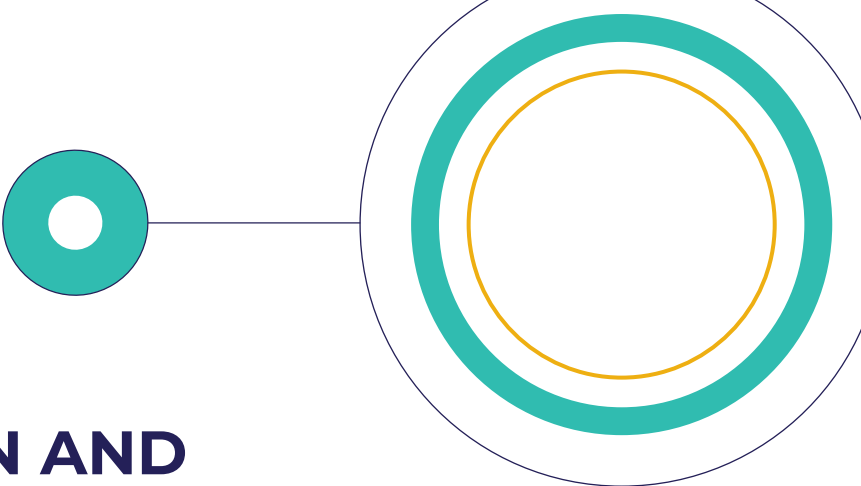


INHALER SELECTION AND TECHNIQUE TRAINING

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INTRODUCTION: INHALER SELECTION AND TECHNIQUE TRAINING

Selection of an inhaler is integral for patients with respiratory disease, including asthma and chronic obstructive pulmonary disease (COPD). Delivery of respiratory medications by inhalation can achieve a higher concentration in the airways, more rapid onset of action, and fewer systemic adverse effects than systemic delivery.^{1,2} However, correct inhaler technique must be learned and continually reinforced in order for the medication to be delivered effectively.

Poor inhaler technique can lead to poor disease control, increased risk of exacerbations, and increased adverse effects.^{1,2} Many patients are unable to use their inhaler correctly, and many health care providers (HCPs) are unable to correctly demonstrate how to use the inhalers they prescribe. It is important for HCPs to choose the best inhaler device for each individual patient and continually train and re-train themselves and patients on proper inhaler technique.

Keys to Maximizing
Use of Inhalation
Devices Are^{1,2}:



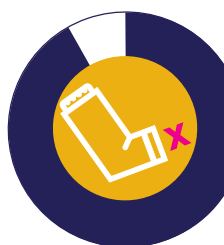
Personalized
device selection



Device
training



Ongoing technique
assessment and
retraining



Up to **92%** of patients with asthma
use their inhalers incorrectly³



25% of patients do not receive
any verbal education on correct
use of a pMDI or DPI⁴



45% receive only 1 session
of instruction⁴



DEVICE SELECTION

Choosing the right device is an important part of disease management.²

Device characteristics and patient capabilities, familiarity, satisfaction, and preference must all be considered to optimize device selection.⁵

DEVICE CHARACTERISTICS

- Many clinical trials have evaluated device use in patients with respiratory disease⁶
- Consider the select advantages and disadvantages below when deciding among different device types for your patient

	Advantages	Disadvantages
Pressurized Metered-Dose Inhaler (pMDI)	• High reproducibility between doses⁷ • Independent of inspiratory flow rate⁸ • Option for spacer add-on to optimize delivery⁷	• Requires coordination of actuation and inhalation⁷ • Many patients cannot use it correctly⁹ • High oropharyngeal deposition⁹
pMDI + spacer	• Easier to coordinate⁹ • Less oropharyngeal deposition⁹ • Higher lung deposition than pMDI⁹	• Subject to static charge⁹ • More expensive than pMDI⁹ • Less portable than pMDI alone⁹
Dry Powder Inhaler (DPI)	• Does not contain propellant⁹ • No coordination needed⁹ • Quicker time to achieve mastery in technique¹⁰	• Requires minimum inspiratory flow⁹ • Many patients cannot use it correctly⁹ • Most types are moisture sensitive⁹
Soft Mist Inhaler (SMI)	• Multidose device⁹ • High lung deposition⁹ • Does not contain propellant⁹	• May require assembly¹¹ • Requires some coordination of actuation and inhalation¹² • Relatively expensive⁹
Nebulizer	• May be used at any age⁹ • No specific inhalation technique required⁹ • May disperse drugs not available with pMDIs and DPIs⁹	• Treatment times can be long⁹ • Performance varies among nebulizers⁹ • Risk of bacterial contamination⁹



