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(copd OR "Pulmonary Disease, Chronic Obstructive"[Mesh])

1

Review

Ann Allergy Asthma Immunol

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. 2026 Jun 27:S1081-1206(26)00303-0.

doi: 10.1016/j.anai.2026.06.035. Online ahead of print.

Biomarkers for COPD with Type 2 Inflammation

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Affiliations Expand

- **PMID: 42364850**

- **DOI: 10.1016/j.anai.2026.06.035**

Abstract

Chronic obstructive pulmonary disease (COPD) is a heterogeneous lung disease traditionally characterized by neutrophilic inflammation. However, a distinct Type 2 (T2) inflammatory endotype is present in 20-40% of patients. This review examines the pathophysiology and clinical consequences of T2 inflammation in COPD, focusing on established and emerging biomarkers to identify this treatable trait and guide targeted therapies. Orchestrated by Th2 cells and innate lymphoid cells, T2

inflammation involves signature cytokines IL-4, IL-5, and IL-13, which drive eosinophilic tissue infiltration, mucus hypersecretion, airway hyperreactivity, and accelerated remodeling. These processes correlate with increased exacerbation risk and more rapid lung function decline. Blood eosinophil count (BEC) is the most validated and accessible biomarker, with established thresholds guiding the use of inhaled corticosteroids and biologics. Fractional exhaled nitric oxide (FeNO) and serum IgE offer complementary predictive value, and combining biomarkers may enhance the identification of responders to specific targeted agents. Clinical trials of biologics, such as dupilumab and mepolizumab, have validated the therapeutic potential of targeting T2 pathways in selected populations, though variable success with other agents highlights unique aspects of COPD pathophysiology and persistent knowledge gaps. Precision medicine, informed by a nuanced interpretation of reliable T2 biomarkers, is crucial for optimizing outcomes in this significant patient subgroup.

Keywords: COPD biomarkers; Eosinophilic COPD; Type 2 Inflammation; blood eosinophil count; epithelial alarmins.

Conflict of interest statement

Declaration of competing interest CP has no conflicts of interest to disclose. JC has no conflicts of interest to disclose. RS participated in an advisory board for Verona Pharma. PA reports grants or contracts from Sanofi, National Institutes of Health, AstraZeneca, Cystic Fibrosis Foundation, Recode, Advanced Research Projects Agency for Health, and 4D Molecular Therapeutics; and consulting fees from AstraZeneca, GSK, Connect Biopharma, Amgen, Sanofi, Vida Ventures, Regeneron, Enveda, and Gilead; outside the submitted work.

Supplementary info

Publication typesExpand

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Sleep Breath

. 2026 Jun 27;30(4):199.

doi: 10.1007/s11325-026-03748-2.

GLP-1 receptor agonists and Risk of Cardiovascular and Pulmonary Complications in patients with OSA and Type 2 Diabetes Mellitus

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- PMID: 42363996

- DOI: 10.1007/s11325-026-03748-2

Abstract

Purpose: Tirzepatide, a GLP-1 receptor agonist (GLP-1RA), is the first approved medication for the treatment of moderate to severe OSA and has previously been found to reduce cardiovascular risks in patients with type 2 diabetes mellitus (T2DM). Our study analyzed the effects of GLP-1RA in preventing cardiovascular and pulmonary complications in patients with OSA and T2DM during a 5-year follow-up period.

Methods: Through the TriNetX database, patients with OSA and T2DM from 2010-2022 were included. We compared patients receiving GLP-1RA versus other diabetic medications including metformin, DPP-4 inhibitors, SGLT-2 inhibitors, sulfonylurea, and thiazolidinedione. Using a propensity score model, participants were matched on a range of demographic and clinical factors. Patients were evaluated for cardiovascular and pulmonary outcomes using a Kaplan-Meier survival analysis. We additionally analyzed the incidence rate of ED visits and inpatient admissions.

Results: After matching, 5,750 to 21,065 patients were included in the GLP-1RA versus other diabetes medication groups. GLP-1RA showed a lower risk of acute respiratory failure compared to metformin (HR 0.89; 95%CI 0.80-0.98), DPP-4 inhibitors (HR 0.78; 95%CI 0.71-0.85), sulfonylureas (HR 0.70; 95%CI 0.64-0.76) and TZD (HR 0.76; 95%CI 0.65-0.89). GLP-1RA group demonstrated significantly lower risk of pulmonary hypertension, chronic obstructive pulmonary disease (COPD), and heart failure when compared to DPP-4 inhibitors, sulfonylureas, and TZD.

Conclusion: GLP-1RA use was associated with a lower risk of pulmonary complications including acute respiratory failure, pulmonary hypertension, and COPD as well as lower ED visits and inpatient admissions compared to other diabetes medications. Further prospective studies are needed to evaluate the benefits of GLP-1RA.

Keywords: Cardiovascular Complications; GLP-1 receptor agonist; Obstructive Sleep Apnea; Pulmonary Complications.

Conflict of interest statement

Declarations. Ethical approval: This study is a secondary analysis of existing data which does not involve intervention or interaction with human subjects and is de-identified per the HIPAA Privacy Rule. Informed Consent: Not applicable. Conflict of

interest: EM Wickwire's institution has received research funding from the AASM Foundation, Department of Defense, Merck, NIH/NIA, ResMed, the ResMed Foundation, and the SRS Foundation. EM Wickwire has served as a scientific consultant to Axsome Therapeutics, DayZz, Eisai, EnsoData, Idorsia, Merck, Nox Health, Primasun, Purdue, and ResMed and is an equity shareholder in WellTap.

- 21 references

Full text links

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Cite

3

Am J Physiol Lung Cell Mol Physiol

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. 2026 Jun 27.

doi: 10.1152/ajplung.00152.2026. Online ahead of print.

Early Dysanapsis in Experimental Bronchopulmonary Dysplasia: Implications for Lifelong Lung Disease

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Affiliations Expand

- PMID: 42363693

- DOI: 10.1152/ajplung.00152.2026

Abstract

Rationale: Disruptions during perinatal fetal lung development can lead to postnatal chronic lung diseases such as bronchopulmonary dysplasia (BPD). Along with decreased alveolar and pulmonary vascular growth, abnormal airways growth occurs in BPD. Previous studies in rats have shown that antenatal endotoxin (AN-ETX) mimicking maternal chorioamnionitis causes dysanapsis during the neonatal period. Whether dysanaptic growth alters long-term lung function remains unknown. Objective: We hypothesized that antenatal endotoxin causes persistent differences between airway and distal lung growth with age in experimental BPD. Methods: Sprague Dawley rats were exposed to AN-ETX at embryonic day 20

(E20) by intra-amniotic injection and delivered on E22, analogous to human preterm 26-28 weeks gestation. Pups raised via naive foster dams were evaluated for BPD-associated parameters on postnatal days 14 (D14) and 28 (D28), akin to infancy and childhood human lung development. Lung histologic morphometry, lung mechanics testing, and airway and pulmonary vasculature micro-CT evaluations were performed to assess growth at D14 and D28. Results: AN-ETX-exposed rats demonstrated persistent somatic growth failure, decreased alveolarization, decreased vascularization, right ventricular hypertrophy, and impaired lung mechanics at both D14 and D28. AN-ETX exposure decreased large airway size at D14, but also medium airway diameters by D28. AN-ETX exposure caused early airflow obstruction at D14 (decreased FEV0.1/FVC ratio), which worsened by D28 (decreased $FEV_{0.1}$ and $FEV_{0.1}$/FVC ratio). Conclusion: Adverse antenatal stress alone is sufficient to cause sustained abnormalities of lung development beyond the neonatal period. Early dysanapsis may predispose to structural obstructive disease and impair lung function over the lifespan.

Keywords: antenatal endotoxin; bronchopulmonary dysplasia; developmental origins of health and disease; dysanapsis; lung function trajectory.

Supplementary info

Grants and fundingExpand

Full text links

4

Am J Respir Crit Care Med

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doi: 10.1093/ajrccm/aamag339. Online ahead of print.

Beyond Frequency: Rethinking Exacerbation Risk in COPD

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Affiliations Expand

- **PMID: 42363406**
- **DOI: 10.1093/ajrccm/aamag339**

No abstract available

Full text links

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5

Am J Respir Crit Care Med

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. 2026 Jun 26:aamag340.

doi: 10.1093/ajrccm/aamag340. Online ahead of print.

Reply to Liu et al.: Beyond Frequency: Rethinking Exacerbation Risk in COPD

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Collaborators, Affiliations Expand

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No abstract available

Keywords: Chronic obstructive pulmonary disease; Exacerbations; Net Benefit; Prediction.

Full text links

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Cite

6

Am J Respir Crit Care Med

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Inhaled Triple Therapy in Symptomatic Smokers with Preserved FEV1/FVC ratio: The CHRONOS Clinical Trial

Anna Salina [1 2 3], Maria Pascarella [4], Leticia Grize [1], Andrei M Darie [5], Andreas Hoheisel [1], Eleni Papakonstantinou [1], Janwillem Wh Kocks [6 7 8 9], Philipp Latzin [10], Mario Cazzola [11], Medea Imboden [12 13], Nicole Probst-Hensch [12 13], Daiana Stolz [1]

Affiliations Expand

- PMID: 42363404

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No abstract available

7

BMC Pulm Med

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doi: 10.1186/s12890-026-04428-3. Online ahead of print.

Doctor-nurse integrated management is associated with improved clinical outcomes in AECOPD patients with multimorbidity: A propensity score-matched retrospective cohort study

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- PMID: 42363145

- DOI: 10.1186/s12890-026-04428-3

Abstract

Background: Acute exacerbations of chronic obstructive pulmonary disease (AECOPD) are frequently complicated by multimorbidity, particularly cardiovascular and metabolic disorders such as heart failure and diabetes. These coexisting conditions create therapeutic conflicts and increase the risk of poor outcomes. Effective management strategies addressing both pulmonary and associated disorders in this high-risk population are urgently needed. This study aimed to evaluate whether a Doctor-Nurse Integrated Management (DNIM) model is associated with better clinical outcomes compared to routine care in AECOPD patients with multimorbidity.

Methods: We conducted a retrospective cohort study at a tertiary hospital in China, screening electronic medical records of patients admitted for AECOPD with confirmed multimorbidity (defined as Charlson Comorbidity Index ≥ 2 or documented cardiac/metabolic comorbidities) between January 2022 and January 2025. Patients were allocated to either a DNIM group, receiving structured collaborative care including joint ward rounds, integrated care plans addressing both pulmonary and comorbid conditions, and collaborative discharge planning, or a routine care (RC) group. Propensity score matching (1:1) was employed to balance baseline characteristics. The primary outcome was a composite of all-cause mortality or readmission for cardiopulmonary events within one year. Secondary outcomes included length of stay (LOS), improvement in COPD Assessment Test (CAT) scores, and in-hospital complications.

Results: After propensity score matching, 104 patients (52 pairs) with well-balanced baseline characteristics were included. The DNIM group demonstrated a significantly lower associated risk of the one-year composite endpoint compared to the RC group (Hazard Ratio [HR] 0.58, 95% Confidence Interval [CI] 0.35-0.96, P = 0.034). Patients in the DNIM group also had a shorter mean length of stay (8.4 ± 2.1 vs. 11.2 ± 3.4 days, P < 0.001) and greater improvement in CAT scores (ΔCAT - 6.2 ± 2.5 vs. -4.1 ± 2.2, P < 0.01). Furthermore, the DNIM model was linked to fewer in-hospital complications (11.5% vs. 28.8%, P = 0.028), particularly hyperglycemia and acute heart failure.

Conclusion: The Doctor-Nurse Integrated Management model was associated with a better one-year prognosis, reduced length of stay, and decreased in-hospital complications in AECOPD patients with multimorbidity. This integrated approach addresses the complex interplay between COPD and its associated comorbidities, supporting its implementation in respiratory clinical practice to enhance patient-centered outcomes.

Keywords: AECOPD; Doctor-Nurse Integrated Management; Multimorbidity; Prognosis; Propensity Score Matching.

Conflict of interest statement

Declarations. Ethics approval and consent to participate: The study protocol was approved by the Medical Ethics Committee of The First Hospital of Hebei Medical University. As this was a retrospective study involving the analysis of anonymized data, the requirement for informed consent was waived by the Medical Ethics

Committee of The First Hospital of Hebei Medical University. All methods were carried out in accordance with relevant guidelines and regulations (Declaration of Helsinki). Consent for publication: Not applicable. Competing interests: The authors declare no competing interests.

Cite

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Sci Rep

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doi: 10.1038/s41598-026-55670-y. Online ahead of print.

Effects of heatwaves on emergency medical service activity in Vienna: a 4-year analysis

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Affiliations Expand

- PMID: 42362598

- DOI: 10.1038/s41598-026-55670-y

Abstract

Heatwaves increase the risk of morbidity and strain emergency medical services. However, prehospital data from Central Europe remain limited. Overall, 936,461 emergency dispatch records were linked to spatially matched meteorological data collected from a 506-point grid across Vienna. Heatwaves were defined based on the daily minimum, mean, and maximum temperatures using the duration-and-threshold approach. During the 2018-2021 study period, group comparison analyses and generalized linear models with a negative binomial distribution were used to estimate incidence rate ratios (IRRs), adjusting for calendar effects. Subgroup analyses assessed heterogeneity by age, sex, diagnostic category, and timing during and after heat events. Daily minimum temperature of ≥ 20.5 °C for 2 consecutive days yielded the strongest association with increased dispatch activity

(IRR = 1.104, 95% CI 1.077-1.131, p < 0.001). The effects intensified with increasing heatwave severity. Subsequent heatwave days exhibited decreased but statistically significant impacts. Female patients (IRR = 1.094) and those aged 0-18 and 76-85 years presented with a disproportionately greater increase in dispatches. Dispatches for heat-related illness, COPD, unconsciousness, and trauma were significantly higher. The first heatwave each year had stronger effects (IRR = 1.118) than the subsequent events. Minimum temperature-based definitions had the highest predictive value. Our results support the need to adapt local heat-health warning systems to account for cumulative exposure, early season risks, and diagnosis-specific vulnerabilities.

Keywords: Ambulance dispatch; Central Europe; Emergency medical services; Heatwave; Temperature.

Conflict of interest statement

Declarations. Competing interests: The authors declare no competing interests. Ethics approval and consent to participate: Ethical approval for this retrospective study (EK-Nr: 1318/2022) was obtained from the Ethics Committee of the Medical University of Vienna, Austria (Chairperson: Prof. Jürgen Zezula) on May 3, 2022. The study was conducted in accordance with the principles of the Declaration of Helsinki and its later amendments. As this was a retrospective analysis of existing clinical data with no direct patient contact, the Ethics Committee waived the requirement for individual informed consent. Accordingly, a Consent to Participate declaration is not applicable for this manuscript. Declaration of generative AI use: To prepare this work, the authors used ChatGPT (OpenAI, San Francisco, USA) for assistance with spelling, phrasing, and language refinement. The authors subsequently reviewed and edited all content and take full responsibility for the final version of the manuscript.

Supplementary info

Grants and fundingExpand

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Eur J Intern Med

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Twelve-year trends in sex and age of patients with COPD and chronic respiratory failure undergoing pulmonary rehabilitation

Matteo Vigna [1], Gaia Riboni [2], Valentina Tibollo [2], Riccardo Bellazzi [3], Michele Vitacca [4]

Affiliations Expand

- PMID: 42362458

- DOI: 10.1016/j.ejim.2026.107035

No abstract available

Keywords: Ageing; COPD; Chronic respiratory failure; Pulmonary rehabilitation; Sex medicine.

Conflict of interest statement

Declaration of competing interest statement The authors have no conflicts of interest to declare.

Supplementary info

Publication typesExpand

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10

Multicenter Study

BMJ Open Respir Res

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. 2026 Jun 25;13(1):e004075.

doi: 10.1136/bmjresp-2025-004075.

GOLD 2026 COPD ABE assessment tool to identify individuals at high risk in a UK multicentre COPD cohort (ERICA)

Gbenga Adesoye [1 2], Alastair Watson [1 2], Tengyu Zhao [3], Charlotte E Bolton [4], Chris J Smith [1], Jonathan Fuld [1 2], Carmel McEniery [2], Joseph Cheriyan [1 2], John Cockcroft [5], William MacNee [6], Ruth Tal-Singer [7], Mike Polkey [8], Ian B Wilkinson [2], Marie Fisk [9 2]

Affiliations Expand

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Free article

Abstract

Identifying people with chronic obstructive pulmonary disease (COPD) who are at high risk of significant health events such as exacerbations and hospital admissions is clinically important to guide optimisation of preventative interventions. We evaluated the utility of the Global Initiative for Obstructive Lung Disease (GOLD) 2026 ABE assessment tool which stratifies based on exacerbations or symptoms to distinguish these patients at high risk.

Methods: 664 participants from the ERICA (*E*valuation of the *R*ole of *I*nflammation in *C*hronic *A*irways Disease) COPD cohort were classified into GOLD ABE groups using both the Chronic Airways Assessment Tool (CAAT) score and the modified Medical Research Council (mMRC) breathlessness scale to define the degree of symptoms. National Health Service hospital episode statistics data were prospectively collected for a median follow-up of 4.75 years. Hospital admissions, including for acute exacerbations of COPD (H-AECOPD (hospitalised acute exacerbations of COPD)), were evaluated. Logistic regression analyses with ORs adjusted for potential confounding factors were performed.

Results: Using CAAT, n=43/182/439 (7%/27%/66%) of participants were in groups A, B and E, respectively. By mMRC, n=144/81/439 (22%/12%/66%) were in groups A, B and E. The ABE tool derived using both CAAT and mMRC predicted H-AECOPD over follow-up. For group B versus group A by CAAT, the OR was 3.72 (95% CI 1.09 to 12.73, p=0.04), and for group E versus group A the OR was 8.13 (95% CI 2.45 to 26.92, p<0.001). By mMRC, for group B versus group A the OR was 2.69 (95% CI 1.36 to 5.32, p=0.005) and for group E versus group A the OR was 4.05 (95% CI 2.38 to 6.05, p<0.001).

Conclusions: In this prospective real-world UK cohort, the simple GOLD 2026 ABE tool identified patients with high-risk COPD for severe exacerbations (H-AECOPD). The differences in groups A and B classification depending on whether the CAAT score or mMRC scale is used have clinical implications that need consideration.

Keywords: COPD Exacerbations; COPD epidemiology; Pulmonary Disease, Chronic Obstructive.

Conflict of interest statement

Competing interests: GA, AW, TZ, CJS, JF, CMcE, JC, WMN, MP and MF report no conflicts of interest. IW held research grants with GSK and Innovate UK. RTS is a former GSK employee and shareholder, is a board member of ENA Respiratory on behalf of the COPD Foundation and received personal fees from GSK, ImmunoMet, AstraZeneca, Boehringer Ingelheim, Roche, Janssen, Renovion, Samay Health, Global Skin, Global Allergy and Airways Patient Platform, Human Health, COPD Foundation and ENA Respiratory. TJC has received support from GSK, Evelo Biosciences, AstraZeneca and Alexion. ELJC is a full-time employee of Cambridge University Hospitals NHS Foundation Trust but was seconded by the trust for 50% of his NHS salaried time to work on GSK clinical trials until October 2020. He received no employee benefits, shares, dividends or income from GSK. CEB has received grants from Innovate UK, GSK, AstraZeneca, Chiesi and NIHR. She sat on an IDMC for Roche.

Supplementary info

Publication types, MeSH termsExpand

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BMJ Open Qual

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doi: 10.1136/bmjoq-2026-004189.

'The evidence is out there…': perspectives of healthcare providers on improving asthma and COPD prevention and care within a major health authority region of British Columbia, Canada

Tina Afshar [1], Aneisha Collins-Fairclough [2], Pat Camp [3 4], Karen Rideout [2 5], Erin Shellington [2 6], Nardia Strydom [2], J Mark FitzGerald [2], Sian Hoe Cheong [7], Mary-Frances Ceccato [7], John Fleetham [8], Carmen Rempel [2], Phalgun Joshi [2 9], Christopher Carlsten [2 8]

Affiliations Expand

- **PMID: 42349994**

- **DOI: 10.1136/bmjoq-2026-004189**

Abstract

Introduction: Asthma and chronic obstructive pulmonary disease (COPD) impose substantial morbidity and health system burden in Canada. Within Vancouver Coastal Health (VCH), a large and geographically diverse health authority in British Columbia, variation in service availability, access and care coordination creates barriers to prevention and high-quality chronic respiratory disease management. This project sought to document healthcare professionals' (HCPs') experiences and recommendations to inform a regional strategy to improve asthma and COPD care.

Methods: We conducted a qualitative quality improvement project using occupation-specific virtual focus groups (March to September 2021) with HCPs involved in asthma and COPD prevention and care across VCH. Purposive sampling targeted diversity in profession, practice setting and geography (urban, suburban, rural and remote). Results were analysed thematically in NVivo using iterative coding and team-based refinement.

Results: 54 HCPs participated across 10 focus groups, including respiratory physicians (n=9), respiratory therapists (n=19), family physicians (n=11), nurse practitioners (n=2), nurses (n=7), pharmacists (n=6) and one registered dietitian (n=1). Themes aligned with a socio-ecological framework and spanned (1) patient-level barriers (financial insecurity, language barriers, comorbid mental health and substance use, medication beliefs and adherence, smoking and vaping), (2) health system barriers (limited access to spirometry and pulmonary rehabilitation, fragmented transitions and unlinked electronic records, workforce and resource constraints) and (3) environmental barriers (medication coverage and formulary restrictions, poor air quality as an exacerbation trigger). HCPs recommended expanding community-based services (including mobile diagnostics and rehabilitation), strengthening prevention and cessation supports, improving medication access and inhaler education, and building integrated pathways and information systems to support continuity across settings.

Conclusions: Frontline HCP perspectives identify actionable, system-level opportunities to improve asthma and COPD prevention and care within a complex health authority. This work provides implementation-oriented insights to inform regional strategy and offers a replicable approach for engaging HCPs to strengthen chronic respiratory care.

Keywords: Asthma; Attitude of Health Personnel; Chronic disease management; Focus Groups; Healthcare quality improvement.

Conflict of interest statement

Competing interests: None declared.

Supplementary info

MeSH termsExpand

Full text links

Cite

12

Respiration

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Unveiling Sex Differences in Severe Acute COPD Exacerbations requiring ICU admission: Evidence from a French Cohort

Alexis Ferré, Nassim Sahki, Sylvain Diop, Pauline Puechoultres, Georges Abi-Abdallah, Stéphane Legriel

- PMID: 42348494

- DOI: 10.1159/000552665

Abstract

Background: Data on sex differences during acute exacerbations of chronic obstructive pulmonary disease (COPD) management and mortality in the intensive care unit (ICU) are scarce. This study aimed to describe and compare sex differences in management and their impact on mortality.

Methods: We conducted a monocentric retrospective cohort study on all patients admitted to our ICU between 2015 and 2022 for a severe acute exacerbation of COPD. Logistic multivariate regression analysis was performed.

Results: A total of 508 patients were included, of whom 331 (65.2%) were males and 177 (34.8%) females. Female patients had a higher proportion of severe COPD (GOLD stage ≥ 3) than males (59.3% vs. 54.4%, p=0.032), whereas males exhibited significantly more cardiovascular comorbidities. Three-month mortality was 19.3% in males and 18.6% in females (p=0.84). In multivariate analysis, factors independently associated with 3-month mortality were older age (HR per year = 1.04, p=0.001), immunodeficiency (HR = 1.66, p=0.022), higher Performance Status (HR per point = 1.68, p<0.001), long-term oxygen therapy (HR = 1.80, p=0.006), and invasive mechanical ventilation (HR = 2.59, 95% CI 1.34-5.01, p=0.05). Sex was not associated with 3-month mortality (p=0.5).

Conclusions: Despite distinct phenotypes between males and females, management, and outcomes of severe COPD exacerbations in ICU were similar,

underscoring the need to better understand sex-related determinants in critical COPD care.

S. Karger AG, Basel.

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13

Am J Respir Crit Care Med

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The frequent exacerbator phenotype in bronchiectasis revisited: Data from EMBARC registry

Oriol Sibila [1], Lidia Perea [2], Pierre Regis Burgel [3], Eva Polverino [4], Rebecca C Hull [5], Merete B Long [5], Sanjay H Chotirmall [6 7], Michal Shteinberg [8], Jennifer Pollock [5], Jamie Stobo [5], Holly Lind [5], Charles Haworth [9], Katerina Dimakou [10], Apostolos Bossios [11 12], Michael R Loebinger [13], Raja Dhar [14], Jin-Fu Xu [15], Pontus Mersch [16], Jessica Rademacher [17 18], Hayoung Choi [19], Natalie Lorent [20 21], Francesco Blasi [22 23], Montserrat Vendrell [24], Pieter Goeminne [25], Felix Ringshausen [26 27 28], Anthony De Soyza [29], Stefano Aliberti [30 31], James D Chalmers [5 32]

Affiliations Expand

- **PMID: 42348458**

- **DOI: 10.1093/ajrccm/aamag297**

Abstract

Rationale: The frequent exacerbator phenotype was previously defined using a threshold of ≥ 3 exacerbations per year in bronchiectasis. However, the contribution of each prior exacerbation to future risk, as well as the influence of severe exacerbations, different etiologies and regions, remain poorly understood.

Objectives: To quantify the risk associated with each prior exacerbation in predicting future exacerbations and severe exacerbations, and to determine

whether this association varies across different etiologies and geographic regions in bronchiectasis.

Methods: We analyzed data from the European Bronchiectasis Registry (EMBARC), including 30 countries across Europe and Asia. The association between baseline exacerbation history and future exacerbations was tested using negative binomial regression over up to 5 years of follow-up. Severe exacerbations were defined as those requiring hospitalization.

Measurements and main results: A total of 19,324 patients with bronchiectasis were included. Each prior exacerbation was associated with an increased risk of exacerbations and severe exacerbations. Incidence Rate Ratio (IRR) for future exacerbations was 1.45 (95%CI 1.34-1.58, p < 0.001) for one exacerbation, 1.84 (95%CI 1.69-1.99, p < 0.001) for two exacerbations, 2.50 (95%CI 2.29-2.73, p < 0.001) for three exacerbations and 3.56 (95%CI 3.32-3.82, p < 0.001) for patients with four or more prior exacerbations. Additionally, one prior severe exacerbation was associated with increased risk of exacerbation (IRR=1.52, 95%CI 1.45-1.60, p < 0.001) and strongly associated with future severe exacerbations (IRR=3.96, 95%CI 3.71-4.22, p < 0.001). The frequent exacerbator phenotype was consistent across different etiologies and geographic regions.

Conclusions: The frequent exacerbator phenotype is highly consistent across patient subgroups and regions. Each prior exacerbation is associated with a progressively higher risk with no definitive threshold defining high risk.

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Ann Am Thorac Soc

. 2026 Jun 24:aaoag164.

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Thirty-Day Readmissions and Predictors of Adverse Outcomes After Bronchoscopic Lung Volume Reduction in the United States, 2019-2022

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Affiliations Expand

- **PMID: 42343591**

- **DOI: 10.1093/annalsats/aaoag164**

Abstract

Background: Bronchoscopic lung volume reduction (BLVR) using endobronchial valves (EBV) is an established therapy for advanced emphysema; however, real-world post-discharge outcomes remain incompletely characterized.

Research question: What are the 30-day all-cause readmission rates, causes, and independent predictors of adverse outcomes after BLVR in a contemporary U.S. cohort?

Study design and methods: We queried the Nationwide Readmissions Database (NRD) from 2019-2022 to identify adult hospitalizations undergoing EBV placement on hospital day 0-1. Weighted analyses generated national estimates. Patients were stratified by 30-day readmission. Multivariable logistic regression identified independent predictors of readmission adjusting for demographics, comorbidities, and in-hospital complications.

Results: In total, 2,306 unweighted BLVR procedures were analyzed. The 30-day all-cause readmission rate was 9.8% (n = 226) and remained stable over time despite increasing procedural volume. Respiratory complications dominated readmissions: pneumothorax (25%), COPD exacerbation (24%), pneumonia (15%), and acute respiratory failure (6%). Independent predictors of readmission were pneumothorax during the index hospitalization (OR 1.69, 95% CI 1.12-2.56), and length of stay ≥ 6 days (OR 1.93, 95% CI 1.21-3.07).

Interpretation: Nearly one in ten patients with BLVR are readmitted within 30 days, predominantly for respiratory complications. Structured peri-discharge pathways targeting patients with index pneumothorax and those with higher-than-expected LOS may reduce early post-BLVR morbidity.

Keywords: Bronchoscopic lung volume reduction; Emphysema; Endobronchial valves; Pneumothorax; Predictors; Readmission.

