



*Second Edition*

# **Asthma Information for Teens**

**Health Tips about Managing Asthma  
and Related Concerns**

*Including Facts about Asthma Causes, Triggers and  
Symptoms, Diagnosis, and Treatment*



*Edited by Kim Wohlenhaus*

*OmniGraphics*

P.O. Box 31-1640, Detroit, MI 48231

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## Chapter 28

# Do Inhaled Steroids Stunt Your Growth?

Teens may worry whether medication used to treat their asthma will make them shorter as adults. A great deal of research has been performed on this subject; this chapter will look at the basis of these concerns, and describe what the evidence tells us.

### **What are corticosteroids, and why do we give them to asthmatics?**

Corticosteroids are a group of hormones that have widespread effects in the human body. Cortisol is produced in the adrenal glands. Among many other functions, it influences immune function, metabolism, blood pressure, and bone growth. A number of synthetic hormones with effects similar to cortisol have been developed to treat a variety of disease conditions. Commonly used corticosteroids include prednisone, prednisolone, triamcinolone, beclomethasone, budesonide, and fluticasone.

Asthma is a disease where chronic airway inflammation is present throughout the lungs. This inflammation leads to airway narrowing through muscle spasm, swelling, and excess mucus production. Reducing the inflammation is essential to treating asthma.

About This Chapter: Text in this chapter was written for Omnigraphics by David A. Cooke, MD, FACP. Dr. Cooke is board-certified in Internal Medicine and practices in Ann Arbor, Michigan. © 2004, Omnigraphics, Inc. Reviewed in 2009.

Corticosteroids have potent anti-inflammatory effects. In asthma, they are used to reduce airway swelling and spasm and stop excess mucus production. This results in less wheezing, less shortness of breath, and increased ability to participate in everyday activities.

Because the inflammation in asthma is mainly confined to the lungs, corticosteroids are most often given as an inhaled mist or powder. This delivers the medication directly to where it is needed.

### What's It Mean?

Adrenal Glands: A pair of yellow, triangle-shaped glands; one sits on top of each kidney. They produce many different important hormones.

Adult Height: How tall you are when you stop growing. Most teens stop growing between age fifteen and nineteen; a few may stop sooner or grow longer.

Bronchodilators: Medications that open airways and relieve shortness of breath. Albuterol is one commonly used bronchodilator medication. Most give quick relief, but they don't treat the inflammation that causes asthma.

Corticosteroids: Hormones made in the human body that reduce inflammation. Many are used as medications.

Growth Velocity: How quickly a person is growing. For example, growing one inch taller per year.

Inflammation: Irritated and swollen tissue, packed with angry white blood cells.

Leukotriene Modifiers: Medications which reduce inflammation in a different way than corticosteroids or mast cell stabilizers. Montelukast, Zafirlukast, and Zileuton are the most commonly used forms. They are also less powerful than corticosteroids, but may be helpful when corticosteroids alone don't stop asthma symptoms.

Mast Cell Stabilizers: Medications to prevent certain cells from releasing hormones that cause more inflammation. Cromolyn and nedocromil are the most commonly used mast cell stabilizers. They have anti-inflammatory effects, but are weaker medications than corticosteroids.

Methylxanthines: An older type of asthma medication that helps open airways. Theophylline is an example. They do not treat inflammation. They are not used often today because of side effects and tricky dosing.

### ♣ It's A Fact!!

Taking your corticosteroid inhaler daily helps prevent:

- Wheezing
- Shortness of breath
- Needing to use your "emergency" inhaler
- Emergency department visits
- Hospitalization
- Death

### Why are there concerns about corticosteroids use in children and teens?

While corticosteroids reduce inflammation, they have many other effects. When given in high doses, corticosteroids reduce bone growth. In growing children and teens, this might lead to slowed growth and shorter heights as adults.

There is little question that these negative effects of corticosteroids are seen when they are given in high doses for months or years by oral or intravenous routes. Inhaled corticosteroids are given in much lower doses, and they are delivered mainly to the lungs.

Some of the inhaled medication is absorbed into the bloodstream from the lungs, however, and could have effects elsewhere in the body.

