

Breath of Fresh Air

Volume 6, No. 1

Information, news and advice for improving asthma well-being

Winter 2001

Understanding Prednisone

As part of its daily function, the human body makes a steroid hormone called cortisol. Hormones are chemicals released into the bloodstream from one part of the body that regulate the activities of other parts of the body. Cortisol is released from adrenal glands (which sit just above the kidneys) and influences numerous processes within our body, including our sugar metabolism, blood pressure, energy level, and wakefulness.

In the early part of the twentieth century, cortisol was for the first time isolated from the adrenal glands of animals, purified, and administered to people in large doses as a medication. Its effects were dramatic. Especially for certain diseases characterized by swelling and irritation (inflammatory diseases), the purified steroid hormone (in its chemical form called cortisone) achieved remarkable cures. From rheumatoid arthritis to psoriasis to asthma, cortisone tablets brought about suppression of inflammation and improvements in symptoms that were never before possible.

Prednisone, a chemical derivative of cortisone

In the years that followed, pharmaceutical companies modified the cortisone chemical, creating stronger and longer-lasting steroid medications, including prednisone, methylprednisolone (brand name: Medrol®), and prednisolone (brand names: Prelone® and Pediapred®).

For severe asthmatic attacks, when swelling of the breathing tubes and excess mucus production threaten to narrow and block off all airways, treatment with steroid tablets like prednisone can be life-saving. When all other medications seem to lose their effectiveness, the oral steroids exert their powerful anti-inflammatory actions and restore normal function to the airways.

Unfortunately, these dramatic benefits come at a cost: steroid-induced side effects. Many of the normal effects of the naturally-occurring cortisol hormone

are exaggerated into unpleasant or even harmful side effects when large doses are given as a medical treatment. If you have ever taken a “course” of oral steroid tablets — typically for 1-2 weeks, beginning at a high dose (40-60 milligrams per day) and tapering gradually to zero — then you likely have experienced at least some of these potential effects. They may

include excess energy, a boundless appetite, fluid retention with a sense of bloating, insomnia, stomach upset, and a tendency toward acne, high blood sugar, and high blood pressure. Some people have upsetting experiences due to mood

alterations, feeling moody, jittery, paranoid, short-tempered, or just not themselves. For most people these side effects are tolerable, in part because they are outweighed by the restoration of normal breathing and in part because they are short-lived, going away when you stop the prednisone.

Side effects from long-term use of oral steroid tablets

An occasional person with very severe asthma will need prednisone not only for treatment of asthmatic attacks but every day for control of asthma symptoms. Without prednisone they experience wheezing, shortness of breath, chest tightness, and a fall in peak flow.

Unfortunately, prednisone taken every day for months and years is particularly harmful in its side effects. With long-term use it causes thinning of the skin with a tendency to bruising and skin tears, cataracts and high pressure (glaucoma) in the eyes, thinning of the bones (osteoporosis), possible muscle weakness (myopathy), and a susceptibility to certain unusual infections. In addition, long-term use of prednisone causes one's adrenal glands to shrink and stop manufacturing the normal amounts of cortisol hormone. As a result, after a few weeks of prednisone use, sudden stopping of the prednisone can be dangerous, leaving the body with the inability to meet its normal requirement for cortisol.

... continued on page 6



Inhaled Steroids for Children with Asthma

In recent years we have come to learn that asthma is a condition in which the airways of the lungs have a persistent, allergic inflammation. Treating this inflammation has become a mainstay of asthma therapy in persons with more than occasional and mild asthma symptoms. The anti-inflammatory family of medications called corticosteroids (or simply “steroids”), inhaled onto the surface of the airways, suppresses this inflammation. Treatment with inhaled steroids reduces the symptoms of asthma and lessens the risk of serious asthma attacks.

Inflammation of the airways in asthma begins at a very early age. It is present in small children as well as in adults. For many years the favored treatment of this inflammation in children has been cromolyn, a non-steroid anti-inflammatory medication. Cromolyn seems to work by blocking one type of inflammatory cell, called the mast cell, from participating in the allergic inflammation. Cromolyn (brand name: Intal®) is an inhaled medication that can be given by metered-dose inhaler or nebulizer. Its major advantage is its complete freedom from side effects. Its major disadvantages are its need to be taken four times a day and, in the opinion of many physicians, the sense that it is not as strong and effective as the inhaled steroids.

Still, there has been reluctance among many physicians to use inhaled steroids in children because of concern about long-term side effects. If some of the steroid medication makes its way from the mouth or airways into the bloodstream, it could have widespread effects throughout the body. Sites particularly vulnerable to harmful effects of the steroids are the bones and eyes. Among growing children, there has been concern that inhaled steroids might interfere with bone growth. Perhaps asthmatic children using inhaled steroids would grow up shorter as a result.

