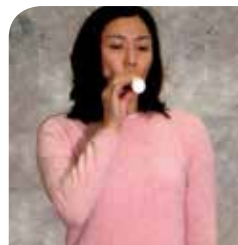
7. Remove from mouth.



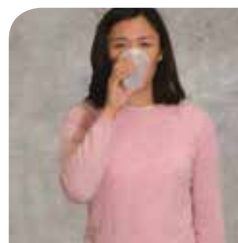
8. Hold your breath for about 10 seconds or as long as you can.



9. Breathe out slowly.



10. Repeat, as prescribed.



11. Rinse your mouth with water and spit after use. Do not swallow.



12. Replace the cap on the Flexhaler.

## Asmanex Twisthaler™ <sup>16</sup>



1. Hold the Twisthaler straight up with the pink portion (the base) on the bottom. It is important that you remove the cap of the Twisthaler while it is in this upright position to make sure that you get the right amount of medicine with each dose.



2. Holding the pink base, twist the cap in a counterclockwise direction to remove it. As you lift off the cap, the dose counter on the base will count down by one. This action loads the device with the medicine that you are now ready to inhale.



3. Inhaling your medication, turn your head away (face away) from the Twisthaler and breathe out fully to empty your lungs.



4. Put in mouth, making sure you are not blocking the ventilation hole.



5. Firmly closing your lips around the mouthpiece making sure your tongue is not blocking the mouthpiece, take in a fast, deep breath.



6. Remove from mouth.



7. Hold breath for about 10 seconds.



8. Be sure that the arrow is in line with the dose-counter window. The cap needs to be put back on and turned in a clockwise direction, as you gently press down.



9. If your doctor has prescribed another dose, you will need to place the cap back on the Twisthaler, making sure that the arrow is in line with the dose counter window and turned in a clockwise direction to ensure it is ready for the next dose, and then repeat steps 2-7 above.



10. If you have taken a second dose, you will need to place the cap back on the Twisthaler, following the directions, above to ensure your device is ready for the next dose.



11. Rinse your mouth with water and spit after use. Do not swallow.

## Peak Flow Monitoring



As with any chronic condition, daily monitoring is critical to ensure positive outcomes. A peak flow meter is generally used by patients with moderate to severe persistent asthma. A peak flow meter is a hand-held device that measures how much air a person can breathe out from their lungs in one second. The speed, or velocity, at which the air leaves the lungs is called the peak expiratory flow (PEF) or peak flow.

After moving the indicator to zero, the person standing takes a deep breath, places the mouthpiece into his/her mouth, and blows the air out as rapidly as possible (huff). The procedure should be repeated two to three times (if feasible) and the best effort recorded in the daily log. Peak flow monitoring should be performed, as recommended by the person's primary health care provider, until the personal best baseline is determined.

Treatment decisions and action plans are then based upon the personal best value. The personal best may change over time and be reassessed periodically by the health care provider. A person with moderate to severe asthma should use a peak flow meter during an asthma episode, when it is difficult to notice symptoms or changes in breathing, and every morning if indicated by a health care provider.

Peak flow meters are helpful in monitoring breathing, catching breathing problems early, identifying when to take quick relief medications, and identifying when to call a health care provider or seek emergency care.

Peak flow meters are available with a health care provider's prescription and are available at pharmacies or durable medical equipment stores.

## Peak Flow Monitoring<sup>16</sup>



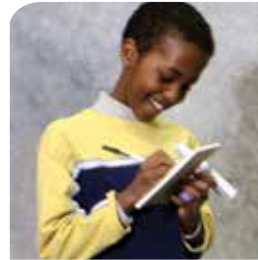
1. Move the marker to the bottom of the numbered scale.



2. Stand up and take a deep breath, filling your lungs completely.
3. Put the mouthpiece inside your mouth and close your lips around it. Do not put your tongue in the mouthpiece. Do not cover vent or block movement of the indicator.



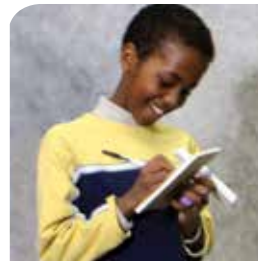
4. Blow out as hard and fast as you can in a single blow.



