DELAWARE MODERN PEDIATRICS, P. A.
David M. Epstein, M.D.
Tamar Hirshberg, RN, CPNP
300 Biddle Avenue, Suite 206
Springside Plaza, Connor Building
Newark, Delaware 19702
Phone: (302) 392-2077
Fax: (302) 392-0020

www.DMPKids.com

Asthma in Children

This handout will help you understand your child's asthma. Asthma is a long-term condition, but usually it is completely controllable. It will be helpful to know:

- what asthma is,
- how to treat attacks,
- what to expect over time, and
- some preventative measures.

At the end of this handout, you will find some other resources listed, to find more information.

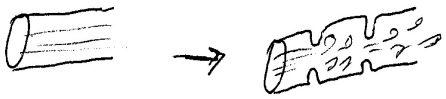
What is asthma?

Asthma is an inflammation of the lungs that obstructs air flow in and out. There are 3 ways that air is obstructed:

1. People with asthma have chronic inflammation of the airways. This causes the walls of the airway to swell, which narrows the space that air must flow through. (Imagine that as a donut swells, the hole in the middle shrinks.)

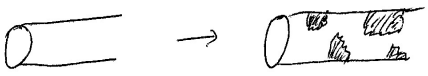
- **Corticosteroids ("steroids")** combat this inflammation of the airways.

2. There are small muscles, called "smooth muscles", which spiral around the outside of the airways. In an asthma attack, these muscles spasm, causing irregular narrowing of the airway. Air flow is obstructed, and the irregular narrowing causes turbulence.



- **Albuterol** reverses the spasm of the smooth muscles.

3. The lungs of people with asthma make a peculiar type of white, sticky mucus in the airway. This mucus causes obstruction of the airway, and stimulates coughing.



- **Steroids, drinking fluids, and humidifying the air** can help reduce this mucus.

What are the symptoms of asthma?

Wheezing on expiration is the asthma symptom everyone thinks of. As an asthma attack progresses, shortness of breath becomes prominent, accompanied by a tight, dry cough.

But some people have only a dry **cough**, especially at night, as their only symptom.

Small infants and children have soft rib cages. So when they suffer airway obstruction, you may see the ribs (or skin) get sucked in momentarily when the child inhales. This is called "retractions," and it is an important symptom to recognize. You may view an excellent YouTube video demonstration, posted by a mother of a child with an asthma attack, here: http://www.youtube.com/watch?v=U-RfbrnMJZE. If you see retractions like this, seek medical help immediately.

An important clue for asthma is that the airway obstruction comes and goes over time. People with mild asthma may wheeze or cough only occasionally, perhaps only every year or two. More severe asthma may, if untreated, give symptoms every day; but the severity of asthma fluctuates over time. If the symptoms of wheeze, cough and trouble breathing do not vary over time, there may be a different disease at work.

Who gets asthma? How do you get it?

Asthma tends to be inherited, although some people with asthma have no known family history. People with asthma (or their relatives) also may have trouble with upper respiratory allergies (hay fever), eczema, and food allergies.

Infants who contract a lung disease called "bronchiolitis" have a 50-50 chance of eventually being diagnosed with asthma. (This is especially true if the bronchiolitis is caused by a virus caused RSV, or if there is a family history of asthma.) No one is sure whether the virus causes lung damage that results in asthma later in life, or if there is something about asthmatics' lungs that makes them more susceptible to catching a virus that causes bronchiolitis as infants.

Asthma is also much more likely in children exposed to cigarette smoke or air pollution.

Asthma attacks are often kicked off by a trigger. In infants, a virus, ear infection, or other infection may be the trigger. School-age children may get asthma attacks when exposed to something that they are allergic to (such as animal dander or pollen). Exercise can cause an asthma flare in older children and teens. Asthma symptoms may vary with the seasons; some families know that their child's asthma is likely to flare in the fall or winter.

Chronic conditions such as obesity, hay fever, recurrent ear infections, or gastroesophageal reflux may also complicate asthma. It is important to treat these conditions concurrently with the asthma.

