

Where **kids** come first

Childhood asthma



L'Hôpital de Montréal pour enfants
The Montreal Children's Hospital

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In Canada, childhood asthma has quadrupled in the last decade. It is one of the most common reasons children are hospitalized or visit emergency departments. A popular theory is the “hygiene hypothesis”. This hypothesis suggests that progress has resulted in people being less exposed to microbes early in life, causing the immune response to shift to an allergic-type response, which in turn leads to the development of asthma, eczema, and allergies.

Asthma is a consequence of inflammation of the bronchial tubes. Symptoms include:

- repeated episodes of wheezing,
- shortness of breath,
- tightness in the chest, and
- coughing.

Asthma has an important hereditary component since children whose parents have asthma have a higher risk of developing asthma.



In the case of tobacco smoke, smoking should be done outside the house, and of course, quitting smoking is encouraged.

Is it asthma?

Asthma is often difficult to diagnose because the symptoms are similar to other conditions that affect the respiratory system. Asthma is diagnosed in a child who has had at least three episodes of wheezing. Other clues are coughing at night and becoming out of breath with exercise. In children over age six, breathing tests can confirm the diagnosis of asthma.

The majority of children with asthma have their first episode before the age of three. Episodes are usually triggered by a viral infection, such as a cold. Children exposed to tobacco smoke have more frequent colds, ear infection and are more likely to wheeze. Two-thirds of young children who wheeze when they have a viral infection will stop wheezing after the age of five. Children who continue to have asthma past the age of five usually have one or more of the following:

- a parent with asthma
- allergies
- eczema

Asthma can be classified as *episodic*, with symptoms appearing for brief periods lasting less than two weeks and no asthma symptoms between the episodes, or *persistent*, where symptoms appear frequently, up to a few times a week.

Episodic asthma occurs most commonly between one and six years of age and has a tendency to disappear as children approach school age. Children with episodic asthma are fine between the episodes, which occur mostly when the child has a cold or other respiratory infection. Even though asthma symptoms may appear less frequently, the episodes can be severe enough to require a visit to the emergency room, and some times, a short hospitalization.

Children with persistent asthma frequently have symptoms, with or without colds. These children miss school frequently, have difficulty doing exercise, and do not sleep well. Up to 80 per cent of children with persistent asthma are allergic and have close relatives with asthma or allergies. Persistent asthma may begin at an early age but more commonly appears during school age and lasts throughout adolescence and adulthood.

What triggers asthma?

A viral infection is the most common trigger for asthma, especially in younger children, followed by environmental irritants such as tobacco smoke, and allergies. In young children, the most common allergies are to dust mites and furry pets. Children over six years of age may also have outdoor allergies, mostly to pollens and moulds. Breathing cold air (below the freezing point), inhaling irritant fumes (smoke, cleaning products, beauty products), and strenuous exercise are also triggers for some children. In general, the worst season for asthma is winter because there are more viral infections and because more time is spent indoors, thereby increasing exposure to many sources of allergies.

How can asthma episodes be prevented?

The regular use of controller medication, as described below, keeps the asthma symptoms under control, allows the child to do their usual activities, and is the best protection for acute episodes during viral infections.

Children should undergo tests to determine the exact type of allergies they have. If the allergy is to pets, these should not be allowed in the indoor living environment or parents should consider finding another home for the animals. To control allergies to dust mites, the use of mattress covers and pillow covers that keep out dust mites is recommended, as well as removing carpets from the child's bedroom. Bed sheets should be washed in hot water on a weekly basis and objects that attract dust mites or trap animal hair, such as books, stuffed animals and non-washable curtains, should be removed from the bedroom. Many asthmatic children have allergic rhinitis, which can cause chronic nasal congestion, and should be treated at the same time as the asthma.

What are the current treatments

Two main types of medications are available to treat asthma. **Relievers**, namely quick-acting bronchodilators delivered by an inhaler, are usually used on an as-needed basis. They open up the airways and relieve symptoms. When needed, bronchodilators can be safely given at home or school, up to three doses 20 minutes apart. If on a regular basis, the child needs a bronchodilator more frequently than two times a week, then controllers may be a better solution.