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J Occup Med Toxicol

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Vapors, gases, dusts and fumes at work and chronic obstructive pulmonary disease/bronchitis: a systematic review and meta-analyses

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Abstract

Background: Chronic obstructive pulmonary disease (COPD) is the third leading cause of death after cardiovascular disease and stroke. A 2019 American Thoracic Society (ATS) statement estimated that 13-15% of all COPD is attributable to occupational exposures.

Research question: This study reports on a systematic review with meta-analysis (PROSPERO 2022 CRD42022302451) that was undertaken to characterize jobs and work exposures associated with an increased risk of developing COPD.

Methods: Five databases were searched (MEDLINE, Embase, CINAHL, Cochrane Systematic reviews, Register of Controlled Trials) from inception until February 26, 2025. Studies published in English or Chinese that studied workers (or workplace exposures) in relation to COPD, chronic bronchitis (CB) or emphysema and reported on a minimum of 15 exposed cases, with a comparison group, were included. The National Heart, Blood, and Lung Institute (NHLBI) Study Quality Assessment Tool was used. All reported estimates (e.g., RR, OR, HR) were extracted. Random effects models were used to estimate meta effect estimates (mEE) with 95% confidence intervals. Stratified models were constructed by study design, smoking, and sex, where possible.

Results: After de-duplication, 9115 citations were screened. Following full-text review 257 studies met the inclusion criteria. Most were cross-sectional (71%) and

conducted in Europe or North America (68%). Most were fair quality (72%) with only 5.8% assessed as good quality. Results showed a consistent relationship between workplace exposure to vapours, gases, dusts or fumes (VGDF) for spirometry-defined COPD (mEE 1.51; 95% CI 1.31-1.73; n = 20 studies), self-reported COPD (mEE 1.48; 95% CI 1.23-1.77; n = 14) and chronic bronchitis (mEE 1.83; 95% CI 1.51-2.21; n = 29). This relationship was slightly stronger in non-smokers and was weaker among women.

Interpretation: There was a consistent relationship of workplace exposures with both CB and COPD. The effect of occupational exposures on COPD outcomes appears to be at least additive with smoking.

Clinical trial registration: The project was registered with PROSPERO, the International Prospective Register of Systematic Reviews (PROSPERO 2022 CRD42022302451). Date of registration: 5th April 2022.

Keywords: Chronic obstructive airways; Occupational; Work-related; Workers.

Conflict of interest statement

Declarations. Consent to participate: Not applicable. Competing interests: The authors declare no competing interests.

- 98 references
- 4 figures

Full text links

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Collagen- and elastin-derived biomarkers and acute severe exacerbations in COPD: a sub study of the CORTICO-COP trial

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Leeming [2], Morten Asser Karsdal [2], Alexander G Mathioudakis [4 6], Mats C H Lassen [7], Niklas Dyrby Johansen [7], Tor Biering-Sørensen [8 9 10 11 5], Jens-Ulrik Jensen [1 5], Pradeesh Sivapalan [12 13]

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Free article

Abstract

Extracellular matrix (ECM) turnover and neutrophil protease activity contribute to chronic obstructive pulmonary disease (COPD) pathobiology, but the prognostic value of circulating neoepitopes for acute exacerbations (AECOPD) is uncertain. In a prospective cohort from the CORTICO-COP trial, the biomarkers C5M and C6M (type V/VI collagen degradation), ELP-3 (proteinase 3-generated elastin fragment), and CPa9-HNE (neutrophil elastase-generated calprotectin fragment) were measured in plasma at hospital admission for AECOPD (exacerbation phase; n = 299) and at day-30 follow-up (stable phase; n = 200). The primary endpoint was time to a composite of readmission with AECOPD or all-cause mortality within 12 months; the secondary endpoint was all-cause mortality. Cox models were adjusted for age, sex, pack-years, Charlson Comorbidity Index, and randomization arm. Single-time-point levels were not associated with the composite endpoint or with mortality at exacerbation or at stable phase. In a post-hoc analysis of paired data, a larger decline in CPa9-HNE from admission to day-30 (lowest quartile of change) was associated with a shorter time to the composite endpoint (HR 1.88, 95% CI 1.18-3.01) but not with mortality. This exploratory signal suggests within-patient decline in plasma CPa9-HNE may mark early re-exacerbation risk, but this requires validation in independent cohorts.

Keywords: AECOPD; Biomarker; C5M; C6M; CPa9-HNE; ELP-3.

Conflict of interest statement

Declarations. Competing interests: T.B-S. reports receiving research grants from Sanofi Pasteur and GE Healthcare, is a Steering Committee member of the Amgen financed GALACTIC-HF trial, on advisory boards for Sanofi Pasteur and Amgen, and speaker honorariums from Novartis and Sanofi Pasteur. J.V. reports personal fees from GlaxoSmithKline, Chiesi Pharmaceuticals, Boehringer-Ingelheim, Novartis, and AstraZeneca. JMBS, DJL and MAK are employed at Nordic Bioscience and hold stocks. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results. All other authors declare no conflicts of interest.

Full text links

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Neutrophil-to-lymphocyte ratio: A disease severity biomarker in stable chronic obstructive pulmonary disease?

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Abstract

Background: The neutrophil-to-lymphocyte ratio (NLR) is a biomarker of systemic inflammation that has been investigated in different chronic diseases. However, its role as biomarker of severity in patients with stable chronic obstructive pulmonary disease (COPD), and particularly its association with cardiovascular risk, remains unclear. This retrospective study aimed to evaluate whether a higher NLR (HNLR) is associated with worse disease control and increased cardiovascular risk compared to a lower NLR (LNLR) in stable COPD.

Methods: Data from inpatients admitted to a pulmonary rehabilitation center between 2021 and 2024 were analyzed. Patients were divided in two groups (HNLR ≥ 2.26 and LNLR < 2.26) based on the NLR threshold best associated with severe exacerbations according to ROC analysis. Comparison between groups and multivariate logistic regression analysis were performed. Cardiovascular risk was assessed using the European Society of Cardiology-recommended algorithm.

Results: A total of 247 patients were included. The HNLR group included a significantly ($p < 0.05$) higher number of patients with severe exacerbations in the previous year, lower forced expiratory volume in 1 second, higher residual volume, and increased partial pressure of carbon dioxide in arterial blood than the LNLR group. Chronic respiratory failure, atrial fibrillation and lung cancer were significantly more frequent in the HNLR group, and these patients had a significantly higher 10-year cardiovascular risk.

Conclusion: Our data suggest that NLR used together with other clinical and functional parameters could represent a useful biomarker in stable COPD, associated with increased disease severity and higher estimated 10-year cardiovascular risk.

Keywords: Chronic bronchitis; Emphysema; Leukocytes; Multimorbidity; Smoking.

Conflict of interest statement

Declaration of competing interest Marco Vanetti: no conflict of interest. Dina Visca: no conflict of interest Francesco Ardesi: no conflict of interest Martina Zappa: no conflict of interest Sara Pessano: no conflict of interest Patrizia Pignatti: no conflict of interest Leonardo M Fabbri declares consulting fees from Chiesi, GlaxoSmithKline, AstraZeneca, Novartis, and Verona Pharma, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events from Chiesi, GlaxoSmithKline, Glenmark, Lusofarmaco, and Sanofi, and participation in a Data Safety Monitoring Board or Advisory Board for Chiesi, Novartis and ICON. All are outside the scope of the current manuscript. Antonio Spanevello declares consulting fees from GlaxoSmithKline, Merck Sharp & Dohme, Sanofi, AstraZeneca and Chiesi, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events from GlaxoSmithKline, Merck Sharp & Dohme, Sanofi, AstraZeneca and Chiesi, and participation in a data safety monitoring board or advisory board for GlaxoSmithKline, Merck Sharp & Dohme, Sanofi, AstraZeneca and Chiesi. All are outside the scope of the current manuscript.

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Review

Eur Respir Rev

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The importance of symptoms in bronchiectasis

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- PMID: 42342265
- PMCID: PMC13291825
- DOI: 10.1183/16000617.0085-2026

Abstract

Bronchiectasis is a chronic respiratory disease characterised by irreversible bronchial dilatation, persistent airway inflammation and recurrent infections. Symptoms, particularly cough, sputum production and dyspnoea, are the most immediate and patient-relevant expression of the disease, linking clinical presentation, airway biology and outcomes. While asthma and COPD management algorithms already integrate symptom burden into therapeutic decision-making, bronchiectasis care has historically relied on exacerbation history to guide preventive interventions. Over the past decade, an expanding body of evidence has demonstrated that daily symptoms mirror current infection and inflammation, profoundly impact quality of life, and predict future exacerbations. Comparative analyses across chronic lung diseases further highlight the central role of symptom monitoring in defining disease activity and risk. The updated European Respiratory Society guidelines translate this evidence into clinical practice, marking a paradigm shift from an exacerbation-driven to a symptom-centred and treatable-traits model. This review synthesises clinical, biological and therapeutic insights linking symptoms to bronchiectasis pathophysiology, disease activity and treatment response. We discuss how airway clearance, mucoactive therapy, antibiotics, pulmonary rehabilitation and targeted anti-inflammatory strategies, including dipeptidyl peptidase-1 inhibition, can address specific symptom profiles. We also mention the role of comorbidities and psychosocial management, establishing symptoms as the cornerstone of a holistic, multidimensional care approach. Recognising symptoms as both biomarkers of activity and therapeutic targets represents a major step toward precision medicine in bronchiectasis, aligning clinical management with patient experience and the biological drivers of disease.

Conflict of interest statement

Conflict of interest: The authors declare the following financial interests/personal relationships which may be considered as potential competing interests. S. Aliberti received consulting fees from INSMED Incorporated, INSMED Italy, INSMED Ireland Ltd, INSMED Netherlands BV, ZAMBON Spa, AstraZeneca, Menarini, CSL Behring GmbH, Pfizer, Fondazione Internazionale Menarini, Moderna Italy, Moderna TX, Boehringer Ingelheim, Chiesi farmaceutica Spa, MSD Italia S.r.l., Vertex Pharmaceuticals, BRAHMS GMBH, Physioassist SAS, AN2 Therapeutics,

GlaxoSmithKline Spa, and Verona; received payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events (payments made to the author) from GlaxoSmithKline Spa, Fondazione Internazionale Menarini, INSMED Italy, INSMED Ireland Ltd, Boehringer Ingelheim, Zambon, and Vertex Pharmaceuticals; participated on a Data Safety Monitoring Board or Advisory Board (payments made to the author) for INSMED Incorporated, INSMED Italy, AstraZeneca UK Limited, MSD Italia S.r.l, and Verona pharma plc. J.D. Chalmers reports grants or contracts from Grifols; consulting fees from Antabio, AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Grifols, Insmed, Janssen, Novartis, Pfizer, and Zambon; and leadership or fiduciary roles as Chair of the European Respiratory Society Bronchiectasis Guideline Task Force, Chief Editor of European Respiratory Journal, Associate Editor of the European Respiratory Review, and Chair of EMBARC Clinical Research Collaboration. O. Sibila reports receiving consulting fees from Insmed and Boehringer-Ingelheim. All other authors declare no competing interests.

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Review

Chest

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Eisenmenger Syndrome: The Pulmonology Perspective

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- PMID: 42341977

- DOI: 10.1016/j.chest.2026.06.017

Abstract

Topic importance: Eisenmenger syndrome (ES) is an advanced form of pulmonary arterial hypertension associated with congenital heart disease, marked by pulmonary vascular disease (PVD) and right-to-left or bidirectional shunting. Although vascular remodeling is central, lung involvement is still under-recognized.

Review findings: This review describes pulmonary and related aspects that accompany ES, their contribution to symptoms, prognosis, and management. A restrictive pattern is common on function testing, while obstructive defects and bronchial hyperresponsiveness may occur even without typical risk factors. Diffusion impairment related to vascular disease is frequent and linked to reduced exercise capacity and poorer survival. Exercise intolerance reflects the combined effects of PVD, shunt-related hypoxemia, and ventilation-perfusion mismatch, which increase ventilatory demand, promote early anaerobic metabolism, and reduce peak oxygen uptake. Cardiopulmonary exercise testing and the six-minute walk test provide prognostic information, with peak VO_2 emerging as the strongest predictor. Additional complications include marked pulmonary artery dilatation, predisposing to in situ thrombosis and compressive syndromes. Hemoptysis, often bronchial in origin, requires a structured emergency pathway. Lower respiratory tract infections are relatively common and may increase morbidity and mortality. Long-term oxygen therapy provides limited benefit because hypoxemia is mainly shunt-driven; supervised rehabilitation is safe and can improve functional capacity. In advanced disease refractory to treatment, bilateral lung or heart-lung transplantation remains the only definitive option, despite suboptimal outcomes.

Summary: ES is a multisystem disorder in which pulmonary abnormalities meaningfully influence symptoms and prognosis; systematic lung assessment can refine risk stratification and support individualized supportive care by integrated cardiology-pulmonology teams.

Keywords: Eisenmenger syndrome; chronic hypoxemia; exercise limitation; lung function; pulmonary hypertension.

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The association between dysphagia and the risk of acute exacerbation of COPD: a systematic review and meta-analysis

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Affiliations Expand

- PMID: 42338681

- PMCID: PMC13284799

- DOI: 10.1183/23120541.01328-2025

Abstract

Background: Acute exacerbations of COPD (AECOPD) significantly impair patients' quality of life and contribute to higher healthcare burdens and mortality. Recent evidence suggests a potential link between dysphagia and AECOPD. This meta-analysis aims to quantitatively evaluate the impact of dysphagia on the risk of AECOPD.

Methods: A comprehensive systematic search was conducted across multiple databases, including PubMed, SinoMed, Web of Science, Embase, China National Knowledge Infrastructure (CNKI) and the Cochrane Library, to identify cohort studies reporting on the association between dysphagia and AECOPD. The search covered all publications from the inception of each database up to 31 May 2025. Two researchers independently performed literature screening, data extraction and quality assessment. Meta-analysis was performed using RevMan 5.4 and Stata 15.0, with pooled risk ratios calculated employing the Mantel-Haenszel method under a random effects model.

Results: Seven studies involving 669 patients were included in the analysis. Meta-analysis showed that dysphagia significantly increased both the risk of AECOPD (rate ratio 2.37 (95% CI 1.75-3.20); p<0.00001) and the annual number of annual exacerbations (mean difference 1.13 (95% CI 0.88-1.38); p<0.00001). The Egger test indicated publication bias (p=0.022); after trim-and-fill adjustment, the revised rate ratio was 1.85 (95% CI 1.35-2.53). Sensitivity analyses confirmed the robustness of these results. Subgroup analyses according to publication year, country, age, study design, lung function, dysphagia assessment methods, definition of a frequent exacerbator and study quality did not significantly change the results.

Conclusion: This systematic review and meta-analysis shows a significant association between dysphagia and increased risk of AECOPD. The findings highlight the importance to add swallowing function screening to standard COPD management. Future research should explore underlying mechanisms and potential confounders further.

Conflict of interest statement

Conflict of interest: All authors have nothing to disclose.

- 34 references
- 3 figures

Full text links

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Acute and 14-day effects of tiotropium/olodaterol on cardiopulmonary function in COPD

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Affiliations Expand

- **PMID: 42338678**
- **PMCID: PMC13284810**
- **DOI: 10.1183/23120541.01282-2025**

Abstract

Background: Lung hyperinflation in COPD adversely affects cardiac function and may influence autonomic nervous system activity. The onset of cardiac improvement with dual bronchodilator therapy remains uncertain.

Methods: In this randomised, placebo-controlled, investigator-blinded, mechanistic, single-dose crossover trial with an open-label 2-week extension we assessed tiotropium/olodaterol (T/O) effects on cardiopulmonary function and muscle sympathetic nerve activity (MSNA) in hyperinflated COPD patients. 32 participants received saline (placebo) and T/O (5 µg/5 µg) in a crossover design, followed by 14 days of open-label T/O. The primary end-point was change in left ventricular end-diastolic volume index (LV-EDVi) measured by magnetic resonance imaging (MRI). Secondary assessments included pulmonary function tests, MSNA measurements and advanced lung imaging including ^{129}Xe-MRI.

Findings: Single-dose T/O significantly increased LV-EDVi relative to placebo (3.25 mL·m^{-2}; 95% CI 0.95 to 5.56), driven partly by a decrease under placebo. Compared with baseline, T/O's acute LV-EDVi gain was minimal, yet it reached significance at 14 days (4.70 mL·m^{-2}; 95% CI 1.75 to 7.65). Pulmonary parameters, in contrast, showed immediate improvement, with a marked reduction in residual volume (-0.67 L; 95% CI -0.82 to -0.51) after a single dose. MSNA demonstrated a nonsignificant numerical rise post single-dose T/O. No serious adverse events occurred.

Interpretation: T/O rapidly improves pulmonary function in hyperinflated COPD patients, but significant cardiac benefits seem to require sustained therapy. These results underscore the importance of continued dual bronchodilator therapy to achieve cardiovascular improvements. The nonsignificant rise in MSNA after a single dose suggests minimal immediate effect on sympathetic activity; further studies are necessary to evaluate long-term autonomic outcomes.

Conflict of interest statement

Conflict of interest: A. Voskrebenzev reports serving as chief executive officer and shareholder of BioVisioneers GmbH, which is involved in pulmonary magnetic resonance imaging services. S. Andreas declares personal fees for lectures from Novartis, AstraZeneca, Chiesi, Merini, Sanofi and Janssen; and is an associate editor of this journal. J.M. Hohlfeld declares grants to his institution for this investigator-initiated trial from Boehringer Ingelheim Pharma GmbH & Co. KG; grants to his institution for clinical trial conduct from Altamira, Astellas, AstraZeneca, Bayer AG, Boehringer Ingelheim Pharma, CSL Behring, Desitin Arzneimittel, EpiEndo, F. Hoffmann-La Roche, Genentech, OM Pharma, Novartis, ReAlta Life Sciences and Sanofi-Aventis Deutschland; and personal fees for consultancy and board activities from Boehringer Ingelheim Pharma, Celerion, CSL Behring, Cureteq, Novartis and Roche. All other authors have no conflict of interest within the scope of the submitted work.

- **34 references**
- **4 figures**

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Transitions to and reversion from a persistent frequent-exacerbator state in COPD

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Affiliations Expand

- PMID: 42338677

- PMCID: PMC13284798

- DOI: 10.1183/23120541.01098-2025

Abstract

Background: Preventing acute exacerbations in COPD (AECOPDs) is key in striving for disease stability. To investigate the differential impact of risk factors across AECOPD phenotypes, we identified baseline health determinants and comorbidities associated with transitions from non-exacerbator (NE) to persistent frequent-exacerbator (FE) and reversion.

Methods: Patients ≥45 years with ≥3 months treatment for obstructive airway diseases or hospital-labelled COPD without (concomitant) asthma were identified in Belgian nationwide data between January 2017-February 2018. Factors associated with disease worsening (transitioning from NE to persistent FE), reversion (from FE to stable NE) or transition to death were investigated using multinomial logistic regression.

Results: Among 183 762 patients (mean age 68.6 years, 48.0% female), 11.5% (21 072) never experienced AECOPDs and 11.6% (21 375) exacerbated frequently in each of three consecutive years. Among 56 933 NE at baseline (31.0%), 4.1% transitioned to persistent FE, whereas among 80 502 FE (43.8%), 7.3% reversed to

stable NE. Transitions from NE towards persistent FE were associated with having lung cancer (adjusted odds ratio (aOR) 3.67, 95% CI 2.33-5.78), being an ever-smoker (aOR 2.09, 95% CI 1.94-2.43) or having neuropsychiatric or musculoskeletal comorbidity. Overuse of short-acting bronchodilators (aOR 0.57, 95% CI 0.46-0.49), ever-smoking or having overuse of maintenance therapy were factors most strongly associated with lower odds of reversion. Cardiovascular comorbidities were significantly associated with increased mortality odds, but not with disease worsening.

Conclusions: The results of this cohort study support addressing smoking and inhaler overuse to promote reversion to stable NE, while managing lung cancer and neuropsychiatric or musculoskeletal comorbidities to reduce worsening.

Conflict of interest statement

Conflict of interest: Outside this manuscript, L. Lahousse has been consulted as expert for AstraZeneca, GlaxoSmithKline (GSK) and Sanofi, has received support for travel by Menarini, and has given lectures sponsored by Chiesi, Johnson and Johnson Services Inc., IPSA vzw and Domus Medica vzw (nonprofit organisations facilitating lifelong learning for health care providers), all paid to her institution. Outside this manuscript, L.E.G.W. Vanfleteren reports to have received research grants from The Family Kamprad Foundation (20190024), the Swedish government and country council ALF grant (ALFGBG-824371), The Swedish Heart and Lung Foundation (20200150), Svensk Lungmedicinsk Förening, AstraZeneca (all paid to institution), and payment or honoraria for lectures, presentation, speakers bureaus, manuscript writing or educational events from GSK, AstraZeneca, Boehringer, Novartis, Chiesi, Resmed, Pulmonx, Sanofi and Grifols (paid personally). All other authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

- 32 references
- 3 figures

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Measuring the effect of azithromycin in chronic respiratory disease using continuous cough monitoring: an open-label exploratory trial

Dominic L Sykes [1 2], Kayleigh Brindle [1], Syed Kazmi [1], Jennifer Nielsen [1], Simon P Hart [1 2], Michael Clarkson [1 2], John Gallagher [2], Warren Jackson [2], Elisabeth Kirton [2], Matthew Rudd [3], Lola Jover [3], Peter Small [3], Mindaugas Galvosas [3], Alyn H Morice [1 2], Michael G Crooks [1 2]

Affiliations Expand

- PMID: 42338676

- PMCID: PMC13284820

- DOI: 10.1183/23120541.00562-2025

Abstract

Background: Azithromycin is beneficial in a multitude of respiratory diseases; however, its effects on both subjective and objective measures of cough have been less extensively studied. Traditional 24-h cough counting assessments are highly variable, potentially underestimating the antitussive effect of therapeutics.

Methods: Patients with asthma, COPD, interstitial lung disease and refractory chronic cough who reported cough as the predominant symptom were continuously monitored using a smart watch equipped with Hyfe cough detection software. Patients were monitored 1 week prior to and 4 weeks after commencing azithromycin. Participants were also assessed using patient-reported outcome measures and a 4-week daily cough visual analogue scale diary. Cough data were analysed using the novel cough metrics "relief of cough" and "cough density".

Results: 30 participants with a broad range of respiratory diseases were recruited; 80% (n=24) had satisfactory usage of the cough monitor (>12 h·day^{-1} for 90% of study days). There was a significant reduction in the geometric mean of coughs per hour from pretreatment baseline to follow-up at week 4 (11.4 *versus* 7.5 coughs·h^{-1}, p=0.026). This reduction was observed after 1 week and cough counts reduced progressively from week 1 to week 4. Of the 24 participants who had adequate cough monitoring, 29% (n=7) had a >50% reduction in cough frequency. The mean proportion of time that participants had relief of cough improved between baseline and follow-up (74% *versus* 81%, p<0.001). There was no significant difference in cough density metric (47.5 *versus* 42.8, p=0.069). Significant improvements were observed in all patient-reported outcomes.

Conclusion: This is the first study to assess the antitussive effect of a drug using continuous cough monitoring. Further trials should use this method of cough assessment to obtain a more granular assessment of cough in airways diseases.

Conflict of interest statement

Conflict of interest: D.L. Sykes has received honoraria from AstraZeneca and Trevi therapeutics, and speaker's fees from AstraZeneca and Chiesi. S.P. Hart reports grants from Chiesi and Boehringer Ingelheim, consulting fees from Boehringer Ingelheim, honoraria from Chiesi, and travel support from Chiesi and Boehringer Ingelheim, is a trustee of Action for Pulmonary Fibrosis and the Morriston Davies Trust, and is an associate editor of this journal. M. Rudd, L. Jover, P. Small and M. Galvosas are employees of Hyfe Inc., the company that developed the monitoring system used in this study. Hyfe Inc. donated the monitors used in this study but did not provide any additional funding for the study to be performed. A.H. Morice has received consulting fees from Bayer, Bellus, Boehringer Ingelheim, Merck, Pfizer, Proctor & Gamble and Shionogi; lecture fees from Boehringer Ingelheim, Merck and AstraZeneca; and grant support from Proctor & Gamble, Merck, Afferent, Infirst, NeRRi and Nocion; and is an associate editor of this journal. M.G. Crooks has received honoraria and/or nonfinancial support from AstraZeneca, Boehringer Ingelheim, Chiesi, Orion and Sanofi; has participated in advisory boards for AstraZeneca, Chiesi, Orion and Synairgen; and has received grants from Asthma & Lung UK, AstraZeneca, Boehringer Ingelheim, Chiesi and the National Institute for Health and Care Research. K. Brindle, S. Kazmi, J. Nielsen, M. Clarkson, J. Gallagher, W. Jackson and E. Kirton declare no conflict of interest pertaining to this article.

- **34 references**
- **4 figures**

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Cardiovascular events in patients with COPD after long-acting bronchodilator initiation

Dave Singh [1 2], Ana R Sousa [3], David E Newby [4], Michele Jonsson Funk [5], Miguel Roman-Rodriguez [6], Peter Kardos [7], Gema Requena [8], Alison Donald [9], David Slade [10], Chris Compton [11]

Affiliations Expand

- **PMID: 42338673**

- **PMCID: PMC13284813**

- **DOI: 10.1183/23120541.01691-2025**

Abstract

Background: Real-world evidence concerning the cardiovascular (CV) risk of umeclidinium (UMEC) monotherapy or UMEC/vilanterol (VI) is scarce. This real-world study investigated CV risk in new users of UMEC or UMEC/VI *versus* new users of tiotropium (TIO) in patients with chronic obstructive pulmonary disease (COPD).

Methods: This prospective, observational, multinational, cohort study enrolled patients ≥18 years with COPD who initiated UMEC, UMEC/VI or TIO between 2 February 2016 and 31 January 2023. Noninferiority (95% confidence interval upper bound <2.0) of UMEC and UMEC/VI to TIO was compared for the time-to-first event (hazard ratio (HR) over 24 months) of a composite CV end-point of myocardial infarction, stroke, heart failure or sudden cardiac death. Stabilised inverse probability of treatment weighting adjusted for differences in baseline covariate balance between groups. Incidence rates for the composite CV end-point were calculated.

Results: In total, 6606 patients were enrolled; 6165 were included in the analysis. Both UMEC (n=1246) and UMEC/VI (n=2448) were noninferior to TIO (n=2471) for the risk of the composite CV end-point (adjusted HR (95% CI): UMEC *versus* TIO: 1.254 (0.830-1.896); UMEC/VI *versus* TIO: 1.352 (0.952-1.922)). Unadjusted composite CV incidence rates were low across cohorts (incidence rate (95% CI) per 100 person-years: UMEC: 1.157 (0.814-1.594); UMEC/VI: 1.287 (1.034-1.584); TIO: 0.924 (0.716-1.174)).

Conclusions: Both UMEC and UMEC/VI were noninferior to TIO for composite CV risk, suggesting that physicians may consider escalating patients to dual bronchodilator therapy if COPD symptoms are not effectively managed with monotherapy.

Conflict of interest statement

Conflict of interest: D. Singh declares consulting fees from Aerogen, AstraZeneca, Boehringer Ingelheim, Chiesi, Cipla, CSL Behring, Epiendo, Genentech, Glenmark, GSK, Gossamerbio, Kinaset, Menarini, Novartis, Pulmatrix, Sanofi, Synairgen, Teva, Theravance and Verona. A.R. Sousa, A. Donald and D. Slade are employed by GSK and hold financial equities in GSK. D.E. Newby declares consulting fees from GSK. M. Jonsson Funk receives salary support as Director of the Center for Pharmacoepidemiology at UNC, which has cooperative agreements with GSK, AbbVie, Astellas, Boehringer Ingelheim, Sarepta, Takeda and UCB. M. Roman-

Rodriguez declares consulting fees from AstraZeneca, Boehringer Ingelheim and GSK. P. Kardos declares consulting fees from AstraZeneca, Chiesi, GSK, Menarini, Novartis and Sanofi-Genentech. G. Requena was employed by GSK at the time of the study. C. Compton was employed by GSK at the time of the study and holds financial equities in GSK.

- 40 references
- 3 figures

Full text links

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Cite

25

ERJ Open Res

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. 2026 Jun 22;12(3):00045-2026.

doi: 10.1183/23120541.00045-2026. eCollection 2026 May.

Beyond spirometry in COPD: expanding the diagnostic paradigm

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Affiliations Expand

- PMID: 42338672
- PMCID: PMC13284819
- DOI: 10.1183/23120541.00045-2026

Abstract

Diagnosis of COPD extends beyond spirometric airflow obstruction https://bit.ly/4q7fQYA.

