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

1

Multicenter Study

Skeletal Radiol

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. 2026 Oct;55(10):2527-2537.

doi: 10.1007/s00256-026-05263-7. Epub 2026 May 31.

[Deep learning-based CT-derived vertebral bone mineral density and metformin therapy: a longitudinal study in the Multi-Ethnic Study of Atherosclerosis](#)

[Sara Momtazmanesh](#)¹, [Quincy A Hathaway](#)², [Payam Jannatdoust](#)³, [Elena Ghotbi](#)¹, [Michael P Bancks](#)⁴, [David A Bluemke](#)⁵, [R Graham Barr](#)⁶, [Benjamin M Smith](#)⁶, [Wendy S Post](#)⁷, [Matthew J Budoff](#)⁸, [João A C Lima](#)⁷, [Shadpour Demehri](#)⁹

Affiliations Expand

- PMID: 42218332
- DOI: [10.1007/s00256-026-05263-7](#)

Abstract

Objective: Evidence on metformin's skeletal effects remains conflicting. We emulated a target trial to evaluate associations between metformin therapy and deep learning-based CT-derived vertebral bone mineral density (vBMD). We also assessed variation across prespecified subgroups.

Materials and methods: Within the Multi-Ethnic Study of Atherosclerosis (MESA), incident metformin users (Exams 4 and 5) were compared with propensity score-matched controls. Noncontrast chest CT scans from Exams 5 and 6 were processed using a previously validated deep learning-based vertebral segmentation and calibration pipeline to quantify trabecular vBMD from T1 to T10. Median imaging follow-up was 6.4 years. Linear mixed-effects models estimated annualized Fracture Risk Assessment Tool (FRAX) absolute vBMD change, applying inverse probability of censoring weights. Prespecified subgroup analyses examined demographic, metabolic, and inflammatory modifiers.

Results: Among 238 trial entries (86 metformin, 152 controls), metformin was not associated with overall vBMD change (time × treatment interaction β , 0.27 mg/cm³ per year; 95%CI, -0.07 to 0.61; $p = 0.12$). Substudy-specific and per-protocol estimates were consistent. Favorable associations were observed in women, body mass index (BMI) < 30 kg/m², ASCVD risk < 0.2, hs-CRP < 2 mg/L, never-smokers, and nondrinkers. Significant effect modification was found for gender, hs-CRP, and smoking status, with borderline trends for BMI.

Conclusions: Metformin use was not associated with overall CT-derived vBMD change. Subgroup analyses indicate heterogeneity of association across demographic, metabolic, and inflammatory profiles, with more favorable associations among women and participants with healthier risk profiles. Findings support metformin's skeletal safety and warrant future context-specific trials.

Keywords: Aging; Bone mineral density; Computed tomography (CT); Metformin; Quantitative imaging; Type 2 diabetes mellitus.

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Conflict of interest statement

Declarations. Ethics approval and consent to participate: This study is in accordance with the ethical standards of the 1964 Helsinki Declaration and its later amendments. The Multi-Ethnic Study of Atherosclerosis (MESA) protocol received approval from the Institutional Review Boards at all participating institutions, with all participants providing written informed consent. Competing interests: RGB received grant funding from the National Institutes of Health (NIH) and the Chronic Obstructive Pulmonary Disease (COPD) Foundation. Other authors have declared that no competing interests exist.

- [45 references](#)

Supplementary info

Publication types, MeSH terms, Substances, Grants and fundingExpand

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Cite

2

Ann Am Thorac Soc

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. 2026 Oct 1;23(10):1435-1436.

doi: 10.1093/annalsats/aaoag153.

[COVID-19 has taught us that not all COPD exacerbations are created equal](#)

[William W Stringer](#)¹

Affiliations Expand

- PMID: 42262219
- DOI: [10.1093/annalsats/aaoag153](#)

Free article

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Cite

3

Eur J Intern Med

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. 2026 Oct:152:107035.

doi: 10.1016/j.ejim.2026.107035. Epub 2026 Jun 27.

[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](https://doi.org/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.

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Cite

4

Am J Respir Crit Care Med

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. 2026 Oct 1;212(10):2691-2692.

doi: 10.1093/ajrccm/aamag340.

[Reply to Liu et al.: Beyond frequency: rethinking exacerbation risk in chronic obstructive pulmonary disease](#)

[Surya P Bhatt](#)^{1,2}, [Mohsen Sadatsafavi](#)³; [all authors](#)

Affiliations Expand

- PMID: 42363405
- PMCID: PMC13624790 (available on 2027-10-01)
- DOI: [10.1093/ajrccm/aamag340](https://doi.org/10.1093/ajrccm/aamag340)

No abstract available

Conflict of interest statement

Please see the ICMJE disclosure forms, which have been provided as supplementary material.

Comment in

- [Beyond frequency: rethinking exacerbation risk in chronic obstructive pulmonary disease.](#)

Liu D, Wang L, Zhang J. Am J Respir Crit Care Med. 2026 Oct 1;212(10):2689-2690. doi: 10.1093/ajrccm/aamag339. PMID: 42363406 No abstract available.

- [3 references](#)

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Cite

5

Editorial

Am J Respir Crit Care Med

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. 2026 Oct 1;212(10):2689-2690.

doi: 10.1093/ajrccm/aamag339.

[Beyond frequency: rethinking exacerbation risk in chronic obstructive pulmonary disease](#)

[Dong Liu](#)¹, [Lele Wang](#)², [Jun Zhang](#)³

Affiliations Expand

- PMID: 42363406
- DOI: [10.1093/ajrccm/aamag339](#)

Free article

No abstract available

Comment on

- [Discriminative performance and clinical utility of chronic obstructive pulmonary disease exacerbation categories for predicting future exacerbations.](#)

Bhatt SP, Adibi A, Bodduluri S, Bowler RP, Burgel PR, Castaldi PJ, Hersh CP, Janson C, Maiorino E, Mullerova H, Nakhmani A, Oelsner EC, Silverman EK, Wilson CG, Sadatsafavi M. Am J Respir Crit Care Med. 2026 Aug 1;212(8):1721-1729. doi: 10.1093/ajrccm/aamag118. PMID: 42085195

- [Reply to Liu et al.: Beyond frequency: rethinking exacerbation risk in chronic obstructive pulmonary disease.](#)

Bhatt SP, Sadatsafavi M; all authors. Am J Respir Crit Care Med. 2026 Oct 1;212(10):2691-2692. doi: 10.1093/ajrccm/aamag340. PMID: 42363405 No abstract available.

Supplementary info

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Cite

6

Observational Study

J Crit Care

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. 2026 Oct;95:155670.

doi: 10.1016/j.jcrc.2026.155670. Epub 2026 Jul 1.

[High-dose corticosteroids are associated with higher mortality in patients with COVID-19 ARDS: Results from a nationwide observational study](#)

[Anders Boyd](#)¹, [Katrijn Daenen](#)², [Sarah Stoof](#)³, [Hugo D G van Willigen](#)⁴, [Diederik Gommers](#)³, [Hazra S Moeniralam](#)⁵, [Corstiaan A den Uil](#)⁶, [Nicole P Juffermans](#)³, [Merijn Kant](#)⁷, [Abraham J Valkenburg](#)⁸, [Janesh Pillay](#)⁹, [Eric van Gorp](#)¹⁰, [Janke Schinkel](#)¹¹, [David M P van Meenen](#)¹², [Robin Goossen](#)¹², [Frederique Paulus](#)¹², [Virgil Dalm](#)¹³, [Lieuwe D J Bos](#)¹², [Henrik Endeman](#)¹⁴, [Jilske A Huijben](#)³; [PRoVENT- and PRoAct-COVID Collaborative Group](#)

Affiliations [Expand](#)

- PMID: 42385526
- DOI: [10.1016/j.jcrc.2026.155670](https://doi.org/10.1016/j.jcrc.2026.155670)

Free article

Abstract

Background: Optimal corticosteroid dosing strategies remain unclear for severe coronavirus disease 2019 (COVID-19) patients admitted to the intensive care unit (ICU). This study compared mortality among patients treated with high-dose versus standard-dose corticosteroids.