5. Write down the number you get. If you cough or make a mistake, do not write down the number, just do it over again.



6. Repeat two more times.



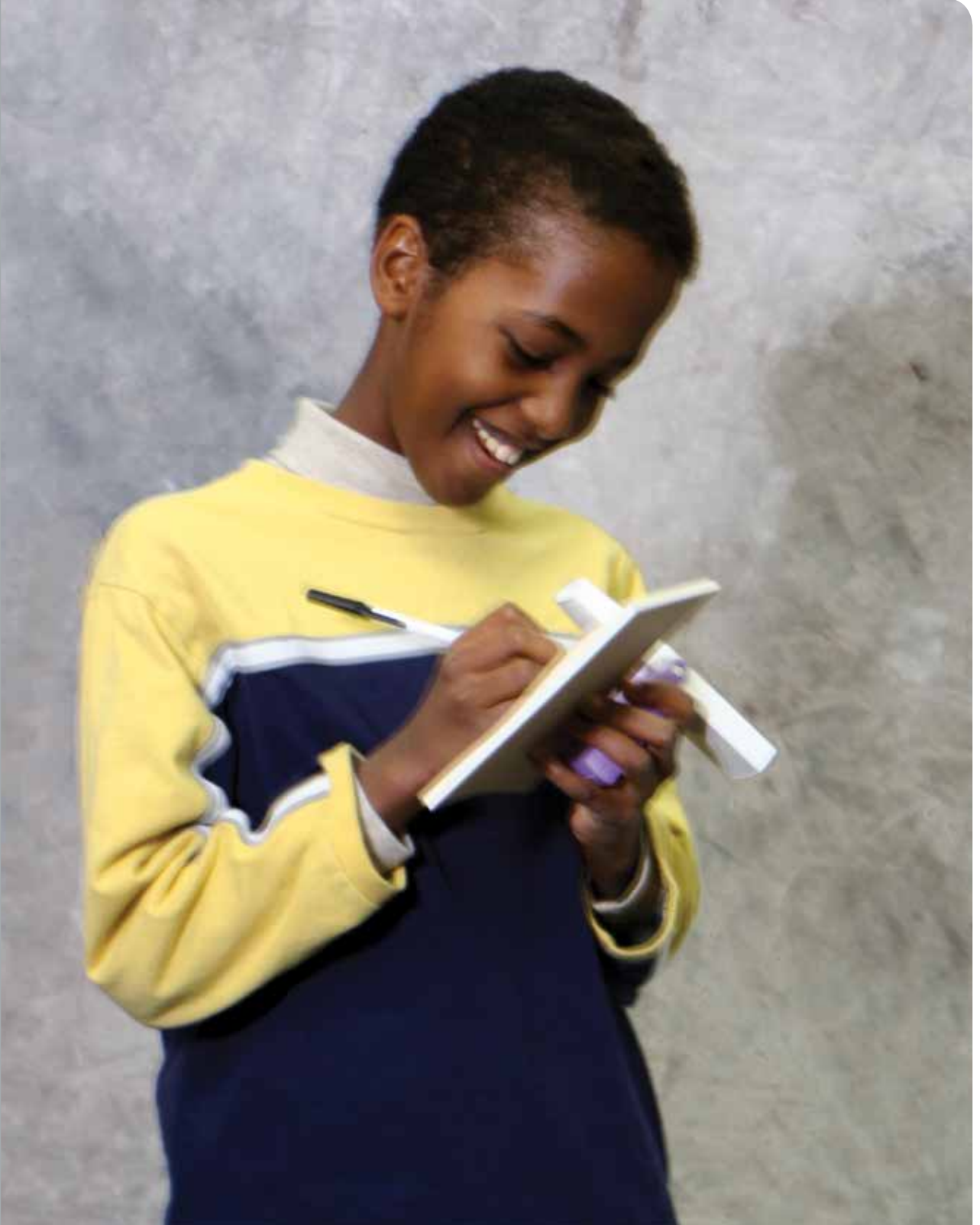
7. Write down the best of the three tries in your asthma diary.



**ASTHMA**  
**101** 

The text "ASTHMA" is in red, uppercase letters. Below it, "101" is in a large, bold, black font. To the right of "101" is a circular icon containing a stylized white outline of a human torso with a red heart and a white outline of a lung.

**ASTHMA ACTION PLAN**



# Importance of an Asthma Action Plan

Any person diagnosed with asthma should have a written Asthma Action Plan. The plan details all necessary information, such as medications and actions, they should take daily, with symptoms, and in an emergency. Studies show that people with written Asthma Action Plans have reduced emergency room visits, hospitalizations, and improved lung function. ALWAYS keep an Asthma Action Plan accessible in case of an emergency.

## Basic Asthma Management

Once asthma signs or symptoms are recognized (coughing, wheezing, shortness of breath, or chest tightness), follow these guidelines:

- Remain calm and reassure the person.
- Stop all physical activity.
- Remove the person from exposure to the known asthma trigger(s) whenever possible.
- Ensure that prescribed medications are given according to the Asthma Action Plan. Allow time for the medication to take effect. The medication used during an asthma episode should be a **quick relief medication**.
- Look for improvement in symptoms.
- Have someone stay with the person with asthma. Don't leave them alone.
- Communicate with emergency contacts if the person with asthma has experienced breathing difficulties while engaging in physical activities.