INCLUDE PATIENT-RELATED FACTORS IN DEVICE DECISION

- Health care providers should seek to understand patient capabilities and preferences to optimize device selection
- The patient's preference, familiarity, and satisfaction with a device type, as well as their ability to correctly use a device, can impact disease management

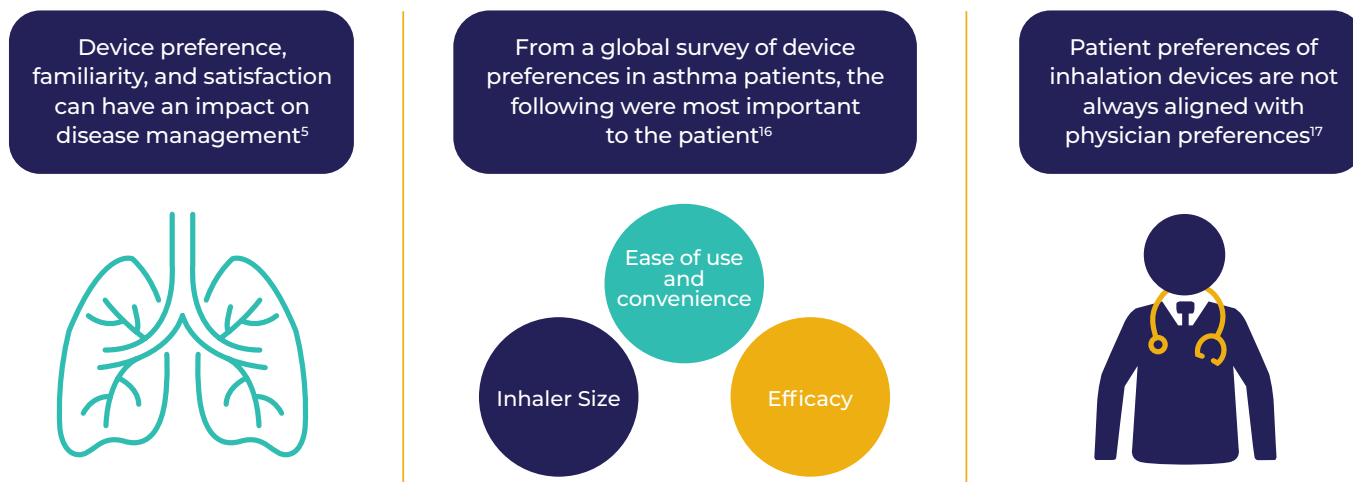
Assessing Patient Capabilities

Considering patient capabilities is a critical component of device selection, as patients may have physical or cognitive limitations that significantly impact their ability to effectively use certain devices.

 Can the patient load, prime, and actuate the device?¹³	 Does the patient have adequate pulmonary function to effectively use the device?^{14,15}
• Does the patient have physical or cognitive limitations that impact effective utilization? • Is the patient capable of hand-inhalation coordination?	• Is the patient capable of conscious inhalation? • Is the patient likely to reliably generate and control sufficient inspiratory flow?

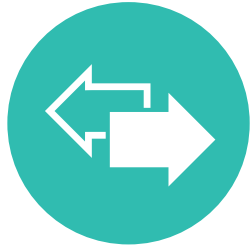
Incorporating Patient Preferences

It has been shown that increases in adherence, quality of life, and disease control are directly linked to patients' satisfaction with their inhaler device. In talking with your patients about their treatment, include a discussion of their preferences, experiences, and satisfaction with specific medications and devices.⁵



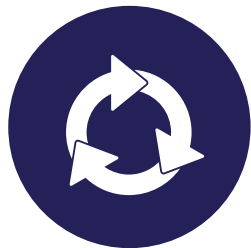


Additional Considerations



Device Switching

- Even when delivering the same type of drug, the type of device may affect adherence and can have an effect on the success of treatment¹⁸
- Ensure patients receive device training and counseling whenever a device is switched¹⁸



