

**“after 40 years of using an inhaler, I’ve not a single clue of how I’m supposed to use it”:
A call to action...**

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Summary

Inhalers are critical tools in managing chronic respiratory conditions such as asthma and chronic obstructive pulmonary disease (COPD). Despite their importance, studies consistently show that a significant proportion of patients fail to use inhalers correctly. Patients express a wide range of views; from misplaced certainty in their technique to the uncertainty manifest in the title. This document explores the multifaceted reasons behind this widespread issue from expert analysis and from patient feedback from participants in the ASSIST clinical study and respondents to the Asthma + Lung UK 2025 survey. The consequences of incorrect inhaler use, and potential strategies to improve patient adherence to proper inhaler techniques are discussed. Many technique improvement initiatives have, in isolation, been able to confer temporary improvement but sustained technique improvement must be a goal. The case is made for a task force to be created from experts, industry and patient associations to guide best practice in inhaler technique training.

Key Message

Collaborative multidisciplinary and multifactorial efforts should target improvement of inhaler technique.

Prevalence of Inhaler Use Errors

Research indicates that a substantial number of patients make errors when using inhalers [1], some of which are critical errors. A systematic review and meta-analysis of U.S. studies found that more than three-quarters of adults with obstructive lung diseases used metered-dose inhalers (MDIs) incorrectly [2]. Common errors included failing to exhale fully before inhalation, not holding the breath after inhalation, and not shaking the inhaler before use. Similarly, a study in Brazil reported that the most frequent mistakes among patients using MDIs and dry powder inhalers were not exhaling before inhalation and failing to hold the breath after inhalation [3]. Clinically-critical technique aspects are widely discussed, but rarely are patients’ voices on what they perceive as the critical aspects of inhaler use heard by our research community. The aim of this article is to begin to address this gap.

Method

A literature review was conducted to distil expert guidance and relevant verbatim quotes from ASSIST study [4] (126 participants) patient focus groups were chosen, additionally feedback from the Asthma + Lung UK 2025 Survey [5] (A+LUK2025) among over 9,000 respondents identifying what they think is the main issue facing people with lung conditions, were analysed for insightful feedback.

Factors Contributing to Incorrect Inhaler Use

Incorrect inhaler use is a multifaceted problem. Some important factors affecting use are shown in Figure 1, and strategies to overcome incorrect use are shown in Figure 2, and discussed below;

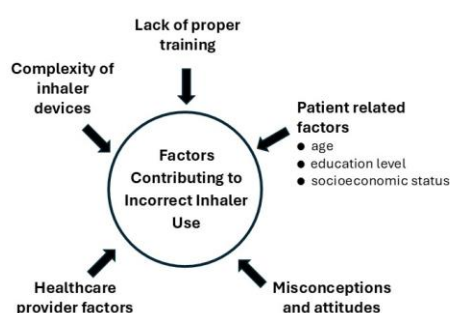


Fig 1 - Factors Contributing to Incorrect Inhaler Use



Fig 2 - Strategies to Improve Inhaler Technique

1. Lack of Proper Training

One of the primary reasons for incorrect inhaler use is inadequate training. Many patients receive insufficient instruction on how to use their inhalers correctly. A study found that only 15.8% of patients reported receiving inhaler technique education from their doctors, while 38.4% were taught by pharmacy staff [6]. This disparity in training sources can lead to inconsistent and incorrect usage, and for those receiving no training they must rely on their own resources *“Failure to explain correct (use) of inhalers”* [5]. Patient feedback, *“lack of knowledge and poor inhaler technique”* [5]. This highlights how deeply embedded the problem is, and illustrates that not all asthma reviews cover inhaler technique despite best practice guidance demanding it, in fact A+LUK found that in UK 54.5% of asthma reviews included inhaler technique checks [5]., *“At asthma reviews, the technique isn’t checked so could go years doing it incorrectly...”* [4]. Although best practice guidance calls for inhaler training to be given, it does not define how it should be delivered for best chances of success [6]. Consequently, the manner in which training is delivered will vary greatly between healthcare professionals.