Commonly used bronchodilators are Ventolin (salbutamol) and Bricanyl (terbutaline).

Controllers are anti-inflammatory medications that control the swelling in the airways. These are used on a regular, long-term basis. Asthma experts currently consider inhaled corticosteroids as the first line of treatment for asthma. If regular use of an inhaled corticosteroid is not enough to control asthma, or if the asthma is more severe, other controller medications are added to the inhaled corticosteroids. The preferred “add-on” medications are long-acting bronchodilators in combination with an inhaled corticosteroid, taken by an inhaler containing both. The alternative is a leukotriene receptor antagonist, taken as a pill, in addition to the inhaled corticosteroid. In the most severe cases, a corticosteroid taken by mouth may be necessary to keep the asthma under control. Short treatments of corticosteroids by mouth are commonly used during acute attacks, which require a visit to the emergency room. Typically, the short treatment is given for five to 10 days.

Commonly used inhaled corticosteroids are Flovent (fluticasone), Pulmicort (budesonide), Qvar (beclomethasone), and Alvesco (ciclesonide). Combinations of inhaled corticosteroid with long-acting bronchodilator include Advair (fluticasone and salmeterol) and Symbicort (budesonide and formoterol). The oral corticosteroid most commonly used in case of an emergency room visit is PediaPred (prednisolone). The only leukotriene receptor antagonist used in children is Singulair (montelukast).

Children with mild wheezing during a cold may be treated at home with just a bronchodilator given every time the child wheezes or is short of breath. With more severe episodes, when the effect of the bronchodilator lasts less than four hours, or when the child does not respond to the bronchodilator, they should be treated in the emergency room. Usually, a short treatment of corticosteroids taken by mouth is started in the emergency room and continued for five days.

for asthma?

Asthma experts do not recommend that inhaled corticosteroids be used only when the child has a cold or other viral respiratory infections in children with episodic wheezing. This is not the case for persistent forms of asthma, where experts agree inhaled corticosteroids should be used on a regular, long-term basis.

Experts also recommend the use of regular controller treatment for preschool children who have episodic wheezing that is excessively frequent or severe, and in those children who have the risk factors (e.g. asthmatic parent, eczema, or allergies) that may cause their asthma to continue in to their school years.

When an asthma treatment is prescribed, your doctor should prepare a personalized action plan with instructions on what to do, how to know if the asthma is not properly controlled and when to seek medical help.

When should I seek further medical help?

If your child is asthmatic, you must promptly consult a doctor when one of the following conditions occurs:

- Your child is wheezing and the bronchodilator is providing no relief after three doses given 20 minutes apart.
- The bronchodilator is needed more frequently than once every four hours.
- The wheezing seems to respond to the bronchodilator but the asthmatic condition doesn't start to get better after two to three days. For example, your child has a cold and continues to need the bronchodilator four to six times a day, two to three days after the onset of the wheezing.

Where can I get help?

The Montreal Children's Hospital (MCH) Asthma Centre has pediatricians, allergists, respirologists, respiratory therapists and asthma nurses. The MCH asthma clinic is open seven half-days a week (by appointment). The clinic offers medical evaluation, pulmonary function and allergy testing, development of a treatment plan including prescription of medications, and teaching and support for the family. You do not need a doctor's referral to make an appointment.

The Quebec Asthma Education Network has named The Montreal Children's Hospital Asthma Centre an Asthma Education Centre. Physicians or other health professionals refer patients for asthma education to the Centre, which provides parents and children with a better understanding of what asthma is and how to deal with it. The Centre also provides instruction on how to use the various devices and medications, how to assess if the asthma is well controlled, and how to use the prescribed action plan.

There is currently no cure for asthma. However, understanding asthma and controlling the symptoms can help children with asthma lead active and healthy lives.



When an asthma treatment is prescribed, your doctor should prepare a personalized action plan.



This information was prepared by the Asthma Centre of The Montreal Children's Hospital of the McGill University Health Centre.

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