Device Consistency

- Different device types require different breathing patterns and techniques to ensure optimal drug delivery. In patients who use more than 1 inhaler, device consistency can be beneficial^{19,20}



Regimen Simplicity

- Simplifying treatment regimens and minimizing the number of different devices used has demonstrated positive effects on disease control¹⁸





INHALER ERRORS

Lack of training regarding device use has been suggested as the primary reason that patients use their devices incorrectly.²¹ However, patients often do not receive any device training or ongoing assessment of inhaler technique.^{21,22}

PATIENTS OFTEN REPORT THEY USE GOOD TECHNIQUE EVEN WHEN ERROR RATES ARE HIGH^{23,24}

Correct use of a device is critical for proper medication delivery; however, observational studies have shown that errors in device use are very common.

Impact of Incorrect Inhaler Use:



Lowers drug deposition
to the lung²⁵



Wastes doses
of medication²⁵



Poor control
of asthma symptoms²⁵



Increased risk
of hospitalization,
emergency department
visits, and use of oral
corticosteroids²⁶

When good asthma symptom control has not been achieved or a patient continues to have exacerbations despite appropriate treatment, check inhaler technique and adherence before increasing the dose or changing the treatment regimen.



COMMON TECHNIQUE-RELATED ERRORS

Common Technique-related Errors with DPIs^{10,23,24,27}

 Correct Technique	 Incorrect Technique
Inhale quickly and deeply	Stop inhaling prematurely (not inhaling to total lung capacity)
Forceful and deep inhalation	Slow and not forceful inhalation
Hold breath after inhalation	Not holding breath long enough after inhalation

Common Technique-related Errors with pMDIs^{10,23,24,27}

 Correct Technique	 Incorrect Technique
Shake inhaler (if needed)	No shaking of inhaler
Breathe out before actuating	No exhalation before actuation
Actuate while breathing in deeply and slowly and continue until total lung capacity	Too fast or too forceful inhalation
Not holding breath long enough	No or short breath-holding after inhalation

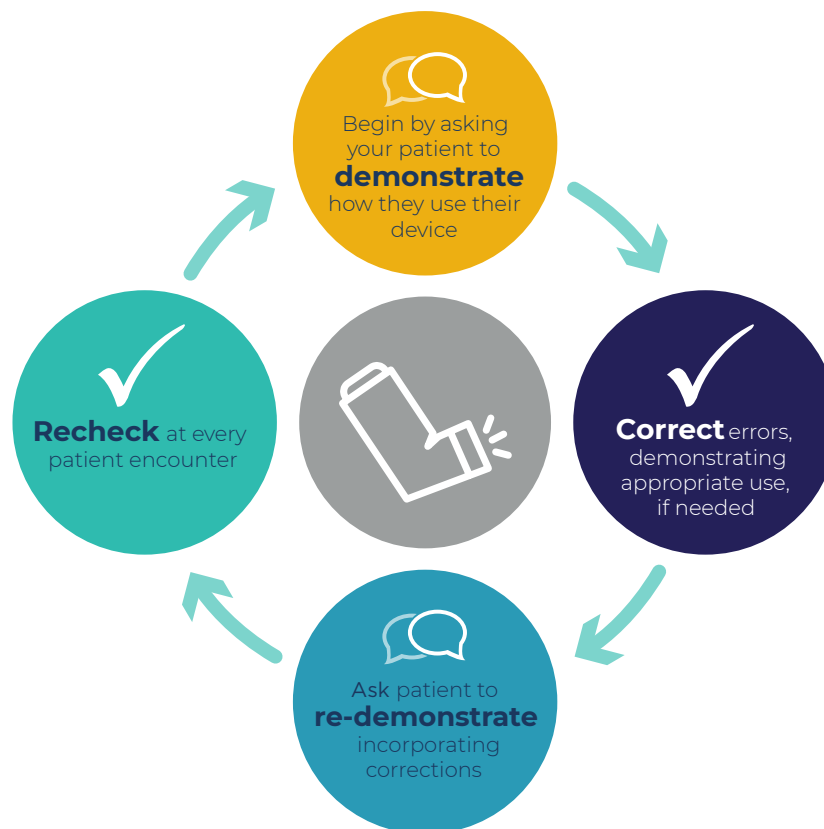


INHALER TECHNIQUE

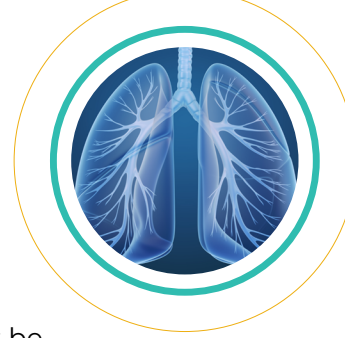
Although written and verbal instructions can improve your patient's inhaler technique, nothing is more powerful than an **accurate physical demonstration**.