Methods: This prospective cohort study included adult patients with COVID-19 ARDS, defined according to Berlin criteria for ARDS, across 22 centers in the Netherlands between March 2020 and January 2021. Mortality hazards were compared between patients receiving high-dose (>6 mg dexamethasone or equivalent) and standard-dose (6 mg dexamethasone or equivalent) corticosteroids using marginal structural models to adjust for time-varying confounding related to initiation of high-dose therapy. Models were constructed using pooled logistic regression with stabilized inverse probability of treatment weights to emulate a per-protocol analysis.

Results: Data from 848 patients were analyzed: 378(44.6%) received high-dose and 470 (55.4%) standard-dose corticosteroids. Among those treated with high-dose corticosteroids, 63 (16.7%) started therapy within the first day after ICU admission, and 315(83.3%) started at a median of 9 days(IQR = 4-14) after admission. During a median 28 days of follow-up, 183 patients in the high-dose and 154 in the standard-dose group died [incident rate = 2.12 per 100 person-days, 95% confidence interval (CI) = 1.81-2.43 and 1.41 per 100 person-days, 95%CI = 1.13-1.63, respectively]. In the marginal structural model, high-dose corticosteroids were associated with increased mortality (hazard ratio = 2.45, 95%CI = 1.97-3.05). Risk was higher in male patients or those with late initiation (>1 day) of therapy.

Conclusion: In patients with COVID-19 ARDS, high-dose corticosteroids were associated with higher mortality during the first 28 days after ICU admission.

Trial registration: ClinicalTrials.gov [NCT05403359](https://clinicaltrials.gov/ct2/show/NCT05403359);
<https://clinicaltrials.gov/ct2/show/NCT05403359>.

Keywords: COVID-19; Corticosteroids; Dose; Intensive care unit; Treatment optimization.

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Conflict of interest statement

Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:(Henrik Endeman reports financial support was provided by ZonMw. If there are other authors, they 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 types, MeSH terms, Substances, Associated dataExpand

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Cite

7

Observational Study

Eur Radiol

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. 2026 Oct;36(10):7928-7939.

doi: 10.1007/s00330-026-12677-3. Epub 2026 Jul 3.

[Body composition's effect on the bone-vascular axis of osteoporosis discovered in AI-based CT analysis of COPD patients](#)

[Bettina K Budai](#)^{1,2}, [Andreas Wagner](#)^{1,2}, [Ondrej Havlicek](#)^{1,2}, [Philip Konietzke](#)^{1,2,3,4,5}, [Franziska C Trudzinski](#)^{2,6}, [Jürgen Biederer](#)^{1,2,7,8}, [Claus P Heußel](#)^{1,2,3}, [Hans-Ulrich Kauczor](#)^{1,2,3}, [Viktoria Palm](#)^{9,10,11}; [COSYCONET study group](#)

Affiliations Expand

- PMID: 42399449
- PMCID: [PMC13574876](#)
- DOI: [10.1007/s00330-026-12677-3](#)

Abstract

Objectives: This study aimed to investigate the effect of body composition on the inverse relationship between vertebral bone density (T12 BMD) and total thoracic vascular calcification (TTVC) in patients with chronic obstructive pulmonary disease (COPD). Moreover, we aimed to assess whether intermuscular adipose tissue (IMAT) affects the bone-vascular axis.

Materials and methods: Chest CT scans of 539 COPD patients from the multicentric prospective COSYCONET study were retrospectively analyzed using AI-based tools for T12 BMD, TTVC, and volumetric body composition. Multivariable linear regression models were built to investigate the effect of conventional body phenotypes (normal, sarcopenic, non-sarcopenic obesity, and sarcopenic obesity). Stepwise interaction model building included T12 BMD, IMAT, their interaction,

adding BMI, clinical and metabolic covariates, lung function, physical performance, and age.

Results: The T12 BMD showed a consistent inverse association with TTVC in all phenotypes, with $\beta = -0.38$ ($p < 0.01$) in normal nutritional status, $\beta = -0.36$ ($p < 0.01$) in sarcopenia, and $\beta = -0.24$ ($p < 0.01$) in non-sarcopenic obesity. However, the phenotype's significant effect was not confirmed in the interaction model. Age and pack-years were associated with calcification, but IMAT remained independently associated ($\beta = 0.15$, 95% CI 0.015-0.28, $p = 0.029$), while the interaction between T12 BMD and IMAT lost significance once age was included.

Conclusion: IMAT index was independently associated with TTVC in COPD. The modifying effect of IMAT on the bone-vascular axis was most evident in models without age adjustment, suggesting that the observed interaction may be influenced by age.

Key points: Question The interactions between body composition, sarcopenia, arteriosclerosis, and osteoporosis are not fully understood. AI-based CT analysis provides a more holistic picture of multimorbidity in COPD. Findings Intermuscular adipose tissue (IMAT) was independently associated with vascular calcification in stepwise-adjusted models. The interaction of IMAT and bone density is demonstrated but showed age-dependence. Clinical relevance Increased IMAT can capture a vulnerable COPD patient group with metabolic dysregulation and physical frailty, besides vascular aging. Muscle fat infiltration may indicate impaired musculoskeletal health and serve as a marker of arteriosclerosis beyond possible effects of age or BMI.

Keywords: Artificial intelligence; Body composition; Chronic obstructive pulmonary disease; Comorbidity; Vascular calcification.

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Conflict of interest statement

Compliance with ethical standards. Guarantor: The scientific guarantor of this publication is Bettina Katalin Budai. **Conflict of interest:** Software support for this study was provided by Siemens Healthineers and Coreline Soft. F.C.T. reports receiving honoraria for lectures and presentations from Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Grifols, Novartis, CSL Behring, Streamed Up, and RG Gesellschaft für Information und Organisation mbH, as well as research funding from the E&H Knorr Stiftung. C.P.H. reports stock ownership in GSK, receiving consultation fees from Voiant from 2025, research funding from Exscientia between 2023 and 2024, and honoraria for lectures from AstraZeneca, Pfizer, Chiesi, and Sanofi, as well as being a patent holder of Method and Device for Representing the Microstructure of the Lungs, IPC8 Class: AA61B5055FI, PAN: 20080208038. C.P.H. is a member of the European Radiology Editorial Board and, as such, has not participated in the review or selection processes for this article. H.U.K. reports receiving honoraria for lectures and presentations from Boehringer Ingelheim, Siemens, Philips, and Streamed Up, as well as research funding from Boehringer Ingelheim, Siemens, Philips, as well as serving on advisory boards for Contextflow and Median. H.U.K. is a member of the European Radiology Editorial Board and, as such, has not participated in the review or selection processes for this article. J.B. is a member of the European Radiology Editorial Board and, as such, has not

participated in the review or selection processes for this article. The remaining authors declare no conflicts of interest. Statistics and biometry: One of the authors has significant statistical expertise. Informed consent: Written informed consent was obtained from all subjects (patients) in this study. Ethics approval: Institutional Review Board approval was obtained. The COSYCONET study was approved by the Ethical Committee of Philipps University Marburg (reference no. AZ 2010-28), as well as the ethics committees of each center. Study subjects or cohorts overlap: No study subjects or cohorts have previously been reported. Methodology: Prospective Diagnostic or prognostic study Performed at multiple institutions (multicentric study)

- [55 references](#)
- [4 figures](#)

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Editorial

Arch Bronconeumol

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. 2026 Oct;62(10):689-691.

doi: 10.1016/j.arbres.2026.06.008. Epub 2026 Jun 23.