Activity can continue when...

- Wheezing has resolved.
- There is no chest tightness.
- There is no shortness of breath.
- Person is able to speak in complete sentences.
- Person is able to freely walk around without symptoms.
- Person's peak flow rate is 80% or better of personal best.



# Zones and Actions

## Green Zone:

- 80-100% of personal best
- No asthma symptoms

## Go

1. Proceed with normal activities and continue daily controller medications, even when feeling well.
2. Keep quick relief medications on hand.
3. Give Asthma Action Plan to other providers, if necessary.
4. Eliminate asthma triggers in home.
5. See health care provider regularly for an asthma check-up.

## Yellow Zone:

- 50-79% of personal best.
- Coughing, wheezing, and shortness of breath may be present.

### Early warning signs of an asthma episode may include:

- A drop in peak flow meter readings
- Itchy chin or neck (*a child may rub his/her chin or neck in response to this feeling*)
- Clipped speech (*speaking in short, choppy sentences in order to catch his/her breath*)
- Itchy, watery eyes
- Dark circles under the eyes
- Runny nose and/or sneezing
- Hunched shoulders
- Change in mood and/or irritability

### What to look for:

- Anxious or scared look
- Pursed-lip breathing
- Hunched-over body position
- Unusual facial paleness
- Perspiring
- Restlessness during sleep
- Flared nostrils
- Vomiting due to hyperventilation
- Fatigue that is not related to activity

### What to listen for:

- Coughing or persistent cough with no other cold symptoms
- Frequent clearing of the throat
- Irregular breathing
- Noisy, difficult breathing
- Wheezing during exhaling

## Caution

1. Step up medications as prescribed and reduce activities, as indicated.
2. Take quick relief medication.
3. Sit down, inhale slowly through the nose, and exhale through the mouth with lips partially open.
4. Keep taking daily controller medicines.
5. Stay calm.

## Red Zone:

- Quick relief medication is not effective, not available, or has been used with the past 4 hours with no relief.
- Less than 50% of personal best.
- Retractions, lots of effort needed to breathe.
- Fingernail beds or lips turning blue/gray.
- Marked wheezing and shortness of breath (*wheezing and coughing may stop because breathing has reduced severely*).

## Stop! Get Help! Call Medical Services or 911

1. Restrict all activity to conserve energy.
2. Call 911 or go to the Emergency Department.



## Emergency Asthma Management

Asthma symptoms requiring prompt action include: coughing, wheezing, difficulty breathing, or chest tightness. Other warning signs may include: fatigue, stomach cramps, headaches, or difficulty keeping up with friends and teammates when physically active. Initiate emergency Asthma Action Plan if any of the following occur:

- Symptoms listed as emergency indicators on a person's Asthma Action Plan are present.
- If no improvement or relief from medications is noted after 15-20 minutes (or time period specified by primary health care provider in the Asthma Action Plan).
- Peak flow monitoring indicates less than 50% of personal best.
- Posturing (hunched over with shoulders lifted straining to breathe).
- Person has difficulty walking or completing a sentence without pausing for breath, or is unable to speak.
- Lips or fingernails turn blue or gray.

## Emergency Action Plan

- Administer emergency medications specified in Asthma Action Plan.
- Notify emergency services or call 911.
- Notify parent, guardian, or emergency contact.

# Asthma Action Plan for Home and School



Name \_\_\_\_\_ DOB \_\_\_\_/\_\_\_\_/\_\_\_\_

Severity Classification  Intermittent  Mild Persistent  Moderate Persistent  Severe Persistent

Asthma Triggers (list) \_\_\_\_\_

Peak Flow Meter Personal Best \_\_\_\_\_

## Green Zone: Doing Well

Symptoms: Breathing is good – No cough or wheeze – Can work and play – Sleeps well at night

Peak Flow Meter \_\_\_\_\_ (more than 80% of personal best)

Control Medicine(s)	Medicine	How much to take	When and how often to take it	Take at
	_____	_____	_____	<input type="checkbox"/> Home <input type="checkbox"/> School
	_____	_____	_____	<input type="checkbox"/> Home <input type="checkbox"/> School

Physical Activity  Use albuterol/levalbuterol \_\_\_\_ puffs, 15 minutes before activity  with all activity  when the child feels he/she needs it

## Yellow Zone: Caution

Symptoms: Some problems breathing – Cough, wheeze, or chest tight – Problems working or playing – Wake at night

Peak Flow Meter \_\_\_\_\_ to \_\_\_\_\_ (between 50% and 79% of personal best)

Quick-relief Medicine(s)  Albuterol/levalbuterol \_\_\_\_ puffs, every 4 hours as needed

Control Medicine(s)  Continue Green Zone medicines

Add \_\_\_\_\_  Change to \_\_\_\_\_

The child should feel better within 20–60 minutes of the quick-relief treatment. If the child is getting worse or is in the Yellow Zone for more than 24 hours, THEN follow the instructions in the RED ZONE and call the doctor right away!