THE BASICS OF EFFECTIVE TRAINING

- Accurate physical demonstration of correct device use has been found to deliver markedly better retention of inhaler skills than written and verbal instructions alone²⁸
- Even when patients have been trained, retraining and ongoing evaluation of inhaler use is necessary²⁹
 - Many patients have subsequent difficulty maintaining correct inhaler technique, irrespective of the device used or the duration of follow-up



Among patients with poorly controlled asthma referred to specialized asthma clinics or assessed in community pharmacies, a high proportion are found to have poor inhaler technique.³⁰⁻³²



Assessing Inhaler Technique

The checklists below provide general steps for use of devices currently available in the United States and routinely prescribed for the treatment of asthma. This should not be viewed as an all-inclusive list of inhalation devices used in the treatment of respiratory illnesses.

Be sure to read the manufacturer's instructions for proper use and cleaning of inhalers as variations among different products exist.

Pressurized Metered-Dose Inhaler (pMDI)/ pMDI with Spacer* Hydrofluoroalkane (HFA) Propellant³³

- | |
|--|
| ☐ Remove cap and shake the inhaler. |
| ☐ Prime the inhaler as needed. |
| ☐ If using a spacer or valved holding chamber (VHC), remove the cap and look into the mouthpiece to ensure nothing is in it. Place the inhaler in the rubber ring on the end of the spacer/VHC. |
| ☐ Stand or sit up straight. |
| ☐ Inhale deeply and then exhale completely to empty the lungs. |
| ☐ Tilt head back slightly, place inhaler mouthpiece in mouth and close lips around it to form a tight seal. |
| ☐ Start to breathe in slowly while pressing down firmly on the top of the inhaler canister. |
| ☐ Breathe in slowly (gently) and deeply for 3 to 5 seconds. |
| ☐ Hold breath for approximately 10 seconds. |
| ☐ Remove inhaler from mouth and breathe out slowly. |

*A spacer device is a tube extension to an MDI or a holding chamber with a port at one end to which the MDI is attached, a mask or mouthpiece being fitted at the other end. Its purpose is to slow the aerosol spray before it reaches the mouth, thus allowing propellants to evaporate and large particles to settle out of the cloud.³⁵



Dry Powder Inhalers³⁶⁻⁴⁰

Examples include: Diskus®, Ellipta®, Flexhaler®, RespiClick®, and Twisthaler®.

- ☐ 1. Remove cap and hold inhaler upright (like a rocket). If the inhaler is a Diskus®, hold it flat (like a flying saucer).
- ☐ 2. Load a dose of medicine according to manufacturer's instructions (each brand of inhaler is different; you may have to prime the inhaler the first time you use it). Do not shake the inhaler.
- ☐ 3. Stand or sit up straight.
- ☐ 4. Inhale deeply and then exhale completely to empty the lungs. Do not blow into the inhaler.
- ☐ 5. Place inhaler mouthpiece in mouth and close lips around it to form a tight seal.
- ☐ 6. Take a fast, deep, forceful breath in through the mouth.
- ☐ 7. Hold breath for approximately 10 seconds.
- ☐ 8. Remove inhaler from mouth and breathe out slowly, facing away from the inhaler.
- ☐ 9. If taking more than 1 inhalation of medicine per dose, wait 1 minute and repeat steps 2 through 8.
- ☐ 10. To close the inhaler, slide the cover back over the mouthpiece. Store the inhaler in a cool, dry place (not in the bathroom).
- ☐ 11. If using an inhaled corticosteroid, rinse mouth with water and spit it out.