[The Potential Role of DPP-1 Inhibitors in Chronic Obstructive Pulmonary Disease](#)

[Article in English, Spanish]

[Oriol Sibila](#)¹, [Lidia Perea](#)², [Alvar Agustí](#)³, [Rosa Faner](#)⁴

Affiliations Expand

- PMID: 42414195
- DOI: [10.1016/j.arbres.2026.06.008](#)

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Am J Respir Crit Care Med

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. 2026 Oct 1;212(10):2560-2563.

doi: 10.1093/ajrccm/aamag256.

[Moving to better COPD care-changes to and challenges for GOLD](#)

[Claus F Vogelmeier](#)¹, [David M G Halpin](#)², [Gerard J Criner](#)³, [Fernando J Martinez](#)⁴, [Dave Singh](#)^{5 6}, [Antonio Anzueto](#)⁷, [Alvar Agusti](#)⁸; [GOLD Science Committee](#)

Collaborators, Affiliations Expand

- PMID: 42417382
- DOI: [10.1093/ajrccm/aamag256](#)

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Cite

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Ann Am Thorac Soc

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. 2026 Oct 1;23(10):1397-1413.

doi: 10.1093/annalsats/aaoag184.

Population health management in chronic obstructive pulmonary disease: an official American Thoracic Society Workshop Report

Lucas M Donovan^{1 2}, Kathryn A Artis^{3 4}, Surya Bhatt⁵, Laura C Feemster^{1 2}, Shawn D Aaron⁶, Arianne K Baldomero⁷, Kevin I Duan⁸, Alex D Federman⁹, Bhrandon A Harris¹⁰, Kathleen Henderson¹¹, Jerry A Krishnan^{12 13}, Stephanie LaBedz¹³, Peter K Lindenauer¹⁴, Sarah N Miller¹⁵, Laura C Myers¹⁶, Edward C Portillo¹⁷, Valerie G Press¹⁸, J Daryl Thornton¹⁹, W Claibe Yarbrough²⁰, Josephine C Young²¹, Jenny Zhang²², David H Au^{1 2 23}; American Thoracic Society Assembly on Behavioral Science and Health Services Research

Collaborators, Affiliations Expand

- PMID: 42417387
- DOI: [10.1093/annalsats/aaoag184](https://doi.org/10.1093/annalsats/aaoag184)

Free article

Abstract

Despite decades of research and advocacy, the quality of care for chronic obstructive pulmonary disease (COPD) remains poor. Millions of patients fail to receive appropriate care, and fundamental changes are needed to improve care quality and patient outcomes. Guided by the Triple Aim of (1) improving population health, (2) improving individual patient experience, and (3) reducing per capita costs for care, population health management strategies aim to redesign healthcare. By adapting the delivery, coordination, and payment of high-quality services, population health management strategies hold promise to improve care for the large and heterogeneous COPD population. This workshop included a multidisciplinary panel of patients, payers, health system leaders, pulmonologists, primary care providers, pharmacists, nurses, and researchers to envision future models of care that achieve population health management for COPD. Past research demonstrates the effectiveness of population-based health system interventions to improve COPD case finding, primary and specialty care integration, inpatient management, and postdischarge services among patients with COPD. Sustaining these interventions will require value-based payment arrangements and adaptations to clinical care processes. The field will need to define meaningful outcomes and tailor appropriate team member roles and responsibilities. As part of healthcare redesign, workshop members recommended adopting effective strategies to encourage personalized high-quality decision-making (eg, nudges) and employ study designs that rigorously and quickly test interventions (eg, pragmatic and adaptive designs). To ensure patient centeredness, it will be essential to incorporate patient and caregiver perspectives and leadership into redesign efforts.

Keywords: chronic obstructive pulmonary disease; integrated practice units; population health management; quality of care.

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Clinical Trial

Br J Pharmacol

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. 2026 Oct;183(19):5895-5913.

doi: 10.1111/bph.70588. Epub 2026 Jul 14.

[Safety, pharmacokinetics and pharmacodynamics of TQC3721, an innovative, dual PDE3 and PDE4 inhibitor, in healthy subjects and patients with chronic obstructive pulmonary disease: Randomised, double-blind, placebo-controlled phase I and IIa clinical trials](#)

[Lixiu He](#)¹, [Ling Yang](#)¹, [Weiguo Li](#)², [Yang Yu](#)², [Ding Yu](#)², [Hui Chen](#)², [Songze Wu](#)³, [Zhu Luo](#)¹

Affiliations Expand

- PMID: 42449486
- DOI: [10.1111/bph.70588](https://doi.org/10.1111/bph.70588)

Abstract

Background and purpose: TQC3721 is a novel inhaled dual phosphodiesterase (PDE3/4) inhibitor designed to provide bronchodilation and anti-inflammatory effects for chronic obstructive pulmonary disease (COPD).

Experimental approach: First-in-human randomised, double-blind, placebo-controlled phase I (SAD: 0.2 to 24 mg single dose; MAD: 12 mg once daily (QD) for 7 days in healthy subjects) and phase IIa studies (0.75 to 6 mg once or twice daily for 4 weeks in moderate-to-severe patients with COPD) were conducted. Primary outcomes included safety, pharmacokinetics (PKs) and pharmacodynamics (PDs), change from baseline of forced expiratory volume in the first second [FEV₁], and FEV₁ at 12 and 24 h post-dose on days 1 and 28.

Key results: TQC3721 was rapidly absorbed (median T_{max} of 0.25 to 0.5 h), mainly by pulmonary absorption rather than gastrointestinal absorption, along with low systemic exposure and lack of significant accumulation. TQC3721 demonstrated favourable safety profiles in healthy subjects and patients with COPD. In patients with COPD, TQC3721 produced rapid and outstanding bronchodilation effect sustained over 12 h post-administration, with FEV₁ peaking at approximately 2 h post-dose and returning to baseline levels by 12 h, which supports a twice-daily dosing regimen for the future, and peak FEV₁ improvements ranging from 186 to 272 ml across dose groups after 4 weeks of treatment. Moreover, twice-daily 3 and 6 mg regimens were recommended for further clinical study.

Conclusions and implications: Pharmacokinetic features, significant bronchodilation effects and overall favourable safety characteristics support further clinical development of TQC3721 as a potential dual-mechanism therapy for COPD.

Keywords: COPD; PDE3/4 inhibitor; TQC3721; pharmacodynamics; pharmacokinetics; phase I; phase IIa; safety.

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- [39 references](#)

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Review

Respir Med

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. 2026 Oct;262:109080.

doi: 10.1016/j.rmed.2026.109080. Epub 2026 Aug 6.

COPD case finding and identification of at-risk individuals: opportunities for early personalized intervention and disease interception

Alberto Papi¹, MeiLan K Han², Paola Rogliani³, Jadwiga A Wedzicha⁴, Marc Miravittles⁵

Affiliations Expand

- PMID: 42562238
- DOI: [10.1016/j.rmed.2026.109080](https://doi.org/10.1016/j.rmed.2026.109080)

Abstract

A substantial proportion of chronic obstructive pulmonary disease (COPD) cases remain undiagnosed, delaying appropriate care and allowing disease progression. Targeted case finding, particularly in symptomatic individuals and those at risk, offers an opportunity to identify COPD earlier and intervene before irreversible airflow limitation occurs. Recognizing at-risk individuals who exhibit clinical, functional, or structural abnormalities despite normal spirometry expands the potential for disease interception and personalized management. Among the modifiable traits relevant to early COPD, chronic bronchitis represents a clinically meaningful phenotype associated with disease progression and poorer outcomes. This narrative review evaluates current and emerging approaches that enhance COPD case finding and identify individuals at risk of developing the disease. These include functional assessments, imaging modalities, biomarkers, and digital health tools, which together may improve precision in detecting early abnormalities and support timely, individualized intervention strategies. Within this framework, evidence on N-acetylcysteine is described. By integrating refined case-finding strategies with targeted treatment of modifiable traits, earlier and more personalized intervention may be achievable, with the potential to alter disease trajectory and reduce the overall burden of COPD.