Conflict of interest statement

Conflict of interest: S.P. Bhatt reports grants from the NIH, Nuvaira, Sanofi/Regeneron, Genentech, the COPD Foundation, Apreo, Uniquity and Connect Biopharma; royalties from Springer; consultancy fees from Sanofi, Regeneron, Boehringer Ingelheim, Apreo, Genentech, Chiesi, AstraZeneca, GSK, Kymera, Merck, Verona Pharma, Polarean, Uniquity and Connect Biopharma; payment or honoraria for lectures, presentations, manuscript writing or educational events from IntegrityCE, Medscape, Horizon CME, Illuminate Health and Integritas Communications; participation on a data safety monitoring board or advisory board with the NIH; and a leadership role with the American Thoracic Society. E.K. Silverman reports support for the present work from the NIH, and grants from Bayer and Northpond Laboratories. J.D. Crapo reports no conflict of interest.

- **4 references**

Supplementary info

Publication typesExpand

Full text links

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Cite

26

Respirology

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. 2026 Jun 23.

doi: 10.1002/resp.70275. Online ahead of print.

Clinical and Inflammatory Phenotypes During Exacerbations Predict In-Hospital Adverse Outcomes in Asthma-COPD Overlap

Lishan Yuan [1], Lei Wang [1], Yulai Yuan [2], Yilai Li [1], Li Zhang [1], Ying Liu [1], Lei Liu [1], Lingyun Lu [1], Min Feng [3 4], Gang Wang [5], Shuwen Zhang [6], Chongyang Zhao [7], Qin Wang [7], Deying Kang [7 8], Xin Zhang [1]

Affiliations Expand

- **PMID: 42337860**

- **DOI: 10.1002/resp.70275**

Abstract

Background and objectives: Exacerbations of asthma-chronic obstructive pulmonary disease overlap (EACO) are associated with high mortality, yet the acute-phase heterogeneity remains poorly characterized. This study aimed to identify distinct inflammatory phenotypes of EACO during hospitalization and evaluate their associations with clinical outcomes.

Methods: A prospective two-centre cohort study enrolled 2444 EACO patients (training and validation cohort). Baseline inflammatory markers and clinical data were collected. Unsupervised k-means clustering identified inflammatory phenotypes, with sensitivity analysis excluding demographic variables. In-hospital clinical outcomes (ICU admission, invasive ventilation, in-hospital mortality) were assessed. Logistic regression and causal mediation analysis evaluated phenotype-outcome associations. A nomogram was developed and validated using receiver operating characteristic curves (AUC).

Results: Three distinct phenotypes were identified: Cluster T1 (neutrophil-to-lymphocyte ratio [NLR]-elevated hypoeosinophilic systemic inflammatory), Cluster T2 (eosinophilic), and Cluster T3 (eosinophil-neutrophil balanced). Cluster T1 exhibited systemic hyperinflammation (elevated white blood cell count, neutrophils, NLR, C-reactive protein (CRP), procalcitonin (PCT), and interleukin-6 (IL-6)), and the highest composite adverse outcome rate (24.2%; $p < 0.001$). Logistic regression revealed absolute neutrophil count ($\beta = 0.38$, $p < 0.001$), D-dimer ($\beta = 0.25$, $p < 0.001$), and absolute lymphocyte count ($\beta = -0.41$, $p < 0.001$) as key outcome predictors, confirmed by causal mediation analysis. The nomogram showed robust predictive performance (AUC training = 0.775; validation = 0.766).

Conclusion: Inflammatory phenotypes during EACO predict differential in-hospital outcomes, with neutrophil-dominant phenotypes conferring the highest risk. Early phenotype-based risk stratification using simple blood biomarkers may guide individualized EACO management.

Keywords: acute exacerbation; asthma-COPD overlap; biomarkers; inflammatory phenotypes; precision medicine.

- 26 references

Supplementary info

Grants and fundingExpand

Full text links

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Cite

27

Pulm Ther

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. 2026 Jun 23.

doi: 10.1007/s41030-026-00361-2. Online ahead of print.

Summary of Research: Dupilumab for Chronic Obstructive Pulmonary Disease with Type 2 Inflammation: A Pooled Analysis of Two Phase 3, Randomised, Double-Blind, Placebo-Controlled Trials

Surya P Bhatt [1], Klaus F Rabe [2], Nicola A Hanania [3], Claus F Vogelmeier [4], Mona Bafadhel [5], Stephanie A Christenson [6], Alberto Papi [7], Dave Singh [8], Linda Walsh [9], Tonya Winders [10], Ashish Bansal [11], Lacey B Robinson [12]

Affiliations Expand

- PMID: 42337097

- DOI: 10.1007/s41030-026-00361-2

Free article

Abstract

Chronic obstructive pulmonary disease (COPD) is a progressive lung disease that is usually caused by long-term exposure to harmful substances, such as cigarette smoke, which can lead to inflammation in the airways. Dupilumab is a drug that works by blocking the activity of interleukins 4 and 13, and helping to reduce type 2 inflammation in various organs, such as the lungs, sinuses, and skin. This summary of research provides an overview of the previously published article on the results of two phase 3 studies of patients with COPD and type 2 inflammation who were treated with either dupilumab or placebo for up to 52 weeks. Dupilumab reduced exacerbations and symptom severity, improved lung function and quality of life in these patients, and was well tolerated. These studies provide evidence that dupilumab is a safe and effective treatment option for patients with COPD who also show signs of type 2 inflammation. ClinicalTrials.gov Identifiers: BOREAS: NCT03930732; NOTUS: NCT04456673.

Keywords: Biologic; COPD; Dupilumab; Efficacy; Exacerbation; Lung function; Quality of life; Safety.

Conflict of interest statement

Declarations. Conflict of Interest: Please see the original article for full author disclosures. Linda Walsh and Tonya Winders have nothing to disclose. Ethics approval, Consent to participate, Consent to publish, Availability of data and material: Not applicable.

- 1 reference

Supplementary info

Associated dataExpand

Full text links

Proceed to details

Cite

28

BMJ Open

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. 2026 Jun 23;16(6):e105321.

doi: 10.1136/bmjopen-2025-105321.

Extreme heat and cause-specific risk of hospital admission in the adult population in England: a case time series analysis

Gillian Flower [1 2], Rebecca Cole [3], Arturo De La Cruz Libardi [3], Luis Mieiro [3 4], Jennifer K Quint [5], Antonio Gasparrini [3], Pierre Masselot [3]

Affiliations Expand

- PMID: 42336790
- PMCID: PMC13295835
- DOI: 10.1136/bmjopen-2025-105321

Abstract

Objectives: This study investigated the impact of heat on the risk of hospital admission due to a range of health conditions in England.

Design: We used records of over 4 million hospital admissions in the summer months between 2008 and 2019, to construct daily time series of admissions in 32 837 census areas. Coupled with high-resolution environmental data, we conducted a case time-series analysis using distributed-lag non-linear models to measure the lagged relationship between summertime temperature and risk of admission for a broad set of health conditions. We derived the relative risks of admission at the 99th compared with the 50th temperature percentile to understand the effect of extreme heat in each locality.

Setting: The adult population of England (aged 18 years and older).

Outcome measures: Unplanned National Health Service (NHS) in-patient hospital admissions for cardiovascular, respiratory, genitourinary, metabolic and infectious diseases, along with their subcategories.

Results: These conditions contributed more than 3.7 million admissions, of which over 1.5 million (42%) were for those aged 75 years and over. More than 80% of admissions were for respiratory, cardiovascular or genitourinary illness, which collectively contributed 3.1 million hospital admissions. There was clear evidence of an increased risk of hospital admission for many conditions, including acute renal failure (1.37, 95% CI 1.32 to 1.42), metabolic disorders (1.28, 95% CI 1.24 to 1.32), infectious and parasitic diseases (1.06, 95% CI 1.04 to 1.08), pneumonia (1.07, 95% CI 1.05 to 1.09) and chronic obstructive pulmonary disease (1.08, 95% CI 1.05 to 1.10). The evidence was less clear for asthma and diabetes, while there were negative associations for many cardiovascular conditions. There was a clear age gradient in heat-related admissions, with older people facing the greatest risk of admission.

Conclusions: These findings highlight the widespread effect of extreme heat across a range of health conditions, in addition to mortality, and have implications for public health planning in our changing climate.

Keywords: Climate Change; EPIDEMIOLOGY; Health; Hospitalization; PUBLIC HEALTH; Risk Factors.

Conflict of interest statement

Competing interests: None declared.

- **28 references**
- **2 figures**

Supplementary info

MeSH termsExpand

Full text links

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Cite

29

Thorax

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. 2026 Jun 23:thorax-2025-224072.

doi: 10.1136/thorax-2025-224072. Online ahead of print.

Body mass index and airway mucus plugs: findings from the COPDGene and ECLIPSE studies

Jose Manuel Martinez Manzano [1 2], Sofia K Mettler [3 2], Ruchita Borgaonkar [3], Wei Wang [2 4], Ruben San Jose Estepar [2 5], Raul San Jose Estepar [2 5], Alejandro A Diaz [3 2]

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- PMID: 42336666

- DOI: 10.1136/thorax-2025-224072

Abstract

Airway-occluding mucus plugs (MPs)-as identified on CT scans-are frequent in patients with chronic obstructive pulmonary disease (COPD). Prior studies have shown that body mass index (BMI) tends to be lower among individuals with MPs. To further investigate this relationship, we assessed whether BMI is associated with MPs in two large, multicentre cohorts of tobacco-exposed participants with and without COPD. In multivariable models, lower BMI was associated with an increased prevalence of MPs in COPD and non-COPD groups. Future studies are warranted to elucidate the mechanisms underlying this association.

Keywords: COPD Pathology.

Conflict of interest statement

Competing interests: None declared.

. 2026 Jun 23:344:104612.

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Emphysema and airway disease synergistically impair exercise tolerance in smokers: A CT-based study

Tomoki Maetani [1], Taketo Sugitani [2], Naoya Tanabe [3], Yusuke Shiraishi [2], Yusuke Hayashi [2], Tsuyoshi Oguma [4], Ryo Sakamoto [5], Kaori Ikeda [6], Yohei Oshima [7], Yuji Yoshioka [7], Ryota Hamada [7], Atsuyasu Sato [2], Susumu Sato [8], Ryosuke Ikeguchi [7], Toyohiro Hirai [2]

Affiliations Expand

- PMID: 42336306

- DOI: 10.1016/j.resp.2026.104612

Abstract

Introduction: Emphysema and airway disease are major pathological features in smokers, including those with chronic obstructive pulmonary disease (COPD); however, how these two distinct pathologies interact to impair exercise capacity remains poorly understood. This study aimed to comprehensively compare physical performance, body composition, and physical activity across four computed tomography (CT)-based phenotypes: emphysema-dominant (ED), airway disease-dominant (AD), both-dominant (Mixed), and neither-dominant (Mild).

Methods: This cross-sectional analysis used baseline data from a single-center prospective cohort of smokers enriched for COPD. Alongside spirometry and 6-minute walk distance (6MWD), chest CT was performed to quantify the low attenuation volume percentage (LAV%) and airway wall area (Pi10), which enabled classification into Mild, AD, ED, and Mixed phenotypes.

Results: A total of 181 smokers (77.9% with COPD) were categorized into Mild, AD, ED, and Mixed groups (n = 62/33/55/31, respectively). The Mixed group exhibited a significantly shorter 6MWD compared with the Mild group. Furthermore, the ED and Mixed phenotypes showed greater dyspnea and oxygen desaturation during exercise. In multivariable analysis, both LAV% and Pi10 were independently associated with 6MWD after adjusting for relevant clinical covariates and muscle strength. A significant interaction between LAV% and Pi10 was observed, demonstrating their synergistic detrimental effect on 6MWD.

Conclusion: Emphysema and airway disease independently and synergistically contribute to impaired exercise tolerance in smokers. CT-based phenotyping, particularly identification of the Mixed phenotype, may be useful to stratify functional risk and guide targeted interventions for preserving physical function in this population.

Keywords: 6-minute walk distance; COPD; airway disease; emphysema; exercise tolerance.

Conflict of interest statement

Declaration of Competing Interest N.T. and T.H. were supported by grants from FUJIFILM Co., Ltd. and Daiichi Sankyo Company, Ltd., outside the submitted work. N.T. received a lecture fee from AstraZeneca outside of the submitted work. S.S. received grants from FUJIFILM Co., Ltd., Nippon Boehringer Ingelheim, Philips-Respironics, Fukuda Denshi, Fukuda Lifetec Keiji, and ResMed outside of the submitted work. None of these companies played a role in the design or analysis of the study, or in the writing of the manuscript. The other authors have no conflicts of interest to declare.

Full text links

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Cite

31

Review

JAAPA

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. 2026 Jul 1;39(7):20-27.

doi: 10.1097/01.JAA.0000000000000377. Epub 2026 Jun 23.

COPD: A Comprehensive Overview of a Prevalent Disease

Zhi Peng Li [1]

Affiliations Expand

- **PMID: 42332389**

- **DOI: 10.1097/01.JAA.0000000000000377**

Abstract

Chronic obstructive pulmonary disease (COPD) is a progressive disease characterized by airflow limitation. Despite the availability of comprehensive, evidence-based guidelines from the Global Initiative for Chronic Obstructive Lung Disease (GOLD), utilization of these recommendations remains limited in clinical practice. COPD contributes substantially to global morbidity, mortality, and economic burden and is projected by the World Health Organization to become the

third leading cause of death worldwide by 2030. Early recognition and diagnosis, adherence to guideline-based pharmacologic management, smoking cessation, vaccination, and pulmonary rehabilitation are mainstay strategies to slow disease progression and prevent exacerbations. Understanding the pathophysiology and systemic complications is essential for improving outcomes and enhancing quality of life in patients with COPD.

Keywords: COPD; GOLD guidelines; acute exacerbation; chronic bronchitis; emphysema; pulmonary hypertension.

- **32 references**

Supplementary info

Publication types, MeSH termsExpand

Full text links

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Cite

32

BMJ Glob Health

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. 2026 Jun 22;11(6):e023674.

doi: 10.1136/bmjgh-2026-023674.

Impact of ambient fine particulate matter ($PM_{2.5}$) pollution on disease burden in BRICS from 1990 to 2023: evidence from the Global Burden of Disease Study 2023

Shangkun Si[#1,2,3], Shizhe Deng[#1,2,3], Yueyang Zhang[#3], Xingxin Wang[#4], Gonglei Yue[5], Yiyang Sun[1,2], Hai Lu[6], Junyang Li[1,2,3], Feng Tao[1,2,3], Mengxuan Lin[1,2,3], Zhexu Dong[1,2,3], Bifang Zhuo[1,2,3], Li Li[1,2], Bo Pang[7], Xinyao Jin[7], Zhihong Meng[8,2,3], Jiangwei Shi[8,2,3]

Affiliations Expand

- **PMID: 42331512**

- **PMCID: PMC13289027**

- DOI: 10.1136/bmjgh-2026-023674

Abstract

Background: Ambient fine particulate matter ($PM_{2.5}$) pollution (APMP) is a leading global mortality risk factor. Its long-term trends, drivers and future burden trajectories in emerging economies remain inadequately understood. This study provides the first systematic assessment of spatiotemporal patterns, key drivers and projections to 2050 of APMP-attributable health loss in BRICS countries (Brazil, Russia, India, China and South Africa) from 1990 to 2023, benchmarked against global and Group of Seven (G7) trends.

Methods: Using Global Burden of Disease 2023 data, this study analysed APMP-attributable deaths and disability-adjusted life years (DALYs) via absolute numbers and age-standardised rates. The multidimensional framework included joinpoint regression, age-period-cohort (APC) modelling, Das Gupta decomposition, disease spectrum ranking and Bayesian-APC projection.

Results: In 2023, APMP caused 2.955 million deaths in BRICS (59% of the global total). Age-standardised mortality and DALY rates remained higher than global averages and increased since 1990, contrasting with sustained declines in the G7. Substantial heterogeneity existed: India's burden was heaviest and growing, China's remained high but stabilised, while Brazil and Russia achieved marked reductions. APC modelling revealed pronounced mortality increases in older ages (especially 95+ years in China and India). Decomposition identified population ageing as the key driver in BRICS, especially China; population growth and deteriorating epidemiological conditions under high exposure drove increases in India and South Africa. Leading APMP-attributable burdens in BRICS were ischaemic heart disease, chronic obstructive pulmonary disease and intracerebral haemorrhage, unlike in the G7 where Alzheimer's disease and other dementias ranked first. Projections indicate the BRICS burden will remain above the global average by 2050, with China and India continuing to bear severe burdens.

Conclusion: BRICS is the epicentre of global APMP-attributable burden. The widening gap with the G7 underscores divergent environmental health governance paradigms. Findings call for differentiated strategies within BRICS and enhanced transnational collaboration to curb APMP burden rises and bridge global environmental health equity gaps.

Keywords: Environmental health; Epidemiology; Global Health; Health policies and all other topics; Public Health.

Conflict of interest statement

Competing interests: None declared.

- 88 references
- 5 figures

Supplementary info

MeSH terms, SubstancesExpand

Full text links

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Cite

33

Am J Respir Crit Care Med

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. 2026 Jun 22:aamag315.

doi: 10.1093/ajrccm/aamag315. Online ahead of print.

Measuring What Matters: Hospitalisation Reduction in COPD

Sanjay Ramakrishnan [1 2 3], Joon Young Choi [4]

Affiliations Expand

- PMID: 42330347

- DOI: 10.1093/ajrccm/aamag315

Free article

No abstract available

Full text links

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Cite

34

Am J Respir Crit Care Med

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. 2026 Jun 22:aamag309.

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Airway Mucus Plugs in Asthma and COPD: Pathobiology, Imaging, and Implications for Clinical Trials

Christopher B Bosma [1], Shawn D Aaron [2], Bartolome R Celli [3], Grace Parraga [4], Sally Seymour [5], George R Washko [6], James P Allinson [7], Federico Baraldi [8], Richard C Boucher [9], Mario Castro [10], Sanjay H Chotirmall [11] [12], Alejandro A Diaz [6], John V Fahy [13], Jonathan G Goldin [14], Andrew J Halayko [15], David M G Halpin [16], Eric Hoffman [17], Wassim W Labaki [1], Njira Lugogo [1], Ella Kazerooni [18], Mehmet Kesimer [9], Alberto Papi [8], Sundaresh Ram [19], Kathryn A Ramsey [20], Raúl San José Estépar [21], Naoya Tanabe [22], Kyle Whelan [23], Jadwiga A Wedzicha [7], Fernando J Martinez [23], MeiLan K Han [1]

Affiliations Expand

- PMID: 42330343

- DOI: 10.1093/ajrccm/aamag309

Free article

Abstract

Mucus plugs have been previously recognized as an important pathological feature in asthma and COPD, but their clinical role in these diseases has not been explored in-depth until recently. Mucus plug formation is driven by mucus hyperconcentration, changes in mucus viscoelastic properties, impaired clearance, and mucociliary collapse. Scoring systems, such as the bronchopulmonary segment mucus plug score, have been used to associate greater mucus plug burden with poor clinical outcomes. Additional scoring methods obtained through quantitative image processing are currently under development. Mucus plug burden has been associated with greater exacerbations and spirometric decline in both asthma and COPD, as well as greater mortality in COPD. Recently, mucus plug burden has been used as an endpoint in clinical trials to evaluate the effectiveness of biologic therapies in asthma; multiple biologic therapies demonstrated decreases in mucus plug burden and associated improvements in spirometry with treatment. Together, this data suggests mucus plugs may be a treatable trait in asthma and COPD. Mucus plug burden has current clinical, phenotypic, and predictive utility and shows promise as a future biomarker. Increased incorporation into clinical trials, expanded evidence of treatment effect, and standardization of methodology and imaging protocols will be needed. CT-detection of mucus plug burden is ready for greater incorporation into both research outcomes and clinical care.

Proceed to details

Cite

35

Am J Respir Crit Care Med

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. 2026 Jun 22:aamag311.

doi: 10.1093/ajrccm/aamag311. Online ahead of print.

Mucus Plug Formation is Associated with Eosinophilic Activation in Chronic Obstructive Pulmonary Disease

Federico Baraldi [1 2], Jordina S Y Mah [1], Abdulrahman Almuhanna [1], Aaron Braddy-Green [1], Sam Bartlett-Pestell [1], Mairi A MacLeod [1], Chloe I Bloom [1], Andrew I Ritchie [1 3], Dexter J Wiseman [1 4], James P Allinson [1], Eric A Hoffman [5], Alberto Papi [2], Jadwiga A Wedzicha [1], Lydia J Finney [1]

Affiliations Expand

- PMID: 42330336

- DOI: 10.1093/ajrccm/aamag311

No abstract available

Full text links

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Cite

36

Am J Respir Crit Care Med

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. 2026 Jun 22:aamag169.

doi: 10.1093/ajrccm/aamag169. Online ahead of print.

Can understanding the spatial expression of IL-33 and its receptor ST2 in the lower airways inform clinical studies?

Alen Faiz [1 2 3], Stephen Rennard [4]

Affiliations Expand

- PMID: 42330335

- DOI: 10.1093/ajrccm/aamag169

Free article

No abstract available

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37

Br J Radiol

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. 2026 Jun 22:tqag148.

doi: 10.1093/bjr/tqag148. Online ahead of print.

The Utility of Advanced Imaging in COPD: Diagnosis, Prognosis, and Treatment-introductory Editorial

Li Fan [1], Sandeep Bodduluri [2]

Affiliations Expand

- PMID: 42330333

- DOI: 10.1093/bjr/tqag148

Free article

No abstract available

Full text links

38

Review

Expert Opin Emerg Drugs

. 2026 Jun 22:1-14.

doi: 10.1080/14728214.2026.2688171. Online ahead of print.

Emerging treatment options for chronic obstructive pulmonary disease: a look into 2026 and beyond

Carolyn J Wang [1 2], Clarus Leung [1 3], Don D Sin [1 3 4]

Affiliations Expand

- PMID: 42314183

- DOI: 10.1080/14728214.2026.2688171

Abstract

Introduction: As a leading cause of worldwide mortality, chronic obstructive pulmonary disease (COPD) is progressive and irreversible, leading to significant challenges with disease management and treatment. This is further complicated by the heterogenous nature of COPD, which is represented by the multiple endotypes that have variable responses to available treatments, thereby negating the one-size-fits-all approach. While recent clinical studies describe the effectiveness of existing therapies, further investigation is required to align COPD endotypes with the appropriate treatment options.

Areas covered: In this review, we discuss the known biomarkers pertaining to both direct and indirect measures of the inflammatory milieu and structural abnormalities in COPD. Combined use of conventional anti-inflammatory and bronchodilator treatments provide some symptomatic relief by reducing exacerbation frequency, however, for some patients, long-term corticosteroid use can increase the risk developing pneumonia and subsequent mortality. Biologics are at the forefront of emerging therapies for COPD, which shifts the target from widespread airway

inflammation to pinpoint precise inflammatory markers involved in pathophysiological mechanisms of COPD.

Expert opinion: Identifying reliable airway-derived biomarkers in COPD will drive the development of therapies that can facilitate a precision medicine approach for patients with COPD.

Keywords: Biologics; chronic obstructive pulmonary disease; endotypes; inflammation; precision medicine.

Supplementary info

Publication typesExpand

"Multimorbidity"[Mesh Terms] OR Multimorbidity[Text Word]

1

BMC Geriatr

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. 2026 Jun 27.

doi: 10.1186/s12877-026-07889-7. Online ahead of print.

Prevalence of frailty, multimorbidity, and polypharmacy and their association with health outcomes in hospitalized older adults: a prospective multicenter cohort study

Anan Al-Jabri [1], Zubaida Al-Falahi [2], Juhaina Salim Al-Maqbali [3], Khalfan Al Zeedy [2], Zaiyana Ambusaidi [2], Abdullah M Al Alawi [1 2 4], Salim Al-Busaidi [5 6]

Affiliations Expand

- **PMID: 42365277**

- **DOI: 10.1186/s12877-026-07889-7**

Abstract

Background: The growing burden of frailty, multimorbidity, and polypharmacy among older adults presents major challenges to healthcare systems worldwide. These interrelated conditions are known to worsen clinical outcomes, yet data from the region are limited. This study aimed to examine the prevalence and clinical impact of frailty, complex multimorbidity, and polypharmacy among hospitalized older adults in Oman.

Methods: A prospective, multicenter cohort study was conducted in general internal medicine wards of two tertiary hospitals in Oman. Patients aged ≥ 65 years were consecutively enrolled and assessed for frailty using Clinical Frailty Scale (CFS), multimorbidity using the Charlson Comorbidity Index (CCI) and a definition of complex multimorbidity (≥ 3 chronic conditions), and polypharmacy (≥ 5 medications). Clinical outcomes included hospital length of stay (LOS), in-hospital mortality, HD/ICU admission, 30- and 90-day mortality, and 30- and 90-day readmission. Multivariable regression and Kaplan-Meier survival analyses were used.

Results: Among 369 patients, high frailty, complex multimorbidity, and polypharmacy were present in 139 (37.67%), 126 (34.15%), and 243 (65.85%) patients, respectively. Higher frailty was associated with longer LOS (6.49 vs. 4.88 days, $p < 0.01$) and increased in-hospital mortality (15.11% vs. 3.54%, $p < 0.01$). High frailty independently predicted 30-day mortality (adjusted odds ratio [aOR] 5.68, $p < 0.01$) and 90-day mortality (aOR 3.53, $p < 0.01$). Complex multimorbidity independently predicted 30-day readmission (aOR 1.92, $p = 0.015$), 30-day mortality (aOR 2.12, $p = 0.026$), and 90-day mortality (aOR 2.42, $p < 0.01$). Kaplan-Meier and adjusted Cox regression analyses showed lower 90-day survival and higher mortality risk among patients with high frailty (adjusted hazard ratio [aHR] 3.16, 95% CI 1.69-5.89, $p < 0.001$) and complex multimorbidity (aHR 1.85, 95% CI 1.15-2.98, $p = 0.011$).

Conclusion: Frailty, complex multimorbidity, and polypharmacy were common among hospitalized older adults in Oman. High frailty and complex multimorbidity were the most consistent predictors of adverse outcomes, supporting early recognition, structured geriatric assessment pathways, and future targeted patient-centered interventions.

Keywords: Frailty; Geriatrics; Mortality; Multimorbidity; Polypharmacy; Readmission.

Conflict of interest statement

Declarations. Ethics approval and consent to participate: This study was approved by the Medical and Research Ethics Committee at the College of Medicine and Health Sciences, Sultan Qaboos University (SQU) [MREC #3028; SQU-EC/099/2023], and the Health Studies and Research Approval Committee (HSRAC) at the Ministry of Health, Oman [MoH/CSR/23/27310]. The study was conducted in accordance with the ethical standards of these committees and with the Declaration of Helsinki. Written informed consent was obtained from all patients or their legally authorized representatives. **Consent for publication:** Not applicable. **Competing interests:** The authors declare no competing interests.

Supplementary info

Grants and fundingExpand

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BMC Pulm Med

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. 2026 Jun 26.

doi: 10.1186/s12890-026-04428-3. Online ahead of print.

Doctor-nurse integrated management is associated with improved clinical outcomes in AECOPD patients with multimorbidity: A propensity score-matched retrospective cohort study

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Affiliations Expand

- PMID: 42363145

- DOI: 10.1186/s12890-026-04428-3

Abstract

Background: Acute exacerbations of chronic obstructive pulmonary disease (AECOPD) are frequently complicated by multimorbidity, particularly cardiovascular and metabolic disorders such as heart failure and diabetes. These coexisting conditions create therapeutic conflicts and increase the risk of poor outcomes. Effective management strategies addressing both pulmonary and associated disorders in this high-risk population are urgently needed. This study aimed to evaluate whether a Doctor-Nurse Integrated Management (DNIM) model is associated with better clinical outcomes compared to routine care in AECOPD patients with multimorbidity.

Methods: We conducted a retrospective cohort study at a tertiary hospital in China, screening electronic medical records of patients admitted for AECOPD with confirmed multimorbidity (defined as Charlson Comorbidity Index ≥ 2 or documented cardiac/metabolic comorbidities) between January 2022 and January 2025. Patients were allocated to either a DNIM group, receiving structured collaborative care including joint ward rounds, integrated care plans addressing both pulmonary and comorbid conditions, and collaborative discharge planning, or a routine care (RC) group. Propensity score matching (1:1) was employed to balance baseline characteristics. The primary outcome was a composite of all-cause mortality or readmission for cardiopulmonary events within one year. Secondary outcomes included length of stay (LOS), improvement in COPD Assessment Test (CAT) scores, and in-hospital complications.