Recent scientific studies on inhaled steroids in children

Recently, two important research studies were published that addressed these questions about the effectiveness and safety of inhaled steroids in children. The first study, called the Childhood Asthma Management Program, was one of the largest long-term studies of pediatric asthma ever undertaken in the United States. More than 1000 children

aged 5-12 years with mild-to-moderate asthma participated in this experiment for a period of 4-6 years. Some of the children were treated with an inhaled steroid called budesonide (brand name: Pulmicort®). Other children received a non-steroid anti-inflammatory medication like cromolyn, called nedocromil (brand name: Tilade®). A third group of children received only placebo inhalers. All of the children used their bronchodilator such as albuterol (brand name: Ventolin®) as needed and received extra medication when they experienced increased asthma symptoms.

Three important observations came out of this report. First, children treated with the inhaled steroid had fewer symptoms of asthma and fewer attacks of asthma that required urgent care, hospitalization, or oral prednisone tablets for treatment. The alternative anti-inflammatory medication, nedocromil, was not as effective. Second, the inhaled steroid affected bone growth only during the first year of treatment. Thereafter, the children grew at identical rates, and it was predicted that children in the different treatment groups would all achieve similar final heights. Only one child treated with inhaled steroids had a questionable cataract in one eye. Third, none of the groups of children had an overall deterioration in breathing capacity. Lung function over the 4-6 years of follow-up was not affected by either of the treatments.

Attaining normal height

The second research report, also published in the *New England Journal of Medicine*, specifically addressed the question of the effect of inhaled steroids on the growth of children. Approximately 140 children treated with an inhaled steroid (budesonide) were followed

. . . continued on page 5

Breath of Fresh Air

Editor-in-chief

Christopher H. Fanta, M. D.

Breath of Fresh Air is published quarterly by the Partners Asthma Center, 75 Francis Street, Boston, MA 02115. We gratefully acknowledge Glaxo Smith Kline for their generous contribution toward publication of this newsletter.

© 2001 Partners Asthma Center.

Requests for permission to reprint should be addressed to the above.

Telephone: (617) 732-7420 Fax: (617) 732-7421

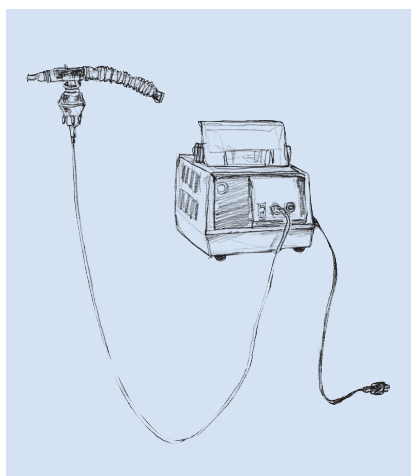
Internet: <http://www.asthma.partners.org>

E-mail: asthma@partners.org

News About Asthma

New delivery forms for inhaled steroids

For the first time an inhaled corticosteroid is now available in liquid form to be administered by com-



pressor and nebulizer. The inhaled corticosteroid is budesonide. Budesonide has been marketed as a dry powder inhaler, called Pulmicort® Turbuhaler®. This same medication has newly been

made available as a liquid in individual dose packages, called Pulmicort® Respules®. The doses are 250 and 500 micrograms per container (compared to 200 micrograms per inhalation from the dry powder device). Pulmicort® Respules® have been approved for use in children and infants as young as 12 months. Its advantage in young children with asthma is the ease of use of nebulizer systems compared to the difficulty that young children may have in coordinating the inhaler devices. It has been shown to be effective when administered once daily.

Traditional metered-dose inhalers with pressurized canisters rely on chlorofluorocarbons (CFCs) as propellants. Because of the harmful effects of CFCs on the earth's ozone layer, alternative, environmentally safe propellants have been sought. 3M Pharmaceuticals has developed the first such agent, called a hydrofluoroalkane or HFA. For a number of years, the bronchodilator, albuterol, has been available with an HFA propellant:

Proventil-HFA®. Now one of the inhaled corticosteroids, beclomethasone, is also available in a metered-dose inhaler utilizing HFA. Beclomethasone is the same inhaled steroid that has been marketed for many years — with traditional CFC propellants — as Beclovent®, Vanceril®, and Vanceril DS®. The brand name for beclomethasone-HFA is QVAR®. QVAR® is available in two strengths, 40 micrograms per puff and 80 micrograms per puff, doses very similar to those in Vanceril® (or Beclovent®) and Vanceril DS®, respectively.