Keywords: Case finding; Chronic obstructive pulmonary disease; N-acetylcysteine; Pre-COPD; Treatable traits.

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Conflict of interest statement

Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Alberto Papi reports grants from Chiesi, AstraZeneca, GSK, Sanofi, personal fees for consultancy and/or advisory board participation and/or lecture fees from Chiesi, AstraZeneca, GSK, Sanofi, IQVIA, Avillion, Zambon, Teva, Moderna, Regeneron, Roche, Zentiva. MeiLan K. Han reports personal fees from GlaxoSmithKline, AstraZeneca, Boehringer Ingelheim, Cipla, Chiesi, Novartis, Pulmonx, Teva, Verona, Merck, Mylan, Sanofi, Roche, DevPro, Aerogen, Polarian, Regeneron, Amgen, UpToDate, Altesa Biopharma, CSL Behring, Bristol Myers Squibb, Zymeworks, Zambon, Windward Bio, Uniquity, Medscape, NACE, MDBriefcase, and Integrity. She has received either in-kind research support or funds paid to the institution from the NIH, Novartis, Sunovion, Nuvaira, Sanofi,

Astrazeneca, Boehringer Ingelheim, Galvanize Therapeutics, Biodesix, the COPD Foundation and the American Lung Association. She has participated in Data Safety Monitoring Boards for Novartis and Medtronic with funds paid to the institution. She has received stock options from Meissa Vaccines and Altesa Biopharma. Paola Rogliani reports grants/research support to her Institution from Arcede Pharma, AstraZeneca, Boehringer Ingelheim, Chiesi Farmaceutici, Sanofi, Verona Pharma and honoraria or consultation fees from AstraZeneca, Boehringer Ingelheim, Chiesi Farmaceutici, GlaxoSmithKline, Menarini Group, Mucpharm, Pfizer, Recipharm, Regeneron, Roche, Sanofi and Zambon. Jadwiga A. Wedzicha reports receiving industry-sponsored research grants or honoraria for lectures, advisory board participation, or consulting from AstraZeneca, Boehringer Ingelheim, Chiesi, GlaxoSmithKline (GSK), Novartis, Handok, Recipharm, Angelini, Roche, Gilead, Empirico, MucPharm, Pfizer, and Genentech. Marc Miravittles has received speaker fees from AstraZeneca, Boehringer Ingelheim, Bial, Chiesi, Cipla, GlaxoSmithKline, Menarini, Kamada, Takeda, Zambon, Tabuk Pharmaceuticals, CSL Behring, Specialty Therapeutics, Sanofi/Regeneron and Grifols, consulting fees from AstraZeneca, AIRNA, Atriva Therapeutics, BEAM Therapeutics, GondolaBio, Chiesi, GlaxoSmithKline, CSL Behring, Korrobio, Menarini, Mereo Biopharma, Specialty Therapeutics, Takeda, Novo Nordisk, Roche, Sanofi/Regeneron, Zambon, Zentiva and Grifols and research grants from Grifols.

Supplementary info

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Cite

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Randomized Controlled Trial

Respir Med

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. 2026 Oct;262:109077.

doi: 10.1016/j.rmed.2026.109077. Epub 2026 Aug 4.

[Lung function after randomization to metformin, lifestyle intervention or placebo in the Diabetes Prevention Program Outcomes Study \(DPPOS\)](#)

[Carrie L Pistenmaa¹](#), [Lindsay Doherty²](#), [Emilia A Hermann³](#), [Angela L Brown⁴](#), [Dana Dabelea⁵](#), [Fernando Holquin⁶](#), [Karol Watson⁷](#), [William C Knowler⁸](#), [Marinella Temprosa²](#), [R Graham Barr⁹](#); [DPP Research Group](#)

Affiliations Expand

- PMID: 42551713
- DOI: [10.1016/j.rmed.2026.109077](https://doi.org/10.1016/j.rmed.2026.109077)

Abstract

Introduction: Metformin and physical activity have been suggested as beneficial for chronic lung disease; however, there are no prior randomized trials.

Methods: The Diabetes Prevention Program (DPP) was a 3-year trial that randomized 3234 individuals at risk for diabetes to metformin, lifestyle intervention or placebo. After the DPP, 88% of participants enrolled in the DPP Outcomes Study that offered lifestyle intervention to all and open-label continuation of metformin. Spirometry was performed at approximately 19 and 22 years post-randomization. Lung function measures were compared in an intention-to-treat (ITT) analysis by original randomization group. Models were unadjusted and adjusted for demographics, body size, smoking and sitting/standing at spirometry. Additional analyses tested prevalence of obstruction ($FEV_1/FVC < 70\%$), restrictive pattern ($FVC < LLN$ and $FEV_1/FVC \geq 70\%$), preserved ratio impaired spirometry (PRISm: $FEV_1 < 80\%$ predicted, $FEV_1/FVC \geq 70\%$) and symptoms (COPD Assessment Test [CAT] score ≥ 10).

Results: The 1888 participants with spirometry were a mean ($\pm$ SD) age of 68.2 ± 9.3 years, 70% female and 6% currently smoked and 33% had previously smoked cigarettes. Mean follow-up time was 19.0 ± 0.8 years. The mean FEV_1 was 2.14 ± 0.60 L, FVC 2.74 ± 0.74 L, FEV_1/FVC $78.4 \pm 6.4\%$, mean BMI was 32.4 ± 6.7 kg/m² and 58% had diabetes. In both unadjusted and adjusted ITT analyses, randomization group was not associated with FEV_1 , FVC or FEV_1/FVC . Likewise, rates of obstruction, restrictive pattern, PRISm or symptoms did not differ by randomization group.

Conclusions: In this long-term follow-up after a randomized trial, we found no significant associations between randomization to metformin or lifestyle intervention and lung function or respiratory symptoms.

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Conflict of interest statement

Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: CLP reports grants from the National Institutes of Health (NIH)/National Heart, Lung, and Blood Institute (NHLBI) during the conduct of the study, research support from AstraZeneca and Sanofi, and participation on a Data Safety Monitoring Board for InflaRx Pharmaceuticals, Inc and Verona Pharma. ALB reports consulting fees from Medtronic. DD reports grants from the NIH/National Institute on Aging. WCK consulting to the DPPOS Coordinating Center, MT reports grants from the NIH, RGB reports grants from NIH/NHLBI, grants from the COPD Foundation and the American Lung Association, and is an unpaid member of the COPD Foundation Medical and Scientific Advisory Committee. LD, EH, FH, KW have no disclosures to report.

Supplementary info

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J Am Med Inform Assoc

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[SMART: structured, meaningful, auditable, responsible, and transparent documentation for clinical AI](#)

[Ankur Lohachab](#)¹, [Frédéric Jung](#)², [Stef Rommes](#)², [Gökhan Ertaylan](#)², [Anshu Ankolekar](#)^{3,4}, [Visara Urovi](#)¹

Affiliations Expand

- PMID: 42616679
- PMCID: [PMC13630299](#)
- DOI: [10.1093/jamia/ocag117](#)

Abstract

Objective: Clinical AI systems and models increasingly need traceable documentation that makes intended use, performance evidence, transparency, and lifecycle status explicit, yet existing model cards, datasheets, reporting guidelines, and other documentation approaches do not consistently bring together structured clinical fields, vocabulary-linked cohort descriptions, structured performance reporting, and governed documentation history. We introduce Structured, Meaningful, Auditable, Responsible, and Transparent (SMART), a framework that adapts the model card concept into structured, lifecycle-aware documentation with OMOP integration, role-based lifecycle governance, and a blockchain-backed audit trail for verifying documentation integrity and lifecycle history.