Results: After propensity score matching, 104 patients (52 pairs) with well-balanced baseline characteristics were included. The DNIM group demonstrated a significantly lower associated risk of the one-year composite endpoint compared to the RC group (Hazard Ratio [HR] 0.58, 95% Confidence Interval [CI] 0.35-0.96, P = 0.034). Patients in the DNIM group also had a shorter mean length of stay (8.4 ± 2.1 vs. 11.2 ± 3.4 days, P < 0.001) and greater improvement in CAT scores (ΔCAT - 6.2 ± 2.5 vs. -4.1 ± 2.2, P < 0.01). Furthermore, the DNIM model was linked to fewer in-hospital complications (11.5% vs. 28.8%, P = 0.028), particularly hyperglycemia and acute heart failure.

Conclusion: The Doctor-Nurse Integrated Management model was associated with a better one-year prognosis, reduced length of stay, and decreased in-hospital complications in AECOPD patients with multimorbidity. This integrated approach addresses the complex interplay between COPD and its associated comorbidities, supporting its implementation in respiratory clinical practice to enhance patient-centered outcomes.

Keywords: AECOPD; Doctor-Nurse Integrated Management; Multimorbidity; Prognosis; Propensity Score Matching.

Conflict of interest statement

Declarations. Ethics approval and consent to participate: The study protocol was approved by the Medical Ethics Committee of The First Hospital of Hebei Medical University. As this was a retrospective study involving the analysis of anonymized data, the requirement for informed consent was waived by the Medical Ethics Committee of The First Hospital of Hebei Medical University. All methods were carried out in accordance with relevant guidelines and regulations (Declaration of Helsinki). Consent for publication: Not applicable. Competing interests: The authors declare no competing interests.

3

Eur J Intern Med

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. 2026 Jun 24:107036.

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Neutrophil-to-lymphocyte ratio: A disease severity biomarker in stable chronic obstructive pulmonary disease?

Marco Vanetti [1], Dina Visca [1], Francesco Ardesi [1], Martina Zappa [2], Sara Pessano [3], Patrizia Pignatti [4], Leonardo M Fabbri [5], Antonio Spanevello [6]

Affiliations Expand

- PMID: 42342518

- DOI: 10.1016/j.ejim.2026.107036

Abstract

Background: The neutrophil-to-lymphocyte ratio (NLR) is a biomarker of systemic inflammation that has been investigated in different chronic diseases. However, its role as biomarker of severity in patients with stable chronic obstructive pulmonary disease (COPD), and particularly its association with cardiovascular risk, remains unclear. This retrospective study aimed to evaluate whether a higher NLR (HNLR) is associated with worse disease control and increased cardiovascular risk compared to a lower NLR (LNLR) in stable COPD.

Methods: Data from inpatients admitted to a pulmonary rehabilitation center between 2021 and 2024 were analyzed. Patients were divided in two groups (HNLR ≥ 2.26 and LNLR < 2.26) based on the NLR threshold best associated with severe exacerbations according to ROC analysis. Comparison between groups and multivariate logistic regression analysis were performed. Cardiovascular risk was assessed using the European Society of Cardiology-recommended algorithm.

Results: A total of 247 patients were included. The HNLR group included a significantly ($p < 0.05$) higher number of patients with severe exacerbations in the previous year, lower forced expiratory volume in 1 second, higher residual volume, and increased partial pressure of carbon dioxide in arterial blood than the LNLR group. Chronic respiratory failure, atrial fibrillation and lung cancer were significantly more frequent in the HNLR group, and these patients had a significantly higher 10-year cardiovascular risk.

Conclusion: Our data suggest that NLR used together with other clinical and functional parameters could represent a useful biomarker in stable COPD, associated with increased disease severity and higher estimated 10-year cardiovascular risk.

Keywords: Chronic bronchitis; Emphysema; Leukocytes; Multimorbidity; Smoking.

Conflict of interest statement

Declaration of competing interest Marco Vanetti: no conflict of interest. Dina Visca: no conflict of interest Francesco Ardesi: no conflict of interest Martina Zappa: no conflict of interest Sara Pessano: no conflict of interest Patrizia Pignatti: no conflict of interest Leonardo M Fabbri declares consulting fees from Chiesi, GlaxoSmithKline, AstraZeneca, Novartis, and Verona Pharma, payment or honoraria

for lectures, presentations, speakers bureaus, manuscript writing or educational events from Chiesi, GlaxoSmithKline, Glenmark, Lusofarmaco, and Sanofi, and participation in a Data Safety Monitoring Board or Advisory Board for Chiesi, Novartis and ICON. All are outside the scope of the current manuscript. Antonio Spanevello declares consulting fees from GlaxoSmithKline, Merck Sharp & Dohme, Sanofi, AstraZeneca and Chiesi, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events from GlaxoSmithKline, Merck Sharp & Dohme, Sanofi, AstraZeneca and Chiesi, and participation in a data safety monitoring board or advisory board for GlaxoSmithKline, Merck Sharp & Dohme, Sanofi, AstraZeneca and Chiesi. All are outside the scope of the current manuscript.

Cite

4

Editorial

J Gen Intern Med

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Recognizing and Addressing Existential Distress Among Older Adults with Multimorbidity

Hawa O Abu [1]

Affiliations Expand

- **PMID: 42332296**

- **DOI: 10.1007/s11606-026-10575-4**

No abstract available

Conflict of interest statement

Declarations. Conflict of interest: The author H.O.A has no conflict of interest to disclose. Clinical Trial Number: Not applicable. Sponsor's Role: The funding source

had no role in the manuscript preparation and decision to submit the manuscript for publication.

- 7 references

Supplementary info

Publication types, Grants and fundingExpand

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5

Comparative Study

BMJ Open

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. 2026 Jun 22;16(6):e114635.

doi: 10.1136/bmjopen-2025-114635.

Nordic Multimorbidity Index, Charlson, Elixhauser and count-based comorbidity indices for mortality risk: a comparative nationwide cohort study using national health registers in Sweden

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Affiliations Expand

- PMID: 42331571

- PMCID: PMC13288703

- DOI: 10.1136/bmjopen-2025-114635

Abstract

Objectives: The aim of the present study was to compare Area Under the Receiver Operating Characteristic curves (AUROCs) of age-and-sex alone, and in addition respectively, the Nordic Multimorbidity Index (NMI), Charlson Comorbidity Index

(CCI) and Elixhauser Comorbidity Index (ECI), and explore simple count-based measures on in-patient care and filled drug prescriptions, with the outcome mortality using Swedish health registries.

Study design and setting: Study population: All persons born in 1975 or earlier who were continuously resident in Sweden between 1 January 2010 and 31 December 2014 (n=5 010 261) with a follow-up for all-cause mortality from 1 January 2015 to 31 December 2019.

Methods: AUROCs were calculated with 1- to 5-year-look-back for age-and-sex, each index and explored measures for 1- to 5-year mortality.

Results: AUROC was for age-and-sex alone for 5-year mortality 0.8731. Age-and-sex alone outperformed, respectively: NMI, difference in AUROC, 0.0695 (95% CI 0.0687 to 0.0704); CCI, 0.1509 (95% CI 0.1500 to 0.1518) and ECI 0.1631 (95% CI 0.1622 to 0.1640). AUROC for NMI when added to age-and-sex, 0.9072 was marginally higher than age-and-sex alone. AUROC for explored measures as numbers of hospitalisations, days hospitalised, or numbers of filled drug prescriptions were around 0.75-0.80 and when added to age-and-sex around 0.90.

Conclusion: Age-and-sex alone showed higher AUROC than any other measure alone and NMI provides modest additional discrimination, with CCI and ECI both less helpful, that is, informative. Explored measures; days hospitalised or numbers of filled prescriptions rendered AUROC of somewhat lower magnitude when added to age-and-sex. Thus, the latter could be considered for use in addition to age-and-sex when full background data are lacking.

Keywords: EPIDEMIOLOGY; INTERNAL MEDICINE; Mortality; Prospective studies; REGISTRIES; STATISTICS & RESEARCH METHODS.

Conflict of interest statement

Competing interests: None declared.

- 20 references
- 4 figures

Supplementary info

Publication types, MeSH termsExpand

Full text links

Clin Med (Lond)

. 2026 Jun 22:100608.

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Heart failure with preserved ejection fraction (HFpEF): diagnosis and management for the general physician

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- PMID: 42331290

- DOI: 10.1016/j.clinme.2026.100608

Free article

Abstract

Heart failure (HF) with preserved ejection fraction (HFpEF) is becoming the dominant HF phenotype in clinical practice, reflecting population aging and increasing cardiometabolic disease. Contemporary HFpEF is recognised as a complex, systemic syndrome with heterogeneous pathophysiology and substantial morbidity. It remains underdiagnosed, with many patients detected only during hospitalisation. Diagnosis requires a high index of suspicion and a structured approach integrating clinical assessment, natriuretic peptides, and echocardiography to demonstrate elevated left ventricular filling pressures and exclude alternative diagnoses. Recent randomised trials have demonstrated that sodium-glucose cotransporter-2 inhibitors and non-steroidal mineralocorticoid receptor antagonists reduce HF hospitalisations and improve quality of life. Additional strategies, including anti-obesity therapies, support phenotype-directed management, alongside core strategies of congestion relief, comorbidity optimisation, and multidisciplinary care. Early recognition and timely initiation of evidence-based therapy are essential to improve outcomes for this population. This review provides a practical, evidence-based framework for the contemporary diagnosis and management of HFpEF.

Keywords: HFpEF; Heart failure with preserved ejection fraction; cardiometabolic disease; diagnosis; echocardiography; management; multimorbidity; natriuretic peptides.

Conflict of interest statement

Declaration of Competing Interest RZ: previous advisory fees from AstraZeneca, Boehringer Ingelheim, Johnson & Johnson, and publication fees from SERB pharmaceuticals outside of the current work. AN: no declarations.

Supplementary info

Publication typesExpand

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7

Review

Lancet

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. 2026 Jun 27;407(10548):2668-2684.

doi: 10.1016/S0140-6736(26)00608-2. Epub 2026 Jun 8.

Interventions for the prevention and management of cardiometabolic multiple long-term conditions

Jonathan Valabhji [1], David Hope [2], Nuha El Sayed [3], Pamela Miloya Godia [4], Claire Lawson [5], Samuel Seidu [6], Kamlesh Khunti [6]

Affiliations Expand

- **PMID: 42259342**

- **DOI: 10.1016/S0140-6736(26)00608-2**

Abstract

Multiple long-term conditions (MLTC or multimorbidity) are increasing in global prevalence and represent a growing burden for individuals and health-care systems. Grouping cardiometabolic MLTC can be justified because aetiological antecedents and risk factors are often shared, and similar therapeutic approaches can have positive effects on the prevention, treatment, and delayed progression of many of the constituent conditions. In this Series paper, we focus on interventions for the prevention and management of cardiometabolic MLTC, under the broad headings of

population-level, individual-level, and system-level interventions. Population-level public health measures such as educational, fiscal, regulatory, and environmental policies, and population-level screening and early detection can result in improved risk factor identification and control, although evidence that they reduce incidence and progression of cardiometabolic MLTC is more scarce. At an individual level, lifestyle interventions and pharmacotherapeutics can reduce the incidence and progression of cardiometabolic MLTC and provide effective treatment. Together with pharmacotherapeutic strategies, approaches to improve medicines management could help to optimise clinical outcomes in those living with cardiometabolic MLTC. System-level solutions, including integrated models of care and care continuity, provide opportunities to better address the holistic needs of people living with cardiometabolic MLTC. Together, combinations of multilevel approaches are required.

Conflict of interest statement

Declaration of interests JV is the national specialty advisor for multiple long-term conditions at NHS England, and he was the national clinical director for diabetes and obesity at NHS England (2013–23). SS has received speaker honoraria from AstraZeneca, Boehringer Ingelheim, Janssen Pharmaceuticals, Lilly, Merck Sharp & Dohme, Novo Nordisk, SB Communications, OmniaMed Communications, Abbott, Roche, Napp, NB Medical Education, Amgen, and Takeda Pharmaceuticals; advisory board honoraria from AstraZeneca, Lilly, Boehringer Ingelheim, Janssen Pharmaceuticals, Merck Sharp and Dohme, Novo Nordisk, Takeda Pharmaceuticals, Sanofi, Abbott, and Dexcom; conference registration and subsistence from Abbott, Boehringer Ingelheim, Janssen, Astra Zeneca, Menarini, Lilly, Novo Nordisk, and Takeda Pharmaceuticals. KK has acted as a consultant, speaker, or has received grants for investigator-initiated studies from AstraZeneca, Bayer, Novo Nordisk, Sanofi–Aventis, Servier, Lilly, Merck Sharp & Dohme, Boehringer Ingelheim, Oramed Pharmaceuticals, Pfizer, Roche, Daiichi–Sankyo, Applied Therapeutics, Embecta, and Nestle Health Science. All other authors declare no competing interests.

Supplementary info

Publication types, MeSH termsExpand

"asthma"[MeSH Terms] OR asthma[Text Word]

1

Review

Respir Med

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. 2026 Jun 26:109003.

doi: 10.1016/j.rmed.2026.109003. Online ahead of print.

The Next Frontier: From Clinical Remission to Structural Remission-Rethinking Airway Remodeling in Asthma

Ourania S Kotsiou [1], Zoe Daniil [2]

Affiliations Expand

- PMID: 42362118

- DOI: 10.1016/j.rmed.2026.109003

Abstract

The concept of remission in asthma has gained increasing prominence with the expanding use of biologic therapies. However, a central conceptual and clinical question remains unresolved: does clinical remission represent true disease resolution, or does it reflect suppression of the most visible manifestations of a still-active airway-wall disease? This review critically examines airway remodeling as a major determinant of asthma chronicity, severity, and incomplete reversibility, while evaluating the extent to which current therapeutic strategies are moving the field toward meaningful structural remission. Contemporary evidence indicates that asthma is not simply a disorder of variable bronchoconstriction, but a complex airway-wall disease characterized by persistent interactions among epithelial dysfunction, type 2 and non-type 2 inflammation, mucus dysregulation, extracellular matrix remodeling, vascular alterations, and airway smooth muscle expansion. These abnormalities may arise early, involve both large and small airways, and persist despite apparent clinical stability. Inhaled corticosteroids remain essential for controlling inflammatory activity and can attenuate selected remodeling features, particularly when introduced early, although their capacity to reverse established structural disease appears limited. Importantly, biologics have major disease-modifying potential, including exacerbation reduction, corticosteroid sparing, lung-function improvement, and possible prevention of further decline or remodeling-related damage. Evidence from bronchial biopsies, computed tomography, physiological studies, and biomarker analyses increasingly suggests that biologics can modify specific remodeling domains. Although complete structural normalization remains unproven, current data indicate that meaningful steps toward disease modification are already being achieved, making structural remission a more realistic long-term goal than previously believed.

Keywords: airways; asthma; biologics; inhaled corticosteroids; remission; remodeling.

Conflict of interest statement

Declaration of Competing Interest ☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary info

Publication typesExpand

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Cite

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J Pediatr Health Care

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. 2026 Jun 26:S0891-5245(26)00199-9.

doi: 10.1016/j.pedhc.2026.06.003. Online ahead of print.

Augmenting Pediatric Care With Artificial Intelligence: Opportunities and Responsibilities for Nurse Practitioners

[Richard Ricciardi][1]

Affiliations Expand

- **PMID: 42360251**

- **DOI: [10.1016/j.pedhc.2026.06.003]**

Abstract

Background: Artificial intelligence (AI) is emerging as a critical tool for nurse practitioners delivering pediatric and adolescent and young adult (AYA) care across primary, acute, and community settings.

Search source: This narrative review used targeted searches of PubMed, CINAHL, and policy reports (2020-2026) focused on AI, pediatrics, clinical decision support, digital health, and AYA care.

Results: AI is positioned to personalize education, strengthen clinical decision support, improve immunization outreach, support triage and antimicrobial stewardship, and enable proactive asthma monitoring. For AYA, AI may also support confidential reproductive health education, contraception and STI

prevention reminders, and mental health screening when developmentally calibrated and clinically supervised.

Conclusions: AI can enhance the reach, precision, and effectiveness of NP practice while advancing patient and family-centered care; however, implementation requires pediatric and AYA specific validation, equity-centered design, transparent governance, privacy safeguards, and clinician oversight.

Keywords: Artificial intelligence, pediatrics, nurse practitioner, digital health, clinical decision support.

Conflict of interest statement

CONFLICT OF INTEREST None to report.

3

Allergy

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. 2026 Jun 26.

doi: 10.1111/all.70423. Online ahead of print.

EAACI Guidelines on Environmental Science for Allergy and Asthma-Evidence-Based Recommendations for Prevention and Public Health Action to Mitigate the Impact of Pollen Exposure on Respiratory Allergy

Lorenzo Cecchi [1], Isabella Annesi-Maesano [2 3], Benedetta Biagioni [1], Kian Fan Chung [3 4], Bernard Clot [5], Gennaro D'Amato [6], Athanasios Damialis [7], Stefano Del Giacco [8], Javier Dominguez-Ortega [9], Carmen Galán [10], Stefanie Gilles [11 12], Stephen Holgate [13], Mohamed Jeebhay [14], Stelios Kazadzis [15], Kari Nadeau [16], Nikolaos G Papadopoulos [17 18], Santiago Quirce [9], Joaquin Sastre [19], Claudia Traidl-Hoffmann [11 12 20], Fiona Tummon [5], Jolanta Walusiak-Skorupa [21], Magdalena Zemelka-Wiacek [22], Marek Jutel [22 23], Cezmi A Akdis [24], Ioana Agache [25]

Affiliations Expand

- **PMID: 42359506**

- DOI: 10.1111/all.70423

Abstract

Developed using the GRADE methodology, these EAACI guidelines provide evidence-based recommendations on the effectiveness of pollen reduction/avoidance strategies for allergic rhinitis (AR) and asthma, the utility of biomarkers for monitoring pollen-induced asthma and the efficiency of mitigation measures and of public health strategies. Systematic and narrative reviews and health economic analysis support the recommendations. According to GRADE, the certainty of evidence was moderate to very low, therefore conditional recommendations are provided to guide healthcare professionals, patients, and policymakers in developing personalized, preventive, and scalable interventions. Reducing/avoiding exposure to pollen should be recommended to reduce the risk of severe asthma exacerbations. Lung function decrease and exhaled nitric oxide increase may be predictive for pollen-induced asthma exacerbations. Real-time pollen monitoring and pollen concentration-based forecast may be recommended for managing pollen-induced AR and/or asthma. Pollutant information should be included in pollen information systems. Combined forecast (weather, pollen, pollutants) and warning systems might reduce the impact of thunderstorm asthma (TA). Emergency department/asthma-related services should be strengthened during pollen season and in TA. Personalized frameworks covering the types and allergenic potential of pollen, the coaggressors and the vulnerability of each patient are needed in daily practice. The fundamental role of prevention should be further prioritized.

Keywords: GRADE; allergic rhinitis; asthma; environmental science; evidence-based recommendations; exposome; guidelines; pollen.

- 181 references

Supplementary info

Grants and fundingExpand

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Cite

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Review

J Clin Med

. 2026 Jun 22;15(12):4848.

doi: 10.3390/jcm15124848.

Evidence-Based Clinical Recommendations for the Appropriate Use of Diagnostic Tests in Pediatric Allergology: Focus on Asthma, Rhinoconjunctivitis, and Keratoconjunctivitis Vernal

Valentina Fainardi [1], Matteo Riccò [2], Rachele Antignani [3], Simona Bellodi [3], Claudia Borrelli [1], Tommaso Carretta [1], Mauro Calvani [4 5], Fabio Cardinale [4 6], Elena Chiappini [7 8], Maria Angiola Crivellaro [9], Massimiliano Esposito [10 11], Roberto Grandinetti [1], Amelia Licari [4 12], Michele Miraglia Del Giudice [4 13], Maria Marsella [14 15], Alberto Martelli [16], Iria Neri [17 18], Rita Nocerino [19], Diego Peroni [4 20], Cristina Piersantelli [21], Giuseppe Pingitore [22], Arianna Rossi [1], Giuseppe Squazzini [3], Mariangela Tosca [4 23], Carlo Caffarelli [1 4], Susanna Esposito [1 24]

Affiliations Expand

- PMID: 42356016
- PMCID: PMC13302709
- DOI: 10.3390/jcm15124848

Abstract

Background: Appropriateness of diagnostic test prescriptions represents a critical component of quality care in pediatric allergology, directly influencing diagnostic accuracy, therapeutic decisions, healthcare resource utilization, and patient outcomes. A multidisciplinary expert panel was convened to develop evidence-based clinical recommendations addressing the appropriate use of specialist consultations and diagnostic investigations in children with asthma, allergic rhinoconjunctivitis, and vernal keratoconjunctivitis (VKC). Methods: Clinical questions were formulated using the PICO framework and prioritized through structured expert consensus. Systematic literature reviews were conducted across major databases, and the certainty of evidence was assessed using the GRADE methodology. Results: Specialist evaluation emerged as a key determinant of improved diagnostic precision, optimization of treatment strategies, and reduction of inappropriate therapies. In asthma, spirometry, FeNO measurement, and allergy testing contributed to enhanced diagnostic accuracy and better control. In allergic rhinoconjunctivitis, allergological assessment supported diagnosis and the selection of immunotherapy, with demonstrated benefits on symptoms and quality of life. For VKC, multidisciplinary specialist involvement facilitated early diagnosis, personalized management, and prevention of complications. Conclusions: Although the overall certainty of evidence ranged from moderate to low, consistent clinical

benefits supported consensus-based recommendations. Implementation of these recommendations may improve care quality, promote equitable access to diagnostic resources, and reduce unnecessary healthcare utilization.

Keywords: asthma; clinical appropriateness; diagnostic testing; evidence-based recommendations; keratoconjunctivitis Vernal; pediatric allergology; rhinoconjunctivitis.

Conflict of interest statement

The authors declare no conflicts of interest.

- 179 references
- 4 figures

Supplementary info

Publication typesExpand

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BMJ Open Respir Res

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. 2026 Jun 25;13(1):e003786.

doi: 10.1136/bmjresp-2025-003786.

Current use and future potential of oscillometry in UK lung function testing: a national survey

Madison E Geeves [1 2 3], Michael J Hughes [1], Harry S Griffin [4], Karl P Sylvester [5 6], Zoe L Saynor [2 3]

Affiliations Expand

- PMID: 42350074

- DOI: 10.1136/bmjresp-2025-003786

Free article

Abstract

Background: Despite growing international momentum, uptake of oscillometry in routine lung function testing services in the United Kingdom (UK) is unclear.

Objectives: Evaluate the current use of oscillometry in UK lung function services, identify key clinical applications, and explore barriers to wider adoption.

Methods: A cross-sectional e-survey, including multiple-choice and free-text responses, was distributed to members of the Association for Respiratory Technology and Physiology (ARTP) and reported in line with the Checklist for Reporting Results of Internet E-Surveys (CHERRIES).

Results: A total of 42 National Health Service (NHS) respiratory services responded. Of these, 40% reported owning an oscillometry device, equally split between forced oscillation technique (Resmon Pro) and impulse oscillometry (Vyntus IOS), with one using both. Oscillometry is already used in clinical practice in 69% of these services, most commonly for adults (57%) but also in paediatrics (21%) and both (21%). It is primarily used in asthma (100%) and chronic obstructive pulmonary disease (57%), and in 86% of cases for patients unable to perform technically acceptable spirometry. Among services without a device, 50% were actively considering purchasing within five years. The main barrier cited was funding (67%). A lack of clinical understanding was identified, with 86% of services perceiving respiratory consultants to have 'little' understanding of oscillometry, and 10% reporting 'none'. Almost all respondents (95%) supported the development of national guidance from ARTP outlining benefits, limitations and reporting standards.

Conclusion: Despite increasing interest, oscillometry is not yet routinely adopted across UK lung function services. It is predominantly used as an alternative to spirometry when technically acceptable results cannot be achieved and as an additional tool to support asthma care. This national survey highlights the need to improve awareness, training and standardisation. Collaboration with the ARTP to establish national guidance represents an important next step toward wider implementation in clinical practice.

Keywords: Asthma; Pulmonary Disease, Chronic Obstructive; Respiratory Function Test; Respiratory Measurement; Surveys and Questionnaires.

Conflict of interest statement

Competing interests: MG received a National Institute for Health and Care Research (NIHR) Applied Research Collaboration (ARC) Wessex Research Initiation Award. KS and ZS declare current loans of ResMon Pro Forced Oscillometry Technique (FOT) devices from Medical Graphics UK. All other authors have no competing interests to declare.

Supplementary info

MeSH termsExpand

Full text links

6

BMJ Open

. 2026 Jun 25;16(6):e118911.

doi: 10.1136/bmjopen-2026-118911.

Understanding Australian healthcare provider attitudes towards smart inhalers for paediatric asthma management: a qualitative study

Natasha E Noble [1 2], Lindsey Cooke [3 2], Jamie Bryant [3 2], Dane Falcioni [3 2], Bernadette Goddard [4], Janine Curtis [5], Ellen Newman [5], Donna Vaughan [5], Nicholas Zwar [6], Simon Deeming [7 8], Christopher Oldmeadow [7], Joerg Mattes [7 8], Megan Freund [3 2]

Affiliations Expand

- PMID: 42350008

- DOI: 10.1136/bmjopen-2026-118911

Free article

Abstract

Objectives: This study aimed to explore the perceptions of Australian healthcare providers (HCPs) of the usefulness of smart inhalers for children with asthma and considerations for their effective integration into routine care.

Design: Qualitative descriptive study using semi-structured interviews. A hybrid thematic analysis approach was used to analyse the data.

Setting: Healthcare services in Australia including general practice, hospitals and Local Health Districts.

Participants: Eight general practitioners, six paediatric specialists and nine respiratory nurses were recruited using a unique purposive sampling strategy for each HCP group.

Primary and secondary outcome measures: Perceptions of the facilitators and challenges to the adoption of smart inhalers for childhood asthma management.

Results: Most HCPs had not previously used smart inhalers. Perceived benefits of smart inhalers included access to objective medication use data to inform asthma treatment decisions and enable opportunities to discuss asthma management with parents and carers. Key facilitators for implementation included evidence of clinical effectiveness, financial incentives (both in terms of subsidised smart inhaler costs for users and reimbursement for HCPs) and integration of smart inhaler data into existing medical record systems. The primary barrier to implementation identified was related to workflow issues, including available resourcing, support and time.

Conclusions: HCPs expressed generally positive views about the potential of smart inhalers to improve asthma management among children. However, they also identified several practical, logistical and clinical barriers that must be addressed prior to widespread implementation of smart inhalers. Targeted strategies that address these barriers will be essential for successful implementation into routine care.

Keywords: Asthma; PAEDIATRICS; Self-Help Devices.

Conflict of interest statement

Competing interests: None declared.

Supplementary info

MeSH terms, SubstancesExpand

Full text links

7

BMJ Open Qual

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. 2026 Jun 25;15(2):e004189.

doi: 10.1136/bmjoq-2026-004189.

'The evidence is out there…': perspectives of healthcare providers on improving asthma and COPD prevention and care within a major health authority region of British Columbia, Canada

Tina Afshar [1], Aneisha Collins-Fairclough [2], Pat Camp [3 4], Karen Rideout [2 5], Erin Shellington [2 6], Nardia Strydom [2], J Mark FitzGerald [2], Sian Hoe Cheong [7], Mary-Frances Ceccato [7], John Fleetham [8], Carmen Rempel [2], Phalgun Joshi [2 9], Christopher Carlsten [2 8]

Affiliations Expand

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- DOI: 10.1136/bmjoq-2026-004189

Free article

Abstract

Introduction: Asthma and chronic obstructive pulmonary disease (COPD) impose substantial morbidity and health system burden in Canada. Within Vancouver Coastal Health (VCH), a large and geographically diverse health authority in British Columbia, variation in service availability, access and care coordination creates barriers to prevention and high-quality chronic respiratory disease management. This project sought to document healthcare professionals' (HCPs') experiences and recommendations to inform a regional strategy to improve asthma and COPD care.

Methods: We conducted a qualitative quality improvement project using occupation-specific virtual focus groups (March to September 2021) with HCPs involved in asthma and COPD prevention and care across VCH. Purposive sampling targeted diversity in profession, practice setting and geography (urban, suburban, rural and remote). Results were analysed thematically in NVivo using iterative coding and team-based refinement.

Results: 54 HCPs participated across 10 focus groups, including respiratory physicians (n=9), respiratory therapists (n=19), family physicians (n=11), nurse practitioners (n=2), nurses (n=7), pharmacists (n=6) and one registered dietitian (n=1). Themes aligned with a socio-ecological framework and spanned (1) patient-level barriers (financial insecurity, language barriers, comorbid mental health and substance use, medication beliefs and adherence, smoking and vaping), (2) health system barriers (limited access to spirometry and pulmonary rehabilitation, fragmented transitions and unlinked electronic records, workforce and resource constraints) and (3) environmental barriers (medication coverage and formulary restrictions, poor air quality as an exacerbation trigger). HCPs recommended expanding community-based services (including mobile diagnostics and rehabilitation), strengthening prevention and cessation supports, improving medication access and inhaler education, and building integrated pathways and information systems to support continuity across settings.

