

## Ask Dr. Sue Your Health and Safety Questions



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# Children With Asthma

by Susan Aronson, MD

Between seven and ten percent of children have the condition known as asthma. Since so many children have asthma symptoms, child care staff must learn as much as they can about this chronic illness. Caregivers need to understand what asthma is and how to prevent asthma symptoms, recognize episodes early enough to provide appropriate management, and use a written asthma action plan for each child with asthma.

### What is Asthma?

Asthma is a chronic disease of the lungs — not just one episode of wheezing, but recurrent episodes. During an asthma episode, airways are inflamed, swollen, and often partially blocked by mucus. Most asthma episodes can be prevented, or at least controlled.

Many children with asthma have related conditions: allergies and eczema. This family of illnesses involves the immune system over-reacting instead of protecting. Common symptoms of asthma are: wheezing, coughing, rapid breathing, change in the child's level of activity, hunched-over posture, and pulling hard on the chest, neck, and stomach muscles to get air in, but especially to get air out of the chest.

You can simulate what happens in an asthma episode. Attach a balloon to a straw so the balloon can simulate a lung and the straw can simulate one of the larger air tubes that branch off in the chest from the lower end of the wind-pipe. The large air tubes in the chest are called bronchi. (Many people who were said to have bronchitis in the past actually had asthma complicated by a lot of mucus or infection in the mucus.) Blow into the straw to inflate the balloon slightly, and then deflate the balloon to stretch out the balloon a little before the demonstration. Now, blow into the straw to show how easy it is to inflate the balloon. Then, bend the straw slightly or pinch it partially closed to show what happens when the bronchi are inflamed and swollen.

To understand why asthma symptoms include having more trouble getting air out than in, you need to know about the mechanics of breathing. By contracting the muscles of the chest and of the diaphragm, we raise our rib cage and flatten the dome of the diaphragm; expanding the volume of the chest cavity. This creates lowered pressure in the chest and the airway within the chest. With the pressure in the chest part of the airway lower than the pressure in the mouth and nose, air rushes in from the mouth and nose to fill this larger, lower pressure space. We call this

breathing in. When we let our chest muscles relax, the chest wall falls, makes the space smaller, and increases the pressure inside the chest so air rushes out through the nose and mouth. We call this breathing out. Usually, the work of breathing is in drawing air in because it involves contracting muscles to raise the chest. When we relax the chest muscles, the chest falls and air flows out easily, without effort. (See diagram on p. 19.)

In an asthma episode, it is harder to get air both in and out, but especially difficult to get air out. When the chest wall falls, the bronchi tend to narrow slightly. This narrowing doesn't affect easy breathing in healthy people. However, when the bronchi are further narrowed in asthma because the muscles constrict them and the air space in the tubes is partially blocked by mucus, this natural narrowing of the bronchi during exhalation adds another obstacle to the flow of air. The narrowing of the bronchi causes the noisy wheezy sound that is louder when people with asthma breathe out than when they breathe in.

### Asthma Triggers

Many things can set off an asthma episode. Some of these triggers are common in child care. By knowing

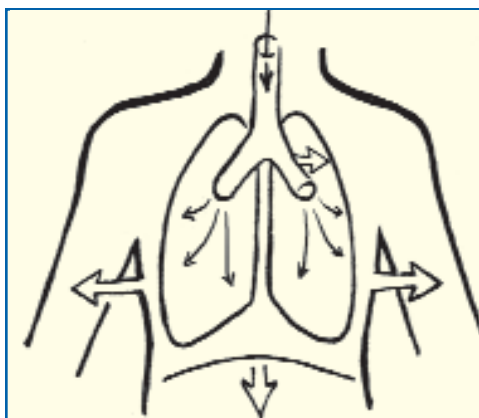
about common asthma triggers, you can reduce those that are easy to control. Asthma is more common in the fall and winter because respiratory infections are a common trigger for this disease. Children with asthma should get priority for flu shots.

Also, make sure to protect children with medication or other measures for those triggers that cannot be eliminated that are known to set off an asthma episode for them. The goal is to have the child with asthma live as normal a life as possible, with as few restrictions as feasible. (See box on page 20.)