Materials and methods: Following a design-science-informed approach, we analyzed documentation requirements, reviewed existing approaches, implemented SMART through open-source packages and smart contracts, and evaluated it using example SMART model cards, an illustrative COPD exacerbation risk-prediction documentation case study, and blockchain-governed lifecycle experiments.

Results: The design process resulted in the SMART framework in which documentation provisions are reflected across Schema, Lifecycle, and Chain (ie, Blockchain) components. Evaluation showed that, in multi-party settings, documentation history remains independently verifiable because lifecycle actions are role-attributed and linked to content hashes; median testnet gas use ranged from 352 722 to 852 399 gas across the evaluated lifecycle operations.

Discussion: SMART positions clinical AI documentation as a shared infrastructure for preliminary model assessment, making role attribution, lifecycle state, and documentation changes more transparent and traceable over time.

Conclusion: By providing an implementable framework, SMART illustrates how clinical AI documentation can be structured, clinically contextualized, auditable, responsible, transparent, and lifecycle-aware.

Keywords: artificial intelligence; blockchain; documentation; electronic health records; medical records systems computerized; reproducibility of results.

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Conflict of interest statement

The authors declare no conflict of interests.

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Review

Lancet Respir Med

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doi: 10.1016/S2213-2600(26)00150-5. Epub 2026 Aug 20.

Symptom burden to characterise, predict, and prevent asthma attacks: a patient-level meta-analysis of randomised trials and translational prospective studies

Simon Couillard¹, Fleur L Meulmeester², Pascal Charland³, Samuel Lemaire-Paquette⁴, Imran Howell⁵, Carlos Celis-Preciado⁶, Philippe Lachapelle³, Liam G Heaney⁷, Peter Bradding⁸, Samuel Mailhot-Larouche³, Sanjay Ramakrishnan⁹, Michael E Wechsler¹⁰, Guy Brusselle¹¹, Sarah E Diver⁸, Christopher E Brightling⁸, Mario Castro¹², Nicola A Hanania¹³, David J Jackson¹⁴, Neil Martin¹⁵, Alison Moore¹⁶, Peter Howarth¹⁶, Megan E Hardin¹⁷, Rebecca Gall¹⁸, Cecile T J Holweg¹⁹, Vennila Dharman²⁰, Richard W Beasley²¹, Jacob K Sont², Ewout W Steyerberg²², Ian D Pavord⁵; Oxford Asthma Attack Risk Scale Meta-analysis (ORACLE2) Consortium

Affiliations Expand

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- DOI: [10.1016/S2213-2600\(26\)00150-5](#)

Abstract

Background: Asthma symptoms often guide disease assessment and management, but their prognostic and predictive value is unclear. We evaluated the extent to which symptom burden measured by the 5-item Asthma Control Questionnaire (ACQ-5) predicts future severe asthma attacks and response to anti-inflammatory therapy.

Methods: We conducted an individual participant data meta-analysis of selected randomised controlled trials and translational observational cohort studies of asthma of varying severity. Primary analyses used the ORACLE2 patient-level meta-analysis (n=6513) of control-group participants from 22 randomised controlled trials. Additional datasets from studies assessing type 2 targeting anti-inflammatory therapies were included on the basis of availability of data, to provide insight into the association between ACQ-5 and sputum cell counts or mediator data. Additional datasets were the DREAM intravenous mepolizumab group (n=461); a cross-sectional severe asthma cohort (SA-OT, n=74); and two acute asthma cohorts (PRISMA, biologic-naïve, n=53; BOOST, anti-interleukin-5-treated, n=60). Associations between baseline ACQ-5 scores and clinical, physiological, and inflammatory profiles, asthma attack risk, and anti-inflammatory treatment responses were examined.

Findings: Across five datasets encompassing 7161 distinct participants, asthma severity, lung function, inflammatory profiles, comorbidities, and ACQ-5 results varied widely. The proportion of patients with high symptom burden (ACQ-5 score >1·5) ranged from 39% to 100%. Baseline ACQ-5 showed no consistent cross-sectional association with other clinical, physiological, or inflammatory asthma features. Each 0·5-point increase in baseline ACQ-5 score was associated with a modest increase in future asthma attack risk (adjusted rate ratio [aRR] 1·09 [95% CI 1·06-1·12]; $\Delta R^2=0\cdot02$ vs multivariable prediction model without ACQ-5). Baseline ACQ-5 score did not alter relative and absolute attack risk reduction from intravenous mepolizumab in DREAM. By contrast, patients with high blood eosinophil counts and high fractional exhaled nitric oxide (FeNO) had the highest

relative and absolute risk reduction (2·81 vs 1·17 attacks; aRR 0·38 [95% CI 0·25-0·57]). In the PRISMA and BOOST datasets, ACQ-5 was not associated with post-corticosteroid lung function change. Across studies, relative and absolute treatment effects showed consistent associations with blood eosinophil counts and FeNO.

Interpretation: In a large, individual patient-level meta-analysis of randomised controlled trials and translational prospective observational cohort studies, we observed little alignment of symptom burden with other clinical, physiological, or biological features of asthma and modest prognostic value for severe attacks. Conversely, type 2 biomarkers more reliably identified patients at high risk and those likely to respond to treatment. Symptoms might require contextual interpretation to guide anti-inflammatory escalation in asthma.

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Conflict of interest statement

Declaration of interests SC has received non-restricted research grants from the National Institute for Health and Care Research Oxford Biomedical Research Centre, the Quebec Respiratory Health Research Network, the Association Pulmonaire du Québec, the Academy of Medical Sciences, AstraZeneca, bioMérieux, Circassia Niox Group, and Sanofi-Genzyme-Regeneron; is the holder of the Association Pulmonaire du Québec's Research Chair in Respiratory Medicine and is a clinical research scholar of the Fonds de recherche du Québec; has received speaker honoraria from AstraZeneca, GlaxoSmithKline, Sanofi-Regeneron, Circassia Niox Group, and Valeo Pharma; has received consultancy fees from FirstThought, Apogee Therapeutics, Connectio biopharma, Upstream Bio, AstraZeneca, GlaxoSmithKline, Sanofi-Regeneron, Access Biotechnology and Access Industries; has received sponsorship to attend or speak at international scientific meetings by or for AstraZeneca and Sanofi-Regeneron; is an advisory board member and holds stock options for Biometry (a company developing a fractional exhaled nitric oxide device called myBiometry); is co-inventor for the patent filed as Method for alleviating dyspnoea with neuromodulation; advised the Institut national d'excellence en santé et services sociaux for an update of the asthma general practice information booklet for general practitioners as well as therapeutic indications for Enerzair; and is a member of the asthma steering committee of the Canadian Thoracic Society. CC-P received an education scholarship from the Université de Sherbrooke within the submitted work, and outside the submitted work, received speaker honoraria from AstraZeneca, GlaxoSmithKline, and Sanofi-Regeneron, and consultancy fees from AstraZeneca, GlaxoSmithKline, and Sanofi-Regeneron. PL reports an investigator-initiated unrestricted research grant from Sanofi-Regeneron for the submitted work; outside the submitted work, he reports consulting fees from AstraZeneca, GlaxoSmithKline, and Sanofi-Regeneron, and speaker honoraria from AstraZeneca, GlaxoSmithKline, Sanofi-Regeneron, Boehringer Ingelheim, and Novartis. LGH has received grant funding, participated in advisory boards, and given lectures at meetings supported by Amgen, AstraZeneca, Boehringer Ingelheim, Circassia, Hoffmann la Roche, GlaxoSmithKline, Novartis, Theravance, Evelo Biosciences, Sanofi, and Teva; has received grants from MedImmune, Novartis UK, Roche