Anticipated new asthma medications

Release of two new medications for asthma is anticipated this year. The first is a new inhaled corticosteroid, mometasone. Mometasone is currently available for use as a nasal steroid preparation, Nasonex®. Its availability for administration to the lungs as a dry powder inhaler (by the name of Asmanex®) is expected within the next few months.

Inhaled corticosteroids and long-acting bronchodilators are often used in combination in persons with moderate or severe asthma. This summer Glaxo Smith Kline, the maker of Flovent® (the inhaled steroid, fluticasone) and Serevent® (the long-acting inhaled bronchodilator, salmeterol) will release a dry-powder inhaler containing both medications in one inhaler. The two medicines in combination, to be called Advair®, will be delivered from a device identical

to the Serevent® Diskus® (see adjacent photo). The new formulation will provide three different dosage strengths for the inhaled steroid (fluticasone) and will usually be prescribed as one inhalation taken twice daily.



News from Partners Asthma Center

Partners Asthma Center has expanded to two new practice sites. With the closing of the Spence Center in Wellesley, the practices of Drs. **Lynda Cristiano**, **Joshua Boyce**, and **Kenan Haver** have had to find new quarters.

New practice sites

Dr. Cristiano is now seeing patients at the Brigham and Women's at Newton Corner practice. Together with Partners Asthma Center nurse, Elaine Carter, she joins a group of Brigham primary care physicians and obstetrician-gynecologists who practice there. The address is 272 Center Street, Newton Corner. The office is very close to the Newton exit (Exit 17) of the Massachusetts Turnpike; free parking is available on-site. The telephone is (617) 796-7100.

Drs. Joshua Boyce and Kenan Haver have moved their Partners Asthma Center practice in pediatric asthma to Newton Wellesley Hospital. Their offices are part of the pediatric specialties unit on 6 North. They are joined by Asthma Center nurses Lisa Stieb and Elaine Carter. Newton Wellesley Hospital is located at 2014 Washington Street in Newton. Washington Street in Newton is also known as Route 16. The telephone number to schedule an appointment is (617) 243-6800. To leave a telephone message for a member of this practice, call (617) 243-6760.

New staff members

Dr. **Barry Kitch** has joined the Partners Asthma Center in its practice at the Center for Chest Diseases at Brigham and Women's Hospital. Dr. Kitch was a medical intern and resident at the Massachusetts General Hospital and completed his fellowship in Pulmonary Medicine at the Combined Harvard Fellowship Program. He has a special research interest in health outcomes regarding asthma.

We also welcome Dr. **Craig Lilly** to the faculty of Partners Asthma Center. Dr. Lilly serves as Director of the Medical Intensive Care Unit at Brigham and Women's Hospital and does basic scientific research into the mechanisms of allergic inflammation in asthma. He has actively represented the Asthma Center in his role as teacher of students, residents, fellows, and practicing physicians.

Nesson Award

Dr. **Lynda Cristiano** was recipient this fall of the H. Richard Nesson Award for Clinical Collaboration at Partners Health Care. The award recognized her work, along with other colleagues, to create and fund a smoking cessation program at the Brigham and Women's Hospital.

The new smoking cessation coordinator at Brigham and Women's Hospital is Alyssa Mann. To contact Alyssa and to obtain more information about this **free** smoking cessation program, call (617) 732-8983.

Asthma Support Group

The Partners Asthma Center Support Group continues to meet on the last Tuesday of each month to discuss selected topics in asthma and to share our experiences in dealing with asthma. We meet at the Brigham and Women's Hospital, Floor 4, Pod A, from 5:00-6:30 p.m.

Tuesday, January 30:

Update on New Asthma Therapies

Tuesday, February 27:

Does Asthma Affect Lung Function Long-Term?

Tuesday, March 27:

Exercise and Lung Health

For more details, call Elaine Carter at (617) 732-7419.

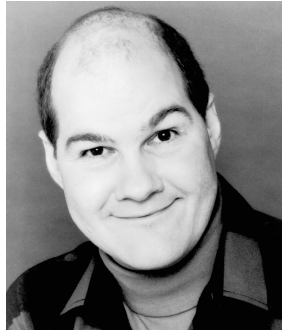


wishes you and your family
a happy and lung healthy
New Year 2001

Breathe free!

Spotlight

For many patients who come to the Partners Asthma Center at the Brigham and Women's Hospital, especially to the Ambulatory Care Center at 850 Boylston Street, a highlight of their visit is a chance to chat with **Mark Anderson**. He may ask them to take in the biggest breath possible and to blast it out as hard and fast as they can, but he does it with such enthusiasm, good cheer, and helpful guidance that it almost makes pulmonary function testing enjoyable!