### If corticosteroids might have these risks, why don't we use other kinds of medications?

A number of medications have been developed for treatment of asthma. These include bronchodilators (such as albuterol), mast cell stabilizers (such as cromolyn), leukotriene modifiers (such as montelukast), and methylxanthines (such as theophylline). Each of these medication types have their roles in asthma therapy, and are often used in addition to inhaled corticosteroids.

It has become very clear from clinical studies, however, that corticosteroids are the most effective medications for treating all but the mildest cases of asthma. Many comparative studies between corticosteroids and other medications have been performed. These studies consistently show that corticosteroids are superior to other medications. Corticosteroids improve air flow and ability to exercise, and reduce wheezing, shortness of breath, hospitalizations, and death more than any other medications tested to date.

Accordingly, corticosteroids have become the cornerstone of asthma therapy. There is universal agreement among experts and medical organizations that corticosteroids should be first-line treatment for asthma.

### **Do corticosteroids slow growth?**

A number of studies have looked at rates of growth in children and teens with asthma. Determining the effects of corticosteroids can be difficult for a number of reasons. Severe asthma itself can affect growth, although in general, asthmatic children do not end up shorter than those without asthma. Because corticosteroids are so important in controlling asthma, it is ethically and practically difficult to study severely asthmatic people who do not receive inhaled corticosteroids. Therefore, nearly all studies have been performed in people with mild to moderate asthma symptoms.

The majority of studies have shown a small but significant reduction in growth velocity among children receiving inhaled steroids for asthma. This seems to be greatest in the first one to two years of use, and decreases as time goes on. Some studies have suggested that this effect may be stronger with some drugs than others. However, most experts feel that all inhaled corticosteroids have the potential to slow growth.

### **So, does this mean corticosteroids will make me shorter as an adult?**

Interestingly, the answer appears to be no. Although the rate of growth may be somewhat slower with inhaled corticosteroids, multiple studies have concluded that there are little or no effects on final adult height.

Many studies have reported no difference in final height between asthmatic children who received inhaled corticosteroids and those who did not. Among those that did find a difference, the difference was very small: about one centimeter (less than half an inch).

#### **♣ It's A Fact!!**

Inhaled corticosteroids change your adult height by less than a half-inch.

**Remember!!**

- If you get short of breath more than twice a week, you probably need an inhaled corticosteroid.
- In people with asthma, the benefits of inhaled corticosteroids almost always outweigh their risks.

**If corticosteroids slow growth velocity, why doesn't this mean shorter adult height?**

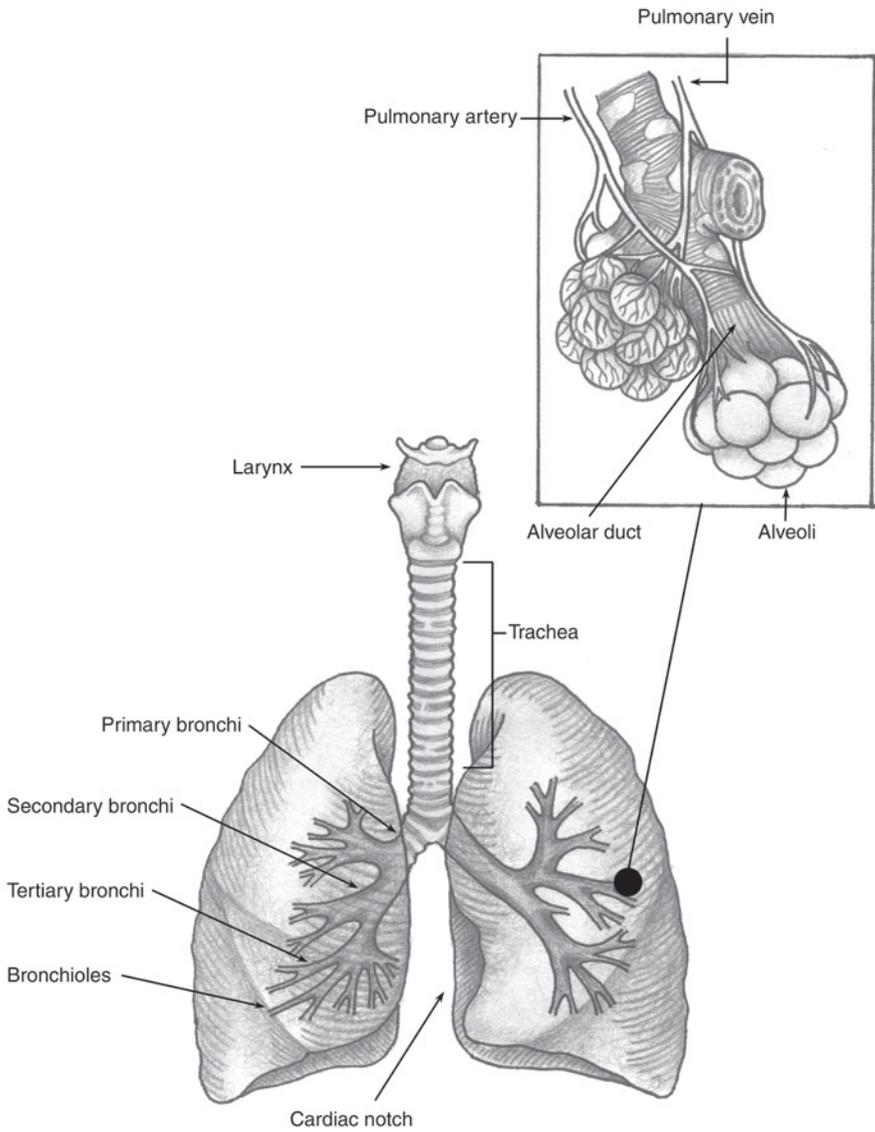
This does seem like a contradiction. The studies don't tell us why treated children don't end up shorter, but there are some theories.