## Red Zone: Get Help Now!

Symptoms: Lots of problems breathing – Cannot work or play – Getting worse instead of better – Medicine is not helping

Peak Flow Meter \_\_\_\_\_ (less than 50% of personal best)

Take Quick-relief Medicine NOW!  Albuterol/levalbuterol \_\_\_\_ puffs, \_\_\_\_\_ (how frequently)

Call 911 immediately if the following danger signs are present

- Trouble walking/talking due to shortness of breath
- Lips or fingernails are blue
- Still in the red zone after 15 minutes

**School Staff:** Follow the Yellow and Red Zone instructions for the quick-relief medicines according to asthma symptoms.

The only control medicines to be administered in the school are those listed in the Green Zone with a check mark next to “Take at School”.

Both the Healthcare Provider and the Parent/Guardian feel that the child has demonstrated the skills to carry and self-administer their quick-relief inhaler, including when to tell an adult if symptoms do not improve after taking the medicine.

### Healthcare Provider

Name \_\_\_\_\_ Date \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_-\_\_\_\_ Signature \_\_\_\_\_

### Parent/Guardian

I give permission for the medicines listed in the action plan to be administered in school by the nurse or other school staff as appropriate.

I consent to communication between the prescribing health care provider or clinic, the school nurse, the school medical advisor and school-based health clinic providers necessary for asthma management and administration of this medicine.

Name \_\_\_\_\_ Date \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_-\_\_\_\_ Signature \_\_\_\_\_

### School Nurse

The student has demonstrated the skills to carry and self-administer their quick-relief inhaler, including when to tell an adult if symptoms do not improve after taking the medicine.

Name \_\_\_\_\_ Date \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_-\_\_\_\_ Signature \_\_\_\_\_

# CONTROL OF ASTHMA



**ASTHMA**  
**101** 

The text "ASTHMA" is in red, and "101" is in black. To the right of "101" is a circular icon containing a stylized white lung with a red heart in the center.

# Goals of Asthma Management

If asthma is under control, a person should be able to:

- Sleep through the night.
- Not cough or wheeze during the day or night.
- Be physically active.
- Not miss school and/or work due to asthma.
- Not have asthma-related visits to emergency room or hospitalization.

**Control of asthma depends on:**

- Being able to get medical care.
- Having self-management skills.
- Having good communication between the person with asthma and those around them (parents, coaches, teachers, child care providers, friends and co-workers).

**Prevention and control of asthma episodes requires working closely with parents/guardians and a child's health care provider to devise and follow a medical plan that...**

- Prevents symptoms.
- Reduces contact with triggers.
- Prepares for any changes in symptoms.
- Ensures medications are being taken correctly.

Approximately 86% of patients don't take their medications correctly.<sup>25</sup>

- Determines when a health care provider's help is needed and when to seek immediate help.

# Is Your Asthma Out of Control?

The following are tools to assess whether a person's asthma is under control or not.

## Asthma Control Test™

The Asthma Control Test™ is a tool that can be used when speaking with a health care provider to help evaluate whether or not asthma is under control. This simple quiz is for anyone 4 years of age or older or for the caregivers of those with asthma who are ages 5 to 12 to take. The answers will provide a score that may help the person with asthma and their health care provider to determine if their treatment plan is working or if changes should be made.

**Asthma Control Test™ is:**

- A quick test that provides a numerical score to assess asthma control.
- Recognized by the National Institutes of Health (NIH) in its 2007 asthma guidelines.\*
- Clinically validated against spirometry and specialist assessment.†

**PATIENTS:**

- Answer each question and write the answer number in the box to the right of each question.
- Add your answers and write your total score in the TOTAL box shown below.
- Discuss your results with your doctor.

1. In the past 4 weeks, how much of the time did your asthma keep you from getting as much done at work, school or at home?

