Asthma

What is asthma?

- Asthma is a chronic long-term condition that causes air passages to the lungs to become inflamed, swollen, and narrowed. The swelling can narrow passages enough to reduce or block airflow to and from the lungs. As air moves through the narrowed airway, it can make a wheezing sound.
- Children with asthma may have repeated episodes of wheezing, coughing, breathlessness, and chest tightness with nighttime or early morning coughing.

How common is it?

Asthma is one of the most common chronic diseases in children, affecting between 5% and 10% of children in the United States.

What are some common characteristics of children who have asthma or of asthma as children present with it?

- Asthma can vary from mild to severe, and it can be occasional or continuous.
- Asthma can worsen with infections, with weather changes, and with exposure to an asthma trigger. Asthma triggers are things that worsen asthma. Common triggers include viral infections, smoke, dust, mold, dust mites, cockroaches, and animal dander.
- Children with asthma may cough, wheeze, or have no symptoms at all, depending on how much air is moving at that time. Cough can be one of the first symptoms that the child experiences when asthma is acting up. Wheezing that can be heard also means there is a problem.
- If the child's airway is badly blocked, nothing might be heard, but the child will look like he or she is having trouble breathing.
- Asthma can and should be controlled. A child whose asthma is under control will look like any other child, will be able to play normally, and will only rarely have asthma symptoms. This control is one of the goals of asthma care, that is, to have the child live a normal life. Fortunately, with good asthma care, this control is possible for most children with asthma.
- A key component of good asthma control is management education for parents/guardians and teachers and caregivers and self-management education for older (school-aged) children. Teachers and caregivers should support older children in after-school care in self-managing their asthma, which includes helping them recognize symptoms and permitting children with adequate knowledge, skills, and behaviors to carry and administer quick-relief medication.
- Children who require frequent quick-relief medications for symptoms may need better controller medications. Use of quick-relief medications and any symptoms that keep children from fully participating in activities should be documented. This information is important to give to parents/guardians, so they can share it with their child's prescribing health care professional.

What are some elements of a Care Plan for children with asthma?

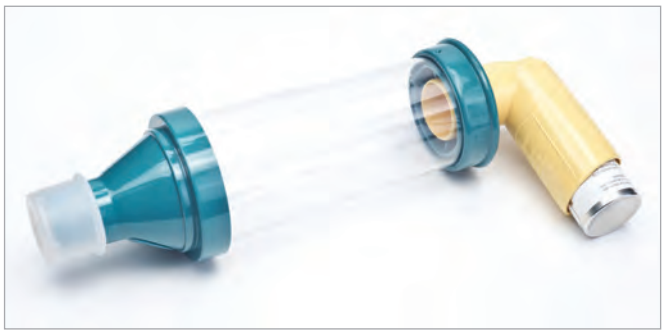
- The Asthma Action Plan is a specialized Care Plan for children with asthma.
- The Asthma Action Plan should include a list of the child's asthma triggers and which things to avoid. It should be updated after hospitalizations, emergency visits, child absences for illness, and changes in medications. A sample of an Asthma Action Plan can be found in Chapter 12.
- The Asthma Action Plan is usually designed with 3 zones based on the colors of a traffic light: red, yellow, and green.
  - Green zone is the plan for when the child is doing well and includes any controller medications that he or she needs to take to stay healthy (see Medications section later in this Quick Reference Sheet).
  - Yellow zone is the plan for when the child begins to develop symptoms such as cough and includes any quick-relief medications (see Medications section later in this Quick Reference Sheet).
  - Red zone is the plan for when the child is in trouble and needs prompt and vigorous treatment.
- Older children may use a peak flow meter to monitor their airway health. Peak flow meter numbers can be used to determine when children should take their quick-relief medications and to monitor how they are doing at different times of the day.

Asthma (*continued*)

What adaptations may be needed?