## Asthma Medications and Devices

Caregivers need to learn the details about whatever medications and devices a particular child uses from that child's health professional. Depending on what works best, one child may use one or more of several types of medicine for different circumstances. These medications may be oral liquids or pills, inhaled powder from special dispenser gadgets, inhaled aerosols from propellant-driven metered dose dispensers used with or without a spacing device, or liquids that are made into aerosols and inhaled from a compressor-driven machine known as a nebulizer.

Many children are under-treated, and their asthma is poorly controlled. Two types of asthma medications are commonly used: controllers (for prevention) and quick-relief medications (for symptom treatment). Controllers prevent the airway from responding to triggers. Many are inhaled, and some are in pill form for children who can swallow pills. Most of the quick-relief medications are inhaled, but some are pills or liquids, too. Inhaled medicines are among the best types because they go right where they are needed, and



relax, the chest falls, and the air rushes out. When the air tubes in the chest are normal size and not blocked, the work and longest time spent in breathing is to get air in. With asthma, the tubes that make up the airway in the chest are narrowed by swelling, mucus, and constriction of muscle bands around the air tubes. So, in asthma, the biggest part of the work of breathing changes to getting air out. If you watch closely, you can see children with asthma pushing the air out, taking longer to exhale than to inhale.

smaller amounts of medicine need to be used when medicine is inhaled.

The devices used for asthma include some that help monitor asthma events to predict and assess the child's situation. The monitoring devices used for children over four years of age are known as peak flow meters. Using peak flow measurements routinely (and when symptoms are suspected) shows whether the child is in good shape or starting to show early signs of airway narrowing. Peak flow readings change before you can tell something is happening otherwise.

## Asthma Action Plan

Every child with asthma should have a written plan that includes the actions and medicines that the child should use. The child's health professional should complete the plan and review it with all those who care for the child. Unfortunately, health professionals rarely know much about the child care facility or even think about the implications for implementation of their prevention and treatment plan in child care. Caregivers

In breathing air in, the chest muscles contract to raise the chest wall and the diaphragm muscle contracts to flatten out and move downward. This expands the volume of the chest, reducing pressure inside the chest. This action pulls open the lungs and air tubes and sucks air down from the nose, throat, and windpipe into the air spaces inside the chest. The opposite happens in exhalation when the chest muscles relax, the chest falls, and the air rushes out. When the air tubes in the chest are normal size and not blocked, the work and longest time spent in breathing is to get air in. With asthma, the tubes that make up the airway in the chest are narrowed by swelling, mucus, and constriction of muscle bands around the air tubes. So, in asthma, the biggest part of the work of breathing changes to getting air out. If you watch closely, you can see children with asthma pushing the air out, taking longer to exhale than to inhale.

must be proactive by asking parents to get a plan that includes measures to use in child care, then review the plan and with parent consent, get the health professional to directly communicate the details and make the modifications that make sense for the reality of the child's life.

The plan should include what to avoid, how to prevent, and how to recognize and manage asthma episodes for this particular child. Some children do not wheeze when they have an asthma episode, but they breathe rapidly, or their lips take on a bluish tinge. Some just stop speaking normally; some show they are in trouble by visibly working harder to breathe, especially when they breathe out.

If children are using quick-relief medicines frequently, they need adjustments in their controller medicines. Some of these medicines require daily use, several times during the day. Some can be used in situations that are known to be likely to trigger an asthma episode for that particular child. In any case, using the proper technique to give the medi-