All of the time	1	Most of the time	2	Some of the time	3	A little of the time	4	None of the time	5
-----------------	---	------------------	---	------------------	---	----------------------	---	------------------	---

2. During the past 4 weeks, how often have you had shortness of breath?

More than once a day	1	Once a day	2	3 to 6 times a week	3	Once or twice a week	4	Not at all	5
----------------------	---	------------	---	---------------------	---	----------------------	---	------------	---

3. During the past 4 weeks, how often did your asthma symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?

4 or more nights a week	1	2 or 3 nights a week	2	Once a week	3	Once or twice a week	4	Not at all	5
-------------------------	---	----------------------	---	-------------	---	----------------------	---	------------	---

4. During the past 4 weeks, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?

3 or more times per day	1	1 or 2 times per day	2	2 or 3 times per week	3	Once a week or less	4	Not at all	5
-------------------------	---	----------------------	---	-----------------------	---	---------------------	---	------------	---

5. How would you rate your asthma control during the past 4 weeks?

Not controlled at all	1	Partly controlled	2	Somewhat controlled	3	Well controlled	4	Completely controlled	5
-----------------------	---	-------------------	---	---------------------	---	-----------------	---	-----------------------	---

**If your score is 19 or less, your asthma may not be under control. Be sure to talk with your doctor about your results.**

Copyright © 2012, by QualityMetric Incorporated. Asthma Control Test is a trademark of QualityMetric Incorporated. The Asthma Control Test is for people with asthma 12 years and older.

**References:** 1. US Department of Health and Human Services, National Institutes of Health, National Heart, Lung and Blood Institute. Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma (2007). NIH Publication No. 08-4051. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2306030/>. Accessed September 10, 2007. 2. Hershkovitz et al. J Allergy Clin Immunol. 2004;113:645.

**ASTHMA ACTION AMERICA™**

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# Asthma Control Test™ is:

- ▶ A quick test that provides a numerical score to assess asthma control.
- ▶ Recognized by the National Institutes of Health (NIH) in its 2007 asthma guidelines.<sup>1</sup>
- ▶ Clinically validated against spirometry and specialist assessment.<sup>2</sup>

**PATIENTS:** 1. Answer each question and write the answer number in the box to the right of each question.  
2. Add your answers and write your total score in the TOTAL box shown below.  
3. Discuss your results with your doctor.

1. In the past **4 weeks**, how much of the time did your **asthma** keep you from getting as much done at work, school or at home?

All of the time	1	Most of the time	2	Some of the time	3	A little of the time	4	None of the time	5
-----------------	---	------------------	---	------------------	---	----------------------	---	------------------	---

SCORE

2. During the past **4 weeks**, how often have you had shortness of breath?

More than once a day	1	Once a day	2	3 to 6 times a week	3	Once or twice a week	4	Not at all	5
----------------------	---	------------	---	---------------------	---	----------------------	---	------------	---

3. During the past **4 weeks**, how often did your **asthma** symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?

4 or more nights a week	1	2 or 3 nights a week	2	Once a week	3	Once or twice	4	Not at all	5
-------------------------	---	----------------------	---	-------------	---	---------------	---	------------	---

4. During the past **4 weeks**, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?

3 or more times per day	1	1 or 2 times per day	2	2 or 3 times per week	3	Once a week or less	4	Not at all	5
-------------------------	---	----------------------	---	-----------------------	---	---------------------	---	------------	---

5. How would you rate your **asthma** control during the **past 4 weeks**?

Not controlled at all	1	Poorly controlled	2	Somewhat controlled	3	Well controlled	4	Completely controlled	5
-----------------------	---	-------------------	---	---------------------	---	-----------------	---	-----------------------	---

TOTAL

**If your score is 19 or less, your asthma may not be under control.  
Be sure to talk with your doctor about your results.**

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The Asthma Control Test is for people with asthma 12 years and older.

**References:** 1. US Department of Health and Human Services, National Institutes of Health, National Heart, Lung and Blood Institute. *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma (EPR-3 2007)*. NIH Item No. 08-4051. <http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm>. Accessed September 10, 2007. 2. Nathan RA et al. *J Allergy Clin Immunol*. 2004;113:59-65.



EXERCISE AND ASTHMA



**ASTHMA**  
**101** 

The text "ASTHMA" is in a large, bold, red font. Below it, "101" is in a large, bold, black font. To the right of "101" is a circular icon containing a stylized white lung with a red heart inside, set against a grey background.



# Exercise-induced Bronchospasm

Exercise-induced bronchospasm, or EIB (also referred to as exercise-induced asthma), is a temporary narrowing of the airways that restricts airflow, triggered by exercise.

## Why does exercise cause asthma symptoms?

The intense breathing that takes place during exertion causes water loss from the lungs, which cools the lungs' moist lining. This drop in temperature may result in constriction of the muscles around the airways and inflammation within the airways—the ingredients of an asthma episode. EIB can occur during, or minutes after, vigorous activities, and may resolve in 20 to 30 minutes after onset. Research shows that with proper asthma management, exercise should be part of a person with asthma's daily routine.

## An asthma management plan for a child or adult with EIB:

1. Pre-treat with medications. Bronchodilators or long-acting bronchodilators may be prescribed for EIB.

Many people with EIB use their quick relief medication 15 minutes before they exercise; but before you do this, always talk to your health care provider for guidance and recommendations.

