

AI-Driven Identification of High-Risk Patients with COPD for Biologic Therapy: Pathway Development Opportunities

Authors: Anna Taylor,¹ Andrew Cushing,¹ Eve Walker,¹ David J. Lowe,^{1,2} *Chris Carlin¹

1. NHS Greater Glasgow and Clyde, UK

2. University of Glasgow, UK

*Correspondence to Chris.Carlin3@nhs.scot

Disclosure: Taylor has received presentation fees from AstraZeneca; travel, accommodation, and registration support for the COPD Leadership Forum from AstraZeneca; and has joint working agreements with AstraZeneca and GlaxoSmithKline. Carlin has served on advisory boards for AstraZeneca, GlaxoSmithKline, Chiesi, and Sanofi Regeneron; received speaker fees for AstraZeneca, GlaxoSmithKline, Chiesi, and Sanofi Regeneron; travel and registration support from AstraZeneca to attend the European Respiratory Society (ERS) Congress and the British Thoracic Society (BTS) Conference; and has joint working agreements with AstraZeneca and GlaxoSmithKline. Cushing, Walker, and Lowe have joint working agreements with AstraZeneca and GlaxoSmithKline.

Keywords: AI, biologic therapy, COPD, pathway development, targeted identification.

Citation: EMJ Respir. 2025;13[1]:68.
<https://doi.org/10.33590/emjrespir/DSOK3099>

BACKGROUND

Biologic therapies targeting eosinophilic inflammation hold promise for COPD management. Realising their benefits will require effective patient identification and pathway development to improve access. AI-based risk prediction models offer a novel approach to stratify patients and optimise treatment delivery.

METHODS

Using de-identified routine clinical data from Glasgow Safe Haven, UK, the authors established a cohort of approximately 38,000 patients with a coded diagnosis of COPD.¹ AI-based models were applied to the 2021 dataset to identify 3,639 patients at the highest risk of hospital admission within 6 months or mortality within 12

months. Among these, 382 patients had an eosinophil count >300 cells/μL in the preceding 12 months, despite using triple inhaler therapy, suggesting eligibility for biologic treatment.

RESULTS

The high-risk group's adverse deprivation demographics mirrored the COPD burden in the wider population. Most biologic-eligible high-risk patients were aged >60 years and resided >5 km from central hospital sites where biologic therapies are typically initiated. However, a high proportion live <5 km from community vaccination hubs, presenting an opportunity to adapt treatment initiation locations. Based on RCT data, a projected reduction of 520 hospital admissions per year could be achieved in the authors' organisation if biologic therapy were provided to this highest-risk cohort.

CONCLUSION

AI-driven risk prediction enables the targeted identification of patients with COPD who may benefit from biologic therapy. Model-derived insights can support pathway reconfiguration to improve access and equality, particularly via decentralised treatment initiation, facilitating timely intervention and better outcomes.

Reference

1. Taylor A et al. AI-driven identification of high-risk COPD patients for biologic therapy: pathway development opportunities. Abstract OA1190. ERS Congress, 27 September-1 October, 2025.