

Optimising inhaler technique through early pharmacy technician intervention.

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Background

Respiratory diseases affect approximately 1 in 5 people in England and are a leading cause of hospital admissions and mortality¹. Correct inhaler technique is essential for effective treatment of asthma and COPD; however, around 80% of patients use their inhalers incorrectly, leading to poor disease control, increased hospital admission, medication waste, and avoidable costs². Within Leeds Teaching Hospitals NHS Trust, inhaler technique reviews were often delayed until discharge or requested reactively by pharmacists or respiratory nurses. This created missed opportunities for early intervention and optimisation of therapy. Embedding inhaler technique assessments into the drug history process could enable earlier identification of errors, improve patient outcomes, reduce waste, and support NHS sustainability goals.

Aim

To evaluate whether integrating inhaler technique assessments into the pharmacy drug history process:

- Improves early identification of inhaler technique errors.
- Enables earlier optimisation of inhaler therapy.
- Reduces unnecessary medication waste and duplication.
- Supports greener prescribing through appropriate device selection.
- Can be delivered efficiently within routine pharmacy practice.

Methods

Setting

- Five respiratory wards at St James's University Hospital.

Baseline Audit

- 12-day data collection period.
- 56 patients prescribed inhalers prior to admission.
- Inhaler reviews were conducted reactively following referral.

Intervention

- Pharmacy technicians completed inhaler technique assessments during routine drug histories, ideally within 24 hours of admission.
- Patients demonstrated their inhaler technique using placebo devices.
- Education, coaching, spacer provision, and device optimisation were provided where required.

Post-Intervention Audit

- 53-day audit period.
- Data collected on:
 - Number of assessments completed.
 - Types of interventions.
 - Common inhaler errors.
 - Time required to complete reviews.
 - Barriers to assessment.

Results

During the 53-day audit period, 391 patients were admitted to the respiratory wards, of which 277 (71%) were prescribed inhalers prior to admission. 74 patients (19%) were using mixed inhaler device types prior to admission, increasing the risk of confusion and incorrect technique. Pharmacy technicians completed inhaler technique assessments for 140 patients during the drug history process, whilst a further 47 reviews were completed prior to discharge following referral.

Impact of Early Inhaler Assessment

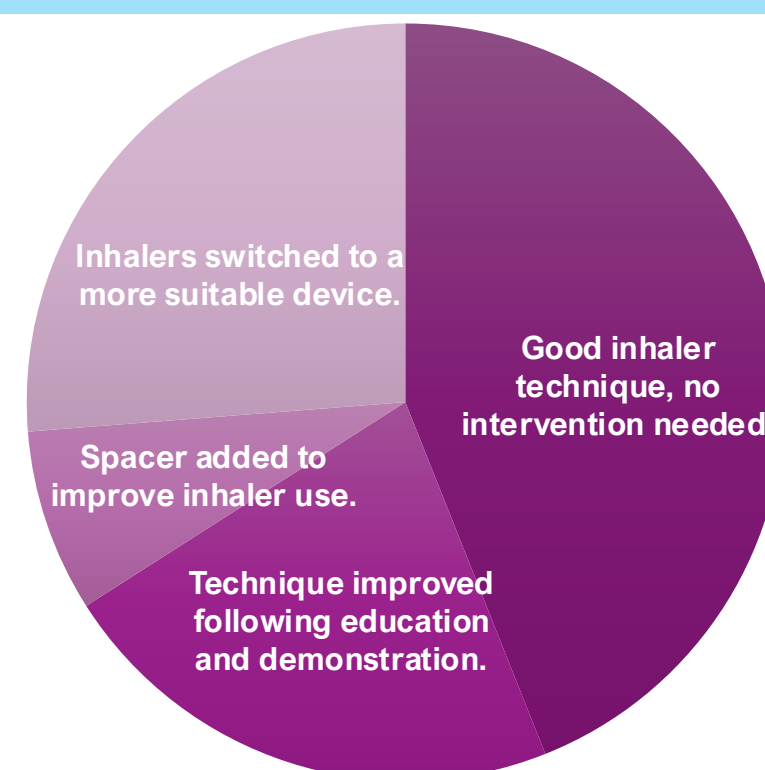
Early assessment identified significant opportunities for optimisation: **44%** of patients demonstrated good inhaler technique and required no intervention.