Conclusions: Frontline HCP perspectives identify actionable, system-level opportunities to improve asthma and COPD prevention and care within a complex health authority. This work provides implementation-oriented insights to inform regional strategy and offers a replicable approach for engaging HCPs to strengthen chronic respiratory care.

Keywords: Asthma; Attitude of Health Personnel; Chronic disease management; Focus Groups; Healthcare quality improvement.

Conflict of interest statement

Competing interests: None declared.

Supplementary info

MeSH termsExpand

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Eur Ann Allergy Clin Immunol

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. 2026 Jun 25.

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Multicenter survey on eosinophilic esophagitis in Italy: trends in diagnosis, diagnostic delay, and type 2 comorbidity burden

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Free article

Abstract

Background. Eosinophilic esophagitis (EoE) is a chronic, immune-mediated esophageal disorder that has been increasingly recognized over recent decades. It is characterized by a type 2 inflammatory response, shared with other type 2

inflammatory conditions such as allergic rhinitis (AR), food allergy (FA), atopic dermatitis (AD), bronchial asthma (BA), and chronic rhinosinusitis with nasal polyps (CRSwNP). Methods. A total of 295 patients with EoE, followed at seven Italian allergy centers with expertise in managing EoE, were included. We analyzed annual EoE diagnoses, diagnostic delay, and the presence of type 2 comorbidities - including AR, FA, BA, AD and CRSwNP - assessed via allergological evaluations at the participating centers. Statistical analyses included non-parametric trend tests, linear and logistic regressions, chi-square tests, and descriptive analyses. Results. Annual EoE diagnoses showed a significant upward trend from 2014 to 2024 (p = 0.002). However, the diagnostic delay remained consistently high, showing no corresponding reduction despite the rise in diagnoses. The burden of type 2 comorbidities was substantial, with 83.4% of patients presenting at least one comorbidity, and most patients exhibited multiple comorbidities. Conclusions. Our findings are consistent with previously reported increases in EoE diagnoses in Italy, alongside persistent diagnostic delays, and highlight the substantial burden of type 2 comorbidities in these patients, emphasizing the importance of systematic allergological evaluation and multidisciplinary managementin patients with EoE.

Keywords: Eosinophilic esophagitis; allergic comorbidities; diagnostic delay; type 2 comorbidity; type 2 inflammation.

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Review

Immunol Invest

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Nanoantibodies: A Review of Diagnostic and Therapeutic Applications in Respiratory Diseases

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Abstract

Background: Conventional monoclonal antibodies generated by hybridoma technology have long been applied in disease diagnosis and treatment, yet they are constrained by inherent limitations, including epitope loss caused by chemical antigen processing and insufficient tissue penetration. Nanobodies, as single-domain antibody fragments derived from camelids and chondrichthyans, possess unique superior physicochemical characteristics such as low molecular weight, low immunogenicity, easy modification, strong tissue permeability, and precise epitope targeting. Notably, camelid-derived nanobodies exhibit high homology with human antibody subfamilies and favorable biosafety, showing promising potential for biomedical applications.

Methods: This review systematically summarizes the unique structural properties and technical advantages of nanobodies. It comprehensively sorts out the latest research progress of nanobodies in common respiratory diseases, including asthma, tuberculosis, respiratory infections, and lung cancer, and further analyzes their unique superiority in pulmonary drug delivery and clinical transformation.

Results: Nanobodies retain the specific antigen-binding capacity equivalent to traditional monoclonal antibodies while overcoming the defects of conventional antibody preparations. Their excellent modifiability, tissue penetration and low immunogenicity enable them to achieve accurate targeted binding in respiratory tissues. Accumulating evidence verifies the outstanding diagnostic performance and therapeutic efficacy of nanobodies in multiple respiratory disorder models, providing new technical support for pulmonary drug delivery and precise intervention of respiratory diseases.

Conclusion: Nanobodies possess irreplaceable advantages in the diagnosis and treatment of respiratory diseases and have broad clinical translation prospects. This review clarifies the application value of nanobodies in mainstream respiratory diseases and proposes innovative strategies for the precise diagnosis and targeted treatment of respiratory disorders, laying a theoretical foundation for further clinical transformation and in-depth application of nanobody-based respiratory therapeutics.

Keywords: Diagnostic and therapeutic; nanoantibodies; respiratory diseases.

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Review

Eur Respir Rev

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Cough biomarkers for diagnosis and monitoring of respiratory disease: a systematic review

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- DOI: 10.1183/16000617.0288-2025

Abstract

Cough is a common and physiologically informative component of respiratory morbidity, but its potential for diagnosing and monitoring disease is not thoroughly investigated. This systematic review synthesised the literature on algorithmic and statistical models analysing cough acoustics for diagnosing or monitoring respiratory conditions. Following PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, five databases (PubMed, Embase, Scopus, Web of Science and CENTRAL) were systematically searched for studies published from January 2010 to June 2025. Eligible studies performed quantitative acoustic feature analysis of human coughs using statistical, machine learning or deep learning models and reported diagnostic or prognostic performance. 89 studies from 34 countries were assessed, covering cough detection (n=31), disease classification (n=55) and disease severity prediction (n=3), reflecting potential applications in disease monitoring. Deep learning approaches, especially convolutional and recurrent networks, were predominant (n=56) and tended to achieve the higher accuracies, although machine learning ensemble methods and logistic regression also demonstrated strong performance, particularly with well-engineered features. Across different diseases, sensitivities and specificities were often reported to be ≥90%, notably for tuberculosis, asthma and COVID-19.

However, methodological weaknesses were common, with only 11.2% of studies introducing external validation, 71.1-87.6% demonstrating high risk of bias (according to PROBAST-AI) and most based on small, homogeneous or crowdsourced cohorts with limited generalisability. These limitations contribute to inflated internal performance and uncertainty about real-world applicability. Cough acoustic biomarkers hold promise as an adjunctive tool for screening and longitudinal monitoring in low-resource environments. Nevertheless, widespread implementation will require large, multicentre validation, standardised calibration, bias control and incorporation into privacy-preserving workflows.

Conflict of interest statement

Conflict of interest: J. Xu, T. Kathiresan, A. Siddiqui, and A. Vogel are employees of Redenlab Pty Ltd., a speech neuroscience company. S.B. Mazzone declares honoraria from Merck, NeRRe Therapeutics, Reckitt Benckiser, Chiesi, iNova and Bellus Health for cough-related consultancy, and grant support from Merck, Reckitt Benckiser and Bellus Health, for cough-related research programmes outside of the submitted work.

- 169 references
- 3 figures

Supplementary info

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Review

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The importance of symptoms in bronchiectasis

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Abstract

Bronchiectasis is a chronic respiratory disease characterised by irreversible bronchial dilatation, persistent airway inflammation and recurrent infections. Symptoms, particularly cough, sputum production and dyspnoea, are the most immediate and patient-relevant expression of the disease, linking clinical presentation, airway biology and outcomes. While asthma and COPD management algorithms already integrate symptom burden into therapeutic decision-making, bronchiectasis care has historically relied on exacerbation history to guide preventive interventions. Over the past decade, an expanding body of evidence has demonstrated that daily symptoms mirror current infection and inflammation, profoundly impact quality of life, and predict future exacerbations. Comparative analyses across chronic lung diseases further highlight the central role of symptom monitoring in defining disease activity and risk. The updated European Respiratory Society guidelines translate this evidence into clinical practice, marking a paradigm shift from an exacerbation-driven to a symptom-centred and treatable-traits model. This review synthesises clinical, biological and therapeutic insights linking symptoms to bronchiectasis pathophysiology, disease activity and treatment response. We discuss how airway clearance, mucoactive therapy, antibiotics, pulmonary rehabilitation and targeted anti-inflammatory strategies, including dipeptidyl peptidase-1 inhibition, can address specific symptom profiles. We also mention the role of comorbidities and psychosocial management, establishing symptoms as the cornerstone of a holistic, multidimensional care approach. Recognising symptoms as both biomarkers of activity and therapeutic targets represents a major step toward precision medicine in bronchiectasis, aligning clinical management with patient experience and the biological drivers of disease.

Conflict of interest statement

Conflict of interest: The authors declare the following financial interests/personal relationships which may be considered as potential competing interests. S. Aliberti received consulting fees from INSMED Incorporated, INSMED Italy, INSMED Ireland Ltd, INSMED Netherlands BV, ZAMBON Spa, AstraZeneca, Menarini, CSL Behring GmbH, Pfizer, Fondazione Internazionale Menarini, Moderna Italy, Moderna TX, Boehringer Ingelheim, Chiesi farmaceutica Spa, MSD Italia S.r.l., Vertex Pharmaceuticals, BRAHMS GMBH, Physioassist SAS, AN2 Therapeutics,

GlaxoSmithKline Spa, and Verona; received payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events (payments made to the author) from GlaxoSmithKline Spa, Fondazione Internazionale Menarini, INSMED Italy, INSMED Ireland Ltd, Boehringer Ingelheim, Zambon, and Vertex Pharmaceuticals; participated on a Data Safety Monitoring Board or Advisory Board (payments made to the author) for INSMED Incorporated, INSMED Italy, AstraZeneca UK Limited, MSD Italia S.r.l, and Verona pharma plc. J.D. Chalmers reports grants or contracts from Grifols; consulting fees from Antabio, AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Grifols, Insmed, Janssen, Novartis, Pfizer, and Zambon; and leadership or fiduciary roles as Chair of the European Respiratory Society Bronchiectasis Guideline Task Force, Chief Editor of European Respiratory Journal, Associate Editor of the European Respiratory Review, and Chair of EMBARC Clinical Research Collaboration. O. Sibila reports receiving consulting fees from Insmed and Boehringer-Ingelheim. All other authors declare no competing interests.

- 110 references
- 2 figures

Supplementary info

Publication types, MeSH termsExpand

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12

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Prediction model for children with anaphylaxis who may not require emergency department care: a multicenter retrospective cohort study

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Lee [24], Chari D Larsen [25], Karen Y Kwan [26], Curtis L Knoles [27], Kajal Khanna [28], Julia F Freeman [13], Justin R Davis [29], Alicia Daggett [30], Joanna S Cohen [31], Ari R Cohen [32], Wee-Jhong Chua [32], Sri S Chinta [12], Brittany Boswell [28], Kelly R Bergmann [33], Paul L Aronson [9], Kenneth A Michelson [34]

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- DOI: 10.1016/j.jaip.2026.06.021

Abstract

Background: The 2023 US Anaphylaxis Practice Parameter indicated that some patients receiving epinephrine in the community might avoid emergency department (ED) visits; however, the criteria and safety of this approach remain unproven.

Objective: To derive and validate a clinical prediction model for identifying children at risk of receiving epinephrine after arriving at the ED.

Methods: We conducted a 31-center retrospective cohort study of children aged 6 months to <18 years who received one pre-ED dose of epinephrine for allergic reactions between 2016 and 2019. The outcome was receipt of epinephrine after ED arrival. We used LASSO regression to derive the model in 70% of the patients to identify pre-ED factors associated with epinephrine administration. Internal and external validations included 20% and 10% of the cohort, respectively.

Results: The 2318 eligible patients had a median age of 8.4 years (IQR, 3.8-13.4), and 15.7% (n = 364) received epinephrine after ED arrival. Prehospital factors associated with the receipt of additional epinephrine included a history of asthma, cardiovascular symptoms before epinephrine, persistent symptoms after epinephrine, and any new/recurrent respiratory, cardiovascular, gastrointestinal, or non-specific symptoms after epinephrine. In the external validation, 30% (65/216) of encounters were classified as low risk. The presence of any risk factor had a sensitivity of 0.93 (95% CI 0.80, 0.98), specificity of 0.35 (95% CI 0.28, 0.43), positive predictive value of 0.25 (95% CI 0.18, 0.33), and negative predictive value of 0.95 (95% CI 0.87, 0.99) for identifying patients who received epinephrine after ED arrival.

Conclusion: We developed and validated a clinical prediction model to identify children treated with a single prehospital dose of epinephrine who may not require ED care. Implementation of the model could reduce avoidable ED visits for children with anaphylaxis.

Keywords: acute allergic reactions; anaphylaxis; epinephrine; prehospital; refractory anaphylaxis.

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Heterogeneity of severe asthma in Europe: a SHARP-er view

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Affiliations Expand

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- DOI: 10.1016/S2213-2600(26)00165-7

No abstract available

Conflict of interest statement

ML reports grants for research or clinical trials, paid to his institution, from AstraZeneca, Deutsche Forschungsgemeinschaft, GSK, and Sanofi, and consulting fees, travel expenses, or honoraria for lectures from Allergologisk Laboratorium København (ALK), Allergopharma, AstraZeneca, Berlin-Chemie, Boehringer Ingelheim, Celltrion, Chiesi, GSK, HAL Allergy, Leti, Novartis, Merck Sharp & Dohme, Sanofi, Stallergenes, and Teva. SK reports consulting fees, travel expenses, or honoraria for lectures from AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Merck & Co, and Sanofi.

Full text links

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Severe asthma and remission prospects in Europe (SHARP): insights from a multicentre observational study based on the European Severe Asthma Registry

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- PMID: 42341792

- DOI: 10.1016/S2213-2600(26)00141-4

Abstract

Background: Severe asthma affects a minority of patients with asthma; however, it substantially impacts morbidity, health-care use, and systemic corticosteroid-related harm. Despite the increasing use of biological treatments, achievement of severe asthma remission remains elusive. Notably, real-world data on the disease burden and remission potential of severe asthma in Europe remain limited. We aimed to close this knowledge gap, offering insights with global relevance.

Methods: Using data from 13 455 adults with severe asthma enrolled in the European Severe Heterogeneous Asthma Registry, Patient-centred Clinical

Research Collaboration (SHARP CRC), this cross-sectional observational study evaluated the burden of severe asthma and remission-related clinical domains (exacerbations, asthma control, airflow limitation, and maintenance oral corticosteroid use) across Europe and examined their relationship with disease duration, biological therapy, and type 2 biomarkers (blood eosinophils, fractional exhaled nitric oxide [FeNO], and total IgE). Patients with severe asthma had been enrolled in national registries according to local principles and guidelines and in accordance with the European Respiratory Society/American Thoracic Society guidelines; 3% (430 of 13 885) of patients were excluded due to no consent for the international study and/or missing medication data.

Findings: Patients were predominantly female (59%; 7999 of 13 453), with adult-onset asthma (82%; 8751 of 10 711), and a median disease duration of 23 years (95% CI 20-26 years). 59% (4148 of 7006) of patients had FEV_1/FVC of 0·7 or less, 62% (4680 of 7568) had FEV_1 lower than 80% predicted, and 89% (3519 of 3968) had at least one active disease domain. Despite 79% (10 632 of 13 453) receiving biological therapy, more than 66% (2621 of 3968) still had at least two active domains. Elevation of type 2 biomarkers persisted (89% [2806 of 3153] with at least one elevated biomarker) despite widespread biological and maintenance oral corticosteroid treatment. A subset of biologic-naive patients (35%; 1069 of 3018) exhibited a rapid accumulation of disease burden within less than 10 years, suggesting a potentially accelerated progression trajectory.

Interpretation: This pan-European analysis of severe asthma revealed significant clinical heterogeneity and a substantial disease burden despite advanced therapies, highlighting the enduring nature of type 2 inflammation, the potential inadequacy of current remission strategies with available therapeutic approaches, and the necessity for early identification of high-risk patients.

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Conflict of interest statement

Declaration of interests EF has received honoraria for lectures from AstraZeneca, ELPEN Pharmaceuticals, Chiesi, Boehringer Ingelheim, Menarini, and GSK, and travel grants from Astra Zeneca, GSK, Boehringer Ingelheim, ELPEN Pharmaceuticals, Menarini, and Chiesi, all unrelated to this work. She has also received financial support from SHARP CRC for running and coordinating this project, planning analyses with the statistician, writing up the manuscript and abstracts, and handling the submission. KEJH has received grants from Astra Zeneca, GSK, and Chiesi paid to his employer, honoraria from Astra Zeneca, GSK, Chiesi, and Sanofi, and travel grants from Astra Zeneca, all unrelated to this work. RL has received research grants from Astra Zeneca, GSK, Chiesi, and Sanofi, consulting fees from Astra Zeneca and GSK, and honoraria from Astra Zeneca, GSK, and Sanofi, all unrelated to this work. GB has received honoraria from Astra Zeneca, GSK, Chiesi, Sanofi, and Regeneron, all unrelated to this work. SP-G has received support for attending meetings and travel from Astra Zeneca, GSK, Sanofi,

and Providense, and honoraria from Pliva Hrvatska, GSK, Astra Zeneca, Boehringer Ingelheim, Sanofi, and Providens (for Chiesi), all unrelated to this work. GP has received honoraria from Berlin-Chemie, Astra Zeneca, Pfizer, Merck Sharp & Dohme, and travel grants from Berlin-Chemie and Astra Zeneca, all unrelated to this work. VS has received honoraria for lectures from GSK, Astra Zeneca, Chiesi, Sanofi, and Novartis, travel grants from Astra Zeneca and Sanofi, and financial support for participation in advisory board meetings from GSK, Astra Zeneca, Eli Lilly, and Novartis, all unrelated to this work. MSt has received honoraria from Astra Zeneca, GSK, and ALK-Abello, and funding for participation on a data safety monitoring board or advisory board from Astra Zeneca, all unrelated to this work. SHr has received lecture fees from Astra Zeneca and GSK, unrelated to this work. CT has received consulting fees from Astra Zeneca, GSK, Sanofi, and Stallergenes, honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Astra Zeneca, GSK, Sanofi Novartis, Stallergenes, Chiesi, and Leo Pharma, and travel grants from Astra Zeneca, GSK, and Chiesi, all unrelated to this work. GD has received consulting fees from GSK, Astra Zeneca, Sanofi, Chiesi, and Roche, honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from GSK, Astra Zeneca, Sanofi, and Chiesi, and travel grants from Astra Zeneca, all unrelated to this work. CG has received financial support from the French Pneumology Society, Astra Zeneca, GSK, Sanofi, and Boston Scientific and Novartis for the RAMSES Cohort, unrelated to this work. EK has received funding from the French Pneumology Society, Astra Zeneca, GSK, and Sanofi, as well as Boston Scientific and Novartis for the RAMSES Cohort, unrelated to this work. CE has received funding from the French Pneumology Society, Astra Zeneca, GSK, and Sanofi, as well as Boston Scientific and Novartis for the RAMSES Cohort, unrelated to this work. DMe has received financial support from the French Pneumology Society, Astra Zeneca, GSK, Sanofi, and Boston Scientific and Novartis for the RAMSES Cohort, unrelated to this work. KS has received grants from the Hellenic Thoracic Society, honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Merck Sharp & Dohme, Chiesi, Astra Zeneca, Menarini, Specialty Therapeutics, GSK, Novartis, ELPEN Pharmaceuticals, Bristol Myers Squibb (BMS), and Boehringer Ingelheim, travel grants from Astra Zeneca, GSK, Chiesi, and ELPEN Pharmaceuticals, and funding for participation on a data safety monitoring board or advisory board from Astra Zeneca, GSK, and Specialty Therapeutics and Menarini, all unrelated to this work. KP has received grants from Astra Zeneca and GSK, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Astra Zeneca, GKS, Chiesi, and Menarini, and travel grants from Astra Zeneca, GKS, Chiesi, and Menarini, all unrelated to this work. EZ has received payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Merck Sharp & Dohme, Chiesi, Astra Zeneca, Menarini, GSK, Novartis, BMS, and Boehringer Ingelheim, support for attending meetings and travel from Astra Zeneca, GSK, BMS, Chiesi, and ELPEN Pharmaceuticals, and financial support for participation on a data safety monitoring board or advisory board from Astra Zeneca, GSK, Chiesi, and Menarini, all unrelated to this work. MG has received a travel grant from Menarini, unrelated to this work. ZC has received payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Astra Zeneca, Berlin Chemie, Sanofi, and Chiesi, and financial support for attending meetings and travel from Sanofi, Orion Pharma, Berlin-Chemie, all unrelated to this work. IH has received payment or honoraria for lectures, presentations, speakers bureaus,

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honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from GSK, Astra Zeneca, Sanofi, and Medinfar, payment for expert testimony from Astra Zeneca and GSK, support for attending meetings and travel from Medinfar, and has a leadership or fiduciary role in the Portuguese Allergology and Clinical Immunology Society ASTHMA interest Group, all unrelated to this work. IBe has received consulting fees from Astra Zeneca, GSK, and Sanofi, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Astra Zeneca, GSK, and Sanofi, and support for attending meetings and travel from GSK, Astra Zeneca, Sanofi, Linde, and VitalAire, all unrelated to this work. SuHa has received payment for expert testimony from Teva and Astra Zeneca, and support for attending meetings and travel from Astra Zeneca, Providens (Chiesi), Medis, and Hemofarm, all unrelated to this work. She is also President of the Allergology Section of the Society of Physicians of Vojvodina, Serbian Medical Society, and President of the Asthma Section of the Respiratory Society of Serbia. VC has received honoraria for lectures and presentations from Astra Zeneca, Berlin Chemie, Menarini, Providens (Chiesi), Medis, Teva, and Actavis, support for attending meetings and travel from Astra Zeneca, Teva, Actavis, and Providens (Chiesi), and funding for participation on advisory boards from Astra Zeneca, Providens (Chiesi), and Medis, all unrelated to this work. VT-S has received honoraria for lectures and presentations from Astra Zeneca, Berlin-Chemie, Menarini, Medis, and Amicus, support for attending meetings and travel from Astra Zeneca, Berlin-Chemie, and Menarini, and is a European Academy of Allergy and Clinical Immunology National Allergy Immunology Societies committee member and national representative and a European Academy of Allergy and Clinical Immunology, Allergen Immunotherapy interest group board member, all unrelated to this work. SSk has received honoraria for educational events, invited lectures, and presentations supported by Sanofi, Astra Zeneca, Medis, Berlin Chemie, and Chiesi, and funding for participation on a local advisory board from Astra Zeneca, all unlinked to this work. PKo has received consulting fees from Astra Zeneca and Berlin Chemie, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Astra Zeneca, Berlin Chemie, Chiesi, and Medis, and funding for participation on a data safety monitoring board or advisory board from Astra Zeneca, Swixx, and Biopharma, all unrelated to this work. LPdL has received grants and contracts from Astra Zeneca, Sanofi, Chiesi, Gebro, and Menarini, consulting fees from Astra Zeneca, GSK, and Sanofi, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events from Astra Zeneca, Menarini, Sanofi, GSK, and Gebro, support for attending meetings and travel from Astra Zeneca, Sanofi, FAES Farma (Fábrica Española de Productos Químicos y Farmacéuticos), and funding for participation on a data safety monitoring board or advisory board from Astra Zeneca, all unrelated to this work. BD has received a grant to support the establishment of SHARP in Sweden and a grant to support the Karolinska Severe Asthma Centre from the Swedish Heart Lung Foundation, GSK, Novartis, and Astra Zeneca, and personal honoraria for lectures from Astra Zeneca, GSK, and Sanofi, unrelated to this work. VY has received a grant for an investigator-led academic study from Astra Zeneca, payment or honoraria for a lecture with presentations from Astra Zeneca, GSK, and Sanofi, and funding for participation in advisory board meetings with payment to institution from GSK and Astra Zeneca, unrelated to this work. OT has received payment or honoraria for lectures from Astra Zeneca, unrelated to this work. JR has received payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from

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institution outside the submitted work and unrelated to this work. He is also Head of Assembly 5 (Airway diseases, asthma, COPD, and chronic cough), European Respiratory Society, and member of the steering committee of the Swedish National Airway Register. All other authors declare no competing interests.

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Switching Biologics in Severe Asthma: Cautionary Lessons from NIMBLE

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Affiliations Expand

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Reply to Siddiqui et al., Godbout et al., and to Chang and Mao

Geoffrey Chupp [1], Hiroyuki Nagase [2], Dirk Skowasch [3], Gilles Devouassoux [4], Andréanne Côté [5], Daniel J Jackson [6], David J Jackson [7], Michael E Wechsler [8], Peter Howarth [9], Ian D Pavord [10]; "Switching to twice-yearly depemokimab from mepolizumab/benralizumab in severe asthma: A multicenter, randomized, double-blind, Phase 3A Clinical Trial (NIMBLE)"

Collaborators, Affiliations Expand

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- DOI: 10.1093/ajrccm/aamag300

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Type 2 inflammation and biologics: a twenty-year journey

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- PMID: 42339850

- DOI: 10.1080/14712598.2026.2695306

Abstract

Introduction: Over the past two decades, targeted biological therapies have profoundly transformed the management of type 2 (T2) inflammatory diseases, including severe asthma, atopic dermatitis, chronic rhinosinusitis with nasal polyps, eosinophilic esophagitis, chronic spontaneous urticaria, and eosinophilic granulomatosis with polyangiitis. This paper reviews the key milestones of this twenty-year journey, focusing on the evolving therapeutic goals, from disease control to clinical remission.

Areas covered: This paper synthesizes evidence from pivotal clinical trials, real-world registries, extension studies, and systematic reviews on biologics in T2 inflammatory diseases. A targeted literature search was conducted across PubMed and major respiratory, allergy, and dermatology journals, prioritizing publications from 2020 to 2026, with inclusion of landmark earlier studies.

Expert opinion: Clinical remission in biologic-treated T2 inflammatory diseases is achievable but not yet reliably predictable; the field urgently requires globally standardized, validated composite remission indices for each major T2 condition that integrate symptom scores, organ function measures, and biomarker profiles. The defining challenge of the next decade is determining whether early biologic intervention can genuinely modify the disease trajectory and achieve sustained off-treatment remission.

Keywords: Biological therapy; FeNO; biomarkers; eosinophils; remission; type 2 inflammation.

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Measuring the effect of azithromycin in chronic respiratory disease using continuous cough monitoring: an open-label exploratory trial

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Kirton [2], Matthew Rudd [3], Lola Jover [3], Peter Small [3], Mindaugas Galvosas [3], Alyn H Morice [1 2], Michael G Crooks [1 2]

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Abstract

Background: Azithromycin is beneficial in a multitude of respiratory diseases; however, its effects on both subjective and objective measures of cough have been less extensively studied. Traditional 24-h cough counting assessments are highly variable, potentially underestimating the antitussive effect of therapeutics.

Methods: Patients with asthma, COPD, interstitial lung disease and refractory chronic cough who reported cough as the predominant symptom were continuously monitored using a smart watch equipped with Hyfe cough detection software. Patients were monitored 1 week prior to and 4 weeks after commencing azithromycin. Participants were also assessed using patient-reported outcome measures and a 4-week daily cough visual analogue scale diary. Cough data were analysed using the novel cough metrics "relief of cough" and "cough density".

Results: 30 participants with a broad range of respiratory diseases were recruited; 80% (n=24) had satisfactory usage of the cough monitor (>12 h·day^{-1} for 90% of study days). There was a significant reduction in the geometric mean of coughs per hour from pretreatment baseline to follow-up at week 4 (11.4 *versus* 7.5 coughs·h^{-1}, p=0.026). This reduction was observed after 1 week and cough counts reduced progressively from week 1 to week 4. Of the 24 participants who had adequate cough monitoring, 29% (n=7) had a >50% reduction in cough frequency. The mean proportion of time that participants had relief of cough improved between baseline and follow-up (74% *versus* 81%, p<0.001). There was no significant difference in cough density metric (47.5 *versus* 42.8, p=0.069). Significant improvements were observed in all patient-reported outcomes.

Conclusion: This is the first study to assess the antitussive effect of a drug using continuous cough monitoring. Further trials should use this method of cough assessment to obtain a more granular assessment of cough in airways diseases.

Conflict of interest statement

Conflict of interest: D.L. Sykes has received honoraria from AstraZeneca and Trevi therapeutics, and speaker's fees from AstraZeneca and Chiesi. S.P. Hart reports grants from Chiesi and Boehringer Ingelheim, consulting fees from Boehringer Ingelheim, honoraria from Chiesi, and travel support from Chiesi and Boehringer Ingelheim, is a trustee of Action for Pulmonary Fibrosis and the Morriston Davies

Trust, and is an associate editor of this journal. M. Rudd, L. Jover, P. Small and M. Galvosas are employees of Hyfe Inc., the company that developed the monitoring system used in this study. Hyfe Inc. donated the monitors used in this study but did not provide any additional funding for the study to be performed. A.H. Morice has received consulting fees from Bayer, Bellus, Boehringer Ingelheim, Merck, Pfizer, Proctor & Gamble and Shionogi; lecture fees from Boehringer Ingelheim, Merck and AstraZeneca; and grant support from Proctor & Gamble, Merck, Afferent, Infirst, NeRRi and Nocion; and is an associate editor of this journal. M.G. Crooks has received honoraria and/or nonfinancial support from AstraZeneca, Boehringer Ingelheim, Chiesi, Orion and Sanofi; has participated in advisory boards for AstraZeneca, Chiesi, Orion and Synairgen; and has received grants from Asthma & Lung UK, AstraZeneca, Boehringer Ingelheim, Chiesi and the National Institute for Health and Care Research. K. Brindle, S. Kazmi, J. Nielsen, M. Clarkson, J. Gallagher, W. Jackson and E. Kirton declare no conflict of interest pertaining to this article.

