**Dry Powder Inhalers: Teaching Correct Use to Maximize Benefit**

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Dry powder inhalers are used by millions of patients with asthma or chronic obstructive pulmonary disease. Although these devices are easier to use than metered-dose inhalers, errors still occur and drug efficacy may be reduced or lost.

Dry powder inhalers (DPIs) are used by millions of patients with asthma or chronic obstructive pulmonary disease (COPD). Although these devices are easier to use than metered-dose inhalers (MDIs), errors still occur and drug efficacy may be reduced or lost.\textsuperscript{1-3} Voluminous literature has documented for 3 decades the frequent incorrect use of MDIs.\textsuperscript{6-9} As more types of DPIs become available, and as more patients use these devices, reports of errors will likewise increase. The Health Guide on page 1465 summarizes the techniques for correct use of the Diskus, Turbuhaler, Aerolizer, HandiHaler, and Twisthaler.

National and international guidelines for the treatment of asthma and COPD emphasize the absolute necessity of patient education, including instruction in the use of inhalation devices.\textsuperscript{10,11} Such instruction must consist of demonstrations of proper use and observation of patient use at each office visit to ensure that the correct technique is used consistently.

**THE IMPORTANCE OF PROPER TECHNIQUE**

DPIs eliminate what is perhaps the most common problem associated with MDI use—that is, coordinating the action of pressing down on the canister and beginning a slow, deep inhalation. DPIs do not require shaking the inhaler, but they do require loading the dose, exhaling first away from the inhaler (ie, not into the dry powder), followed by adequate inspiratory flow to ensure good pulmonary deposition, and subsequent breath-holding. At each step, there is opportunity for error. Some potential errors are listed in the **Table**. Although they may not be reported in the literature, we have either seen these errors in our practices or heard of their occurrence from our colleagues.
A recent study of 3 DPIs (Diskus, Turbuhaler, Easyhaler) was conducted in 326 adult or adolescent patients with asthma or "asthma symptoms." These patients, who were inhaler-naive, were asked to use the devices after reading printed instructions. Only about half the patients were able to use the devices correctly at that point. Patients were then given detailed instructions until they learned to use the devices correctly. Four weeks later, 10% to 20% of patients still were unable to use the devices correctly despite twice-daily use and having the instruction leaflet at home for those 4 weeks.

Beyond the lack of patient skill in using DPIs and other inhalation devices, several studies clearly document inadequate skills among those responsible for educating these patients—including physicians, medical students, pharmacists, and nurses. It is crucial for physicians to ensure that someone in the office is trained in instructing patients on the correct use of the devices. Furthermore, national guidelines recommend that the "principal clinician" introduce key educational messages and that these messages be reinforced and expanded by all members of the health care team. For example, pharmacists who are trained in the correct use of inhalation devices can contribute significantly to patient education and other key components of patient care, with a resulting improvement in outcomes.

At least 15 million to 20 million Americans have asthma, and another 20 million have COPD. Inhaled medications are the cornerstone of treatment for most of these patients. Application of the principles of the NIH Guidelines for asthma—including detailed and continual patient education—is associated with a reduced number of emergency department visits and hospitalizations. Correct use of DPIs and other inhalation delivery devices is essential for optimal benefit and improved outcomes.

References: REFERENCES:
15. Chafin CC, Tolley E, Demirkan K, et al. Effect of a brief educational intervention on medical


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