Soft-Mist Inhaler³⁴ Respimat®

- ☐ Hold upright and keep the cap closed.
- ☐ **Turn** the clear base in the direction of the arrows on the label until it clicks (half a turn).
- ☐ **Open** the cap until it snaps fully open.
- ☐ Breathe out slowly and fully.
- ☐ Close lips around the mouthpiece without covering the air vents.
- ☐ Point the inhaler to the back of the throat.
- ☐ While taking a slow, deep breath through the mouth, **press** the dose-release button and continue to breathe in.
- ☐ Hold breath for approximately 10 seconds or for as long as comfortable.
- ☐ Repeat **Turn, Open, Press** for a total of 2 puffs.
- ☐ Close inhaler cap.



PATIENT RESOURCES

In addition to educating patients regarding correct inhaler technique, it's important to ensure they understand the purpose of the medication, how the medication works, and how to use the medication appropriately.

Inhaler Identification

The Asthma and Allergy Network (AAN) has created materials that may help you speak with your patients about their inhalers and how they work. Materials from the AAN are available at the following link:

<https://allergyasthmanetwork.org/news/inhalers-at-a-glance-posters-resources/>

Patient Education Resources on Inhaler Technique

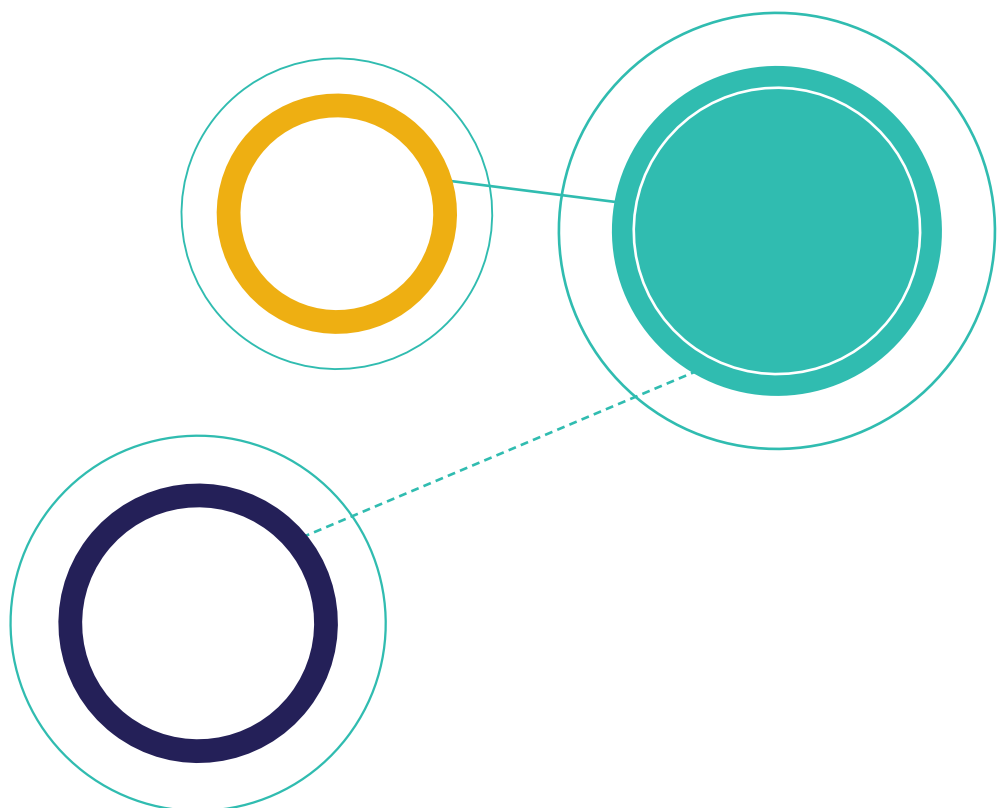
There are many online resources to which you can direct your patients to access videos, tutorials, and step-by-step information on how to appropriately use their prescribed inhalers. While not a comprehensive list, patient resources regarding device technique can be found on the following websites:

[Allergy and Asthma Network](#)

[Asthma and Allergy Foundation of America](#)

[National Heart, Lung, and Blood Institute](#)

[Agency for Healthcare Research and Quality](#)