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Respirology

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Early Intervention With Biologics for Asthma Remission: Promising or Premature?

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Affiliations Expand

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- DOI: 10.1002/resp.70276

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Keywords: biologics; early intervention; remission; severe asthma.

- 22 references

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Allergy burden score and lung function impairment in children with asthma: a dose-response cross-sectional study

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- **PMID: 42337151**
- **PMCID: PMC13291023**
- **DOI: 10.1007/s00431-026-07195-9**

Abstract

Children with asthma commonly present with multiple allergic comorbidities; however, the quantitative dose-response relationship between cumulative allergic burden and lung function has not been established in pediatric populations. This retrospective cross-sectional study included 264 treatment-naive children with asthma aged 4-16 years. An allergy burden score (ABS) was constructed using a cumulative disease count strategy incorporating allergic rhinitis, atopic dermatitis, food allergy, drug allergy, and family history of allergic disease. Multivariable linear regression and restricted cubic spline (RCS) analyses assessed dose-response relationships between ABS and FEV_1% predicted. Bootstrap-based statistical decomposition examined the contribution of type 2 inflammatory markers, and logistic regression assessed the odds of lung function abnormality. In the fully

adjusted model, each 1-point increase in ABS was associated with a 3.03% decrease in FEV_1% predicted (95% CI: - 3.77 to - 2.29; P < 0.001). RCS analysis indicated significant nonlinearity (P for nonlinearity < 0.001), with accelerated decrease at ABS ≥ 3. Type 2 inflammatory markers accounted for only 2.7% of the statistically decomposed total association. Each 1-point increase in ABS was associated with 43% higher odds of lung function abnormality (adjusted OR = 1.43, 95% CI: 1.07-1.94).

Conclusion: A dose-response association exists between cumulative allergic comorbidity burden and lung function impairment in treatment-naive children with asthma. Peripheral type 2 inflammatory markers explain only a small proportion of this association, suggesting additional contributing mechanisms. The ABS may warrant further evaluation as a simple clinical indicator for identifying children with greater lung function impairment, pending prospective multicenter validation.

Trial registration: Not applicable. As a retrospective cross-sectional study, this research analyzed existing medical records without prospective assignment of interventions by the research team, and therefore does not meet the WHO criteria for clinical trial registration.

What is known: • Allergic comorbidities are prevalent in children with asthma and associated with worse clinical outcomes. The quantitative dose-response relationship between cumulative allergic burden and lung function has not been established in pediatric populations.

What is new: • Each 1-point increase in the Allergy Burden Score (ABS) was associated with a 3.03% decrease in FEV1% predicted, with a nonlinear threshold effect at ABS ≥ 3. Type 2 inflammatory markers collectively accounted for only 2.7% of the total association, suggesting that mechanisms beyond peripheral type 2 inflammation may be involved.

Keywords: Allergic multimorbidity; Asthma; Child; Dose–response relationship; Lung function.

Conflict of interest statement

Declarations. Ethics approval: This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of the First Affiliated Hospital of Xinjiang Medical University (No. K202509-54). Consent to participate: As this was a retrospective analysis using de-identified data, the requirement for informed consent was waived by the institutional review board. Consent to publish: Not applicable. This study used fully de-identified retrospective data; therefore, individual consent for publication was not required. Competing interests: The authors declare no competing interests.

- 44 references
- 4 figures

Supplementary info

MeSH terms, Grants and fundingExpand

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Extreme heat and cause-specific risk of hospital admission in the adult population in England: a case time series analysis

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- PMCID: PMC13295835
- DOI: 10.1136/bmjopen-2025-105321

Abstract

Objectives: This study investigated the impact of heat on the risk of hospital admission due to a range of health conditions in England.

Design: We used records of over 4 million hospital admissions in the summer months between 2008 and 2019, to construct daily time series of admissions in 32 837 census areas. Coupled with high-resolution environmental data, we conducted a case time-series analysis using distributed-lag non-linear models to measure the lagged relationship between summertime temperature and risk of admission for a broad set of health conditions. We derived the relative risks of admission at the 99th compared with the 50th temperature percentile to understand the effect of extreme heat in each locality.

Setting: The adult population of England (aged 18 years and older).

Outcome measures: Unplanned National Health Service (NHS) in-patient hospital admissions for cardiovascular, respiratory, genitourinary, metabolic and infectious diseases, along with their subcategories.

Results: These conditions contributed more than 3.7 million admissions, of which over 1.5 million (42%) were for those aged 75 years and over. More than 80% of admissions were for respiratory, cardiovascular or genitourinary illness, which collectively contributed 3.1 million hospital admissions. There was clear evidence of an increased risk of hospital admission for many conditions, including acute renal failure (1.37, 95% CI 1.32 to 1.42), metabolic disorders (1.28, 95% CI 1.24 to 1.32), infectious and parasitic diseases (1.06, 95% CI 1.04 to 1.08), pneumonia (1.07, 95% CI 1.05 to 1.09) and chronic obstructive pulmonary disease (1.08, 95% CI 1.05 to 1.10). The evidence was less clear for asthma and diabetes, while there were negative associations for many cardiovascular conditions. There was a clear age gradient in heat-related admissions, with older people facing the greatest risk of admission.

Conclusions: These findings highlight the widespread effect of extreme heat across a range of health conditions, in addition to mortality, and have implications for public health planning in our changing climate.

Keywords: Climate Change; EPIDEMIOLOGY; Health; Hospitalization; PUBLIC HEALTH; Risk Factors.

Conflict of interest statement

Competing interests: None declared.

- **28 references**
- **2 figures**

Supplementary info

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Review

J Allergy Clin Immunol

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Innate immunity in allergic diseases: Novel concepts

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Affiliations Expand

- PMID: 42336292

- DOI: 10.1016/j.jaci.2026.06.007

Abstract

Dysregulation of type 2 (T2) immunity, which normally protects the host against large parasites, toxins, and venoms, leads to aberrant inflammatory responses underlying several allergic diseases. Recent advances have highlighted the important role of innate immune responses in the initiation and persistence of these disorders, identifying innate immune cells as key drivers as well as potential biomarkers and therapeutic targets. In this review, we summarize recent findings on the molecular mechanisms through which innate immune cells interact with adaptive immunity to promote the development and chronification of T2-mediated diseases, including allergic rhinitis, chronic rhinosinusitis with nasal polyps, asthma, food allergy, eosinophilic esophagitis, and atopic dermatitis. We also discuss the emerging role of trained immunity and maladaptive trained immunity in either protecting against or promoting allergic disease development. A better understanding of innate immune pathways and their interplay with adaptive immunity might be crucial for the identification of novel biomarkers and therapeutic targets, fostering precision medicine approaches aimed at improving patients' quality of life while reducing the considerable socioeconomic burden of allergic diseases.

Keywords: Allergic diseases; innate immunity; trained immunity; type 2 inflammation.

Supplementary info

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23

J Allergy Clin Immunol Pract

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. 2026 Jun 23:S2213-2198(26)00512-X.

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Screening for Eosinophilic Esophagitis in the Pediatric Asthma Clinic Leads to Increased Diagnosis and Identifies a High Prevalence of Disease

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Affiliations Expand

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- DOI: 10.1016/j.jaip.2026.06.020

Abstract

Background: Eosinophilic esophagitis (EoE) is a chronic, progressive disease associated with atopic conditions, including asthma. EoE prevalence among pediatric asthma patients remains poorly characterized. Delayed EoE diagnosis is common and contributes to complications including stricture formation and growth failure.

Objective: Estimate the prevalence of EoE among pediatric asthma patients using non-invasive- screening.

Methods: A modified Pediatric Eosinophilic Esophagitis Symptom Severity v2.0 (PEESSv2.0) was administered to patients (age 7-17) with asthma or parents (patients age 3-6) in a tertiary care center asthma and allergy clinic. The presence of symptoms deemed concerning for EoE by the allergist prompted referral to gastroenterology (GI). Data were collected through completion of GI workup including endoscopy when indicated.

Results: Of 189 participants, 152 (80.4%) screened positive, 72 (47.4%) of whom were referred to GI. Forty-four (61.1%) completed the referral. Among the 24 who underwent endoscopy, 8 (33%) were diagnosed with EoE. The total projected prevalence of EoE among asthma patients in the asthma and allergy clinic population is 8.0% (95% CI: 5.1%, 11.7%); prevalence rises to 13.9% (95% CI: 10.1%, 18.4%) when accounting for non-participants and those lost to follow-up. Vomiting was the only individual screening symptom significantly associated with EoE

diagnosis (p=0.001). Demographic characteristics of EoE patients mirrored the study cohort, with 75% identifying as non-White.

Conclusion: Screening in a pediatric asthma clinic identified a previously unrecognized high prevalence of EoE. This approach may facilitate earlier diagnosis, prevent fibrostenotic complications, and reduce racial disparities. Further studies are needed to refine screening tools and evaluate applicability across atopic populations.

Keywords: EGID; EoE; Non-IgE mediated; allergic gastrointestinal disease; allergic march; allergic reaction; atopic; atopic march; non-IgE-mediated food allergy; pediatric gastroenterology.

Cite

24

J Allergy Clin Immunol Pract

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Development and validation of clinical scoring system to estimate mucus plug presence in asthma

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- PMID: 42336200

- DOI: 10.1016/j.jaip.2026.06.017

Abstract

Background: Airway mucus plugs on chest computed tomography (CT) are increasingly recognized for their impact and potential as treatable traits. However, radiation exposure warrants reasonable patient selection.

Objective: We aimed to develop and externally validate a practical clinical score to predict CT-detected mucus plug presence in two asthma cohorts and to evaluate its association with clinical outcomes.

Methods: This multicenter retrospective analysis used clinical and CT data from adult patients with stable asthma. The primary outcome was mucus plug presence on CT. We identified independent predictors using multivariable logistic regression, derived a practical scoring system in the exploratory cohort, and validated it in an independent cohort.

Results: The prevalence of mucus plugs was 50.8% (218/429) in the exploratory cohort and 76.5% (143/187) in the validation cohort. Age (A; maximum 2 points), body mass index (B; maximum 2 points), blood eosinophil count (E; maximum 2 points), fractional exhaled nitric oxide (N; maximum 1 point), and percent-predicted forced expiratory volume in 1 s (F; maximum 2 points) were independently associated with the presence of mucus plugs. The derived score (ABENF score; maximum 9 points) showed good discrimination in both cohorts (AUC 0.781, 95% CI 0.742-0.820; AUC 0.836, 95% CI 0.783-0.889). The high-score group (ABENF score ≥4) had a shorter time to first exacerbation (p=0.046) and higher sputum eosinophil percentage (p<0.001) in the validation cohort.

Conclusion: The ABENF score could be a practical tool to estimate mucus plug presence, potentially supporting more selective CT use.

Keywords: Asthma; Chest computed tomography; Mucus plugs; Scoring system; Type-2 inflammation.

Cite

25

Am J Gastroenterol

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Dupilumab for Eosinophilic Esophagitis in Adolescents and Adults: Real-World Outcomes Across Different Dosing Regimens from the EoE CONNECT Registry

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Infante [8], Isabel Pérez-Martínez [9 10], Carlo María Rossi [11], Emanuele Dilaghi [12], Danila Guagnozzi [2 13], Leonardo Blas-Jhon [14], Elena Betoré [15], Sonia Fernández-Fernández [16], Juan Enrique Naves [17], Valentín Roales [18], Stefania Piccirelli [19], Alicia Granja-Navacerrada [20], Raúl Honrubia-López [21 22], Laura Martín-Asenjo [23], Gaia Pellegatta [24], Anne Lund Krarup [25], Diana Zaffalon [26], Silvia Patricia Ortega-Moya [27], Julia Nicolay-Maneru [4], Daria Maniero [5], Elena Resina [3 6], Roberto Penagini [7], Matteo Ghisa [5], Óscar Nantes-Castillejo [4], Ángel Arias [2 3 28 29], Cecilio Santander [2 3 6 30], Alfredo J Lucendo [1 2 3]

Affiliations Expand

- **PMID: 42335360**

- **DOI: 10.14309/ajg.0000000000004088**

Abstract

Background: Real-world data on dupilumab for eosinophilic esophagitis (EoE), particularly regarding flexible dosing and fibrostenotic phenotypes, are scarce.

Objective: To evaluate the effectiveness and safety of dupilumab in clinical practice using the EoE CONNECT registry.

Methods: This cross-sectional analysis included all patients prospectively recruited in the largest European multicenter EoE registry. Baseline characteristics, dosing regimens (300 mg weekly vs. semi-weekly), clinico-histological response (CHR), dose adjustments, and treatment tolerability were assessed.

Results: We analyzed 161 patients (145 adults; 16 adolescents). At baseline, 69.1% of patients displayed endoscopic fibrotic features (rings/strictures). After a median of 6.5 months, peak eosinophil count decreased from 57±45 to 8±19 eos/hpf, EREFS score declined from 3.0±1.6 to 1.3±1.3, and DSS improved from 5.8±3.7 to 2.5±2.8 (all p<0.001). CHR was achieved by 86.0% of patients on 300 mg weekly and 81.2% on semi-weekly dosing (p=0.57). Multivariate analysis identified severe atopy as the reason for starting dupilumab as the strongest predictor for semi-weekly regimen choice (OR: 26.9; p<0.001), with conjunctivitis, asthma, and having two or more food allergies being significant. Both regimens were equally effective in reducing peak eos/hpf, symptomatology and EREFS. Dose tapering from weekly to semi-weekly/monthly was successful in all evaluable cases (8/8), while dose escalation from semi-weekly to weekly rescued 80% (4/5) of non-responders. Discontinuation occurred only in 8 patients (5%), primarily due to adverse events.

Conclusion: Dupilumab is effective and safe in real-world EoE management, with no significant differences between weekly and semi-weekly induction. Efficacy was generally regained after escalation or maintained after dose tapering.

Keywords: adverse events; dupilumab; eosinophilic esophagitis; treatment effectiveness.

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Mod Rheumatol Case Rep

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doi: 10.1093/mrcr/rxag050. Online ahead of print.

Mepolizumab add-on after relapse during rituximab maintenance in MPO-ANCA-positive eosinophilic granulomatosis with polyangiitis: a case report and literature review

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Affiliations Expand

- PMID: 42335035

- DOI: 10.1093/mrcr/rxag050

Abstract

Eosinophilic granulomatosis with polyangiitis is a heterogeneous vasculitic and eosinophilic disorder in which patients who are positive for myeloperoxidase antineutrophil cytoplasmic antibody often develop glomerulonephritis and peripheral neuropathy and may require prolonged immunosuppressive therapy. Although rituximab and mepolizumab have been used in selected patients with EGPA, relapse during rituximab maintenance remains difficult to manage. We report a 59-year-old woman with adult-onset asthma and chronic rhinosinusitis who presented with severe eosinophilia, mononeuritis multiplex, myeloperoxidase anti-neutrophil cytoplasmic antibody positivity, and pauci-immune necrotising glomerulonephritis. Induction therapy with high-dose glucocorticoids, intravenous immunoglobulin, and rituximab achieved clinical remission and allowed tapering to a low dose of prednisolone. Despite rituximab maintenance, she later relapsed with recurrent sinonasal symptoms, worsening neuropathic complaints, and a marked rise in myeloperoxidase antineutrophil cytoplasmic antibody levels. In this setting, further escalation of immunosuppression during maintenance, including cyclophosphamide, may be considered; however, given the possibility that residual eosinophilic inflammation contributed to ongoing disease activity, including autoantibody production, mepolizumab was added after retreatment with rituximab

as sequential therapy. Symptoms stabilised and improved over subsequent months, myeloperoxidase antineutrophil cytoplasmic antibody titres progressively declined to the normal range, and prednisolone was discontinued. Remission has been maintained on mepolizumab without further rituximab for maintenance. This case suggests that sequential eosinophil-targeted therapy may help consolidate remission after relapse during rituximab maintenance in myeloperoxidase antineutrophil cytoplasmic antibody-positive eosinophilic granulomatosis with polyangiitis.

Keywords: Eosinophilic granulomatosis with polyangiitis; MPO-ANCA; Mepolizumab; Relapse; Rituximab.

27

BMC Pregnancy Childbirth

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. 2026 Jun 23.

doi: 10.1186/s12884-026-09517-z. Online ahead of print.

"Actionable" risk for preterm birth: patterns and prediction in California singleton births 2016-2020

Laura L Jelliffe-Pawlowski [1 2 3 4 5 6 7 8], Rebecca J Baer [9 10 11 12 13 14 15 16], Scott Oltman [17 18 19 11 12], Safyer McKenzie-Sampson [12 20], Deborah Adeyemi [18 12], Ashley Becker [12], Kacie C A Blackman [12 21], Bridgette Blebu [12 22], Justin S Brandt [9 10 12], Elena Flowers [12 23], Dana R Gossett [9 10 12], Emily C Hanselman [12 24], Sasha Hernandez [9 10 12], Liang Liang [12 25 26], Audrey Lyndon [17 12], Allison M Momany [12 24], Elizabeth E Rogers [12 15], Kelli K Ryckman [12 27], Louie M Swander [12 15], Karen M Tabb [12 28], Kelly D Taylor [11 12 29], Sophia L Wiggins [12], Akila Subramaniam [12 30]

Affiliations Expand

- PMID: 42332637

- DOI: 10.1186/s12884-026-09517-z

Free article

Abstract

Background: Preterm birth (PTB, < 37 weeks of gestation) is the leading cause of child mortality in the United States (U.S.) and worldwide, and has substantial short- and long-term health consequences for mothers and infants. Each year, > 350,000 infants in the U.S. are born preterm, and rates continue to rise in parallel with maternal risk factors such as hypertension, diabetes, anemia, asthma, and mental health conditions. Evidence-based interventions exist for many of these conditions and are associated with improved pregnancy outcomes, including low-dose aspirin for preeclampsia prevention in individuals with chronic hypertension or pregestational diabetes, inhalers for asthma, iron for anemia, and therapy or medication for mental health disorders, but fewer than half of eligible individuals receive them, reflecting persistent gaps in use. To address this, we developed the PTB Actionable Risk Index (PTB-ARIx), which leverages factors with known evidence-based interventions to identify individuals who are pregnant and are at increased risk for PTB. This study evaluates performance of the PTB-ARIx throughout pregnancy with respect to risk determination and characterization of actionable risk factors, including their combined contributions to PTB.

Methods: A retrospective cohort study was conducted using linked data for 1.9 million singleton live births in California in 2016-2020, divided into training and testing sets. Poisson regression estimated associations between 18 candidate risk factors for PTB with evidence-based interventions spanning clinical, behavioral, and social risks, including preeclampsia risk composites (≥ 1 high-risk or ≥ 2 moderate-risk factors based on U.S. Preventive Services Task Force (USPSTF) criteria), maternal conditions (e.g., gestational hypertension, asthma), substance use, and social adversity. Beta coefficients were combined to construct the PTB-ARIx, evaluated by per-unit associations with PTB and by area under the receiver operating characteristic curve (AUC) overall, by early (< 32 weeks), late (32-36 weeks), spontaneous, and medically-indicated PTB, and by PTB co-occurring with preeclampsia.

Findings: All risk factors were found to be associated with increased PTB risk. Having ≥ 1 high-risk or ≥ 2 moderate-risk factors for preeclampsia (based on composites) was most strongly related to PTB (relative risk (RR) 6.73, 95% confidence interval (CI) 6.57, 6.89). Each unit increase in PTB-ARIx was associated with > 60% higher PTB risk (RRs 1.66-1.72) across training and testing samples, with consistent findings across PTB and race/ethnicity-insurance subgroups. Model performance was modest for late PTB (AUC ≈ 0.63), stronger for early PTB (0.69-0.72), and especially high for early PTB with preeclampsia (AUCs up to 0.97). Over 70% of individuals with PTB-ARIx scores ≥ 3.00 experienced PTB or another adverse outcome such as low birth weight (< 2,500 grams).

Conclusions: The PTB-ARIx is a well-performing metric for identifying individuals at increased risk for PTB and other adverse pregnancy outcomes. By centering on modifiable risks, the PTB-ARIx combines risk identification with opportunities for intervention. Demonstrating strong performance across subgroups, including for

early PTB and PTB with preeclampsia, the PTB-ARIx provides a potential pathway to improve patient-provider communication and uptake of equitable, evidence-based care. Further validation, including integration with treatment data, is needed to confirm its potential to reduce PTB risk and rates.

Keywords: Anemia; Asthma; Diabetes; Hypertension; Prediction; Preeclampsia; Pregnancy; Preterm birth; Treatment.

Conflict of interest statement

Declarations. Ethics approval and consent to participate: Methods and protocols for the study were approved by the Committee for the Protection of Human Subjects within the California Health and Human Services Agency (CalHHS, Federalwide Assurance (FWA) #00000681) which is guided by principles delineated in the Belmont Report. The study approval included a waiver of informed consent and has been ongoing since 2019 with annual reviews. The project number is 2019–024. This study adhered to the World Medical Association Declaration of Helsinki Ethical Principles for Medical Research Involving Human Participants. Consent for publication: Not applicable. Competing interests: The following authors report these competing interests: LJP is a founder and senior scientific advisor to Egg Healthy Pregnancy Inc. a company whose work focuses on helping individuals better understand and address risks during pregnancy. LL is a co-founder of NiMo Therapeutics which focuses on identifying biomolecular predictors of poor pregnancy outcomes. No other authors declare that they have competing interests.

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Multicenter Study

BMJ Open Respir Res

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. 2026 Jun 22;13(1):e004163.

doi: 10.1136/bmjresp-2026-004163.

Clinical validation of the Rapid Cough Questionnaire across diverse lung diseases

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Collaborators, Affiliations Expand

- PMID: 42331391
- PMCID: PMC13289343
- DOI: 10.1136/bmjresp-2026-004163

Abstract

Background: The Rapid Cough Questionnaire (RCQ) is a simplified three-item instrument developed as a pragmatic alternative to the Leicester Cough Questionnaire (LCQ). However, its performance across diverse respiratory diseases, particularly structural lung diseases, has not been sufficiently validated. This study evaluated the performance of the RCQ across major respiratory disease subgroups.

Methods: A total of 300 adult patients with chronic cough were prospectively enrolled from multiple respiratory centres. Participants completed five cough-specific instruments: Numeric Rating Scale (NRS), Cough Symptom Score (CSS), COugh Assessment Test (COAT), LCQ and RCQ. Construct validity was evaluated using correlation analyses across disease subgroups, including chronic obstructive pulmonary disease, asthma, idiopathic pulmonary fibrosis (IPF) and bronchiectasis.

Results: The RCQ showed strong correlations with the LCQ (r=0.93), COAT (r=-0.75), CSS (r=-0.62) and NRS (r=-0.59). These relationships remained robust among all aetiologies, with the correlation coefficients between RCQ and LCQ exceeding 0.88 in each subgroup. Bland-Altman plots and an intraclass correlation analysis indicated a high level of concordance between the RCQ and LCQ scores. The RCQ aligned closely with multidimensional symptom burden and maintained strong correlation with the LCQ even for IPF, where LCQ correlations with unidimensional tools (NRS or CSS) were attenuated.

Conclusions: The RCQ demonstrated strong cross-sectional concordance with the LCQ across heterogeneous respiratory conditions. Its brevity and consistent performance support its suitability in routine clinical practice and large-scale or longitudinal research settings. Further studies are warranted to evaluate its responsiveness and longitudinal performance.

Keywords: Cough/Mechanisms/Pharmacology.

Conflict of interest statement

Competing interests: None declared.

- 31 references
- 4 figures

Supplementary info

Publication types, MeSH termsExpand

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29

Am J Respir Crit Care Med

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Airway Mucus Plugs in Asthma and COPD: Pathobiology, Imaging, and Implications for Clinical Trials

Christopher B Bosma [1], Shawn D Aaron [2], Bartolome R Celli [3], Grace Parraga [4], Sally Seymour [5], George R Washko [6], James P Allinson [7], Federico Baraldi [8], Richard C Boucher [9], Mario Castro [10], Sanjay H Chotirmall [11 12], Alejandro A Diaz [6], John V Fahy [13], Jonathan G Goldin [14], Andrew J Halayko [15], David M G Halpin [16], Eric Hoffman [17], Wassim W Labaki [1], Njira Lugogo [1], Ella Kazerooni [18], Mehmet Kesimer [9], Alberto Papi [8], Sundaresh Ram [19], Kathryn A Ramsey [20], Raúl San José Estépar [21], Naoya Tanabe [22], Kyle Whelan [23], Jadwiga A Wedzicha [7], Fernando J Martinez [23], MeiLan K Han [1]

Affiliations Expand

- **PMID: 42330343**

- **DOI: 10.1093/ajrccm/aamag309**

Free article

Abstract

Mucus plugs have been previously recognized as an important pathological feature in asthma and COPD, but their clinical role in these diseases has not been explored in-depth until recently. Mucus plug formation is driven by mucus hyperconcentration, changes in mucus viscoelastic properties, impaired clearance, and mucociliary collapse. Scoring systems, such as the bronchopulmonary segment mucus plug score, have been used to associate greater mucus plug burden with poor clinical outcomes. Additional scoring methods obtained through quantitative image processing are currently under development. Mucus plug burden has been associated with greater exacerbations and spirometric decline in both asthma and COPD, as well as greater mortality in COPD. Recently, mucus plug burden has been used as an endpoint in clinical trials to evaluate the effectiveness of biologic therapies in asthma; multiple biologic therapies demonstrated decreases in mucus plug burden and associated improvements in spirometry with treatment. Together, this data suggests mucus plugs may be a treatable trait in asthma and COPD. Mucus plug burden has current clinical, phenotypic, and predictive utility and shows promise as a future biomarker. Increased incorporation into clinical trials, expanded evidence of treatment effect, and standardization of methodology and imaging protocols will be needed. CT-detection of mucus plug burden is ready for greater incorporation into both research outcomes and clinical care.

Full text links

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Cite

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Postgrad Med J

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. 2026 Jun 22:qgag029.

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Asthma therapy over 100 years

Peter J Barnes [1]

Affiliations Expand

- **PMID: 42328736**

- **DOI: 10.1093/postmj/qgag029**

Free article

Abstract

100 years ago, the main treatments for asthma were the sympathomimetic ephedrine, theophylline tablets, inhaled anticholinergics in the form of "asthma cigarettes". Together with adrenaline injections for acute exacerbations, these treatments were all bronchodilators derived from natural products. Adrenaline injections evolved into inhaled β2-agonists as the most effective bronchodilators in asthma, whereas theophylline and inhaled anticholinergics are less useful treatments. The efficacy of desiccated adrenal glands extract, used since 1900, is likely due to steroids derived from the adrenal cortex. Corticosteroids are the most effective treatment for asthma and target the underlying eosinophilic airway inflammation. Combination inhalers of corticosteroid and long-acting β2-agonist are now the mainstay of asthma therapy. Recently, short-acting β2-agonists as relievers have been replaced by relievers containing an inhaled corticosteroid, together with a rapid onset long-acting β2-agonist formoterol (anti-inflammatory reliever). This addresses the major issue of poor adherence with inhaled corticosteroids. Poor inhaler technique is being addressed with the development of smart inhalers. In patients with severe asthma not controlled by inhaled therapy, antibodies that block cytokines involved in eosinophilic inflammation have been very effective. In the future, longer acting antibodies will simplify the treatment of these patients. New drugs are also in development for severe non-eosinophilic asthma. There have been remarkable advances in asthma therapy over the last century, although our current treatments have their origins in the therapies used in 1925.

Keywords: anticholinergic; biological therapy; corticosteroid; inhaler; theophylline; β2-agonist.

31

Review

Drug Ther Bull

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doi: 10.1136/dtb.2023.000058.