2. Decreased activity should only be a temporary solution. With proper asthma management, everyone should be able to exercise comfortably.
3. Encourage warm-up and cool-down exercises before and after exertion.
4. Make quick relief medications available at all times.
5. Avoid cold, dry air. If this is not possible, wearing a scarf or mask over their face during activities under these conditions will humidify the air before it reaches the lungs.
6. Remember to stop activity if coughing, wheezing, shortness of breath, and/or chest tightness occurs and follow your Asthma Action Plan.

Schools, child care provider sites, or families may wish to utilize the *Indoor Air Quality Checklist* to assess their environment and identify potential triggers.

## Indoor Air Quality Checklist<sup>18</sup>

The children you care for are counting on you to help them breathe easier. The quality of air we breathe greatly influences lung health. By ensuring good indoor air quality, you can reduce or eliminate potential allergy or asthma triggers for yourself as a provider and for the children in your care. Careful cleaning can reduce dust, mold, and other allergens. Other air pollutants might also be present, but are not easily detected such as asbestos, formaldehyde, carbon monoxide, and radon. This checklist can help identify possible pollutants/triggers and indicate areas of your building where they might be found. Knowing what to look for and making changes are the first steps in ensuring healthy indoor air for the children in your care.

Please take a few minutes to look through each area of your building and check the appropriate boxes in each section. After each section heading, certain triggers appear with a brief explanation of how these items might affect the air quality of the children in your care. You may wish to add notes and date when the checklist was completed.

Please note that these triggers might be found in more than one room. Care providers with asthma/allergies should take precautions to protect their health at all times as well.

### Infant/Toddler Room/Bedroom

Dust mites are tiny organisms that are present everywhere. Many individuals who suffer from allergies and asthma are sensitive to them. Respiratory viruses can also trigger an asthma episode, so careful cleaning and sanitizing can help stop the spread of these illnesses. If a child is not feeling well, it is best that he/she stay at home so that viruses are not spread.

	Yes	No	Notes	Date
1. Vacuuming ( <i>recommended with a HEPA filter</i> ) and cleaning is done after hours or when children are not present.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
2. Spills on carpet are cleaned immediately and the carpet is allowed to dry completely.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
3. Crib and sleeping mattresses are encased and wiped daily with a damp cloth.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
4. Sheets and blankets are washed weekly in hot water (140°F or hotter) with unscented detergent.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
5. Dolls and toys are wiped down daily with fragrance-free disinfectant wipes.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
6. Children do not sleep with stuffed animals.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
7. Diaper changing area is cleaned after each use, including carefully disposing of diapers and wiping changing area with fragrance-free disinfectant wipes.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

## Bathroom

Excess moisture can result in the growth of mold and mildew. (Both can cause health problems, especially to individuals with respiratory problems.) Strong odors, such as those found in many cleaning supplies and soaps, can also cause allergic or asthmatic reactions for some children and adults.

	Yes	No	Notes	Date
1. Bathroom, especially near sinks and toilets, has been checked and is free of leaks, moisture, and mold.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__
2. Wastebaskets are emptied at the end of each day.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__
3. Floors, toilets, and sinks are cleaned daily with fragrance-free disinfectant wipes.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__
4. Cleaning supplies are tightly sealed and locked out of children's reach.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__
5. Air fresheners, soaps and hand sanitizers do not have strong, perfumed scents.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__

## Kitchen/Lunch Area

Spills and food not properly stored can draw unwanted pests, like cockroaches. Their droppings and decaying bodies can be harmful to the lungs of children with asthma.

	Yes	No	Notes	Date
1. Spills are wiped up immediately and countertops are wiped down daily with fragrance-free disinfectant wipes.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__
2. Wastebaskets and recycling are removed from area and disposed of at the end of each day.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__
3. Food is stored tightly in containers.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__
4. Cooking is done with proper ventilation of fumes.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__
5. Pans under refrigerators are emptied and cleaned regularly.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__

## General Classroom Area

Classrooms should be carefully cleaned on a regular basis when children are not present. Pets can be very harmful to a child with allergies or asthma. Animal dander, skin flakes, saliva, or urine can cause a reaction.

	Yes	No	Notes	Date
1. Vacuuming (with a HEPA filter) and cleaning are done at the end of each day when children are not present.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__
2. There are no pets in the facility.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__
3. If a pet visits the center, cages are clean and kept away from ventilation systems and fans.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__
4. Toys and books are wiped down on a regular basis and are allowed to dry completely.	<input type="checkbox"/>	<input type="checkbox"/>	_____	__

5. Art supplies are kept in sealed containers, and supplies with strong scents or dust are not used. (ex. scented markers, strong smelling paints, chalk)

\_\_\_\_\_

### Throughout the Building

The following items will help you to determine if other kinds of air pollutants are present and the changes you might need to make.

