Asthma, COPD: Why the 'right' drug often fails in the 'wrong' device

Written by The Life Science Feed Editorial Team · Published 6 September 2026 · Edited by Mara Voss

> The sheer number of inhaler devices available for asthma and chronic obstructive pulmonary disease (COPD) should, in theory, simplify treatment. Instead, it often complicates it, creating a persistent mismatch between patient capability and device requirements. This ongoing struggle impacts adherence and, consequently, clinical outcomes.

KEY TAKEAWAYS

- The Pivot: Despite advancements in drug formulations, the physical act of inhalation remains a critical, often overlooked, barrier to effective therapy.
- The Data: No specific data points are provided in the source material, but the underlying issue is suboptimal drug delivery due to poor inhaler technique.
- The Action: Clinicians must prioritise a thorough assessment of patient dexterity, cognitive function, and inspiratory flow before prescribing any inhaler device.

Managing chronic respiratory conditions like asthma and COPD hinges on effective drug delivery to the airways. Inhalers are the cornerstone of this strategy, providing targeted therapy with fewer systemic side effects than oral medications. But the efficacy of these inhaled therapies is inextricably linked to the patient's ability to use the device correctly, a factor often underestimated in busy clinical settings.

The landscape of inhaler technology, encompassing the market of available devices, is diverse, encompassing metered-dose inhalers (MDIs), dry powder inhalers (DPIs), and soft mist inhalers (SMIs). Each type demands a specific technique, from coordinating actuation with inspiration for MDIs to generating sufficient inspiratory flow for DPIs. This variability means that a device perfectly suited for one patient might be entirely inappropriate for another, leading to suboptimal drug deposition and, predictably, poor disease control.

The mechanics of delivery

MDIs require precise hand-breath coordination. Patients must actuate the canister while simultaneously inhaling slowly and deeply. This can be a significant hurdle for many, particularly children, the elderly, or those with cognitive impairments. Spacers can mitigate some of these coordination issues, improving drug delivery and reducing oropharyngeal deposition, but they add another step and another device to manage.

DPIs, on the other hand, are breath-actuated. The patient's inspiratory effort releases the medication. This eliminates the need for hand-breath coordination, but it introduces a new requirement: sufficient inspiratory flow. Patients with severe airflow limitation, or those who cannot generate a forceful, rapid inhalation, may not receive an adequate dose.

This is a common problem in advanced COPD, where the very disease being treated compromises the ability to use the device effectively. The choice between these devices can significantly impact how well a patient's asthma is controlled, a challenge that sometimes leads to persistent symptoms even with appropriate medication, as seen in patients on benralizumab.

SMIs represent a newer generation of inhalers that deliver a fine, slow-moving mist, potentially making them easier to inhale for some patients. They require a slow, deep inhalation, similar to MDIs, but without the need for precise coordination. Still, each device type has its own learning curve, and mastering the technique is not a one-time event. Regular re-education and assessment are essential to maintain proficiency.

Beyond the drug: Patient factors

The focus in clinical trials is, understandably, on the drug itself: its pharmacodynamics, pharmacokinetics, and efficacy in specific populations. But in the real world, the drug's potential is only realised if it reaches its target. Patient factors play a decisive role here. Manual dexterity, visual acuity, cognitive function, and even cultural beliefs about medication can all influence inhaler technique and adherence.

Consider an elderly patient with rheumatoid arthritis and COPD. Their joint pain and stiffness might make it difficult to actuate an MDI or load a DPI. Their declining vision could hinder reading dosage counters. Cognitive decline might impair their ability to follow complex instructions. Prescribing the 'best' drug without considering these practical limitations is a recipe for therapeutic failure. This is why a holistic approach, often involving a general practice handbook for quick reference, is so vital.

Adherence is another critical component. Even with perfect technique, an inhaler that is not used consistently will not work. Complex regimens, multiple devices, and perceived lack of benefit can all contribute to poor adherence. Simplifying regimens, where possible, and ensuring patients understand the purpose and benefit of each medication can improve compliance. The challenge of adherence is not unique to inhalers; it is a pervasive issue across chronic disease management, but the technical demands of inhalers amplify it.

The clinician's role in device selection

Selecting the optimal inhaler device requires more than just knowing the drug. It demands a detailed understanding of the patient. Clinicians must assess inspiratory flow rates, evaluate manual dexterity, and gauge cognitive ability. This often means dedicating time to demonstrate and observe inhaler technique, a luxury not always afforded in a busy clinic schedule. But this investment upfront can prevent countless exacerbations and hospitalisations down the line.

Guidelines often recommend specific drug classes for different severities of asthma and COPD, but they rarely dictate device type. This leaves the decision to the prescribing clinician, who must navigate the nuances of drug formulation, device mechanics, and patient characteristics. The choice should be a shared decision, involving the patient in the process to foster a sense of ownership and improve engagement. For instance, while triple therapy in asthma has shown benefits, the device delivering it must be appropriate.

Training and re-training are paramount. Initial instruction should be comprehensive, ideally with a placebo device. Patients should demonstrate their technique, allowing for immediate correction of errors. Follow-up appointments should include a review of inhaler technique, as proficiency can wane over time. Educational materials, videos, and even mobile applications can supplement in-person instruction, providing ongoing support.

Where the system falls short

The current healthcare system often prioritises cost over optimal device selection. Formularies may restrict access to certain devices, forcing clinicians to prescribe a less-than-ideal option based on insurance coverage rather than patient need. This creates a barrier to personalised care and can lead to poorer outcomes, particularly for vulnerable populations. Another issue is the lack of standardised assessment tools for inhaler technique and patient capability. While some clinics use peak inspiratory flow meters, their widespread adoption is inconsistent. A more systematic approach to evaluating patient factors before prescribing would ensure a better match between patient and device. The ongoing challenge of severe asthma treatment decisions highlights this gap.

The pharmaceutical industry also bears some responsibility. While innovation in drug molecules is constant, device innovation often lags. Developing devices that are inherently easier to use, or that provide real-time feedback on technique, could significantly improve outcomes. Simpler designs, larger buttons, and clearer indicators would benefit many patients, especially those with limited dexterity or vision.

The problem is not a lack of effective drugs; it is a failure to consistently deliver those drugs effectively to the patient's lungs. Until device selection is elevated to the same level of importance as drug selection, and until systemic barriers to optimal choice are removed, patients will continue to struggle with preventable exacerbations and suboptimal disease control. The next step in improving respiratory care is not necessarily a new molecule, but a renewed focus on the interface between patient and device.

CLINICAL IMPLICATIONS

The persistent struggle with inhaler technique is not merely a patient compliance issue; it is a systemic failure to integrate human factors into prescribing decisions. Clinicians often default to familiar devices or those dictated by formulary restrictions, rather than meticulously assessing individual patient needs. This oversight directly translates to uncontrolled symptoms and avoidable healthcare utilisation.

Industry has a role to play beyond developing novel molecules. Device design must evolve to be more intuitive and forgiving, especially for an aging population with increasing comorbidities. A device that requires a PhD in engineering to operate correctly is simply not fit for purpose in real-world clinical practice.

For patients, the consequence of this mismatch is clear: continued suffering despite being on 'the right' medication. They are often blamed for poor adherence when the real issue lies in a device that is physically or cognitively challenging for them to use. This erodes trust and disempowers patients from actively participating in their own care.

We need a fundamental shift in how we approach inhaler prescribing. It must begin with a mandatory, objective assessment of inspiratory flow and manual dexterity, followed by a shared decision-making process that prioritises patient capability over convenience or cost. Anything less is simply prescribing failure.

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