

Breath of Fresh Air

E-Volume 1, No. 3

Information, news and advice for improving asthma well-being

Winter 2013-14

Our New Year's Asthma Wish List

Living with asthma can be full of frustrations and sometimes worse, imposing limitations and causing frightening attacks. Short of finding a cure, here is our wish list – the short list -- for improvements in asthma care that we think should be, within our grasp.

1. Low-cost, generic asthma medications. Ten years ago a generic albuterol inhaler was available without insurance coverage for less than \$20. With the banning of inhaled medications using chlorofluorocarbon (CFC) propellants beginning in 2009, generic albuterol disappeared from sale, replaced by brand-name versions of albuterol with hydrofluoroalkane (HFA) as propellant, such as ProAir, Proventil, and Ventolin, all considerably more expensive. And despite their availability now for several decades, inhaled corticosteroids by metered-dose inhaler or dry-powder inhaler have never had a generic version available. It is true that generic albuterol and the inhaled steroid, budesonide, are available for nebulization, but it is not practical to ask all persons with asthma to administer their medications by nebulizer over 5-10 minutes for each dose, let alone carry a nebulizer with them at all times for emergency use. The Food and Drug Administration (FDA) should ease whatever restrictive regulations prevent release of generic



albuterol-HFA and at least one generic inhaled steroid, such as beclomethasone (released in the US in the early 1970s) or fluticasone (available in the US for more than 30 years).

2. Reduced medication side effects. Most persons with asthma can achieve good asthma control with currently available medications taken once or twice daily. Unfortunately, though generally well tolerated, these medications are not free of side effects. In particular,

we are struck by how often our patients taking an inhaled medication that contains a corticosteroid complain of hoarse voice. Other side effects from the inhaled steroids include the risk of oral

candidiasis and, after many years of use at high doses, a slightly increased risk of cataracts, glaucoma, and loss of bone mass (osteoporosis). In growing children, slightly slowed vertical growth (ultimate height reduced on average by approximately 1/4-1/2 inch) is a concern. Although we can't expect our medications to be entirely free of all undesirable effects, these are annoying side effects that sometimes limit use and are a worthy target for drug development or drug modification.

3. Identical health outcomes for people of color with asthma. More than twenty years ago epidemiologic studies identified the unequal distribution of asthma morbidity and

... continued on page 2

Asthma Wish List ... continued from page 1

mortality in the US. The rates of hospitalization and death due to asthma among African-Americans and Hispanics were 3-4 times greater than among whites. Now, after three releases of *Guidelines for the Diagnosis and Management of Asthma* to care providers throughout the US, overall rates of hospitalization and death from asthma are decreasing, but racial and ethnic inequalities remain unchanged. In the US the color of one's skin is a risk factor for dying from a severe asthma attack. Exactly why this injustice persists is uncertain, but it is likely that increased rates of poverty among persons of color play a major role. Addressing poverty and its link to poor asthma control is not an easy assignment, but it is not insurmountable.

4. Novel therapies for severe, refractory asthma. It is estimated that as many as 20-25% of persons with asthma continue with frequent symptoms and multiple asthmatic attacks despite faithful use of strong, best-that-we-have asthma medications. Even if the true percentage were less, say 10%, that would mean that nearly two million Americans are in need of newer, more effective therapy for their asthma. Research is progressing in the development of novel medications for this subgroup of persons with "refractory" asthma. Designer molecules (e.g., monoclonal antibodies) are being developed that will block the recruitment of eosinophils and other inflammatory cells to the airways. Examples include monoclonal antibodies against interleukin-5 (mepolizumab and reslizumab), interleukin-13 (lebrikizumab), and the shared molecular receptor for interleukin-4 and -13 (dupilumab). Although the promise of these new biologic therapies is great, they are destined to be hugely expensive and require administration by injection or intravenous infusion. The search for alternative, simpler small molecular inhibitors of key biologic processes in asthma continues.

5. Preventing dangerous asthma attacks: "An app for that." Despite progress in treating asthma, dangerous attacks continue to occur. Nearly two million times a year persons with asthma rush to the emergency department for treatment of asthma attacks. Sometimes these attacks develop gradually, as cough and chest tightness evolve into greater and greater breathlessness. Sometimes they catch us by surprise, lacking the usual warning signs; suddenly we are in a crisis, unable to breathe and desperately seeking quick relief. Even then, some of these sudden attacks may have had warning signals, if we had been able to perceive them. In general, narrowing of the bronchial tubes comes on gradually, over hours to days, as swelling of the tubes develops, mucus forms, and the bronchial muscles tighten their grip. In this age of electronic self-monitoring, we need a smartphone app for tracking asthma and preventing early asthma attacks from progressing to such severity that they become life-threatening. Our New Year's asthma wish list includes the asthma app that will sound the alarm to tell us when to take action because our asthma is getting out of control.