AIR and MART approach to asthma treatment

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- PMID: 42120188

- DOI: 10.1136/dtb.2023.000058

Abstract

Collaboration between the British Thoracic Society, National Institute for Health and Care Excellence and Scottish Intercollegiate Guidelines Network has resulted in a joint asthma guideline on the diagnosis, monitoring and management of chronic asthma. This marks a significant change in approach and brings the national asthma guideline in line with many of the recommendations made by the Global Initiative for Asthma. It is widely recognised that poor adherence to regular preventer treatment and overreliance on short-acting beta-2 agonists (SABAs), as highlighted by the recent Medicines and Healthcare products Regulatory Agency alert, may mask disease progression, leading to severe exacerbations with an increased risk of hospitalisation and mortality. To combat this, the national asthma guideline now advocates anti-inflammatory reliever (AIR) as the first step in those aged over 12 years. The guideline also promotes the use of maintenance and reliever therapy (MART) as second-line treatment or first-line for newly diagnosed asthma (in highly symptomatic patients or those presenting with a severe exacerbation). AIR and MART regimens ensure that patients receive both fast-acting formoterol and an inhaled corticosteroid with every dose, thereby treating the acute symptoms while also targeting the underlying airway inflammation respectively. AIR and MART provide potentially simpler asthma treatment plans for patients as they can be titrated according to patient needs, thereby addressing the overreliance on SABAs. Also, they reduce the carbon footprint associated with inhaler use by replacing the need for two inhalers (reliever and preventer).

Keywords: Asthma; Pharmacy; Therapeutics.

Supplementary info

Publication typesExpand

"rhinitis"[MeSH Terms] OR rhinitis[Text Word]

1

BMC Pediatr

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doi: 10.1186/s12887-026-07197-4. Online ahead of print.

Nasal eosinophilia in pediatric non-allergic rhinitis: correlation with clinical severity scales

Hüseyin Günizi [1], Gözde Orhan Kubat [2], Özlem Ceren Günizi [3], Ergün Sevil [4 5], Emre Yıldırım [4], Anıl Eren [4]

Affiliations Expand

- PMID: 42365301

- DOI: 10.1186/s12887-026-07197-4

Abstract

Background: Non-allergic rhinitis syndrome (NAR) is a chronic rhinitis characterized by the significant absence of an allergy history, negative skin prick test results, and normal serum IgE levels. Nasal cytology is a valuable diagnostic method that enables qualitative and quantitative assessment of inflammatory cells - including eosinophils, neutrophils, mast cells, and lymphocytes - in the nasal mucosa. This study aimed to evaluate the levels of nasal eosinophilia in a pediatric NAR population and to evaluate the correlation of this local inflammatory biomarker with clinical severity scales such as ARIA and PRQLQ.

Methods: This prospective, cross-sectional study included 103 children aged 5-18 years: 53 with NAR and 50 healthy controls. Symptom duration and severity were classified according to ARIA 2019 criteria. The Paediatric Rhinitis Quality of Life Questionnaire (PRQLQ) was used for quality of life assessment. Nasal cytology specimens were collected by nasal swab from the middle meatus and the eosinophil percentage was calculated by counting a total of 100 cells in the area of highest cell density.

Results: A total of 103 children were enrolled: 53 NAR patients and 50 healthy controls. Median age was 10 (8-13) years in the study group and 11 (8-14) years in the control group. Family history of allergy was significantly higher in the study group (30.2%) compared to controls (12.0%) ($p = 0.024$). Median nasal eosinophil level was 7.0 (3.5-15.5) in the study group and 0 (0-3.0) in controls; the difference was statistically significant ($p < 0.001$). The nasal eosinophil cut-off value was determined as 3.5%. No significant difference was found between nasal eosinophil groups (< 3.5% and ≥ 3.5%) and any PRQLQ subscale or total score ($p > 0.05$).

Conclusions: Nasal cytology may serve as a simple, non-invasive diagnostic tool to identify NAR subtypes and to determine clinical severity in pediatric patients.

Keywords: ARIA; NARES; Nasal cytology; Nasal eosinophilia; Non-allergic rhinitis; PRQLQ; Pediatric; Quality of life.

Conflict of interest statement

Declarations. Ethics approval and consent to participate: This study was conducted in accordance with the Declaration of Helsinki. Ethical approval was obtained from the Clinical Research Ethics Committee of Alanya Alaaddin Keykubat University Faculty of Medicine (date: 27/09/2023, decision no: 13 − 02). Written informed consent was obtained from the parents or legal guardians of all participants. Consent for publication: Not applicable. Competing interests: The authors declare no competing interests.

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Review

Ann Allergy Asthma Immunol

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. 2026 Jun 27:S1081-1206(26)00295-4.

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Remission and Meaningful Outcomes in Chronic Rhinitis and Rhinosinusitis

Martin Wagenmann [1], Francesca Gehrt [2], Kathrin Scheckenbach [2]

Affiliations Expand

- **PMID: 42364847**

- **DOI: 10.1016/j.anai.2026.06.025**

Abstract

In this review, we examine remission and related meaningful outcomes in chronic rhinitis and rhinosinusitis, with a particular focus on chronic rhinosinusitis with

nasal polyps (CRSwNP). We summarize current conceptual frameworks distinguishing treatment response, disease control, and remission, emphasizing durability, absence of clinically relevant disease activity, and freedom from escalation such as systemic corticosteroids or surgery. Real-world studies of biologic therapy in CRSwNP demonstrate that remission is achievable in a subset of patients, although reported rates vary widely due to heterogeneous definitions and predominantly observational evidence. Objective assessment of disease activity remains central to remission evaluation and currently relies on nasal endoscopy. We further discuss the clinical implications of remission for long-term disease management, patient-centered care, and cautious consideration of treatment maintenance and de-escalation strategies. In contrast, remission in allergic rhinitis remains conceptually appealing but insufficiently operationalized, as existing outcome measures primarily capture symptom control and sustained benefit rather than stable disease inactivity. Overall, remission represents a promising but evolving treatment goal in upper airway disease that requires standardized definitions, prospective validation, and dedicated research across pharmacological and surgical treatment modalities.

Keywords: Allergic rhinitis; Biologic therapy; Chronic rhinosinusitis; Disease control; Remission.

Conflict of interest statement

Declaration of competing interest M. Wagenmann has received lecture fees and participated in advisory boards of Allergopharma, ALK-Abelló, AstraZeneca, Celltrion, CSL Behring, Genzyme, GSK, HAL Allergie, MSD, NeilMed, Regeneron, Sanofi, Stallergenes; and received research grants from ALK-Abelló, AstraZeneca, EU, GSK, Novartis, Regeneron, Sanofi, Takeda. F. Gehrt: none K. Scheckenbach has received lecture fees and participated in advisory boards of GSK, HAL MSD, Regeneron, RG; and received research grants from EU, BMBF

Supplementary info

Publication typesExpand

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3

Clin Otolaryngol

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A Novel Device to Improve the Tolerability of Intranasal Corticosteroid Sprays for Allergic Rhinitis and Postoperative Chronic Rhinosinusitis: A Crossover Trial

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Affiliations Expand

- PMID: 42363677

- DOI: 10.1111/coa.70137

Abstract

Background: Allergic rhinitis (AR) and chronic rhinosinusitis (CRS) are commonly treated with intranasal corticosteroid sprays. Despite their efficacy, unpleasant sensations associated with their application, including post-nasal drip and nasal irritation, are often cited as reasons for poor compliance. Optimising the intranasal application experience is key to improving long-term adherence. We developed a nasal adaptor for metered-dose inhalers (MDIs) to reduce the unpleasantness of nasal administration, potentially improving patient compliance.

Methods: Two crossover trials were conducted in AR and postoperative CRS participants (n = 16 per group). Participants used a standard fluticasone nasal spray (50 µg) and a fluticasone MDI (125 µg) with the adaptor for 3 weeks each, separated by a 1-week washout period. Device order was alternated, and doses were adjusted to ensure an approximately equal fluticasone dose. Device preference was determined using an adjusted Clinical Trial Patient Preference Questionnaire, and symptom improvement was assessed using Total Nasal Symptom Score and Sino-nasal Outcome Test-22 questionnaires.

Results: Symptom improvement was comparable between the devices. However, in both groups, 11/16 (69%) participants preferred the MDI with the adaptor over the standard nasal spray, citing fewer unpleasant sensations. Satisfaction score improvement was significantly greater with the novel device in the CRS cohort. Participants reported a higher likelihood of compliance with the novel device, suggesting improved adherence.

Conclusions: An MDI with the adaptor was preferred over a standard nasal spray among AR and postoperative CRS participants. The enhanced tolerability may promote improved compliance, and consequently, more effective long-term symptom control.

Keywords: AR; CRS; FESS; SNOT-22; corticosteroids; device; intranasal; postoperative.

- 25 references

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Allergy

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. 2026 Jun 26.

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EAACI Guidelines on Environmental Science for Allergy and Asthma-Evidence-Based Recommendations for Prevention and Public Health Action to Mitigate the Impact of Pollen Exposure on Respiratory Allergy

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- PMID: 42359506

- DOI: 10.1111/all.70423

Abstract

Developed using the GRADE methodology, these EAACI guidelines provide evidence-based recommendations on the effectiveness of pollen reduction/avoidance strategies for allergic rhinitis (AR) and asthma, the utility of biomarkers for monitoring pollen-induced asthma and the efficiency of mitigation measures and of public health strategies. Systematic and narrative reviews and health economic analysis support the recommendations. According to GRADE, the certainty of evidence was moderate to very low, therefore conditional recommendations are provided to guide healthcare professionals, patients, and policymakers in developing personalized, preventive, and scalable interventions. Reducing/avoiding exposure to pollen should be recommended to reduce the risk of severe asthma exacerbations. Lung function decrease and exhaled nitric oxide increase may be predictive for pollen-induced asthma exacerbations. Real-time

pollen monitoring and pollen concentration-based forecast may be recommended for managing pollen-induced AR and/or asthma. Pollutant information should be included in pollen information systems. Combined forecast (weather, pollen, pollutants) and warning systems might reduce the impact of thunderstorm asthma (TA). Emergency department/asthma-related services should be strengthened during pollen season and in TA. Personalized frameworks covering the types and allergenic potential of pollen, the coaggressors and the vulnerability of each patient are needed in daily practice. The fundamental role of prevention should be further prioritized.

Keywords: GRADE; allergic rhinitis; asthma; environmental science; evidence-based recommendations; exposome; guidelines; pollen.

- **181 references**

Supplementary info

Grants and fundingExpand

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Randomized Controlled Trial

Signal Transduct Target Ther

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. 2026 Jun 26;11(1):249.

doi: 10.1038/s41392-026-02744-y.

Therapy of allergic rhinitis using ribavirin spray to clear nasal commensal viruses

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Affiliations Expand

- PMID: 42350364
- PMCID: PMC13303864
- DOI: 10.1038/s41392-026-02744-y

Abstract

Much attention has focused on commensal bacteria in health and disease, but the role of commensal viruses is largely unexplored. Although commensal viruses are suggested in some organs such as intestine to maintain tissue homeostasis, it is unknown whether they participate in the physiology or pathology of nose, which directly contacts outer environment. Here, we focused on nasal commensal viruses in the development of allergic rhinitis (AR), a global health problem affecting 20% to 30% of the population, and found that clearance of nasal commensal viruses using ribavirin alleviated AR symptoms, suggesting that these viruses contribute to AR pathogenesis. Mechanistically, nasal commensal viruses, recognized by innate sensors, initiated the production of type I interferon, recruiting and generating a population of interferon-induced neutrophils in the nasal cavity, which released neutrophil extracellular traps (NETs) to promote AR. Most importantly, to verify whether clearing nasal commensal viruses could treat AR patients clinically, we performed a randomized, double-blind, placebo-controlled, phase 2 clinical trial (Chinese Clinical Trial Registry identifier: www.chictr.org.cn ChiCTR2400082642) to explore the efficacy and safety of ribavirin spray in treating AR patients, and found that the patients of ribavirin group experienced significantly reduced nasal commensal viruses and alleviated symptoms as compared to the placebo group, determining the therapeutic efficacy of ribavirin spray. Thus, we suggest a new mechanism for AR and a new approach for treating AR patients.

Conflict of interest statement

Competing interests: All authors declare no potential conflict to disclose. Xuetao Cao is one of the Associate Editors of Signal Transduction and Targeted Therapy, but he has not been involved in the process of the manuscript handling.

- 46 references
- 8 figures

Supplementary info

Publication types, MeSH terms, Substances, Grants and fundingExpand

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Cite

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Eur Ann Allergy Clin Immunol

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. 2026 Jun 25.

doi: 10.23822/EurAnnACI.1764-1489.443. Online ahead of print.

Multicenter survey on eosinophilic esophagitis in Italy: trends in diagnosis, diagnostic delay, and type 2 comorbidity burden

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- DOI: 10.23822/EurAnnACI.1764-1489.443

Free article

Abstract

Background. Eosinophilic esophagitis (EoE) is a chronic, immune-mediated esophageal disorder that has been increasingly recognized over recent decades. It is characterized by a type 2 inflammatory response, shared with other type 2 inflammatory conditions such as allergic rhinitis (AR), food allergy (FA), atopic dermatitis (AD), bronchial asthma (BA), and chronic rhinosinusitis with nasal polyps (CRSwNP). Methods. A total of 295 patients with EoE, followed at seven Italian allergy centers with expertise in managing EoE, were included. We analyzed annual EoE diagnoses, diagnostic delay, and the presence of type 2 comorbidities - including AR, FA, BA, AD and CRSwNP - assessed via allergological evaluations at the participating centers. Statistical analyses included non-parametric trend tests, linear and logistic regressions, chi-square tests, and descriptive analyses. Results. Annual EoE diagnoses showed a significant upward trend from 2014 to 2024 ($p = 0.002$). However, the diagnostic delay remained consistently high, showing no corresponding reduction despite the rise in diagnoses. The burden of type 2 comorbidities was substantial, with 83.4% of patients presenting at least one comorbidity, and most patients exhibited multiple comorbidities. Conclusions. Our findings are consistent with previously reported increases in EoE diagnoses in Italy, alongside persistent diagnostic delays, and highlight the substantial burden of type

2 comorbidities in these patients, emphasizing the importance of systematic allergological evaluation and multidisciplinary managementin patients with EoE.

Keywords: Eosinophilic esophagitis; allergic comorbidities; diagnostic delay; type 2 comorbidity; type 2 inflammation.

Full text links

chronic cough

1

Review

Lung

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. 2026 Jun 27;204(1):43.

doi: 10.1007/s00408-026-00907-w.

Validation Approaches for Cough Monitoring Tools: A Scoping Review

Laylaa Ramos Arriaza [1], Laurie Slovarp [2], Brandon D Abell [3], Mindaugas Galvosas [4], Simon Grandjean Lapierre [5 6], Marie E Jetté [7]

Affiliations Expand

- **PMID: 42365132**

- **DOI: 10.1007/s00408-026-00907-w**

Abstract

Objective: To characterize validation approaches used in ambulatory cough monitoring systems and identify methodological variability that may limit clinical and research applications.

Study design: Scoping review.

Data sources: A comprehensive search was performed in Embase (last updated May 8, 2026), and was limited to English-language, peer-reviewed human studies.

Review methods: This review followed PRISMA-ScR guidelines. Studies were included if they reported validation of cough monitoring systems in human participants or human-derived datasets. Two reviewers independently screened and selected studies, with discrepancies resolved by a senior author. Data were extracted using a standardized form and synthesized descriptively.

Results: Fifty studies met inclusion criteria. Most studies evaluated adult populations (72%) and were conducted in laboratory (29%) or home (25%) settings. Validation approaches were heterogeneous, with manual human annotation used as the reference standard in 66% of studies, neural network-based approaches in 12%, and alternative methods in 22%. Definitions of cough events and outcome metrics varied widely, including counts of cough events, epochs, and time-based measures. Technologies ranged from audio-based systems to wearable sensors and machine learning-enabled platforms. While many systems demonstrated high accuracy in controlled environments, performance in real-world settings was more variable, particularly in the presence of background noise and multiple speakers.

Conclusion: Validation of cough monitoring systems remains highly heterogeneous, with no standardized framework for reference measures or outcome metrics. Manual annotation is the most commonly used reference standard, although annotation methods and cough event definitions vary across studies. Standardization of validation protocols, development of shared datasets, and incorporation of real-world testing are needed to support clinical translation of cough monitoring technologies.

Keywords: Chronic cough; Cough monitor; Neural network; Scoping review; Validation.

Conflict of interest statement

Declarations. Conflict of interest: LS is a paid consultant for Hyfe, Inc. MG was employed by Hyfe, Inc. during development of the manuscript. SGL has collaborated scientifically with Hyfe-related research projects but has not received financial or in-kind compensation from Hyfe, Inc. The remaining authors declare no competing interests Ethical Approval: Institutional review not required due to the use of secondary data.

- **56 references**

Supplementary info

Publication typesExpand

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Cite

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Ann Med

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. 2026 Dec;58(1):2681282.

doi: 10.1080/07853890.2026.2681282. Epub 2026 Jun 26.

Fractional exhaled nitric oxide at multiple flow rates in chronic cough: association with lung function and airway hyperresponsiveness

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Affiliations Expand

- PMID: 42359726

- DOI: 10.1080/07853890.2026.2681282

Abstract

Background: The relationship between airway inflammation and airflow obstruction in patients with chronic cough remains unclear. This study aimed to evaluate the relationships between multi-flow fractional exhaled nitric oxide parameters ($FeNO_{50}$, $FeNO_{200}$, and CaNO) and lung function, and to assess their utility in predicting airway hyperresponsiveness (AHR) in this population.

Materials and methods: This retrospective study enrolled 2205 chronic cough outpatients who underwent spirometry and multiple-flow FeNO measurements. Patients were stratified by airway function and FeNO levels for group comparisons, and Spearman's rank correlation was used. In a subgroup (n = 582) who underwent methacholine bronchial provocation test (BPT), the diagnostic accuracy of these parameters for AHR was evaluated.

Results: Among 2014 patients with normal ventilation or airflow obstruction, $FeNO_{50}$ and $FeNO_{200}$ were significantly higher in outpatients with airflow obstruction than those with both normal ventilation and normal small airway function ($p < 0.01$). Weak but significant negative correlations were found between $FeNO_{50}$ or $FeNO_{200}$ and lung function parameters (all coefficients ~0.1), which were slightly stronger in females. $FeNO_{50}$ and $FeNO_{200}$ showed moderate diagnostic value (AUCs: 0.775 and 0.721, Cut-off: 31.5 and 14.5 ppb, respectively), while CaNO showed none. Combining $FeNO_{50}$ with small airway parameter (FEF_{50}%pred) yielded the highest predictive accuracy (AUC: 0.895).

Conclusions: $FeNO_{50}$ and $FeNO_{200}$ are associated with the severity of airflow obstruction and moderately predict AHR in chronic cough, whereas CaNO does not. Combining FeNO with lung function parameters enhances predictive performance.

Despite statistical significance, the weak correlations between FeNO and lung function parameters warrant cautious clinical interpretation.

Keywords: Airway hyperresponsiveness (AHR); chronic cough; fractional exhaled nitric oxide (FeNO); lung function tests.

Plain language summary

Elevated $FeNO_{50}$ and $FeNO_{200}$ levels are associated with more severe airflow obstruction and show moderate predictive value for airway hyperresponsiveness (AHR) in patients with chronic cough.Combining $FeNO_{50}$ with the small airway function parameter FEF_{50} (%pred) significantly improves the prediction accuracy for AHR compared with using either marker alone.In contrast to $FeNO_{50}$ and $FeNO_{200}$, alveolar nitric oxide (CaNO) shows minimal association with lung function and no diagnostic utility for AHR in this chronic cough cohort.

Supplementary info

MeSH terms, SubstancesExpand

Full text links

Cite

3

Laryngoscope

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. 2026 Jun 25.

doi: 10.1002/lary.70710. Online ahead of print.

Pregabalin Efficacy in Treatment of Chronic Neurogenic Cough

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Affiliations Expand

- **PMID: 42348173**

- **DOI: 10.1002/lary.70710**

Abstract

Objectives: Chronic neurogenic cough (CNC) is prevalent in Otolaryngology settings and impactful. Targeted neuromodulators may offer benefits. This longitudinal study of CNC patients taking pregabalin evaluates success of treatment, duration of treatment, and responses in relation to presence of other trigger conditions.

Methods: Ninety five patients (73% female, mean age 62y [12.5, SD]) treated with pregabalin for CNC were evaluated by patient-reported outcome measures, ratings of cough improvement and ability to discontinue therapy.

Results: Patients presented with mean 3.5 year [2.75 SD] cough duration. Seventy-eight percent of individuals administered pregabalin reported significant cough improvement or resolution, with mean 6.5 weeks [5, SD] of therapy. Significant reduction in HARQ from 32 [11, SD] to 22 [15, SD], [t-4.15, p = 0.0001, d = 0.60], and RSI scores from 21 [8, SD] to 14.4 [8.2, SD], [t = 6.71, p < 0.001, d = 0.75] were seen following treatment, with moderate effect sizes. 17% of patients taking pregabalin did not report improvement, with 1% reporting worsening cough. Side effects requiring discontinuation of therapy were reported in 4% of patients. Presence of hiatal hernia, dysmotility or reflux findings did not change the likelihood of positive response (75% [no findings] vs. 80% [positive findings]). Sex did not affect likelihood of improvement (female 82% vs. male 85%, p = n.s).

Conclusion: Pregabalin is a well-tolerated neuromodulator providing relief of CNC symptoms in patients presenting to an Otolaryngology clinic. Treatment duration of 6 weeks provides relief to more than three quarters of patients and response to therapy occurs equally across genders and in those with gastrointestinal comorbidities.

Keywords: cough; neurogenic cough; neuromodulator; pregabalin.

- 21 references

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Review

Eur Respir Rev

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. 2026 Jun 24;35(180):250288.

doi: 10.1183/16000617.0288-2025. Print 2026 Apr.

Cough biomarkers for diagnosis and monitoring of respiratory disease: a systematic review

Jinming Xu [1 2], Thayabaran Kathiresan [1 2], Alveena Siddiqui [1 2], Stuart B Mazzone [3 4], Adam Vogel [5 2 6]

Affiliations Expand

- PMID: 42342266
- PMCID: PMC13291828
- DOI: 10.1183/16000617.0288-2025

Abstract

Cough is a common and physiologically informative component of respiratory morbidity, but its potential for diagnosing and monitoring disease is not thoroughly investigated. This systematic review synthesised the literature on algorithmic and statistical models analysing cough acoustics for diagnosing or monitoring respiratory conditions. Following PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, five databases (PubMed, Embase, Scopus, Web of Science and CENTRAL) were systematically searched for studies published from January 2010 to June 2025. Eligible studies performed quantitative acoustic feature analysis of human coughs using statistical, machine learning or deep learning models and reported diagnostic or prognostic performance. 89 studies from 34 countries were assessed, covering cough detection (n=31), disease classification (n=55) and disease severity prediction (n=3), reflecting potential applications in disease monitoring. Deep learning approaches, especially convolutional and recurrent networks, were predominant (n=56) and tended to achieve the higher accuracies, although machine learning ensemble methods and logistic regression also demonstrated strong performance, particularly with well-engineered features. Across different diseases, sensitivities and specificities were often reported to be ≥90%, notably for tuberculosis, asthma and COVID-19. However, methodological weaknesses were common, with only 11.2% of studies introducing external validation, 71.1-87.6% demonstrating high risk of bias (according to PROBAST-AI) and most based on small, homogeneous or crowdsourced cohorts with limited generalisability. These limitations contribute to inflated internal performance and uncertainty about real-world applicability. Cough acoustic biomarkers hold promise as an adjunctive tool for screening and longitudinal monitoring in low-resource environments. Nevertheless, widespread implementation will require large, multicentre validation, standardised calibration, bias control and incorporation into privacy-preserving workflows.

Conflict of interest statement

Conflict of interest: J. Xu, T. Kathiresan, A. Siddiqui, and A. Vogel are employees of Redenlab Pty Ltd., a speech neuroscience company. S.B. Mazzone declares honoraria from Merck, NeRRe Therapeutics, Reckitt Benckiser, Chiesi, iNova and Bellus Health for cough-related consultancy, and grant support from Merck, Reckitt Benckiser and Bellus Health, for cough-related research programmes outside of the submitted work.

- 169 references
- 3 figures

Supplementary info

Publication types, MeSH terms, SubstancesExpand

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5

Review

Eur Respir Rev

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. 2026 Jun 24;35(180):260085.

doi: 10.1183/16000617.0085-2026. Print 2026 Apr.

The importance of symptoms in bronchiectasis

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Affiliations Expand

- **PMID: 42342265**

- **PMCID: PMC13291825**

- **DOI: 10.1183/16000617.0085-2026**

Abstract

Bronchiectasis is a chronic respiratory disease characterised by irreversible bronchial dilatation, persistent airway inflammation and recurrent infections. Symptoms, particularly cough, sputum production and dyspnoea, are the most immediate and patient-relevant expression of the disease, linking clinical presentation, airway biology and outcomes. While asthma and COPD management algorithms already integrate symptom burden into therapeutic decision-making, bronchiectasis care has historically relied on exacerbation history to guide preventive interventions. Over the past decade, an expanding body of evidence has demonstrated that daily symptoms mirror current infection and inflammation, profoundly impact quality of life, and predict future exacerbations. Comparative analyses across chronic lung diseases further highlight the central role of symptom monitoring in defining disease activity and risk. The updated European Respiratory Society guidelines translate this evidence into clinical practice, marking a paradigm shift from an exacerbation-driven to a symptom-centred and treatable-traits model. This review synthesises clinical, biological and therapeutic insights linking symptoms to bronchiectasis pathophysiology, disease activity and treatment response. We discuss how airway clearance, mucoactive therapy, antibiotics, pulmonary rehabilitation and targeted anti-inflammatory strategies, including dipeptidyl peptidase-1 inhibition, can address specific symptom profiles. We also mention the role of comorbidities and psychosocial management, establishing symptoms as the cornerstone of a holistic, multidimensional care approach. Recognising symptoms as both biomarkers of activity and therapeutic targets represents a major step toward precision medicine in bronchiectasis, aligning clinical management with patient experience and the biological drivers of disease.

Conflict of interest statement

Conflict of interest: The authors declare the following financial interests/personal relationships which may be considered as potential competing interests. S. Aliberti received consulting fees from INSMED Incorporated, INSMED Italy, INSMED Ireland Ltd, INSMED Netherlands BV, ZAMBON Spa, AstraZeneca, Menarini, CSL Behring GmbH, Pfizer, Fondazione Internazionale Menarini, Moderna Italy, Moderna TX, Boehringer Ingelheim, Chiesi farmaceutica Spa, MSD Italia S.r.l., Vertex Pharmaceuticals, BRAHMS GMBH, Physioassist SAS, AN2 Therapeutics, GlaxoSmithKline Spa, and Verona; received payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events (payments made to the author) from GlaxoSmithKline Spa, Fondazione Internazionale Menarini, INSMED Italy, INSMED Ireland Ltd, Boehringer Ingelheim, Zambon, and Vertex Pharmaceuticals; participated on a Data Safety Monitoring Board or Advisory Board (payments made to the author) for INSMED Incorporated, INSMED Italy, AstraZeneca UK Limited, MSD Italia S.r.l, and Verona pharma plc. J.D. Chalmers reports grants or contracts from Grifols; consulting fees from Antabio, AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Grifols, Insmed, Janssen, Novartis, Pfizer, and Zambon; and leadership or fiduciary roles as Chair of the European Respiratory Society Bronchiectasis Guideline Task Force, Chief Editor of European Respiratory Journal, Associate Editor of the European Respiratory Review, and Chair of EMBARC Clinical Research Collaboration. O. Sibila reports

receiving consulting fees from Insmed and Boehringer-Ingelheim. All other authors declare no competing interests.

- 110 references
- 2 figures

Supplementary info

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Lancet Respir Med

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. 2026 Jun 24:S2213-2600(26)00141-4.

doi: 10.1016/S2213-2600(26)00141-4. Online ahead of print.

