

Inhalers in Asthma Management: Is Demonstration the Key to Compliance?

Successful asthma management is 10% medication and 90% education. An ample range of drugs is available to adequately control most asthma, yet a majority of patients with moderate to severe disease fail to adhere to prescribed therapy. Studies examining the degree of compliance with prescribed inhaled therapy range from 24% to 69%.¹ This failure is in large part due to the failure of the health care team to effectively communicate the purpose and techniques of prescribed therapy. Compliance with aerosol therapy is complicated by issues of comprehension, competence, and contrivance. The “convenient” answer to patient comprehension is providing the package insert or a printed set of instructions for use and maintenance of an aerosol inhaler. In the United States, which seeks to “leave no child behind,” previous studies have shown that up to 40% of adults (many with high school diplomas), are unable to comprehend simple written instructions.²

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Effective use of aerosol devices is compromised by the inability of both professionals and patients to properly use common aerosol devices. Inability to properly operate aerosol devices makes successful therapy virtually impossible. Many researchers have reported poor technique with the traditional pressurized metered-dose inhaler (pMDI). Guidry et al were among the first to document that knowledge of correct MDI technique among health professionals is often poor,³ reporting that 92% of the respiratory therapists studied acceptably demonstrated MDI administration, but only 65% of house staff physicians, 57% of nurses, and 50% of nonpulmonary attending physicians did so. In a study of Canadian physicians in training, Rebeck et al found that only 39% demonstrated acceptable performance, and 8 months after instruction only 59% continued to demonstrate proper technique.⁴ These studies show that non-specialists need frequent re-training in proper technique to be effective patient educators. Although less frequently reported, similar results have been documented with nebulizers and dry powder inhalers (DPIs).

Each device has different instructions. DPIs require rapid high inspiratory flows with different ways to load a dose, while pMDIs work better with slow deep inspiration. Pa-

tient confusion between devices can result in reductions of label dose available to the lung exceeding 70%.⁵

Optimal adherence to prescribed inhaled therapy requires that the patient master the proper technique for preparing and activating the device and inhaling the medication in a coordinated manner. Repeated studies have shown that mastering the preferred technique of inhaled medication therapy is difficult, especially when pMDIs are used.^{1,6-9} In a study of 176 home oxygen patients who also received pMDI therapy, Johnson and Robart¹⁰ found that, among those not using a spacer, correct technique was observed in only 18% of patients. Patients with poor technique were instructed in correct use, yet only 21% of these were able to correctly use the MDI after in-home instruction by a respiratory therapist. Even more disappointing, when evaluated several months after instruction, few patients were able to retain the modest improvement in technique resulting from personalized instruction. For example, 70% of patients were able to exhale to functional residual capacity or residual volume prior to activating the MDI during instruction, but only 12% remembered to do this step at a re-evaluation months later.

A review of studies of patient-related problems using MDIs¹ demonstrates that up to 50% of patients may have trouble with one or more of the following steps:

1. Shaking inhaler
2. Exhaling to functional residual capacity or residual volume
3. Coordinating MDI activation and inspiration
4. Inhaling slowly
5. Holding breath for 5 seconds

With only 5 simple steps, still some patients were noted to activate the MDI *after* full inspiration, reducing the respirable dose to virtually nothing. It is fair to suggest that these patients were a bit unclear on the concept.

Depending on the setting, patient training in inhaler use may be the responsibility of the physician, pharmacist, nurse or respiratory therapist. In some institutions, and across the community, there seems to be some confusion as to who is responsible for patient education. While respiratory therapists are not commonly present in the outpatient setting, we are not free of responsibility with this problem. Thompson et al found that, despite a hospital-wide effort to prepare physicians, nurses, and respiratory

therapists to provide training in pMDI use to in-patients, only 27% of eligible patients actually received instruction.⁷ They noted that hospital policies failed to address the question of who was to provide the training, and sufficient time was not provided.

In this issue of *RESPIRATORY CARE*, Basheti et al¹¹ present a snapshot of the experience of patients in learning to use a specific brand of DPI, with assessment of their proficiency upon evaluation before and after one of 3 educational interventions by pharmacists. They surveyed 87 patients to find that 77 reported never having had their inhaler technique assessed by a health care professional, although 93% claimed to have been advised on inhaler technique by their primary health care providers. When a subset of these patients were brought in for evaluation, none had optimal technique, and only 23% had satisfactory technique, implying that > 70% of patients were not getting full benefit from their prescribed medication. Of the 3 teaching strategies, only the actual demonstration with a device showed superior improvement in performance after 2 weeks. Whether assessed by 9 steps for optimal therapy or 4 steps for satisfactory therapy, this study makes it clear that these patients were not given sufficient training to do either consistently.