	Yes	No	Notes	Date
1. Smoking is prohibited.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
2. Strong perfumes and hair sprays are not worn.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
3. Fresh or dried flowers or plants are avoided. Real plants, if over watered, can lead to mold; artificial plants can harbor dust.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
4. I am aware that changes in the temperature or weather can affect children that have asthma or allergies.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
5. Air conditioning is used during warm months whenever possible to minimize outdoor allergens and pollutants in the building.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
6. Heating, cooling, and ventilation systems are checked yearly by trained professionals and any problems are addressed.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
7. Building is free of asbestos. (Professional inspection is recommended.)	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
8. Exposure to formaldehyde is minimized. Formaldehyde is found in some building material adhesives and wood products used in furniture, cabinets, and wall paneling.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
9. Building has been tested for radon. Radon is a colorless, odorless, radioactive gas that occurs naturally in soil, rock, and water.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
10. Carbon monoxide detectors are installed and working properly. Carbon monoxide is a colorless, odorless gas that can cause serious health problems and can be deadly at high levels.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
11. An Asthma Action Plan for children with allergies and asthma is accessible in the building so that providers and volunteers know what to do if there is an emergency.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

Congratulations for all of the items you were able to check "YES"! By checking these items, you are doing positive things to make sure all of the children in your care are breathing a little easier. It is important to address those items that were checked "NO" and make those changes to ensure good indoor air quality in your building so that children can learn and grow in a healthy environment.



# The Asthma/Allergy Connection

An estimated 50 million people suffer from allergies, according to the National Institute of Allergies and Infectious Diseases; that is, 30% of adults and 40% of children suffer from allergies. Allergic rhinitis, more commonly known as hay fever, is the most common of all allergies. The most common allergy symptoms include:

- Prolonged, sneezing spells
- Clear, watery nasal discharge
- Nasal congestion
- Itchy nose, eyes, ears, and throat

Many of these symptoms are similar to upper respiratory infections; however, the aches and fever that accompany a cold rarely occur with allergies. If symptoms persist, the individual may have allergic rhinitis (hay fever).

For some people, this affliction is seasonal; for others it occurs year-round. If a person has asthma and allergic rhinitis, the allergies often trigger asthma symptoms. An estimated 50% of asthma in adults and 80% in children are triggered by allergies. An estimated 20% of all children with allergic rhinitis will develop asthma within the next 8 to 10 years.

There is a strong link between asthma and allergies, so it is important to keep allergens under control. Because some allergies affect the upper airway, they can trigger an asthma episode in the lower airway. People who suffer from allergies are six times more likely to have asthma than people who do not have allergies. However, all asthma is not allergy-related, and not all allergies will cause an asthma episode. Identifying and minimizing exposure to known allergens can improve quality of life.

## Allergy Treatment

The good news is that people with allergies have plenty of treatment options. The medications used to treat allergic rhinitis fall into four categories: anti-histamines, decongestants, steroid nasal sprays and non-steroidal nasal sprays. Examples of over-the-counter anti-histamines are:

- Allegra®
- Benadryl®
- Chlor-trimeton®
- Claritin®
- Tavist®
- Zyrtec®

Prescription anti-histamines include:

- Clarinex®
- Diphenhydramine HCL® injection
- Dramamine®
- Hyzine®
- Palgic®
- Periactin®
- Promethazine®
- Xyzal®

The following are examples of antihistamines/decongestants:

- Actifed®
- Aprodine®
- Allegra-D®
- Claritin-D®
- Contac®
- Dristan®
- Sudafed-Plus®
- Zyrtec-D®

Nasal steroid sprays are also important in managing allergies; they typically begin to work about one week after beginning use.

Examples of these prescription nasal sprays are:

- Flunisolide®
- Nasacort®
- Nasonex®
- Rhinocort AQ®
- Veramyst®

A non-steroidal nasal spray, like Nasalcrom, which is over-the-counter, may take up to two weeks to begin working.

Nasal spray side effects can include:

- Dry mouth
- Drowsiness
- Nosebleeds
- Increased heart rate
- Nervousness

Examples of these non-steroidal nasal sprays are:

- Astelin®
- Astepro®
- Ipratropium®

This is not a complete list of all side effects. Patients should consult a health care provider for the medication that best treats their allergic symptoms.

## Helpful Hints for Allergy Sufferers!

- Mattress covers, box springs, and pillows are the first line of defense for people with dust mite allergy. A focus on the bedroom for the allergy sufferers is important-stuffed animals, house pets, carpeting, trophies, or other items that collect dust aggravate allergy sufferers.
- Vacuum frequently with a HEPA filter-equipped vacuum cleaner.
- Most importantly, identify the allergy trigger and minimize or eliminate triggers.