Severe asthma and remission prospects in Europe (SHARP): insights from a multicentre observational study based on the European Severe Asthma Registry

Evangelia Fouka [1], Aruna T Bansal [2], Kjell Erik Julius Håkansson [3], Fabienne Jaun [4], Renaud Louis [5], Shane Hanon [6], Guy Brusselle [7], Stéphanie Ziant [5], Virginie Paulus [5], Sanja Popović-Grle [8], Gordana Pavlisa [8], Marina Lampalo [8], Mirna Vergles [9], Eugenija Basioli Kasap [10], Vratislav Sedlak [11], Marianne Søndergaard [3], Susanne Hansen [3], Svetlana Sergejeva [12], Jeanne-Marie Perotin [13], Camille Taillé [14], Gilles Devouassoux [15], Caroline Giboin [16], Eve Klising [16], Candice Estellat [17], Dounya Metdaoui [16], Eckard Hamelmann [18], Konstantinos Samitas [19], Konstantinos Porpodis [20], Eleftherios Zervas [19], Mina Gaga [21], Zsuzsanna Csoma [22], Ildiko Horvath [23], Dóra Lúdvíksdóttir [24], Kristín Dóra Sigurdardóttir [24], Giorgio Walter Canonica [25], Enrico Heffler [25], Cristina Cardini [26], Anna Alloni [27], Iveta Kroiča [28], Dace Matisa [29], Kristina Bieksiene [30], Jolita Palacionyte [30], Nils Christian [31], Romain Tching [31], Ilse Boudewijn [32], Jacob K Sont [33], Simone Hashimoto [34], Piotr Kuna [35], Maria Morawska [35], Claudia Chaves Loureiro [36], João A Fonseca [37], Diogo Canhoto [36], Hadassa Santos [38], Ana Mendes [39], Inês Belchior [40], Carlos Lopes [41], Florin Mihaltan [42], Sanja Hromis [43], Mihailo Stjepanovic [44], Vojislav Cupurdija [45], Vesna Tomic-Spiric [46], Sabina Skrgat [47], Peter Kopac [48], David Ramos-Barbon [49], Luis Pérez de Llano [50], Victor Lozoya Garcia [51], David Morenos Martos [51], Barbro Dahlén [52], Valentyna Yasinska [53], Oksana Tenselius [54], Christer

Janson [55], Arne Egesten [56], Jens Richter [56], Össur Ingi Emilsson [57], Joerg Leuppi [4], Bilun Gemicioglu [58], Gulfem Celik [59], Ebru Damadoglu [60], Ozlem Goksel [61], Liam Heaney [62], John Busby [63], Charlene Redmond [62], Matthew Masoli [64], Rekha Chaudhuri [65], Patrick Dennison [66], Simon Doe [67], Ramesh Kurukulaaratchy [68], Elisabeth Bel [69], Ratko Djukanovic [70], Arnaud Bourdin [71], Anneke Ten Brinke [32], Florence Schleich [72], Celeste Porsbjerg [3], Apostolos Bossios [73]

Affiliations Expand

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- DOI: 10.1016/S2213-2600(26)00141-4

Abstract

Background: Severe asthma affects a minority of patients with asthma; however, it substantially impacts morbidity, health-care use, and systemic corticosteroid-related harm. Despite the increasing use of biological treatments, achievement of severe asthma remission remains elusive. Notably, real-world data on the disease burden and remission potential of severe asthma in Europe remain limited. We aimed to close this knowledge gap, offering insights with global relevance.

Methods: Using data from 13 455 adults with severe asthma enrolled in the European Severe Heterogeneous Asthma Registry, Patient-centred Clinical Research Collaboration (SHARP CRC), this cross-sectional observational study evaluated the burden of severe asthma and remission-related clinical domains (exacerbations, asthma control, airflow limitation, and maintenance oral corticosteroid use) across Europe and examined their relationship with disease duration, biological therapy, and type 2 biomarkers (blood eosinophils, fractional exhaled nitric oxide [FeNO], and total IgE). Patients with severe asthma had been enrolled in national registries according to local principles and guidelines and in accordance with the European Respiratory Society/American Thoracic Society guidelines; 3% (430 of 13 885) of patients were excluded due to no consent for the international study and/or missing medication data.

Findings: Patients were predominantly female (59%; 7999 of 13 453), with adult-onset asthma (82%; 8751 of 10 711), and a median disease duration of 23 years (95% CI 20-26 years). 59% (4148 of 7006) of patients had FEV_1/FVC of 0·7 or less, 62% (4680 of 7568) had FEV_1 lower than 80% predicted, and 89% (3519 of 3968) had at least one active disease domain. Despite 79% (10 632 of 13 453) receiving biological therapy, more than 66% (2621 of 3968) still had at least two active domains. Elevation of type 2 biomarkers persisted (89% [2806 of 3153] with at least one elevated biomarker) despite widespread biological and maintenance oral corticosteroid treatment. A subset of biologic-naive patients (35%; 1069 of 3018) exhibited a rapid accumulation of disease burden within less than 10 years, suggesting a potentially accelerated progression trajectory.

Interpretation: This pan-European analysis of severe asthma revealed significant clinical heterogeneity and a substantial disease burden despite advanced therapies, highlighting the enduring nature of type 2 inflammation, the potential inadequacy of current remission strategies with available therapeutic approaches, and the necessity for early identification of high-risk patients.

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Conflict of interest statement

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patients needing to do or wear anything, and captures respiratory rate, heart rate, cough, laboured breathing, air quality, and many more), all unrelated to this work. PKu has received payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Adamed, Angellini, Astra Zeneca, Berlin Chemie, Menarini, Glenmark, Chiesi, GSK, Polpharma, Celon Pharma, Sanofi, Teva, and Zentiva, and support for attending meetings and travel from Astra Zeneca, Berlin Chemie, and Menarini, all unrelated to this work. CCL has received grants from GSK, consulting fees from Astra Zeneca, GSK, and Sanofi, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Astra Zeneca, GSK, and Sanofi, support for attending meetings and travel from Astra Zeneca and Sanofi, and funding for participation on a data safety monitoring board or advisory board from Astra Zeneca, GSK, and Sanofi, all unrelated to this work. JAF has received study contracts from Astra Zeneca and payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Astra Zeneca and Teva, all unrelated to this work. DC has received consulting fees from Astra Zeneca and Medinfar, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Astra Zeneca and GSK, support for attending meetings and travel from Astra Zeneca, Sanofi, Medinfar, Pfizer, Menarini, Boehringer Ingelheim, Merck Sharp & Dohme, VitalAire, Linde, Vivisol, Nippon, and D'Ar Saúde, and funding for participation on a data safety monitoring board or advisory board from Astra Zeneca and Medinfar, all unrelated to this work. AM has received grants and contracts from GSK, Astra Zeneca, and Sanofi, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from GSK, Astra Zeneca, Sanofi, and Medinfar, payment for expert testimony from Astra Zeneca and GSK, support for attending meetings and travel from Medinfar, and has a leadership or fiduciary role in the Portuguese Allergology and Clinical Immunology Society ASTHMA interest Group, all unrelated to this work. IBe has received consulting fees from Astra Zeneca, GSK, and Sanofi, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing, or educational events from Astra Zeneca, GSK, and Sanofi, and support for attending meetings and travel from GSK, Astra Zeneca, Sanofi, Linde, and VitalAire, all unrelated to this work. SuHa has received payment for expert testimony from Teva and Astra Zeneca, and support for attending meetings and travel from Astra Zeneca, Providens (Chiesi), Medis, and Hemofarm, all unrelated to this work. She is also President of the Allergology Section of the Society of Physicians of Vojvodina, Serbian Medical Society, and President of the Asthma Section of the Respiratory Society of Serbia. VC has received honoraria for lectures and presentations from Astra Zeneca, Berlin Chemie, Menarini, Providens (Chiesi), Medis, Teva, and Actavis, support for attending meetings and travel from Astra Zeneca, Teva, Actavis, and Providens (Chiesi), and funding for participation on advisory boards from Astra Zeneca, Providens (Chiesi), and Medis, all unrelated to this work. VT-S has received honoraria for lectures and presentations from Astra Zeneca, Berlin-Chemie, Menarini, Medis, and Amicus, support for attending meetings and travel from Astra Zeneca, Berlin-Chemie, and Menarini, and is a European Academy of Allergy and Clinical Immunology National Allergy Immunology Societies committee member and national representative and a European Academy of Allergy and Clinical Immunology, Allergen Immunotherapy interest group board member, all unrelated to this work. SSk has received honoraria for educational events, invited lectures, and presentations supported by Sanofi, Astra Zeneca, Medis, Berlin Chemie, and Chiesi, and funding for participation on a local advisory board from

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Measuring the effect of azithromycin in chronic respiratory disease using continuous cough monitoring: an open-label exploratory trial

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Abstract

Background: Azithromycin is beneficial in a multitude of respiratory diseases; however, its effects on both subjective and objective measures of cough have been less extensively studied. Traditional 24-h cough counting assessments are highly variable, potentially underestimating the antitussive effect of therapeutics.

Methods: Patients with asthma, COPD, interstitial lung disease and refractory chronic cough who reported cough as the predominant symptom were continuously monitored using a smart watch equipped with Hyfe cough detection software. Patients were monitored 1 week prior to and 4 weeks after commencing azithromycin. Participants were also assessed using patient-reported outcome measures and a 4-week daily cough visual analogue scale diary. Cough data were analysed using the novel cough metrics "relief of cough" and "cough density".

Results: 30 participants with a broad range of respiratory diseases were recruited; 80% (n=24) had satisfactory usage of the cough monitor (>12 h·day^{-1} for 90% of study days). There was a significant reduction in the geometric mean of coughs per hour from pretreatment baseline to follow-up at week 4 (11.4 *versus* 7.5 coughs·h^{-1}, p=0.026). This reduction was observed after 1 week and cough counts reduced progressively from week 1 to week 4. Of the 24 participants who had adequate cough monitoring, 29% (n=7) had a >50% reduction in cough frequency. The mean proportion of time that participants had relief of cough improved between baseline and follow-up (74% *versus* 81%, p<0.001). There was no significant difference in cough density metric (47.5 *versus* 42.8, p=0.069). Significant improvements were observed in all patient-reported outcomes.

Conclusion: This is the first study to assess the antitussive effect of a drug using continuous cough monitoring. Further trials should use this method of cough assessment to obtain a more granular assessment of cough in airways diseases.

Conflict of interest statement

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Ingelheim, honoraria from Chiesi, and travel support from Chiesi and Boehringer Ingelheim, is a trustee of Action for Pulmonary Fibrosis and the Morriston Davies Trust, and is an associate editor of this journal. M. Rudd, L. Jover, P. Small and M. Galvosas are employees of Hyfe Inc., the company that developed the monitoring system used in this study. Hyfe Inc. donated the monitors used in this study but did not provide any additional funding for the study to be performed. A.H. Morice has received consulting fees from Bayer, Bellus, Boehringer Ingelheim, Merck, Pfizer, Proctor & Gamble and Shionogi; lecture fees from Boehringer Ingelheim, Merck and AstraZeneca; and grant support from Proctor & Gamble, Merck, Afferent, Infirst, NeRRi and Nocion; and is an associate editor of this journal. M.G. Crooks has received honoraria and/or nonfinancial support from AstraZeneca, Boehringer Ingelheim, Chiesi, Orion and Sanofi; has participated in advisory boards for AstraZeneca, Chiesi, Orion and Synairgen; and has received grants from Asthma & Lung UK, AstraZeneca, Boehringer Ingelheim, Chiesi and the National Institute for Health and Care Research. K. Brindle, S. Kazmi, J. Nielsen, M. Clarkson, J. Gallagher, W. Jackson and E. Kirton declare no conflict of interest pertaining to this article.

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Clinical validation of the Rapid Cough Questionnaire across diverse lung diseases

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Abstract

Background: The Rapid Cough Questionnaire (RCQ) is a simplified three-item instrument developed as a pragmatic alternative to the Leicester Cough Questionnaire (LCQ). However, its performance across diverse respiratory diseases, particularly structural lung diseases, has not been sufficiently validated. This study evaluated the performance of the RCQ across major respiratory disease subgroups.

Methods: A total of 300 adult patients with chronic cough were prospectively enrolled from multiple respiratory centres. Participants completed five cough-specific instruments: Numeric Rating Scale (NRS), Cough Symptom Score (CSS), COugh Assessment Test (COAT), LCQ and RCQ. Construct validity was evaluated using correlation analyses across disease subgroups, including chronic obstructive pulmonary disease, asthma, idiopathic pulmonary fibrosis (IPF) and bronchiectasis.

Results: The RCQ showed strong correlations with the LCQ (r=0.93), COAT (r=-0.75), CSS (r=-0.62) and NRS (r=-0.59). These relationships remained robust among all aetiologies, with the correlation coefficients between RCQ and LCQ exceeding 0.88 in each subgroup. Bland-Altman plots and an intraclass correlation analysis indicated a high level of concordance between the RCQ and LCQ scores. The RCQ aligned closely with multidimensional symptom burden and maintained strong correlation with the LCQ even for IPF, where LCQ correlations with unidimensional tools (NRS or CSS) were attenuated.

Conclusions: The RCQ demonstrated strong cross-sectional concordance with the LCQ across heterogeneous respiratory conditions. Its brevity and consistent performance support its suitability in routine clinical practice and large-scale or longitudinal research settings. Further studies are warranted to evaluate its responsiveness and longitudinal performance.

Keywords: Cough/Mechanisms/Pharmacology.

Conflict of interest statement

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Spectrum of Interstitial Lung Disease in Sarcoidosis

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Affiliations Expand

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- DOI: 10.1055/a-2871-9924

Abstract

in English, German

Abstract: Sarcoidosis is a multifactorial granulomatous disease that affects adults of all ages, primarily targeting the lungs. Symptoms can range from none at all to severe respiratory failure requiring lung transplantation. Diagnosis is made using three main criteria: compatible clinical or radiological findings, histological proof of non-necrotizing granulomatous inflammation in tissue, and ruling out other causes of granulomatous disease. Pulmonary fibrosis, advanced findings on high-resolution chest CT, decreased pulmonary function, and pulmonary hypertension are widely recognized as significant predictors of adverse clinical outcomes. A narrative, non-systematic review of important recent literature was carried out using computerized database searches, manual searches, and authoritative sources. This review examines the various patterns observed in high-resolution computerized tomography of the chest and their association with the severity and the pathophysiology of sarcoidosis. The patterns addressed include nodules, ground-glass opacities, consolidations, honeycombing, traction bronchiectasis, and cysts. Both historical and current methods of categorizing high-resolution CT interstitial findings will be reviewed.

Key points: · Chest HRCT in sarcoidosis demonstrates a broad spectrum of interstitial lung disease patterns, including micronodules, ground-glass opacities, traction bronchiectasis, honeycombing, and cystic change, with important implications for differential diagnosis.. · The diagnosis of pulmonary sarcoidosis requires concordant clinical and radiologic findings, histologic evidence of non-necrotizing granulomatous inflammation, and exclusion of alternative granulomatous disorders.. · Fibrotic HRCT manifestations of sarcoidosis are associated with adverse clinical outcomes, including impaired pulmonary function, pulmonary hypertension, and chronic respiratory failure, and should be distinguished from UIP/IPF despite overlapping imaging features..

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Conflict of interest statement

The authors declare that they have no conflict of interest.

Full text links

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The frequent exacerbator phenotype in bronchiectasis revisited: Data from EMBARC registry

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Abstract

Rationale: The frequent exacerbator phenotype was previously defined using a threshold of ≥ 3 exacerbations per year in bronchiectasis. However, the contribution of each prior exacerbation to future risk, as well as the influence of severe exacerbations, different etiologies and regions, remain poorly understood.

Objectives: To quantify the risk associated with each prior exacerbation in predicting future exacerbations and severe exacerbations, and to determine whether this association varies across different etiologies and geographic regions in bronchiectasis.

Methods: We analyzed data from the European Bronchiectasis Registry (EMBARC), including 30 countries across Europe and Asia. The association between baseline exacerbation history and future exacerbations was tested using negative binomial regression over up to 5 years of follow-up. Severe exacerbations were defined as those requiring hospitalization.

Measurements and main results: A total of 19,324 patients with bronchiectasis were included. Each prior exacerbation was associated with an increased risk of exacerbations and severe exacerbations. Incidence Rate Ratio (IRR) for future exacerbations was 1.45 (95%CI 1.34-1.58, p < 0.001) for one exacerbation, 1.84 (95%CI 1.69-1.99, p < 0.001) for two exacerbations, 2.50 (95%CI 2.29-2.73, p < 0.001) for three exacerbations and 3.56 (95%CI 3.32-3.82, p < 0.001) for patients with four or more prior exacerbations. Additionally, one prior severe exacerbation was associated with increased risk of exacerbation (IRR=1.52, 95%CI 1.45-1.60, p < 0.001) and strongly associated with future severe exacerbations (IRR=3.96, 95%CI 3.71-4.22, p < 0.001). The frequent exacerbator phenotype was consistent across different etiologies and geographic regions.

Conclusions: The frequent exacerbator phenotype is highly consistent across patient subgroups and regions. Each prior exacerbation is associated with a progressively higher risk with no definitive threshold defining high risk.

Full text links

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Review

Eur Respir Rev

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The importance of symptoms in bronchiectasis

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Abstract

Bronchiectasis is a chronic respiratory disease characterised by irreversible bronchial dilatation, persistent airway inflammation and recurrent infections. Symptoms, particularly cough, sputum production and dyspnoea, are the most immediate and patient-relevant expression of the disease, linking clinical presentation, airway biology and outcomes. While asthma and COPD management algorithms already integrate symptom burden into therapeutic decision-making, bronchiectasis care has historically relied on exacerbation history to guide preventive interventions. Over the past decade, an expanding body of evidence has demonstrated that daily symptoms mirror current infection and inflammation, profoundly impact quality of life, and predict future exacerbations. Comparative analyses across chronic lung diseases further highlight the central role of symptom monitoring in defining disease activity and risk. The updated European Respiratory Society guidelines translate this evidence into clinical practice, marking a paradigm shift from an exacerbation-driven to a symptom-centred and treatable-traits model. This review synthesises clinical, biological and therapeutic insights linking symptoms to bronchiectasis pathophysiology, disease activity and treatment response. We discuss how airway clearance, mucoactive therapy, antibiotics, pulmonary rehabilitation and targeted anti-inflammatory strategies, including dipeptidyl peptidase-1 inhibition, can address specific symptom profiles. We also mention the role of comorbidities and psychosocial management, establishing symptoms as the cornerstone of a holistic, multidimensional care approach. Recognising symptoms as both biomarkers of activity and therapeutic targets

represents a major step toward precision medicine in bronchiectasis, aligning clinical management with patient experience and the biological drivers of disease.

Conflict of interest statement

Conflict of interest: The authors declare the following financial interests/personal relationships which may be considered as potential competing interests. S. Aliberti received consulting fees from INSMED Incorporated, INSMED Italy, INSMED Ireland Ltd, INSMED Netherlands BV, ZAMBON Spa, AstraZeneca, Menarini, CSL Behring GmbH, Pfizer, Fondazione Internazionale Menarini, Moderna Italy, Moderna TX, Boehringer Ingelheim, Chiesi farmaceutica Spa, MSD Italia S.r.l., Vertex Pharmaceuticals, BRAHMS GMBH, Physioassist SAS, AN2 Therapeutics, GlaxoSmithKline Spa, and Verona; received payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events (payments made to the author) from GlaxoSmithKline Spa, Fondazione Internazionale Menarini, INSMED Italy, INSMED Ireland Ltd, Boehringer Ingelheim, Zambon, and Vertex Pharmaceuticals; participated on a Data Safety Monitoring Board or Advisory Board (payments made to the author) for INSMED Incorporated, INSMED Italy, AstraZeneca UK Limited, MSD Italia S.r.l, and Verona pharma plc. J.D. Chalmers reports grants or contracts from Grifols; consulting fees from Antabio, AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Grifols, Insmed, Janssen, Novartis, Pfizer, and Zambon; and leadership or fiduciary roles as Chair of the European Respiratory Society Bronchiectasis Guideline Task Force, Chief Editor of European Respiratory Journal, Associate Editor of the European Respiratory Review, and Chair of EMBARC Clinical Research Collaboration. O. Sibila reports receiving consulting fees from Insmed and Boehringer-Ingelheim. All other authors declare no competing interests.

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Review

Eur Respir Rev

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Mucoactive agents in bronchiectasis: a systematic review and meta-analysis

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Abstract

Background: Mucoactive agents aim to improve mucociliary clearance in bronchiectasis, disrupting the cycle of impaired clearance, infection and inflammation. Registry data show 28% of patients use these agents, but prescribing varies due to limited evidence. We aimed to update evidence on mucoactive agents' effects in adults with bronchiectasis.

Methods: We conducted a systematic review and meta-analysis, searching Medline, Embase, CENTRAL and trial registries to 1 October 2025. Eligible studies included adults with bronchiectasis, evaluating any mucoactive agent *versus* placebo or control. Cystic fibrosis and paediatric studies were excluded. The primary outcome was exacerbation frequency; secondary outcomes included lung function, quality of life and adverse events.

Findings: From 1512 records, 24 studies (20 randomised, four observational: n=7051) evaluated eight mucoactive agents (ambroxol, bromhexine, carbocisteine, erdosteine, hypertonic saline, mannitol, N-acetylcysteine, rhDNase). Most trials had high or some risk of bias. Seven randomised studies (n=1259) reported exacerbations; pooled analysis did not demonstrate a statistically significant difference in annualised exacerbation incidence (mean difference -0.40 per patient per year, 95% CI -1.04-0.24; p=0.22; I^2=91%; very low certainty). Nine studies (n=767) reported percent predicted forced expiratory volume in 1 s (FEV_1 % pred), showing a small mean increase of 3.23% (95% CI 0.31-6.15; p=0.03; I^2=69.9%; very low certainty). Pooled analyses did not demonstrate significant differences for other spirometry measures, quality of life or adverse events.

Interpretation: Pooled evidence did not show a reduction in exacerbations and FEV_1 % pred improvements were small. Evidence certainty was low/very low,

meaning overall clinical benefit remains uncertain, highlighting the need for targeted trials of specific agents and subgroups.

Conflict of interest statement

Conflict of interest: Several authors of this review (J.M. Bradley, B. O'Neill, R.H. McLeese, D.F. McAuley, J.S. Elborn, A. De Soyza, J.D. Chalmers and M. Clarke) were also involved in conducting one of the studies included in this systematic review (the CLEAR trial [22]). In accordance with Cochrane guidelines for managing competing interests among trial authors contributing to systematic reviews, we implemented measures to minimise potential bias [29]. Specifically, all data extraction and risk-of-bias assessments for the CLEAR trial were completed independently by review authors who were not involved in the conduct of that study (B. McCullough, B. Connolly and J. Busby). All review procedures, including study selection, data extraction and risk of bias appraisal, were undertaken according to a predefined protocol registered on PROSPERO (CRD42024545050), to ensure objectivity and consistency. Additional conflicts of interest are as follows. B. Connolly reports grants from National Institute for Health and Care Research, participation on a data safety monitoring board or advisory board with ABC Post ICU Trial (UK), and leadership or fiduciary role with UK Critical Care Research Group, Intensive Care Society (UK) and NIHR Critical Care National Specialty Group. D. Linden reports grants from NI Chest Heart and Stroke and Academy of Medical Sciences and Belfast HSC Trust and HSC R&D, and payment or honoraria for lectures, presentations, manuscript writing or educational events from GSK. D.F. McAuley reports support for the present study from NIHR, grants from NIHR, Innovate UK, MRC, Novavax, Northern Ireland HSC R&D Division, Randox and Wellcome Trust, royalties or licenses from Queen's University Belfast, consultancy fees from Bayer, Aptarion, Direct Biologics, MSD, Healios and Novartis, participation on a data safety monitoring board or advisory board with Vir Biotechnology and Faron Pharmaceuticals, leadership or fiduciary role with Intensive Care Society, MRC/NIHR and NIHR, and other financial or non–financial interests with Insmed and California Institute for Regenerative Medicine. A. De Soyza reports grants from Boehringer Ingelheim, Sanofi, Innogen, AstraZeneca, GSK and Inogen, consultancy fees from Insmed, Fisher & Paykel, Sanofi, Innogen, 30T, AstraZeneca and GSK, payment or honoraria for lectures, presentations, manuscript writing or educational events from Insmed, Fisher & Paykel, Sanofi, Innogen, AstraZeneca and GSK, support for attending meetings from Sanofi, and participation on a data safety monitoring board or advisory board with Bayer. J.D. Chalmers reports grants from AstraZeneca, Genentech, Boehringer Ingelheim, Gilead, Chiesi, Grifols, Insmed and Trudell, consultancy fees from AstraZeneca, Chiesi, GlaxoSmithKline, Insmed, Grifols, Novartis, Boehringer Ingelheim, Pfizer, Janssen and Antabio, and consultancy fees from Zambon. J.M. Bradley reports grants from NIHR and Novavax, royalties or licenses from Queen's University Belfast, and leadership or fiduciary role with HSC NI.

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Analysis of clinical characteristics and bronchoalveolar lavage fluid microbial community diversity in non-cystic fibrosis bronchiectasis patients with *Pseudomonas aeruginosa* colonization

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Free article

Abstract

This study aims to examine the differences in microbial community abundance and species distribution in the bronchoalveolar lavage fluid (BALF) obtained from non-cystic fibrosis bronchiectasis (NCFB) patients between those with and without *Pseudomonas aeruginosa* (*P. aeruginosa*) colonization, and to assess the impact of *P. aeruginosa* colonization on airway microecological imbalance in NCFB. Sixty-four patients were enrolled, grouped into *P. aeruginosa*-colonized (PA, 29) and non-colonized (NPA, 35) groups. Among patients with NCFB, those with *P. aeruginosa* colonization had greater disease severity than those without colonization, with significantly higher bronchiectasis severity index (BSI) scores ($P < 0.05$). The proportions of patients with higher Bhalla and E-FACED scores were also greater in the PA group than in the NPA group (62.1% vs 42.8% and 34.1% vs 20%, respectively). Annual hospitalization frequency was numerically higher in PA

(2.14 ± 2.43 vs 1.47 ± 0.86; *P* = 0.543). The PA group exhibited poorer pulmonary function, with significantly lower FEV1 and FEV1% predicted (both *P* < 0.01). In addition, NCFB patients in the PA group showed higher proportions of elevated white blood cell counts (31% vs 17.1%) and neutrophil percentages (41.4% vs 31.4%). Microbiota analysis of BALF demonstrated reduced alpha diversity in NCFB patients with *P. aeruginosa* colonization, with a predominance of *Pseudomonas*, whereas non-colonized NCFB patients had relatively higher abundances of *Streptococcus*, *Acinetobacter*, *Rothia*, *Veillonella*, and *Prevotella*. Overall, *P. aeruginosa* colonization in NCFB is associated with increased disease severity, heightened inflammation, and impaired lung function, accompanied by decreased microbial diversity, *Pseudomonas* dominance, and suppression of commensal taxa.

Importance: *Pseudomonas aeruginosa* is a common colonizer in the airways of patients with non-cystic fibrosis bronchiectasis (NCFB), linked to disease severity, but research on its impact on clinical outcomes and airway microbiome diversity remains limited. This study compared *P. aeruginosa*-colonized (PA group) and non-colonized (NPA group) NCFB patients and found that the PA group had more severe disease (higher exacerbation, severity scores) and reduced bronchoalveolar lavage fluid (BALF) microbial α/β diversity (marked by *Pseudomonas* dominance and suppressed symbionts like *Streptococcus*). These findings indicate that *P. aeruginosa* reshapes the microecology and is associated with airway microbial imbalance. This study confirms that *P. aeruginosa* colonization is a key factor in NCFB disease progression and airway microecological imbalance, highlighting reduced colonization and restored homeostasis as precision intervention strategies that inform targeted therapies.

Keywords: 16S rRNA sequencing; Pseudomonas aeruginosa; bronchoalveolar lavage fluid; non-cystic fibrosis bronchiectasis.

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Clinical validation of the Rapid Cough Questionnaire across diverse lung diseases

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Abstract

Background: The Rapid Cough Questionnaire (RCQ) is a simplified three-item instrument developed as a pragmatic alternative to the Leicester Cough Questionnaire (LCQ). However, its performance across diverse respiratory diseases, particularly structural lung diseases, has not been sufficiently validated. This study evaluated the performance of the RCQ across major respiratory disease subgroups.

Methods: A total of 300 adult patients with chronic cough were prospectively enrolled from multiple respiratory centres. Participants completed five cough-specific instruments: Numeric Rating Scale (NRS), Cough Symptom Score (CSS), COugh Assessment Test (COAT), LCQ and RCQ. Construct validity was evaluated using correlation analyses across disease subgroups, including chronic obstructive pulmonary disease, asthma, idiopathic pulmonary fibrosis (IPF) and bronchiectasis.

Results: The RCQ showed strong correlations with the LCQ (r=0.93), COAT (r=-0.75), CSS (r=-0.62) and NRS (r=-0.59). These relationships remained robust among all aetiologies, with the correlation coefficients between RCQ and LCQ exceeding 0.88 in each subgroup. Bland-Altman plots and an intraclass correlation analysis indicated a high level of concordance between the RCQ and LCQ scores. The RCQ aligned closely with multidimensional symptom burden and maintained strong correlation with the LCQ even for IPF, where LCQ correlations with unidimensional tools (NRS or CSS) were attenuated.

Conclusions: The RCQ demonstrated strong cross-sectional concordance with the LCQ across heterogeneous respiratory conditions. Its brevity and consistent performance support its suitability in routine clinical practice and large-scale or longitudinal research settings. Further studies are warranted to evaluate its responsiveness and longitudinal performance.

Keywords: Cough/Mechanisms/Pharmacology.