Genentech, Glaxo Smith Kline, Amgen, Astra Zeneca, MedImmune, Glaxo Smith Kline, Aerocrine, and Vitalograph; has received sponsorship for attending international scientific meetings from AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, and Napp Pharmaceuticals; has taken part in asthma clinical trials sponsored by AstraZeneca, Boehringer Ingelheim, Hoffmann la Roche, and GlaxoSmithKline for which his institution received remuneration; and is the Academic Lead for the Medical Research Council Stratified Medicine UK Consortium in Severe Asthma, which involves industrial partnerships with a number of pharmaceutical companies including Amgen, AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Hoffmann la Roche, and Janssen. PB has received research funding from Genentech via the University Hospitals of Leicester NHS Trust and DEShawResearch via the University of Leicester, consultancies for Genentech and DEShawResearch via the University of Leicester, one honorarium from AstraZeneca, and support to attend scientific meetings from GSK and Sanofi Genzyme. SR reports grants from the Charities Research Foundation, the National Health and Medical Research Council, the Medical Research Future Fund, and the Raine Medical Research Foundation paid to his institution; consulting fees from Connect BioPharma; speaker honoraria from AstraZeneca, GlaxoSmithKline, Chiesi, Boehringer Ingelheim, and Sanofi; travel support from AstraZeneca, Boehringer Ingelheim, and Sanofi; and advisory board participation for GlaxoSmithKline, Sanofi-Regeneron, and AstraZeneca, outside the submitted work. MEW has received consulting, advisory, or speaking honoraria from Abbvie, Allakos, Amgen, Apogee, Areteia Therapeutics, Arrowhead Pharmaceutical, AstraZeneca, Avalo Therapeutics, Belenos Bio, Celldex, Connect Biopharma, Cytoreason, Eli Lilly, Enveda, Equillium, General Mediciens, Gilead, GlaxoSmithKline, Jasper, Kinaset, Kymera, Merck, MyBiometry, Pharming, Phylaxis, Pfizer, Pulmatrix, Rapt Therapeutics, recludix Pharma, Regeneron, Roche Genentech, Sanofi Genzyme, Sentien, Sound Biologics, SpiroMedical, Tetherex Pharmaceuticals, Uniquity Bio, Upstream Bio, Verona Pharma, and Zurabio. He is on the data safety and monitoring board for Sentien. He holds stock options for Upstream Bio and Cellergy. GB has received speaker honoraria from AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Merck Sharp & Dohme, Novartis, and Sanofi-Regeneron, and is past president of the Belgian Respiratory Society. SED received consultancy fees from AstraZeneca. CEB has received grants and consultancy fees from 4D Pharma, Areteia, AstraZeneca, Chiesi, Genentech, GSK, Mologic, Novartis, Regeneron Pharmaceuticals, Roche, and Sanofi. MC has received grants or contracts from American Lung Association, Apogee, AstraZeneca, Celldex, Connect BioPharma, Enveda, Gala Therapeutics, Genentech, GSK, Kymera, National Institutes of Health, Nacion, Novartis, PCORI, Pfizer, Pulmatrix, Sanofi-Aventis, Shionogi, Teva, and Theravance Biopharma. He has also received consulting fees from Allakos, Amgen, Apogee, Apreo Health, Arrowhead Pharmaceuticals, Blueprint Medicines, Connect BioPharma, Evommune, Genentech, Generate Biomedicines, GSK, Jasper, Johnson & Johnson, Kinaset, Merck, Novartis, OM Pharma, Pfizer, Pioneering Medicines, Sanofi-Aventis, Teva, Third Rock Ventures, Upstream Bio, Verona Pharmaceuticals, and VIDA; honoraria from Amgen, AstraZeneca, Med Learning Group, Regeneron Pharmaceuticals, and Sanofi; and stock options from Aer Therapeutics. NAH has received honoraria for serving as a consultant or advisor to GSK, AstraZeneca, Genentech, Sanofi, Regeneron, Verona, and Amgen and research grant support from GSK, AstraZeneca, Genentech, Regeneron, and Sanofi. DJJ has received advisory board and speakers' fees from AstraZeneca, Boehringer Ingelheim, Novartis, Teva, GSK, Sanofi-Regeneron, and Chiesi. NM is an employee and shareholder of AstraZeneca. AM is an employee of GlaxoSmithKline.

PH is an employee of GlaxoSmithKline and holds shares in GSK. MEH is an employee of Sanofi. RG is an employee of Regeneron and holds shares in the company. CTJH is a former employee of Genentech and no longer holds stock, and is a current employee of AbbVie and owns AbbVie stock. VD is an employee of Novartis. RWB has received institutional research funding from AstraZeneca, Teva, Health Research Council, Cure Kidz, and Perpetual Guardian; personal fees from AstraZeneca, Avillion, and Teva; and is chair of the Asthma Foundation of New Zealand adolescent and adult asthma guidelines, a reviewer for the Global Initiative for Asthma, and a former member of the Global Initiative for Chronic Obstructive Lung Disease board. JKS has received non-restricted research grants from AstraZeneca, European Respiratory Society Severe Heterogeneous Asthma Research collaboration—Patient Centred Clinical Research Collaboration, Register of Adult Patients with Severe Asthma for Optimal Disease Management Foundation, and ZonMw. EWS received consultancy fees from GSK and holds royalties from Springer for the book Clinical Prediction Models. IDP received speaker honoraria, advisory panel honoraria, educational event payments, and meeting sponsorship from AstraZeneca, Aretriea, Circassia, Amgen, Novartis, Chiesi, Sanofi-Regeneron, Menarini, GSK, Teva, Merck, and Genentech, and holds stock options for Upstream Bio and Mybiometry. All other authors declare no competing interests.

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Clinical Trial

NEJM Evid

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. 2026 Oct;5(10):EVIDoa2600231.

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[Metoprolol in Chronic Obstructive Pulmonary Disease without Cardiovascular Disease](#)

[Josefin Sundh](#)¹, [Anders Magnuson](#)², [Marika Kvarnström](#)³, [Folke Sjöberg](#)⁴, [Magnus Ekström](#)^{5,6}, [Johan SanMartin Berglund](#)⁶, [David Ellingsen](#)⁷, [Daniel Wilhelms](#)^{8,9}, [Mikael Hasselgren](#)¹⁰, [Sara Fristorp Cesarini](#)¹¹, [Katarina Berndtsson Blom](#)¹², [Anders Blomberg](#)¹³, [Lowie E G W Vanfleteren](#)^{14,15,16}, [Andreas Palm](#)¹⁷, [Carolina Smith](#)^{2,10}, [Lina Renström](#)^{18,19}, [Jens Ellingsen](#)¹⁷, [Christer Janson](#)¹⁷, [Martin Lundvall](#)²⁰, [Florim Delijaj](#)¹⁸, [Elsa Norberg](#)¹⁰, [Beatrice Larsson](#)²¹, [Taivo Kipper](#)²², [Zaky Chowdhury](#)²³, [Emily Jensen](#)¹⁰, [Henning Stenberg](#)^{24,25}, [Maria Hårdstedt](#)^{26,27,28}, [Zainab Ahmadi](#)⁵, [Kaveh Azizi](#)⁴, [Wolfgang Greger](#)²⁹, [Scott Montgomery](#)^{2,30}, [Ole Frøbert](#)^{31,32,33,34}

Affiliations Expand

- PMID: 42701865
- DOI: [10.1056/EVIDoa2600231](https://doi.org/10.1056/EVIDoa2600231)

Abstract

Background: Beta-blockers may improve outcomes in patients with chronic obstructive pulmonary disease (COPD) without cardiovascular disease, but randomized trials have been inconclusive.