When our Asthma Center first opened its doors in 1989 (at that time under the name of Longwood Medical Area Adult Asthma Center), we sought technical help in performing pulmonary function tests on-site, so that our patients would not need to travel to other parts of the hospital to have their breathing capacity tested. Mark was there to get us off to a good start. He came to work part-time as pulmonary function technician, while he completed his postgraduate musical studies at the Boston University Opera Institute. Soon thereafter he graduated from Boston University and the Asthma Center grew, with not one but several sessions each week. Mark came to work full-time at the Brigham. It didn't take us long to recognize his professional talents, both his technical and interpersonal skills.

What we didn't know at the time, though, was that he also was a computer whiz. Over the years he has been asked to devote more and more of his time to computer support for the Pulmonary and Critical Care Division at the Brigham. He is our computer guru. For the Partners Asthma Center he does graphic design work, maintains our mailing lists, solves our computer software and hardware problems, and maintains our web site (www.asthma.partners.org). He is Coordinator of Special Projects, a job that includes organization of the annual Spring Asthma Symposium and Autumn Asthma Fair.

And this is only his day job! By also working nights, weekends, and occasional sabbaticals from the Partners Asthma Center, Mark has been able to continue his musical career as an opera singer

(bass). You may have caught some of his performances around town, such as at the Boston Lyric Opera, Longwood Opera, Temple Israel in Brookline, or Second Church of Newton. With his wife, Donna Ames, also an opera singer, he has performed and taught music both around the country (for instance, with the Arizona Opera, Portland Opera Repertory Theater, San Diego Opera, and Opera Theatre of Saint Louis) and around the world (in Moscow, Salisbury, Bulgaria, and Germany). His favorite roles? Verdi's *Requiem* and the role of Figaro in Mozart's *Marriage of Figaro*.

Last year Mark's contribution to the Partners Asthma Center was formally acknowledged by the institution. He was awarded an individual Partners in Excellence Award for his incredible commitment to both the patients and professional staff of the Center. For all of us at the Asthma Center, he sets the standard of excellence — in his hard work, dedication, precision, enthusiasm, and integrity — to which we aspire.



Inhaled Steroids . . . continued from page 4

until they attained their adult height. They were compared to their non-asthmatic siblings and to a control group with asthma who never received inhaled steroids. As in the Childhood Asthma Management Program described above, these researchers found that during the first year of their use, inhaled steroids slowed the rate of growth, but thereafter, growth continued at a normal rate and the final height was unaffected. The children in this study, which was conducted in Denmark, were treated with budesonide on average for 9 years at an average dose of approximately 400 ug per day (equivalent to 2 inhalations per day from a Pulmicort® Turbuhaler®).

We know that inhaled steroids are effective in treating childhood asthma. They lessen symptoms and lessen the vulnerability to asthma triggers. Children treated with inhaled steroids have fewer attacks of asthma, including fewer severe attacks. We now know that children can use inhaled steroids in low doses without fear of growing up shorter than their peers. Having another group of medications that are safe and effective for long-term use in children with asthma is indeed good news.

Understanding Prednisone . . . continued from page 1

Consequently, it is necessary to withdraw gradually (over a period of several weeks) from the steroid tablets, allowing the adrenal glands to increase in size again and recover their normal functioning.

In persons with severe, steroid-dependent asthma, the goal of treatment always includes minimizing the dose of prednisone and finding alternatives to its use. When this goal is not immediately achievable, one can protect somewhat against steroid-induced side effects. For example, calcium and vitamin D supplements plus bone-strengthening medications such as biphosphonates, estrogens, or calcitonin can protect the bones against osteoporosis.

For a detailed discussion on how to minimize the adverse effects of long-term prednisone, you may wish to read a book — available through the Partners Asthma Center lending library — entitled *Coping with Prednisone* by Eugenia Zukerman and Julie R. Ingelfinger, M.D.

Our New Year's wishes

For all persons with asthma we have two prednisone-related wishes for the New Year: may your asthma be well-controlled and prednisone-free this coming year; and may medical research develop a medication that has the beneficial effects of prednisone without any of its harmful effects . . . soon.



Breath of Fresh Air

Partners Asthma Center
Brigham and Women's Hospital
Massachusetts General Hospital
Faulkner Hospital
75 Francis Street
Boston, MA 02115
1-800-9PARTNERS

Non-Profit
Organization
U. S. Postage
PAID
Permit #187
Burlington, MA

INSIDE

- ◆ Understanding Prednisone
- ◆ Inhaled Steroids for Children with Asthma
- ◆ News About Asthma
- ◆ News from Partners Asthma Center
- ◆ Spotlight: Mark Anderson