# Food Allergies

Food allergy is an abnormal immune response to certain food(s) that the body reacts to as harmful. Estimates of the prevalence of food allergies range from approximately 4% to 8% of children and 2% of adults.<sup>19,20</sup> Though reasons for this are poorly understood, the prevalence of food allergies and associated anaphylaxis appears to be on the rise. Risk factors associated with food allergy include: family history of asthma and allergies, genetic predisposition to allergic disease, elevated allergen-specific serum immunoglobulin levels (IgE concentrations), and being younger than 3 years of age. There are 8 foods that account for 90% of all food-allergy reactions: cow's milk, egg, peanut, tree nuts (for example, walnuts, pecans, almonds, and cashews), fish, shellfish, soybeans, and wheat.<sup>20,21,22</sup> While 3.3 million Americans are allergic to peanuts or tree nuts, 6.9 million are allergic to seafood. Combined, food allergies cause 30,000 cases of anaphylaxis, 2,000 hospitalizations, and 150 deaths annually.<sup>20</sup>

## Symptoms of Food Allergy

Symptoms of a food-allergy reaction can be sudden and severe and commonly include one or more of the following:<sup>23</sup>

- Hives
- Tingling in the mouth
- Swelling in the tongue and throat
- Difficulty breathing
- Abdominal cramps
- Vomiting or diarrhea
- Eczema or rash
- Coughing or wheezing
- Loss of consciousness
- Dizziness

## Treatment of Food Allergies

Some types of mild food allergies are treatable with an antihistamine or bronchodilator. Severe, or anaphylactic reactions, require epinephrine. At present, there is no cure for food allergies. The best method for managing food allergies is prevention by way of strict avoidance of any food that triggers a reaction.<sup>24</sup>



# Frequently Asked Questions

## Q: Is asthma inherited?

**A:** One school of thought is that there is a tendency for asthma to run in families, especially if one of the triggers is allergies. Other experts believe that it is the exposure to the same triggers in foods and/or the daily environment which may activate the same biochemical reactions and activate asthma in family members. Recent studies indicate that abnormalities on Chromosome No. 5 may be involved in asthma.

## Q: Is the incidence of asthma gender related?

**A:** In children, asthma is more prevalent among males. In adults, asthma is more prevalent among females.

## Q: Do children outgrow asthma?

**A:** The human body continues to develop new lung tissue for the first eight years of life. With the growth of new lung tissue, some symptoms may appear less dramatic than the earlier ages. With proper monitoring and medications, asthma can be successfully managed. When asthma is properly managed, symptoms are reduced or minimized to the point that they are not noticeable. Unless desensitization is prescribed, a person may continue to be sensitized to their known triggers. With teamwork between student, family, and school personnel, exposure to the person's known triggers can be minimized.

## Q: Does asthma affect Americans of all backgrounds equally?

**A:** No. Among all racial and ethnic groups, Puerto Ricans have the highest rate of lifetime asthma and Mexicans the lowest. Grouping all Hispanics together masks this difference. Puerto Ricans were almost 80% more likely and non-Hispanic blacks and American Indians were about 25% more likely to have ever been diagnosed with asthma than non-Hispanic whites.

## Q: Why is daily monitoring so important?

**A:** As with any chronic condition, daily status is critical for successful management of persistent asthma. Just as an individual with diabetes monitors daily blood sugar levels and adjusts diet or insulin accordingly, so must an individual with asthma monitor lung function and symptoms daily. Peak flow monitoring provides objective information about the lung status. Serial peak flow monitoring provides information about the person's condition and allows adjustments to be made in care based upon results.

## Q: Are antibiotics used to treat an asthma episode?

**A:** Antibiotics are not recommended for the treatment of acute exacerbations except as needed for other conditions (i.e. pneumonia, sinusitis) that may be contributing to an asthma episode.

## Q: Are the steroids used in asthma the same as those banned in athletic competitions?

**A:** No. The steroids used in asthma management are corticosteroids and are permissible for use in athletic competition. Many athletes have asthma and are allowed to use their prescribed medications in competition. Anabolic steroids have been used by athletes to build body mass and are banned from use in many athletic competitions.

## Q: How can I tell if a student is pretending to be sick?

**A:** Peak flow monitoring provides objective information regarding the child's status. However, treat all complaints and symptoms seriously. A child knows his/her body better than anyone else and can often perceive changes before symptoms become apparent to others. If you feel a student is using asthma as an excuse not to participate on a regular basis, communication with the school nurse, principal, and parent/guardian should be initiated.



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