Methods: This was a multicenter, open-label, pragmatic, phase 4 randomized trial. Patients 40 years of age or older with COPD, sinus rhythm, and no cardiovascular disease were randomly assigned in a 1:1 ratio to receive metoprolol, at a target dose of 100 mg daily, in addition to standard care or to receive standard care alone. The primary end point was the time to the first occurrence of a COPD exacerbation, cardiovascular event, or death during 1 year of follow-up.

Results: A total of 1695 patients underwent random assignment; their mean age was 70 years, and 62% were female. The primary end point occurred in 27% of patients assigned to receive metoprolol and in 30% assigned to receive standard care (hazard ratio, 0.87; 95% confidence interval [CI], 0.73 to 1.05; P=0.14). The corresponding hazard ratios were 0.88 (95% CI, 0.72 to 1.06) for COPD exacerbations, 0.73 (95% CI, 0.48 to 1.11) for cardiovascular events, 0.92 (95% CI, 0.48 to 1.77) for death, and 0.87 (95% CI, 0.58 to 1.28) for exacerbations requiring hospitalization. Serious adverse events occurred in 80 (9.4%) of 848 participants in the metoprolol group and 66 (7.8%) of 847 participants in the standard care group. Nonserious adverse events occurred in 293 (34.6%) of 848 patients in the metoprolol group and 247 (29.2%) of 847 in the standard care group.

Conclusions: Among patients with COPD and no cardiovascular disease, metoprolol did not significantly improve the time to a composite of exacerbations, cardiovascular events, or death. (Funded by research grants from the Swedish Research Council and others; ClinicalTrials.gov number, [NCT03566667](https://clinicaltrials.gov/ct2/show/study/NCT03566667)).

Comment in

- [Beta-Blockers in COPD - Getting to the Heart of the Issue.](#)

Wade RC, Dransfield MT. NEJM Evid. 2026 Oct;5(10):EVIDe2600306. doi: 10.1056/EVIDe2600306. Epub 2026 Sep 6. PMID: 42701866 No abstract available.

Supplementary info

Publication types, MeSH terms, Substances, Associated dataExpand

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Editorial

NEJM Evid

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[Beta-Blockers in COPD - Getting to the Heart of the Issue](#)

[R Chad Wade](#) ^{1 2 3}, [Mark T Dransfield](#) ^{1 2 3}

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- PMID: 42701866
- DOI: [10.1056/EVIDe2600306](https://doi.org/10.1056/EVIDe2600306)

No abstract available

Comment on

- [Metoprolol in Chronic Obstructive Pulmonary Disease without Cardiovascular Disease.](#)

Sundh J, Magnuson A, Kvarnström M, Sjöberg F, Ekström M, Berglund JS, Ellingsen D, Wilhelms D, Hasselgren M, Cesarini SF, Blom KB, Blomberg A, Vanfleteren LEGW, Palm A, Smith C, Renström L, Ellingsen J, Janson C, Lundvall M, Delijaj F, Norberg E, Larsson B, Kipper T, Chowdhury Z, Jensen E, Stenberg H, Hårdstedt M, Ahmadi Z, Azizi K, Greger W, Montgomery S, Fröbert O. NEJM Evid. 2026 Oct;5(10):EVIDo2600231. doi: 10.1056/EVIDo2600231. Epub 2026 Sep 6. PMID: 42701865 Clinical Trial.

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Meta-Analysis

Emerg Med Australas

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doi: 10.1111/1742-6723.70350.

[High-Flow Nasal Oxygen Versus Conventional Oxygen Therapy and Non-Invasive Ventilation for Acute Respiratory Failure in the Emergency Department: A Systematic Review and Meta-Analysis](#)

[Rupert Phillips](#)¹, [Adrianna Klejnotowska](#)², [Harry Claxton](#)³, [Matthew Cadd](#)⁴

Affiliations Expand

- PMID: 42728228
- PMCID: [PMC13569469](#)
- DOI: [10.1111/1742-6723.70350](#)

Abstract

This systematic review and meta-analysis compares the use of high-flow nasal oxygen (HFNO) with conventional oxygen therapy (COT) and non-invasive ventilation (NIV) in the management of acute respiratory failure (ARF) in the emergency department (ED). A comprehensive search of relevant sources was undertaken. Randomised controlled trials (RCTs) assessing adult patients (≥ 18 years) treated in the ED for ARF and comparing HFNO to COT/NIV were included. The primary outcome was the need for endotracheal intubation and mechanical ventilation (IMV). Secondary outcomes included physiological and biochemical parameters, ICU admission, hospital length of stay, dyspnoea scores and mortality. A total of 17 RCTs (1955 patients) were included. There was a significant reduction in IMV favouring the HFNO group compared to COT and NIV (RR 0.64, 95% CI 0.47-0.88). HFNO showed significant improvements in RR, SpO₂, PaO₂ and Modified Borg Dyspnoea Scale. Subgroup analysis showed reduced rates of IMV with HFNO compared to COT (RR 0.61, 95% CI 0.41-0.91), but not compared to NIV (RR 0.69, 95% CI 0.42-1.14). HFNO additionally showed a reduction of IMV compared to NIV and COT in undifferentiated patients (RR 0.61, 95% CI 0.41-0.93), but not in exacerbations of COPD or acute heart failure. Ten of the 17 studies had at least some concern for risk of bias, with several analyses having notable heterogeneity.

HFNO showed a significant reduction in rates of IMV, improvement in peripheral oxygen saturations, PaO₂, respiratory rate and patient dyspnoea scores compared to COT and NIV.

Keywords: HFNO; NIV; emergency; oxygen; respiratory.

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Conflict of interest statement

The authors declare no conflicts of interest.

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- [5 figures](#)

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Cite

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MedComm (2020)

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[Improvements With Tiotropium Maintenance Therapy in COPD Patients Without Dyspnea](#)

[Zihui Wang](#) ^{#1}, [Junfeng Lin](#) ^{#1}, [Guannan Cai](#) ^{#1}, [Fan Wu](#) ^{1,2}, [Zhishan Deng](#) ¹, [Qi Wan](#) ¹, [Gaoying Tang](#) ¹, [Cuigiong Dai](#) ¹, [Lifei Lu](#) ¹, [Kunning Zhou](#) ¹, [Xiaohui Wu](#) ¹, [Suyin Huang](#) ^{1,2}, [Fangyan Wu](#) ¹, [Nanshan Zhong](#) ^{1,2}, [Yumin Zhou](#) ^{1,2}, [Pixin Ran](#) ^{1,2}

Affiliations Expand

- PMID: 42756486
- PMCID: [PMC13583477](#)
- DOI: [10.1002/mco2.71001](#)

Abstract

Current Global Initiative for Chronic Obstructive Lung Disease (GOLD) recommendations emphasize symptom-driven management, which may limit the use of maintenance bronchodilator therapy in patients without dyspnea. In this exploratory post hoc analysis of the tiotropium in early-stage chronic obstructive pulmonary disease (Tie-COPD) trial, we assessed tiotropium in 305 patients with mild-to-moderate chronic obstructive pulmonary disease (COPD) and a modified Medical Research Council dyspnea score of 0 (157 tiotropium, 148 placebo). Over 2 years, tiotropium maintained a higher pre-bronchodilator forced expiratory volume in 1 s (FEV₁) than placebo (adjusted between-group differences 143-183 mL; all $p < 0.001$). The lung function benefit was similar across subgroups defined by age, body mass index, symptom burden, blood eosinophil count, GOLD stage, and smoking (all p for interaction >0.05). The annual exacerbation rate was lower with tiotropium (adjusted incidence rate ratio 0.51, 95% confidence interval [CI] 0.32, 0.82; $p = 0.005$), as was the risk of a first clinically important deterioration (adjusted hazard ratio 0.55, 95% CI 0.43, 0.70; $p < 0.001$), whereas COPD assessment test and clinical COPD questionnaire scores did not differ. These hypothesis-generating findings indicate that tiotropium may provide benefits in lung function and exacerbations in COPD without dyspnea, suggesting that a strictly symptom-based treatment criterion warrants prospective reevaluation.