Children who attend daycare are somewhat more likely to suffer from their asthma, because of their exposure to viruses. However, the mildly increased risk of asthma attacks usually outweighs the social and family benefits of daycare; I rarely recommend removing

children from a well-run daycare solely to avoid asthma attacks. (In an acute attack, a child who is wheezing enough to be kept from school or daycare should be seen in our office that day, if possible.)

What medications are used to treat asthma? When should I use them?

As described above, **steroids** reduce the inflammation in the lungs. The most commonly used steroid through a nebulizer is Budesonide (Pulmicort®). Fluticasone (Flovent®) is a commonly used steroid in a Metered Dose Inhaler (MDI). Steroids are usually used once or twice a day. It may take a couple of days for their effect to take hold, but the benefit can last for several days. Inhaled steroids are most effective at preventing asthma attacks when used **every day** over weeks to months.

Albuterol is called a "rescue" treatment, during acute attacks. It relaxes the spasm in the airway's smooth muscles. Albuterol can be given as often as every 4 hours (or occasionally even more frequently), but its effect lasts only 4 hours. It is available for nebulizers as a generic medication. Unfortunately, albuterol MDI's are only available as brand-name medicines (such as Proventil® or Ventolin®), which makes them expensive unless covered by insurance.l

Albuterol should be given right away if a child with asthma develops a cough, wheeze or trouble breathing. If a child needs albuterol more than once a week, he probably needs to increase his daily preventative treatment.

Oral steroids (prednisone, prednisolone or dexamethasone) can be used as a short "burst" for severe attacks. For children with more severe asthma, we may recommend that you keep a small supply at home in your medicine cabinet. If a child has a bad attack, we may instruct you by phone to give the oral steroids until you can get to our office; sometimes this will avoid a trip to the hospital.

If daily inhaled steroids are not sufficiently effective to prevent recurrent attacks, other daily medication may be started. Singulair® (montelukast), one oral dose daily, is easy and effective (and also can treat hay fever). Behavioral side effects can occur but are rare. Sometimes we use higher doses of inhaled steroids, or a combination medication such as Advair®.

How are the medications administered?

Asthma medicines are usually inhaled, through a nebulizer machine or with a Metered Dose Inhaler (MDI).

Nebulizers:

Albuterol and budesonide (Pulmicort®)are medications for the nebulizer machine, sold in small, disposable, individual-dose vials, about 24 in a box. You may get them from your pharmacy with a prescription from us.

The nebulizer machine forces compressed air through a length of tubing, to a mask or T-tube. The medications are emptied into a holding container on the mask or T-tube, and the compressed air makes a mist that the child breathes. (Albuterol and budesonide may be administered together in the nebulizer.) Administering a dose takes about 5 minutes.

Infants and younger children must use a mask on their face with the nebulizer. The mask must be in physical contact with the child's face so that the medication mist does not escape - even if the child cries and fights! Over time, if children learn that they have no choice but to take each dose of their nebulizer medicine, they usually calm down and accept it.

Older children may be able to breathe through a T-tube, keeping it tightly in their mouth until the medication chamber is empty.

Nebulizer machines can be obtained through our office, or delivered to your home by a 3rd party, depending on your health insurance plan. You can also buy convenient portable, rechargeable nebulizers on the internet.

Metered Dose Inhalers (MDI's):

MDI albuterol and inhaled steroids are very convenient. They are easy to transport, they take less than a minute to use, and they work just as well as nebulizers when used correctly.

However, there is a technique to using MDI's that must be learned and practiced, in order to benefit from the medication. Many children and adults do not learn the correct MDI technique, unless they are taught properly and practice daily. It is crucial to be inhaling at the moment that the MDI is actuated (pressed). Please ask us to demonstrate the correct technique, or see the excellent videos at this website:
http://www.use-inhalers.com

What are the side effects of asthma medication?

In some patients, albuterol may cause jitteriness or a rapid heart rate. Usually this effect resolves within 20 minutes or so. If the jitteriness is excessive an alternative medication (such as Xopenex®) can be tried, although it is more expensive. In those rare patients with a known cardiac arrhythmia, caution must be used when giving albuterol.