Medications

- All staff who will be administering medication should have medication administration training (see Chapter 6).
- Asthma medications are often categorized as *controller* or *quick-relief.* These 2 types of medications are used together for better asthma control.
  - **Controller medications** fight the inflammation and keep the airway open.
    - The most common controller medications are inhaled steroids, which are typically given by parents/guardians at home.
    - Although these medications have few side effects, the mouth should be rinsed after taking inhaled steroids to prevent thrush, that is, a yeast infection of the mouth lining.
    - Sometimes, the child will take oral steroids, such as prednisone, by mouth for a short period.
    - Side effects of oral steroids include mood swings, increased appetite, nausea, weight gain, and behavior changes. If oral steroids are taken over a longer period, the immune system can become suppressed.
  - **Quick-relief medications** relieve the muscle spasm to allow better airflow temporarily.
    - Sometimes, they are referred to as *rescue* medications, but this terminology is not preferred because it can imply waiting until symptoms are bad.
    - The most common quick-relief medications are β-adrenergic agonists such as albuterol. Side effects include jitteriness, fast heart rate, and hyperactivity. Some children will be sleepy after a treatment. Albuterol can be administered in different ways.
      - **Metered-dose inhalers with spacers:** Most children lack the coordination to properly use a metered-dose inhaler, by inhaling slowly and deeply while they depress the inhaler to release the medication. They will get a better dose of medication if they use a spacer. A spacer can have a mask or a mouthpiece on the end of it for the child to use that delivers the medication to the child. The inhaler-spacer method of giving inhaled medication takes very little time and delivers more medication to the lungs than using the inhaler alone or using a nebulizer.
      - Typically, the inhaler is easily attached to one end of the spacer, and the opposite end of the spacer is fitted with a mouthpiece or mask. The mask is held against the child's face, or the mouthpiece is held by the child's lips. The inhaler is depressed to release the medication as a mist into the spacer (the chamber). The child inhales 2 to 3 times to draw the medication from the spacer into the lungs. Then the spacer is washed and allowed to air-dry.
      - **Nebulizers:** Nebulizers are machines that drive air through liquid medication and make it into a mist that can be inhaled. Typically, it takes 5 to 10 minutes to complete a treatment using a nebulizer. The nebulizer allows mist to escape into the surrounding air throughout the treatment.
      - Younger children may use a mask over their mouths and noses to get medication; older children may breathe through a mouthpiece.
      - The delivery device and its tubing should be cleaned regularly and dried completely.
      - Some children dislike nebulizer treatments and may need a distraction such as reading a book or watching a video.



Metered-dose inhaler with a spacer

- Older (school-aged) children may be able to take their own medications, but they should have authorization from their parents/guardians and health care professionals that reflect that they have the maturity to recognize their symptoms and to use their medications properly.
- Quick-relief medications should be available for children with asthma to use if they need them while they are in school or child care.

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Administering quick-relief medication

- The ways to recognize that the child needs treatment with a quick-relief medication should be clearly stated in lay language in the Care Plan (see Asthma Action Plan for Home & School [page 211] in Chapter 12).
- As always, expiration dates of medications should be checked regularly and medications should be stored in a safe location. The number of puffs used should be documented and a cumulative count kept, ensuring that medication is still in the inhaler.
- Children with asthma are especially vulnerable to respiratory tract infections.

Dietary Considerations

Diet may need to be modified for children with asthma who have food allergies.

Physical Environment and Other Considerations

- **Indoor environment:** Be tobacco-free (true smoke-free environments do not allow smoking outside), control mold and mildew by fixing any water leak quickly, avoid having furry or feathered pets, clean the environment frequently, use integrated pest management to limit pesticide use and pests, use dustcovers for bedding, ensure good ventilation, change air filters frequently, and avoid using strong perfumes and scented cleaning products.
- **Outdoor play:** Be aware of ozone and pollen levels. Air temperature extremes can sometimes be a problem but should be balanced with the child's need to run and play outdoors. These are good issues to problem-solve with parents/guardians and health care professionals. Children with exercise-induced asthma may need to use their albuterol inhalers before physical activity.