2. Complexity of Inhaler Devices

The complexity of inhaler devices can contribute to errors. Different inhalers require specific techniques, and patients may struggle to remember the correct steps for each device. The multitude of inhaler types and their varying instructions can overwhelm clinicians and patients, as can switching of product dispensed, leading to mistakes in training and usage, *“confusing advice about using inhalers”* [5].

3. Patient-Related Factors

Many patient-related factors can influence inhaler technique, some examples:

- Age: Older adults may have difficulty with inhalation strength, manual dexterity required to operate certain inhalers or forgetfulness, leading to incorrect use [1].
- Education Level: Patients with lower educational attainment may have a limited understanding of their condition and the importance of correct inhaler use, resulting in higher error rates [7].
- Socioeconomic Status: Individuals from lower socioeconomic backgrounds may face barriers such as limited access to healthcare resources, which can affect their ability to learn and maintain proper inhaler techniques, *“With a life-long condition such as asthma prescription costs add up when you are on more than two medications”* [5].

4. Misconceptions, Attitudes and Learning

Patients' beliefs and attitudes towards their condition and treatment can impact their adherence to proper inhaler use. Positive perceptions (such as sensation of relief) can reinforce behaviour, *“my technique improved a lot and big difference in control of my asthma”* [4]. Understanding that correct technique can lead to lifestyle changes can help, *“As I am now using inhaler correctly, I can do 5 to 10 minutes on the treadmill”* [4]. However, since the goal of asthma control is an absence of symptoms positive reinforcement may be absent. Some may underestimate the severity of their disease, lack confidence in their physician or believe that medication is unnecessary, *“Lack of confidence in GP regarding diagnosis and treatment”* [5], leading to non-compliance or incorrect usage. Habit has a strong impact, *“I thought I knew how to use my inhaler correctly, but was wrong, as are all my relatives”* [4].

Learning plays a key role in development of technique and insufficient guidance and reinforcement detract from adoption of good technique, *“I wasn’t using inhaler correctly – very quick. I learned that I need to take time to use it correctly and take a slower breath”* [4]. Measures of success (such as requiring less reliever) can enable patients to see improvement, *“I previously needed lots of reliever every day, I enjoy seeing my improvement and correlating with how I’m feeling. [4]”* Comparisons with previous experiences can help embed learning, *“I get a flare-up every year around Christmas and this is the first year I haven’t had an exacerbation - I am now using my inhaler correctly and that is probably why”* [4].

Additionally, cultural beliefs and religious practices can influence the acceptance and use of inhalers, especially if the medication contains ingredients that conflict with personal or religious values [8].

Many examples of inhaler technique retrievable from online sources do not provide valid guidance and examples seen in popular media seldom illustrate correct technique. Respondents to the A+LUK survey felt that the seriousness of their condition was poorly understood, *“not helped by tv/films showing asthma attacks being resolved with a puff of a reliever inhaler”* [5].

5. Healthcare Provider Factors

Healthcare providers play a crucial role in ensuring correct inhaler use. However, studies have shown that only a minority of healthcare professionals can demonstrate correct inhaler technique [9], and even fewer regularly assess patients' inhaler techniques during follow-up visits. This lack of ongoing assessment and reinforcement can rapidly lead to patients reverting to incorrect techniques. Reimbursement for the provision of inhaler technique training is noticeably absent in many countries. In some cases, pharmaceutical companies have provided free-of-charge training tools or placebo demonstration devices but in isolation this has not resolved the problem. The A+LUK2025 survey had numerous reports from patients unable to get face to face appointments with GPs even in emergencies, *"Lack of access to emergency appointments and a lack of face to face annual asthma reviews with an expert"* [5], and often being critical of healthcare practitioner skills, and a feeling of not being listened to, *"Nobody listens they just keep giving out medicines"* [5].

Consequences of Incorrect Inhaler Use

Incorrect inhaler use can have serious consequences for patients with respiratory conditions. Ineffective medication delivery can lead to poorly controlled symptoms, increased frequency of exacerbations, and a higher risk of hospitalisations, *"I now realise how important it is to take time to use correctly..."* [4]. Poorly controlled asthma may lead to dose escalation, which may be unnecessary if inhaler technique is poor, *"Strength of my preventer went up and up which may not have been needed if I had used my initial inhaler correctly"* [4]. In severe cases, improper inhaler use can result in life-threatening situations [10]. Additionally, poor technique with inhaled corticosteroids may lead to excessive oropharyngeal deposition which can diminish local immunity and lead to fungal infections.