While children or teens initially grow more slowly on inhaled corticosteroids, it may be that they later “make up” for the lost growth near the start of treatment. It is also possible that teens on inhaled corticosteroids stop growing at a later age, so that slower growth is balanced by more time for growth.

**What's the bottom line? Will inhaled steroids stunt my growth?**

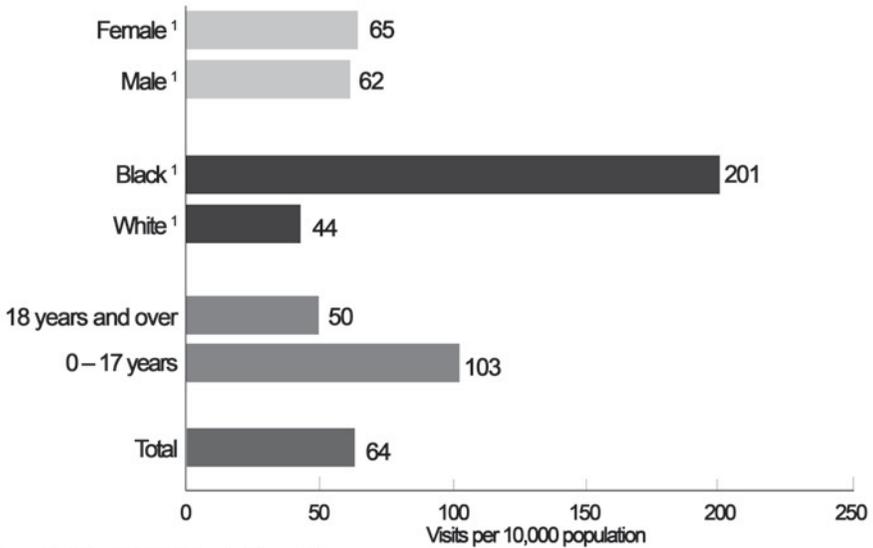
The evidence strongly indicates that inhaled corticosteroid use has little, if any, effects on their height as adults. Inhaled corticosteroid use will not stunt your growth.

Each person is different, and your treatment will need to be tailored to your individual needs. If your asthma requires high doses of inhaled corticosteroids, talk to your doctor about making regular growth measurements. Still, for the vast majority of asthmatics, the health benefits of inhaled corticosteroids far outweigh any known or theoretical risks.



*Figure 1.2. Bronchi, Bronchial Tree, and Lungs. SEER Training Module, Anatomy and Physiology, National Cancer Institute. Image re-drawn for Omnigraphics by Alison DeKleine.*

### Number of asthma emergency department visits per 10,000 population: United States, 2004



<sup>1</sup> Age adjusted to 2000 U.S. standard population.