22% improved their technique following education and demonstration, no other intervention needed.

8% required a spacer to improve inhaler use.

37 inhalers were changed and standardised to more suitable devices, including:

- 27 pMDIs/BA-pMDIs switched to DPIs.
- 10 DPIs switched to pMDIs/BA-pMDIs.



Common Inhaler Technique Errors

The most frequently observed errors were:

pMDIs

- Failure to exhale before inhalation.
- Inhaling too quickly.
- Poor hand-breath coordination.

DPIs

- Failure to exhale before inhalation.
- Insufficient inspiratory effort.

These findings were consistent across both admission-based and requested reviews.

Efficiency of the Intervention

Integrating inhaler technique reviews into the drug history process proved highly efficient:

- Most assessments added **less than 5 minutes** to the drug history process whereas reactive referrals required an average of **12.5 minutes** per review.
- Patients reviewed at admission received assessment significantly earlier than those referred later in their hospital stay.
- Integrating inhaler reviews reduced requested reviews by **approximately 33%**, demonstrating improved efficiency and earlier identification of inhaler-related issues.
- Delaying inhaler ordering until after assessment enabled early device optimisation and correction of prescribing issues, reducing the risk of supplying inappropriate inhalers and preventing avoidable medication waste.

Discussion

Integrating inhaler technique reviews into medicines reconciliation significantly improved early identification of inhaler-related problems.

Key benefits included:

- Reviews completed within 24 hours of admission rather than an average of 68 hours when performed reactively.
- Reduction in duplicate referrals for inhaler reviews.
- Improved inhaler technique through targeted education.
- Device optimisation and standardisation, reducing patient confusion.
- Prevention of inappropriate inhaler ordering and medication waste.
- Support for NHS Net Zero ambitions through increased use of lower-carbon DPI devices where clinically appropriate³.
- Incorporating inhaler technique assessments into the drug history process was time efficient, with most reviews adding less than five minutes whilst reducing the need for separate follow-up assessments later in admission.

Conclusion

Early pharmacy technician-led inhaler technique assessments are:

- Feasible within routine clinical practice
- Time efficient
- Effective at identifying and correcting inhaler errors
- Able to improve inhaler optimisation and patient education
- Supportive of NHS sustainability and waste-reduction goals

This audit demonstrates that incorporating inhaler technique reviews into the admission drug history process can improve patient care, reduce duplication of work, and create opportunities for greener, more cost-effective prescribing.

The next phase of the project will focus on expanding inhaler technique assessments across all inpatient wards, ensuring that patients prescribed inhalers are reviewed at the point of admission. To support this, training will be provided to all pharmacy technicians in inhaler technique assessment and education. This will enable earlier identification of inhaler-related issues, improve consistency of care, and maximise opportunities for inhaler optimisation across the Trust.



References

- ¹ Global Initiative for Asthma (2022). *Global Strategy for Asthma Management and Prevention*. [online] Available at: <https://ginasthma.org/wp-content/uploads/2022/07/GINA-Main-Report-2022-FINAL-22-07-01-WMS.pdf>
- ² Capstick, T.G.D., Azeez, N.F., Deakin, G., Goddard, A., Goddard, D. and Clifton, I.J. (2021). Ward based inhaler technique service reduces exacerbations of asthma and COPD. *Respiratory Medicine*, 187, p.106583. doi:<https://doi.org/10.1016/j.rmed.2021.106583>.
- ³ NHS England (2022). *Delivering a 'Net Zero' National Health Service*. [online] Available at: <https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2022/07/B1728-delivering-a-net-zero-nhs-july-2022.pdf>.