Earth-Friendly (and People-Friendly) Inhalers

Powder inhalers, nebulizers, and newer aerosols are replacing chlorofluorocarbon-driven inhalers for asthma and COPD.

Traditional inhalers for asthma and chronic obstructive pulmonary disease (COPD) are simple devices that release an aerosol spray through an L-shaped mouthpiece. But a new generation of inhalers has arrived, employing hinges and wheels, blister packs and capsules.

Why the change? Older aerosol sprays rely on chlorofluorocarbons (CFCs) to propel the medication, and although CFCs don't harm the lungs directly, they contribute to skin cancer and other health problems by depleting the Earth's ozone layer. Twenty countries banned CFCs starting in 1996 as part of the Montreal Protocol; an exception was granted for medical devices such as inhalers until suitable alternatives could be found.

The New Inhalers

Drug companies have responded to the CFC phaseout by developing a variety of new products: aerosols that use alternate propellants, handheld mininebulizers, and dry powder inhalers.

Non-CFC aerosols. Two brands of albuterol are now available with a non-CFC propellant: Proventil HFA and Ventolin HFA. These aerosols use a propellant called hydrofluoroalkane, which is nontoxic, nonreactive, and nonflammable.

The new aerosols are so effective that the American Lung Association has petitioned the U.S. Food and Drug Administration (FDA) to remove albuterol inhalers from the list of products permitted to use CFCs. In fact, the manufacturer of Ventolin discontinued the CFC version in late 2003.

The FDA is holding off on banning CFC-propelled albuterol, however, in case manufacturing difficulties or unexpected side effects should occur with the new propellant. The FDA is also concerned about cost; generic versions of the HFA inhalers are not yet available.

Handheld mininebulizer. Premeasured vials of an ipratropium/albuterol solution (DuoNeb) are available for people with COPD to use with a nebulizer. Taking this medication involves squeezing the contents of one vial into the nebulizer reservoir and activating a compressor that turns the medication into a fine mist. The user breathes in this mist through a mouthpiece or face mask for approximately 5 to 15 minutes.

Although nebulizers are small—about the size of a pill bottle—compressors weigh 5 to 15 lbs. and must be plugged into an electrical outlet, which can make some types of travel difficult.

Sleep studies. Sleep studies (polysomnography) can be used to monitor certain body functions during sleep. Polysomnography involves electrocardiography to monitor heart rate and rhythm; electroencephalography to monitor brain waves; electromyography to monitor muscle activity; pulse oximetry to measure oxygen saturation; and measures of airflow and movements of the chest and abdomen. These studies can detect the presence, pattern, and severity of sleep-related breathing disorders (such as sleep apnea) and typically are performed in sleep laboratories.

GENERAL APPROACHES TO MANAGEMENT

Usually, the general evaluation just described provides enough information to diagnose a lung disorder and devise a management plan. Sometimes, however, the initial evaluation does not provide a definitive diagnosis. If this is the case, invasive procedures to obtain biopsy samples of cells and tissues may be necessary. For example, when fluid collects in the space around the lung, it may be sampled

Dry-powder inhalers. Most new devices for asthma and COPD are dry-powder inhalers, which are designed to release one dose of medication at a time from a blister pack or capsule. Although the medication is inhaled instead of being sprayed into the mouth, it is no less effective than aerosols. In fact, dry-powder inhalers (such as the Advair Diskus, Serevent Diskus, Foradil Aerolizer, Flovent Rotadisk, and Pulmicort Turbuhaler) are sometimes more effective than aerosols because they don't require the user to coordinate pressing the device with breathing in.

Some dry-powder inhalers are somewhat larger than aerosols but come with the medication preloaded; others are more compact but require the user to place medication capsules or packets in the device periodically or before each use.

One disadvantage of dry-powder inhalers is that excess humidity can cause the powder to clump together. To avoid this problem, the manufacturers encase the devices in protective foil and recommend discarding them 4 to 8 weeks after opening.

Another issue is cost: Dry-powder inhalers can cost more than $100 each, and to date no generic versions are available.

To Switch or Not To Switch?
If you're still using a CFC-propelled inhaler, rest assured that the FDA will not pull it off the market until acceptable alternatives are available. But now is a good time to ask your physician about switching to a new type of inhaler. Countries such as Canada, the European Union, Australia, and Japan have all banned albuterol inhalers that contain CFCs—the United States could be next.

Inhalers That Use CFCs	CFC-Free Devices
AeroBid	Advair Diskus
AeroBid-M	DuoNeb
Alupent	Flovent Rotadisk
Atrovent	Foradil Aerolizer
Azmacort	Proventil HFA
Beclovent	Pulmicort Turbuhaler
Combivent	Serevent Diskus
Intal	Ventolin HFA
Maxair	
Proventil	
Tilade	
Vanceril	

("tapped") with a needle (a procedure called thoracentesis). Analysis of the fluid may aid in diagnosis and treatment, while removal of the fluid might help relieve shortness of breath.

Treating someone with a respiratory illness involves weighing the risks and benefits of each treatment option and taking the patient's personal preferences into account. In some instances, the problem clears on its own or with treatment. A cure is available for many lung disorders, including many caused by infections. But for all lung disorders, a goal of treatment is to relieve symptoms.

OBSTRUCTIVE DISEASES OF THE LUNGS

Asthma and chronic obstructive pulmonary disease (COPD) are obstructive lung diseases. Obstructive lung diseases are characterized by a reduction in the diameter of the airways that obstructs airflow during exhalation. The obstruction tends to be intermittent and reversible in asthma but unremitting and less responsive to medication in COPD.