“Can You Show Me How You Use Your Inhaler?”

This past year a new type of delivery device for inhaled medications became available. It is used to deliver the bronchodilators albuterol and ipratropium in combination (Combivent) and is called a “soft-mist” inhaler. With activation, a slow-moving mist of medication – somewhat like the aerosol from



a nebulizer – is released for approximately 1½ seconds. A full dose of medication is contained within the mist, which is to be inhaled from the mouth-piece of the device.

The soft mist inhaler joins a variety of other devices, including metered-dose inhalers, dry-powder inhalers, and hand-held nebulizers, used to deliver medications by inhalation. What strikes us as remarkable is the daunting challenge faced by persons with asthma (and other lung diseases) as they try to master use of these very different inhaler devices. Some of the devices release a plume of medication traveling at high speed; others come in the form of a powder that is turned into an aerosol only by the force of a breath in. Some are best combined with a hollow chamber (“spacer”) that will hold the medicine in a confined space for a second or two prior to breathing it in; others cannot be combined with a spacer. Some medications

come in more than one form – metered-dose inhaler and liquid for nebulizer; metered-dose inhaler and dry-powder inhaler – although most do not.

What we wish to share in this article is the way that we teach inhaler use. As part of the “package insert,” each device comes with instructions that describe the steps involved in preparing and then inhaling the specific medication, and many companies provide additional printed hand-outs, often in multiple languages. In addition, video instructions are often available on-line. Nonetheless, in our opinion, there is no substitute for live demonstration in the office. It takes no more than a minute or two, it can be repeated as often as necessary, reading skills and internet access are not required, and there is no charge or adverse side-effect! If available, a placebo demonstration device is very useful; otherwise, role play also works well.

Here’s what we say for **metered-dose inhalers**: shake the medicine one or two times; with the device held upright (mouthpiece at the bottom), put the mouthpiece between lips and teeth and seal lips around it. To release the medicine, depress and then release the canister in its plastic holder held between thumb and index finger; and then immediately take a *slow, deep* breath in. *Slow* and *deep* allow the medication to enter deep into the lungs (instead of impacting on the back of the throat) and to deposit onto hundreds of bronchial tubes, large and small. A slow, steady breath over

... continued on page 4

“Can You Show Me How You Use Your Inhaler?” ... continued from page 3

4-5 seconds should do the trick. Then hold your breath for a few seconds before exhaling, to prevent losing much of the medication in the exhaled air.

In our experience, the “slow and deep breath in and then hold your breath a bit” are the parts most often omitted. We all find ourselves too busy, in too much of a hurry, too focused on other things to concentrate on the act of properly using our inhalers. And yet it makes a difference, often a big difference. The difference between poorly-controlled asthma and well-controlled asthma can at times be a matter of properly inhaling one’s current medications, rather than escalating the dose of medicine or changing from one medicine to another.

A spacer can be used with metered-dose inhalers and helps to relieve the “stress” of getting exactly the right timing between squirting the medication from the device and immediately beginning to breathe in. By releasing the medication into the confined volume of the spacer, one can then, stepwise, breathe in only after the medication is where you want it, waiting to be pulled from the chamber into the lungs. Still, the subsequent steps are key, as before: slow and deep breath in and hold your breath for perhaps 5 seconds. Besides helping with the timing of hand-breath coordination, the spacer reduces the amount of medication that would otherwise settle on the tongue and throat. For steroid medications like fluticasone (Flovent), this means less steroid available to be swallowed and absorbed from the stomach into the rest of the body. If a patient is well-skilled in using a quick-relief bronchodilator inhaler such as albuterol (Proair, Proventil, or Ventolin), then there is no need to tack on a spacer. If he or she has trouble coordinating the inhaler – and, in the case of steroids, to reduce the amount of steroids settling on the oropharynx -- the spacer is a useful addition.

No plume of medication is released from **dry-powder inhalers**. With the force of one’s breath in, one turns the collection of powder in the inhaler into an aerosol that can be breathed deep into the lungs. Each device is prepared for the next dose of medication in a slightly different way, but when the medication is ready to be released, the process is the same: seal your lips around the mouthpiece, take in a strong breath to pull the medication out of the device, continue a long and deep breath in to distribute the medication widely throughout the lungs, and then hold your breath for a few seconds before exhaling. Again, the *long* and *deep* and *then hold your breath* steps are the ones that we want to emphasize. A short, quick gasp puts medicine primarily on the uvula and windpipe without getting it far out onto the bronchial tubes where it is needed. Spacers cannot be used with dry-powder inhalers (including those that deliver steroid medication).

Breath of Fresh Air

Editor-in-Chief Chris Fanta, M.D.
Breath of Fresh Air is published quarterly by Partners Asthma Center, 75 Francis Street, Boston, MA 02115.

© 2013 Partners Asthma Center
Requests for permission to reprint should be addressed to the above.

E-mail: asthma@partners.org