Inhaled steroids generally have no side effects at all. Very rarely, a yeast infection in the mouth (thrush) will develop, which is easily treated.

I must emphasize that albuterol and inhaled steroids are remarkably safe. These medications do not build up in the body; they do not suppress the child's immune system; and they do not lose their effectiveness with repeated doses. One cannot become "addicted" or "immune" to albuterol or inhaled steroids.

Please reassure friends or relatives who fear “overuse” of asthma medications; it is harmful to try to teach an asthmatic child not to “depend” on medication, or to minimize its use. In fact, inhaled medications work better if given **before** the child gets very sick and the

airways become narrow. "Overuse" of inhaled asthma medications causes no harm to the child. So if the question arises whether to administer an asthma treatment, the answer is always "yes." Don't wait to treat!

The only circumstance of "overusing" asthma medications occurs if an asthmatic patient tries to depend on albuterol alone, more than once or twice a week, without using daily preventative medication or seeking medical attention. In this case, the underlying inflammation is not treated, and respiratory distress will persist. If albuterol is needed more than once a week, please call us.

What happens over time to children with asthma? Can you outgrow it?

Many children under 3 with asthma (perhaps 80%) will outgrow it by the age of 6.

However, only a small number of children over 6 with asthma will outgrow it. The severity of the asthma may fluctuate as the years go by, and it may seem to disappear entirely for a few years, but it might recur as an adult.

Avoiding the use of asthma medication does not make it more likely that a child will grow out of asthma. In fact, undertreatment over the long term will increase the chances of permanent lung damage as an adult.

What can I do to minimize my child's asthma attacks?

The most important thing is to avoid **cigarette smoke**. Even "3rd-hand smoke" (cigarette smoke odor from clothes, carpeting, bed sheets, smoke from another room, or even the breath of a heavy smoker) can exacerbate asthma symptoms. It is worthwhile to discuss this with your family and other visitors, and ask them to avoid smoking near your child. (Tell them that it's "doctors' orders"!)

Make sure that your child gets a **flu vaccine** every year. Be sure that all other family members and caregivers are immunized for flu every year as well, to minimize contagion. Asthmatics can get very ill if they catch the flu.

In the home, frequent **hand washing** can minimize the spread of viruses that might precipitate an asthma attack. Managing pet dander and dust is also important; our handout about "Environmental Allergies" will give more information.

See us periodically for an "asthma recheck" to review symptoms and tune up the treatment. I recommend a visit every 3 to 6 months – more frequently if needed. Your insurance should cover the cost of these visits.

If your child is over 5 or so, we may prescribe a **peak flow meter** for you to use at home. This meter measures the maximum rate of air flow when a child blows into it as hard as he can. It is useful to track the peak flow frequently, even twice a day; once you know your child's "usual best" peak flow, it is easy to tell how bad the asthma is when his peak flow drops, and when it's getting better.

If your child's asthma is not well controlled, we may **refer** you to a pulmonologist or an allergist for specialty treatment. In particular, if allergies are a prominent component, a course of allergy shots may give significant long-term improvement for the asthma and allergy symptoms.

The school nurse is asking for an Asthma Action Plan. What is that?

Your child's asthma may flare up at school. The nurse can use your child's albuterol to start treatment, but she needs instructions from a doctor. An Asthma Action Plan is an instruction form, tailored to your child, that instructs the nurse or other responsible adult what to do in case of an asthma attack. Many such forms are available, but we have developed one for our patients that is clear and easy to follow. Usually we complete these forms for you at an asthma recheck in the office.

How can I learn more?

The American Lung Association maintains a website with a wealth of information for both you and your child. Read more at http://www.lung.org/lung-disease/asthma/.

The National Institutes of Health (CDC) also has an extensive website, with diagrams. Click http://www.nhlbi.nih.gov/health/health-topics/topics/asthma/ to read more.

Asthma Camp is a summer camp run for the benefit of children with asthma. In addition to usual camp activities, kids undergo activities that educate them about their asthma and how to take care of themselves. Search the web for "Delaware Asthma Camp" for more information.

-- David M. Epstein MD