Transportation Considerations

- Consider how to handle respiratory distress that develops during transportation to and from school or child care settings if it is not done by parents/guardians. Medication, the child's Care Plan, and a mobile phone should all be available.
- If the child's asthma is temperature sensitive, be aware of vehicle temperatures and, if possible, take time to use heat or air conditioning to stabilize the temperature as necessary before the child enters the vehicle.

What should be considered an emergency?

- Notify parents/guardians if
  - Symptoms do not improve after using the dose prescribed for the quick-relief medication.
  - The quick-relief medication has been needed 2 or more times during the day.
- Always notify parents/guardians about any asthma symptoms, even when they do not reach the level that constitutes an emergency, so the parents/guardians can work with the child's health care professional to monitor control of the asthma and keep the symptoms under good control. A daily symptom checklist can be a good communication tool to use with parents/guardians.
- Call emergency medical services (EMS) (911) without delay for any of the following emergencies experienced by the child:
  - Severe breathing problems such as struggling to breathe and pulling in at the neck or under the rib cage with every breath
  - Difficulty talking or walking
  - Lips or fingernails that are turning blue
  - Symptoms that are not improving after a second dose of quick-relief medication
- Keep emergency contact information updated at all times.

Asthma (*continued*)

What types of training or policies are advised?

- Preventing exposure of the child to asthma triggers.
- Recognizing the symptoms of an acute asthma episode.
- Treating acute episodes, including an understanding of the purpose of treatment, the expected response, and possible side effects. Caregivers should be able to assist and supervise the child during the treatment.
- Knowing when to call EMS (911).
- Using health consultants for training.
- Working as a team.
- Tracking absences and early dismissals.
- There should be a clear policy about exclusion and readmission associated with active wheezing.

What are some resources?

- American Academy of Pediatrics: www.aap.org, https://shop.aap.org, 1-866-843-2271
  - *Allergies and Asthma: What Every Parent Needs to Know* (book)
  - *Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs,* 3rd Edition (book), http://cfoc.nrckids.org/CFOC
    - Standard 3.1.3.2, Playing Outdoors
    - Standard 3.1.3.3, Protection From Air Pollution While Children Are Outside
  - Dinakar C, Chipps BE; American Academy of Pediatrics Section on Allergy and Immunology and Section on Pediatric Pulmonology and Sleep Medicine. Clinical tools to assess asthma control in children. *Pediatrics.* 2017;139(1):e20163438
- American Lung Association: "Improve Asthma Management in Schools" (Web page), www.lung.org/lung-health-and-diseases/lung-disease-lookup/asthma/asthma-education-advocacy/asthma-in-schools.html
- Asthma and Allergy Foundation of America: www.aafa.org
- Centers for Disease Control and Prevention: www.cdc.gov, 1-800-CDC-INFO (1-800-232-4636)
  - "Asthma Guidelines and Strategies" (Web page), www.cdc.gov/HealthyYouth/asthma/strategies.htm
  - "Asthma in Schools" (Web page), www.cdc.gov/healthyschools/asthma/index.htm
  - "Managing Chronic Health Conditions in Schools" (Web page), www.cdc.gov/healthyschools/chronicconditions.htm
- National Heart, Lung, and Blood Institute National Asthma Education and Prevention Program
  - "How asthma-friendly is your child-care setting?" (checklist), www.nhlbi.nih.gov/health/public/lung/asthma/chc_chk.pdf
  - "How asthma-friendly is your school?" (checklist), www.nhlbi.nih.gov/health/public/lung/asthma/friendly.pdf
  - *Managing Asthma: A Guide for Schools* (booklet), www.nhlbi.nih.gov/files/docs/resources/lung/NACI_ManagingAsthma-508%20FINAL.pdf
- National Institute of Allergy and Infectious Diseases: www.niaid.nih.gov
- US Environmental Protection Agency: "Creating Healthy Indoor Air Quality in Schools" (Web page), www.epa.gov/iaq/schools

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