REFERENCES

- 1.** GOLD. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease, 2026 report. Available at www.goldcopd.org. Accessed June 20, 2026. **2.** GINA. Global Strategy for Asthma Management and Prevention, 2026. Accessed June 20, 2026. www.ginasthma.org. **3.** Bonds RS, Asawa A, Ghazi AI. Misuse of medical devices: a persistent problem in self-management of asthma and allergic disease. *Ann Allergy Asthma Immunol*. 2015;114(1):74-76.e2. **4.** Lavorini F, Magnan A, Dubus JC, Voshaar T, Corbetta L, Broeders M, et al. Effect of incorrect use of dry powder inhalers on management of patients with asthma and COPD. *Respir Med*. 2008;102(4):593-604. **5.** Virchow JC, Akdis CA, Darba J, Dekhuijzen R, Hartl S, Kobelt G, et al. A review of the value of innovation in inhalers for COPD and asthma. *J Mark Access Health Policy*. 2015;3. doi: 10.3402/jmahp.v3.28760. **6.** Laube BL, Janssens HM, de Jongh FHC, Devadason SG, Dhand R, Diot P, et al. What the pulmonary specialist should know about the new inhalation therapies. *Eur Respir J*. 2011;37(6):1308-1331. **7.** Chrystyn H, Price D. Not all asthma inhalers are the same: factors to consider when prescribing an inhaler. *Prim Care Respir J*. 2009;18(4):243-249. **8.** Bonini M, Usmani OS. The importance of inhaler devices in the treatment of COPD. *COPD Res Pract*. 2015;1:1-9. **9.** Lavorini F. The challenge of delivering therapeutic aerosols to asthma patients. *ISRN Allergy*. 2013;2013:102418. **10.** Melani AS, Bonavia M, Mastropasqua E, Zanforlin A, Lodi M, Martucci P, et al. Time required to rectify inhaler errors among experienced subjects with faulty technique. *Respir Care*. 2017;62(4):409-414. **11.** Boehringer Ingelheim. How to use SPIRIVA RESPIMAT. Available at <https://patient.boehringer-ingelheim.com/us/products/spiriva/bipdf/respimat-quick-start-guide-downloadable>. Accessed June 20, 2026. **12.** Anderson P. Use of Respimat Soft Mist inhaler in COPD patients. *Int J Chron Obstruct Pulmon Dis*. 2006;1(3):251-259. **13.** Barrons R, Wheeler J, Woods JA. Opportunities for inhaler device selection in elderly patients with asthma or COPD. *Patient Intelligence*. 2015;7:53-65. **14.** Dekhuijzen PN, Vincken W, Virchow JC, Roche N, Agusti A, Lavorini F, et al. Prescription of inhalers in asthma and COPD: towards a rational, rapid and effective approach. *Respir Med*. 2013;107(12):1817-1821. **15.** Al-Showair RAM, Tarsin WY, Assi KH, Pearson SB, Chrystyn H. Can all patients with COPD use the correct inhalation flow with all inhalers and does training help? *Respir Med*. 2007;101(11):2395-2401. **16.** Molimard M, Colthorpe P. Inhaler devices for chronic obstructive pulmonary disease: insights from patients and healthcare practitioners. *J Aerosol Med Pulm Drug Deliv*. 2015;28(3):219-228. **17.** Roche N, Scheuch G, Pritchard JN, Nopitsch-Mai C, Lakhani DA, Saluja B, et al. Patient focus and regulatory considerations for inhalation device design: report from the 2015 IPAC-RS/ISAM workshop. *J Aerosol Med Pulm Drug Deliv*. 2017;30(1):1-13. **18.** Bjermer L. The importance of continuity in inhaler device choice for asthma and chronic obstructive pulmonary disease. *Respiration*. 2014;88(4):346-352. **19.** Bosnic-Anticevich S, Chrystyn H, Costello RW, Dolovich MB, Fletcher MJ, Lavorini F, et al. The use of multiple respiratory inhalers requiring different inhalation techniques has an adverse effect on COPD outcomes. *Int J Chron Obstruct Pulmon Dis*. 2016;12:59-71. **20.** Price D, Chrystyn H, Kaplan A, Haughney J, Román-Rodríguez M, Burden A, et al. Effectiveness of same versus mixed asthma inhaler devices: a retrospective observational study in primary care. *Allergy Asthma Immunol Res*. 2012;4(4):184-191. **21.** Chrystyn H, van der Palen J, Sharma R, Barnes N, Delafont B, Mahajan A, et al. Device errors in asthma and COPD: systematic literature review and meta-analysis. *NPJ Prim Care Respir Med*. 2017;27(1):22. **22.** Braman SS, Carlin BW, Hanania NA, Mahler DA, Ohar JA, Pinto-Plata V, et al. Results of a pulmonologist survey regarding knowledge and practices with inhalation devices for COPD. *Respir Care*. 2018;63(7):840-848. **23.** Souza ML, Meneghini AC, Ferraz E, Vianna EO, Borges MC. Knowledge of and technique for using inhalation devices among asthma patients and COPD patients. *J Bras Pneumol*. 2009;35(9):824-831. **24.** Jahedi L, Downie SR, Saini B, Chan HK, Bosnic-Anticevich S. Inhaler technique in asthma: How does it relate to patients' preferences and attitudes toward their inhalers? *J Aerosol Med Pulm Drug Deliv*. 2017;30(1):42-52. **25.** Murphy A. How to help patients optimise their inhaler technique, examining the impact of sub-optimal inhaler technique and how healthcare professionals can support patients in optimising their technique. *Pharm J*. 2016:1-11. **26.** Melani AS, Bonavia M, Cilenti V, Cinti C, Lodi M, Martucci P, et al. Inhaler mishandling remains common in real life and is associated with reduced disease control. *Respir Med*. 2011;105(6):930-938. **27.** Luczak-Wozniak K, Dabrowska M, Domagala I, Miszczuk M, Lubanski W, Leszczynski A, et al. Mishandling of pMDI and DPI inhalers in asthma and COPD - repetitive and non-repetitive errors. *Pulm Pharmacol Ther*. 2018;51:65-72. **28.** Price D, Bosnic-Anticevich S, Briggs A, Chrystyn H, Rand C, Scheuch G, et al; Inhaler Error Steering Committee; Inhaler competence in asthma: common errors, barriers to use and