How does the Australian experience of pharmacists¹¹ relate to respiratory care practice in the United States? This study confirms that improper use of inhalers, be they pMDIs or DPIs, is an international problem, and education should at the very least include demonstration with a placebo device. Any member of the health care team can do this training, and leaflets and package inserts are simply inadequate. Demonstration with a placebo produces a significant improvement in inhaler technique after 2 weeks. It is reasonable to assume that these issues relate to any DPI or pMDI. It is important to realize that the community-based pharmacist can play a huge role not only in training, with demonstration with a placebo for each type of inhaler that they dispense to a patient, but also in identifying poorly controlled asthma, by scanning the use and refill pattern of bronchodilators versus inhaled steroids. Asthma in any patient under 50 years old who uses more than one β agonist inhaler per month is possibly out of control. A simple review of β agonist and inhaled steroid use by the dispensing pharmacist with each refill of β agonists can identify asthmatics whose illness is out of control. This should trigger the pharmacist to educate the patient and possibly to notify the primary care provider of the potential problem. This is rarely institutional policy, but could be a really valuable contribution.

As for the other members of the team, we can ask the patient to bring their medications with them to clinic visits and demonstrate how they use their inhalers for direct assessment by health care professionals (Table 1). This assures ongoing opportunity for needs assessment and pro-

Table 1. Teaching Psychomotor Skills: General Principles

Set aside uninterrupted time to complete the instruction.
Perform the demonstration in a suitable environment.
Have all necessary equipment and devices close at hand.
Engage the patient's attention.
Explain verbally what you will do and why.
Conduct a demonstration of inhaler technique, verbally naming and explaining each step.
Repeat again without explanation (talking, while necessary in the above step, interferes with correct timing and inspiratory maneuvers).
Repeat again with verbal comments.
Have the patient demonstrate the maneuver, including correct identification of inhalers and assembly of inhaler/spacer combination.
Identify problems in performance, and repeat instruction and patient return demonstration.
Ask patient to verbalize the most important aspects of the procedure, and those they find most troublesome.
Arrange for follow-up instruction. Assure patient some loss of skill over time is typical and can be corrected. Remind patient to bring inhalers and spacers to every appointment.
Provide instruction to family or friends if requested. Review and dispense instructional leaflets or videos if available.

(Adapted from Reference 12.)

viding appropriate level of training. Respiratory therapists and nurses can demonstrate correct use of inhalers to patients as a component of in-patient therapy. These powerful practices can be easy to adopt into both personal and institutional practice.

To facilitate these programs the pharmaceutical industry should provide multiple placebos for each type of inhaler it produces to every dispensing pharmacist and prescribing clinician, as well as to other team members upon request, and free of charge.

Between demonstration with a placebo and periodic return demonstration by the patient, we can substantially improve the benefit patients derive from the inhalers. In the United States, respiratory therapists receive more training in aerosol devices than any of the other members of the health care team. We need to adopt these educational components in our individual practice, as well as to educate and advocate these practices to other members of the health care team and within our institutions,

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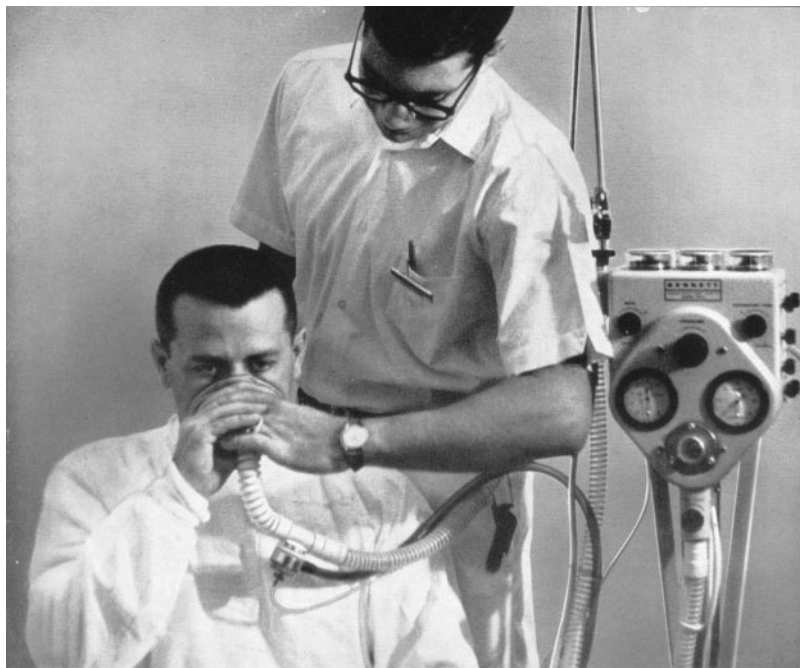
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