Editorials

Choosing the Right Inhaled Medication Device for COPD

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As Dr. Lee and colleagues describe in this issue of *American Family Physician*,[1] inhaled therapy is the preferred route of medication delivery in patients with chronic obstructive pulmonary disease (COPD). Data suggest that inhaler devices have similar effectiveness in treating patients with COPD; however, a variety of factors must be considered when selecting the best device for each patient[2] (see *Table 1* on page 652). Factors such as the patient's ability to use the device properly, the need for multiple inhaled medications, cost and reimbursement, convenience, and patient preferences must be considered.

A patient's ability to use a device may be affected by cognitive function, strength, and dexterity. The prevalence of COPD increases with age, which increases the likelihood of additional comorbid conditions that further complicate device selection. Patients with declining cognitive function may not be able to attain and recall the technique needed to use inhaler devices appropriately. Additionally, most inhaler devices require some dexterity and strength for appropriate use. Patients with more severe COPD may have difficulty using inhaler devices because some devices are dependent on peak inspiratory flow, which diminishes with advanced COPD. Long-acting bronchodilators are commonly used to treat patients with COPD; however, these patients also require a short-acting bronchodilator for acute shortness of breath. The more devices a patient uses, the greater the chances of using them incorrectly.[3]

Because Medicare is the primary insurance provider for older patients in the United States and prescription coverage is provided through Medicare Part D, cost and reimbursement should also be considered when selecting inhaler devices. Although newer inhalers may be available through pharmaceutical company samples, a long-term plan must be in place to ensure that the patient can afford the medications prescribed. Convenience and patient preferences have important roles in device selection; patients are more likely to use a device that they prefer and are comfortable with and that does not interfere with daily activities.[4,5]

Regardless of the inhaler device prescribed, time and resources must be dedicated to patient education, and physicians should have sufficient knowledge and training to provide counseling on proper use. Patient education materials should consider patient health literacy and should serve as a viable tool for information recall once the patient is home. The physician should confirm that the patient understands the instructions and can demonstrate proper inhaler technique during the initial visit when the inhaled medication is prescribed, and also at subsequent visits to ensure that the information is retained. Although inhaled medications for COPD have been shown to reduce symptoms, improve quality of life, and in some cases prevent COPD exacerbations, these medications cannot accomplish this without patient adherence and proper inhaler technique. Appropriate device selection and patient education are crucial to ensuring that expected clinical outcomes are achieved.

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Table 1. Inhalation Device Options for Patients with Chronic Obstructive Pulmonary Disease

Medications	*Advantages*	*Disadvantages*	*Patient counseling*
Dry powder inhalers			
Aclidinium (Tudorza Pressair) Fluticasone/salmeterol (Advair Diskus) Formoterol (Foradil) Indacaterol (Arcapta) Salmeterol (Serevent Diskus) Tiotropium (Spiriva)	Compact, convenient, no hand-breath coordination required, portable, rapid medication delivery; individually packaged dose or dose counter makes it easy to know how many doses remain	Dependent on peak inspiratory flow; dose loading and activation are necessary for single-dose devices; single-dose devices require dexterity; requires additional device for short-acting agent	Load and activate the dose; exhale fully, not into the mouthpiece of the device; seal lips around the mouthpiece; inhale quickly and deeply for two to three seconds; hold breath for at least six seconds; exhale slowly
Nebulizers			
Albuterol Arformoterol (Brovana) Budesonide (Pulmicort) Formoterol (Perforomist) Ipratropium Ipratropium/albuterol (Duoneb)	Easy to use, minimal cognition required, no hand-breath coordination required, not dependent on peak inspiratory flow, reimbursed by Medicare Part B, strength and dexterity not required	Device cleaning and maintenance needed, long medication delivery time, not portable or convenient, power source needed	Ensure medication dose is properly measured; seal lips around the mouthpiece or ensure mask is in place; inhale through the mouth slowly and deeply; clean nebulizer after each use; mix only nebulized medications as instructed
Pressurized metered-dose inhalers			
Albuterol Beclomethasone (Qvar) Budesonide/formoterol (Symbicort) Ciclesonide (Alvesco) Fluticasone (Flovent) Fluticasone/salmeterol (Advair HFA) Ipratropium (Atrovent HFA) Ipratropium/albuterol (Combivent) Levalbuterol (Xopenex HFA) Mometasone/formoterol (Dulera)	Compact, convenient, may be used with a spacer or valved holding chamber, not dependent on peak inspiratory flow, portable, rapid medication delivery	Difficult for patients with low cognition, difficult to determine remaining doses if there is no dose counter, inconvenient if spacer/chamber is required, patient must actuate device, requires coordination of device actuation and inhalation unless the patient consistently uses a spacer/chamber (which is uncommon)	Shake well, prime inhaler the first time it is used or if it has not been used for days or weeks; exhale fully, then place inhaler between lips, holding upright; press inhaler once while inhaling slowly and deeply through the mouth; hold breath for at least six seconds; exhale slowly
Soft mist inhaler			
Ipratropium/albuterol (Combivent Respimat)	Compact, convenient, dose indicator and auto lock when cartridge is empty, more time to coordinate breath to actuation, portable, rapid medication delivery	Expires three months after cartridge is inserted; strength and dexterity required to prepare inhaler	Insert cartridge before initial use; write discard by date on cartridge; prime inhaler the first time it is used or if it has not been used for days or weeks; hold inhaler upright with cap closed, turn clear base in direction of white arrows until it clicks; exhale fully, not into the mouthpiece of the device; seal lips around the mouthpiece without covering the air vents; begin to inhale slowly and deeply through the mouth; press the dose release button and continue to inhale for as long as possible; hold breath for at least six seconds; exhale slowly