REFERENCES (cont'd)

recommended solutions. *Respir Med*. 2013;107:37-46. **29.** Toumas-Shehata M, Price D, Basheti IA, Bosnic-Anticevich S. Exploring the role of quantitative feedback in inhaler technique education: a cluster-randomised, two-arm, parallel-group, repeated-measures study. *NPJ Prim Care Respir Med*. 2014;24:14071. **30.** Harnett CM, Hunt EB, Bowen BR, O'Connell OJ, Edgeworth DM, Mitchell P, et al. A study to assess inhaler technique and its potential impact on asthma control in patients attending an asthma clinic. *J Asthma*. 2014;51(4):440-445. **31.** Hardwell A, Barber V, Hargadon T, McKnight E, Holmes J, Levy ML. Technique training does not improve the ability of most patients to use pressurised metered-dose inhalers (pMDIs). *Prim Care Respir J*. 2011;20(1):92-96. **32.** Armour CL, Lemay K, Saini B, Reddel HK, Bosnic-Anticevich SZ, Smith LD, et al. Using the community pharmacy to identify patients at risk of poor asthma control and factors which contribute to this poor control. *J Asthma*. 2011;48(9):914-922. **33.** National Jewish Health. Devices for inhaled medications (asthma inhalers, COPD inhalers). Metered-Dose Inhaler (MDI). Available at <https://www.nationaljewish.org/conditions/medications/asthma-medications/devices/metered-dose-inhaler>. Accessed June 20, 2026. **34.** National Jewish Health. Devices for inhaled medications (asthma inhalers, COPD inhalers). Using a Respimat®. Available at <https://www.nationaljewish.org/conditions/medications/asthma-medications/devices/using-a-respimat>. Accessed June 20, 2026. **35.** McFadden ER Jr. Improper patient techniques with metered dose inhalers: clinical consequences and solutions to misuse. *J Allergy Clin Immunol*. 1995;96(2):278-283. **36.** Advair Diskus [package insert]. Research Triangle Park, NC: GlaxoSmithKline; 2026. **37.** Breo Ellipta [package insert]. Research Triangle Park, NC: GlaxoSmithKline; 2024. **38.** Proair Resplick [package insert]. Horsham, PA: Teva Respiratory, LLC; 2020. **39.** PULMICORT FLEXHALER [package insert]. Wilmington, DE: AstraZeneca Pharmaceuticals LP; 2025. **40.** Asmanex Twisthaler [package insert]. Whitehouse Station, NJ: Merck & Co., Inc.; 2021.