NOTE: Hispanic origin not available; estimates for race categories include both Hispanic and non-Hispanic persons.

SOURCE: National Hospital Ambulatory Medical Care Survey, National Center for Health Statistics, CDC.

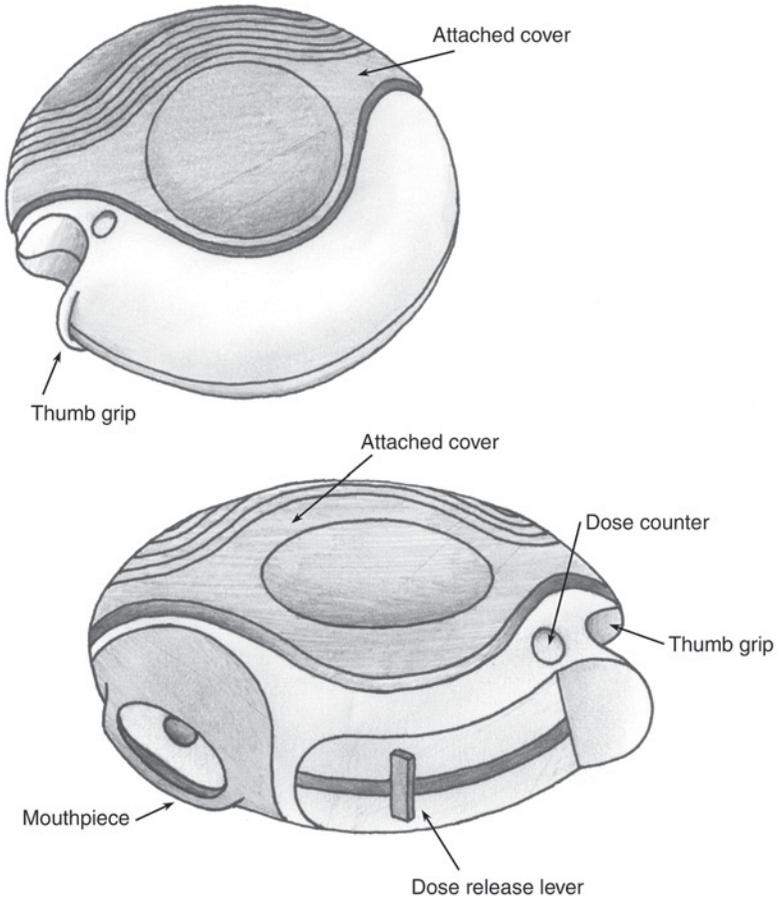
*Figure 3.3. Number of asthma emergency department visits per 10,000 population: United States, 2004. From Asthma Prevalence, Health Care Use and Mortality: United States, 2003–2005. National Center for Health Statistics, Centers for Disease Control and Prevention, October 2008.*

Current asthma prevalence in children under 18 ranges from 5.7 percent in South Dakota and Idaho to 11.9 percent in Delaware.<sup>6</sup>

Within the last few years, mortality and hospitalizations due to asthma have decreased and asthma prevalence has stabilized, possibly indicating a better level of disease management, such as increased use of inhaled steroids.

Asthma medications help reduce underlying inflammation in the airways and relieve or prevent airway narrowing. Control of inflammation should lead to reduction in airway sensitivity and help prevent airway obstruction.

Two classes of medications have been used to treat asthma—anti-inflammatory agents and bronchodilators. Anti-inflammatory drugs interrupt the development



*Figure 30.4. A Diskus looks like this.*

### ✓ Quick Tip

Always write down the number of puffs you've taken so that you can anticipate when you need to refill your prescription.

Store all MDIs at room temperature.

## Flu/Cold Or Allergies?

Cough. Sneeze. Wheeze. You know the symptoms, but do you really know the cause? The similarities between symptoms of the flu/cold and nasal allergies (also called allergic rhinitis, indoor or outdoor allergies, seasonal allergies or hay-fever) can cause confusion. Worse, it can cause you to make the wrong diagnosis and treat with the wrong medications. And, if allergies are left untreated, it can cause more serious conditions like sinusitis or ear infections.

Learn about the difference in Table 34.1, and talk to your doctor about a complete medical exam to find out for sure.