Strategies to Improve Inhaler Technique

To address the issue of incorrect inhaler use, several strategies can be implemented:

1. Enhanced Patient Education

Providing comprehensive education on inhaler techniques is essential – there are already some resources for trainers and patients. Education should include verbal instructions, written materials, and hands-on demonstrations. Repeated training sessions and regular assessments can help reinforce correct techniques and address any issues promptly. Training sessions need to be both available and engaging and may benefit from being targeted towards at-risk groups, it is often not like this, *"7 week delay to see my Dr and 1 year wait to see a consultant"* [5].

2. Simplification of Inhaler Devices

Simplifying inhaler devices can reduce the likelihood of errors. Manufacturers should consider designing user-friendly inhalers that are easier to operate, especially for older adults or those with physical limitations, *"Not enough innovation in puffers. Not even a dose count on Ventolin in the UK which is farcical"* [5].

3. Personalised Inhaler Selection

Healthcare providers should consider individual patient needs when prescribing inhalers. Factors such as manual dexterity, cognitive function, and personal preferences should be taken into account to ensure that patients are comfortable with and capable of using their prescribed inhalers correctly, *"People need to have individualised care plans, and be listened too about what works best for them"* [5]

4. Regular Monitoring and Feedback

Existing guidance calls for regular asthma review visits and should include assessments of inhaler technique, especially when switching treatment. Healthcare providers should observe patients using their inhalers and provide immediate feedback and correction if necessary. This ongoing monitoring can help maintain proper inhaler use over time. *"I don't know really, better access to support, more regular monitoring, once a year by phone doesn't feel like support"* [5].

5. Utilization of Technology

Digital tools, such as smartphone applications and electronic reminders, can support patients in managing their inhaler use. These tools can provide prompts for medication adherence, track usage

patterns, and offer educational resources to reinforce correct techniques. “it’s not much hassle really just to have your phone there with the app running while you’re using it.” [4] “Fantastic. It’s a training resource and trains people along the way.” “...would suggest keeping it simple!” [4]. In isolation some of these strategies have only provided temporary improvement in inhaler technique. Reversion to bad habits usually occurs quickly. Together they may represent a more coordinated approach (Figure 2), and a framework to achieve this should be developed – hence the call to action

A unified approach

In isolation, each of the individual measures to improve inhaler technique have not had the necessary impact to make a positive difference. Therefore, it is proposed that a more unified approach is taken based on combining the strategies outlined above in a single initiative. It is further proposed that a task force be set-up with expert and patient voices to figure out how a sustainable improvement can be achieved. Previously, an ERS/ISAM task force was created with an eminent list of contributors to address ‘What the pulmonary specialist should know about the new inhalation therapies’ [1] and this inspirational document has guided thinking with over 1100 citations (Google Scholar). Now, such a task force could help to develop an approach for patients to learn to use their inhalers, with representation from the likes of ERS, BTS, ISAM, GINA, Asthma + Lung UK and IPAC-RS, among others, as well as patients.

Conclusion

Failure to use inhalers correctly is a multifaceted issue influenced by factors related to patients, healthcare providers, and the devices themselves. Addressing this problem requires a comprehensive and coordinated approach that includes proper training, patient-centred care, and ongoing support. By implementing these strategies in a unified approach, healthcare systems can improve inhaler technique, leading to better disease management and improved quality of life for patients with chronic respiratory conditions. The incorrect use of inhalers is a problem that is currently unowned. To make progress with solving the problem industry leading agencies could align to create guidance that leads to a future where industry is encouraged to create devices that embrace how people learn to use their inhalers properly and healthcare systems collaborate to ensure that correct technique training is widely delivered and reviewed periodically. Last word, we need to move beyond this patient’s view of training: “It’s just a box ticking exercise for them” [5] because when correctly deployed it is appreciated by patients: “I am really shocked regarding proper technique compared to what I was doing, very valuable.” [4]

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