## Here is a list of common asthma triggers and preventive measures:

TRIGGER	PREVENTIVE MEASURE
<p><b>Dust mites:</b> little insects that live in carpets and other fabrics where human contact provides food in the form of cells that are normally shed from the skin every day.</p>	<p>Avoid carpets, fabrics, and fabric-covered toys where they are not needed. Launder those that are used in hot water or put them through the dryer to kill the dust mites. Use damp wiping and mopping of non-porous surfaces. Use allergy covers on pillows and beds. Store loose articles, books, and toys to minimize dust collection. Use washable shades instead of drapes or blinds as window coverings.</p>
<p><b>Animal substances:</b> pets and pests are sources of dander, droppings, and other animal secretions that can cause asthma. The most allergenic are cats and cockroaches.</p>	<p>Ban furry or feathered pets and furnishings in environments of children with asthma. For all children use aggressive control measures to prevent cockroaches and mice, using the least toxic bait or extermination method. Avoid exposing children to pesticides.</p>
<p><b>Mold and mildew:</b> mold grows where there is excessive moisture.</p>	<p>Use exhaust fans and dehumidifiers in moist areas (restrooms, kitchens, and basements). Remove wet carpets and padding. Use chlorine bleach solution (¼ cup to 1 gallon of water) to wipe down all moldy surfaces that are color safe. Use non-chlorine bleach in double the laundry dilution to wipe other areas. Avoid plants and foam pillows.</p>
<p><b>Outdoor pollens and mold spores:</b> these are largely seasonal, with the highest exposure in the early afternoon and evening.</p>	<p>Keep windows closed during periods of high pollen counts announced in the news. Use clean filters on air conditioners. Keep outdoor yard areas clear of cut grass, fallen leaves, and compost.</p>
<p><b>Irritants:</b> tobacco smoke, chemical fumes, fragrances, strong odors.</p>	<p>Ban these substances from facilities. Do not allow staff to wear perfume or to use sprays, including commercial sanitizer sprays that have an odor.</p>
<p><b>Respiratory infection:</b> common colds irritate the airway and can trigger asthma.</p>	<p>Follow good hand washing and environmental hygiene practices to minimize transmission of infection. When children have colds, give them plenty of fluids so their bodies can heal quickly. Be sure to recommend a flu shot in October or November.</p>
<p><b>Cold air and wind:</b> the dry, cold outdoor winter air and wind that carry particles into the airway can irritate the airway and set off an asthma episode.</p>	<p>When it is cold and dry outdoors, have children with asthma wear a scarf that covers mouth and nose so the air is less harsh when they breathe it in. Encourage nose, rather than mouth breathing, so the air that reaches the lower part of the airway can be warmed and humidified by the natural process during passage through the nose. Keep the humidity indoors at recommended levels for the winter: around 30-40%.</p>
<p><b>Exercise:</b> running around hard and breathing through the mouth can trigger an asthma episode.</p>	<p>Encourage children with asthma to warm up for active play, and to play hard as long as they feel well so they can develop the endurance they will need in an asthma episode. If the pollen or air pollution levels are high, play needs to be indoors. Swimming is often well tolerated because of the humid air in a mold-controlled setting. Keep an eye on children with asthma during active play. If you see they are having trouble breathing, have them rest until the symptoms subside.</p>

cine is essential for the medicine to work. Each person who is involved with these medicines should have instruction from a health professional (doctor, nurse, pharmacist, respiratory therapist) and not just from the parent. Parents may understand the instructions, but be unable to effectively teach someone else what to do.

### Preparing the Child Care Facility

Having training for the staff on asthma should be part of every child care facility's health and safety plan. Local chapters of the American Lung Association, the Asthma and Allergy

Foundation of America, and the child's own health professionals are all potential sources for such training. Only a few training materials specifically address what to do in the child care setting or illustrate how to care for very young children.

One excellent tool is on the Internet web site of the National Heart, Lung, and Blood Institute, "How Asthma-Friendly is Your Child-Care Setting? Checklist." In addition to asking about triggers, planning, and training, the checklist asks whether your child care facility has a medical or nursing consultant who can help the staff write policy and guidelines for managing all aspects of asthma prevention and management. There is no substitute for having a health professional help child care staff work out the details at the operational level.

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For information on books  
and subscriptions for groups,  
contact: Caren Brown  
(800) 221-2864

[caren@ChildCareExchange.com](mailto:caren@ChildCareExchange.com)

Obtain asthma information and education materials from:

- U.S. Environmental Protection Agency  
[www.epa.gov/iaq](http://www.epa.gov/iaq)  
(800) 438-4318
- The National Heart, Lung, and Blood Institute  
[www.nhlbi.nih.gov/health/public/lung/asthma](http://www.nhlbi.nih.gov/health/public/lung/asthma)
- National Asthma Education and Prevention Program  
(301) 592-8573  
*Materials focus largely on the school-age child with asthma, but they are adaptable to younger children.*
- Allergy and Asthma Network/Mothers of Asthmatics, Inc.  
(800) 878-4403  
*Some materials are specific to child care.*
- American Academy of Allergy, Asthma, and Immunology  
(800) 822-2762
- American Lung Association  
(800) LUNG-USA
- Asthma and Allergy Foundation of America  
(800) 7-ASTHMA  
*Now testing an asthma training curriculum for teaching child care providers about asthma.*