**Table 34.1.** The Differences Between Symptoms Of Flu/Cold And Allergies

	Allergies	Flu/Cold
Symptoms	Allergies usually cause runny nose ( <b>clear</b> discharge), stuffed nose, violent sneezing, wheezing, coughing, watery and itchy eyes.	Flu/cold usually includes runny nose ( <b>yellow</b> discharge), aches and pains, sore and scratchy throat along with sneezing and coughing.
Fever	There is <b>no fever</b> with allergies.	If you have a <b>fever</b> it is almost certainly a flu/cold rather than allergies.
When	<b>Anytime</b> of the year: spring, summer, fall or winter.	Usually appear in <b>winter</b> , but are also possible in the fall, spring or summer.
Warning	Symptoms begin almost <b>immediately</b> after exposure to allergens.	Usually takes a <b>few days</b> for flu/cold symptoms to appear.
Duration	Symptoms last a <b>long time</b> , as long you are exposed to the allergen. If the allergen is present all year long, symptoms can be chronic.	Flu/cold symptoms should clear up within a <b>few days</b> to a week. Rarely lasts more than 10 days.

## Chapter 59

# Asthma Organizations

### **Allergy and Asthma Network Mothers of Asthmatics**

2751 Prosperity Avenue, Suite 150  
Fairfax, VA 22031  
Toll Free: (800) 878-4403  
Fax: (703) 573-7794  
Website: <http://www.aanma.org>

### **Allies Against Asthma**

Center for Managing Chronic Disease  
University of Michigan  
School of Public Health  
109 Observatory Street  
Ann Arbor, MI 48109-2029  
Phone: (734) 615-3312  
Fax: (734) 763-9115  
Website: <http://www.asthma.umich.edu>  
E-mail: [asthma@umich.edu](mailto:asthma@umich.edu)

### **American Academy of Allergy, Asthma, and Immunology**

555 East Wells Street, Suite 1100  
Milwaukee, WI 53202-3823  
Phone: (414) 272-6071  
Website: <http://www.aaaai.org>  
E-mail: [info@aaaai.org](mailto:info@aaaai.org)

### **American Academy of Family Physicians**

11400 Tomahawk Creek Parkway  
Leawood, KS 66211-2680  
Phone: (913) 906-6000  
Toll Free: (800) 274-2237  
Fax: (913) 906-6075  
Website: <http://www.aafp.org>

About This Chapter: Information in this chapter was compiled from many sources deemed accurate; inclusion does not constitute endorsement. All contact information verified in August 2009.

## Chapter 60

# If You Would Like To Read More About Asthma

### Books

*100 Questions and Answers About Asthma.* Plotte, Claudia S. Sudbury, MA: Jones and Bartlett Publishers, Inc., 2005.

*American Academy of Pediatrics Guide to Your Child's Allergies and Asthma: Breathing Easy and Bringing Up Healthy, Active Children.* Welch, Michael J. and American Academy of Pediatrics. New York: Random House, 2000.

*The American Lung Association Family Guide to Asthma and Allergies.* The American Lung Association Asthma Advisory Group with Norman H. Edelman, M.D., New York: Little Brown and Company, 1998.

*The Asthma and Allergy Action Plan for Kids: A Complete Program to Help Your Child Live a Full and Active Life.* Dozor, Allen and Kate Kelly. New York: Fireside, 2004.

About This Chapter: A large number of books, websites, and web-based resources discuss asthma and related concerns. It is not possible to list them all here. The ones included in this chapter were selected to give you a sampling of information from a wide variety of sources. The lists are not all inclusive and inclusion does not constitute endorsement. To make topics easier to identify, books, websites, and web-based documents are listed alphabetically by title within each category. Website addresses verified in September 2009.

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Page numbers that appear in *Italics* refer to illustrations. Page numbers that have a small ‘n’ after the page number refer to information shown as Notes at the beginning of each chapter. Page numbers that appear in **Bold** refer to information contained in boxes on that page (except Notes information at the beginning of each chapter).

## A

- AAAAI *see* American Academy of Allergy, Asthma and Immunology
- AAFA *see* Asthma and Allergy Foundation of America
- AAFP *see* American Academy of Family Physicians
- ABG *see* arterial blood gases
- ACAAI *see* American College of Allergy, Asthma, and Immunology
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