Keywords: chronic obstructive pulmonary disease; clinically important deterioration; exacerbations; lung function; non-dyspneic; tiotropium.

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Conflict of interest statement

The authors declare no conflicts of interest.

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Cite

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Review

Eur J Clin Invest

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doi: 10.1111/eci.70256.

Updates in COPD Management: From Inflammatory Pathways to Targeted Therapies

Sasha Raman¹, Sreya Rahman¹, Francesca Polverino¹, Muhammad Adrish¹

Affiliations Expand

- PMID: 42773542
- PMCID: [PMC13598273](#)
- DOI: [10.1111/eci.70256](#)

Abstract

Background: Chronic obstructive pulmonary disease (COPD) is a heterogeneous respiratory disorder driven by neutrophilic and eosinophilic inflammation, structural changes, and airflow limitation. Shared pathophysiology makes cardiovascular disease a prevalent COPD comorbidity, necessitating an integrated cardiopulmonary assessment. Screening questionnaires may aid early COPD detection. CT imaging can supplement spirometry to characterise structural changes. Recent advances have shifted COPD management toward phenotype-directed approaches that incorporate novel biomarkers and emerging targeted therapies.

Methods: This narrative review summarises recent advances in COPD management. Relevant literature was identified through database searches focusing on COPD guidelines, randomised controlled trials, systematic reviews, and emerging therapies.

Results: Current management emphasises smoking and e-cigarette cessation, vaccination against respiratory pathogens, and early recognition of disease phenotypes. Blood eosinophils and other biomarkers correlate with corticosteroid responsiveness. Dual long-acting bronchodilator therapy (LABA/LAMA) remains foundational for maintenance treatment, while triple therapy (ICS/LABA/LAMA) reduces exacerbations in patients with recurrent exacerbations and eosinophilic inflammation. Advances in targeted therapies include biologics such as dupilumab and mepolizumab that improve outcomes in patients with eosinophilic COPD. Phosphodiesterase inhibitors provide additional therapeutic options including ensifentrine, which combines bronchodilator and anti-inflammatory effects, and roflumilast, which reduces frequent exacerbations and chronic bronchitis. Emerging therapies that target inflammatory pathways including tezepelumab, and IL-33 inhibitors such as astegolimab, itepekimab, and tozorakimab, are under investigation.

Conclusion: COPD management is evolving toward precision medicine, guided by inflammatory phenotypes, biomarkers, and individualised risk profiles. Continued investigation into targeted biologics, anti-inflammatory agents, and incorporating biomarkers into clinical practice may improve outcomes and reduce disease burden.

Keywords: biologic therapy; biomarkers; chronic obstructive pulmonary disease (COPD); eosinophilic inflammation; phenotype-directed treatment; phosphodiesterase inhibitors.

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Conflict of interest statement

The authors declare no conflicts of interest.

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J Cachexia Sarcopenia Muscle

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. 2026 Oct;17(5):e70381.

doi: 10.1002/jcsm.70381.

[The Clinical Characteristic and Prognostic Value of Frailty in Elderly COPD Patients](#)

[Tao Li](#)¹²³⁴, [Ping Zhang](#)¹²³⁴, [Qing Song](#)¹²³⁴, [Cong Liu](#)¹²³⁴, [Ling Lin](#)¹²³⁴, [Yugin Zeng](#)¹²³⁴, [Ping Chen](#)¹²³⁴

Affiliations Expand

- PMID: 42786423
- PMCID: [PMC13612742](#)
- DOI: [10.1002/jcsm.70381](#)

Abstract

Background and objective: Frailty, as one of the extrapulmonary comorbidities of chronic obstructive pulmonary disease (COPD), is highly prevalent in COPD patients. The primary objective of this research was to assess how frailty influences subsequent exacerbation and augments the predictive capacity of dyspnoea or the exacerbation history among elderly COPD patients.

Methods: The elderly COPD patients in this study were registered in the RealDTC study from June 2023 to March 2024. The Fried frailty phenotype was used to evaluate frailty, and patients were classified as robust, pre-frail or frail. A Modified Medical Research Council Dyspnea Scale (mMRC) score of ≥ 2 was defined as more dyspnoea. For a risk index involved with frailty, dyspnoea and the exacerbation history, different scores were assigned to each factor. After 1 year of follow-up, moderate to severe exacerbations and all-cause mortality were recorded.

Results: In total, 466 elderly patients were enrolled. Their mean age was 71.2 ± 4.5 years, with 89.0% male and 79.0% smokers. The mean COPD Assessment Test (CAT) score and forced expiratory volume in 1 s (FEV_1)/forced vital capacity (FVC) were 14.1 ± 6.5 and 50.2 ± 11.6 , respectively. Among all patients, 255 (54.7%) were in pre-frailty and 132 (28.3%) were in frailty. Age (odds ratio [OR] = 1.135, 95% confidence interval [95%CI] = 1.060-1.216) and dyspnoea (OR = 3.654, 95%CI = 2.106-6.340) were correlated with pre-frailty, and age (OR = 1.269, 95%CI = 1.120-1.438), dyspnoea (OR = 37.959, 95%CI = 12.694-113.503), educational level (OR = 0.303, 95%CI = 0.111-0.829), $FEV_1\%$ predicted (OR = 0.976, 95%CI = 0.955-0.998) and BMI (OR = 0.845, 95%CI = 0.753-0.948) were independently associated with frailty in elderly COPD patients (all $p < 0.05$). The elderly COPD patients with pre-frailty (OR = 2.182, 95% CI = 1.081-4.405) or frailty (OR = 3.377, 95%CI = 1.614-7.063) had an increased risk for future frequent exacerbation. Regarding all-cause mortality, frailty has less effect on it in the 1-year follow-up of elderly COPD patients. By the ROC curve, frailty has the capacity (area under curve [AUC] = 0.607) to predict future exacerbation in elderly COPD patients. The combination of frailty and dyspnoea or the exacerbation history exhibited better predictive abilities than dyspnoea or the exacerbation history alone for future exacerbation, respectively (all $p < 0.05$).

Conclusion: Frail elderly COPD patients present older age, lower BMI, poorer educational level, heavier symptom burden and worse pulmonary function. As a key COPD comorbidity, frailty increases the risk of future exacerbation, and combining it with dyspnoea or exacerbation history improves the predictive value for subsequent exacerbation.

Keywords: COPD; dyspnoea; exacerbation; frailty.

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Conflict of interest statement

The authors declare no conflicts of interests.

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ERJ Open Res

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. 2026 Sep 28;12(5):01606-2025.

doi: 10.1183/23120541.01606-2025. eCollection 2026 Sep.

[Pulmonary vascular reactivity in severe pulmonary hypertension associated with COPD](#)

[Etienne-Marie Jutant](#)^{1 2}, [Benoit Delarche](#)¹, [Magali Croquette](#)³, [Antoine Beurnier](#)^{4 5 6}, [Alexandre Diaz](#)^{7 8 9}, [Vanessa Bironneau](#)^{1 2}, [Fabrice Caron](#)¹, [Marianne Riou](#)^{10 11}, [Athénaïs Boucly](#)^{5 6 12}, [Xavier Jaïs](#)^{5 6 12}, [Laurent Savale](#)^{5 6 12}, [Olivier Sitbon](#)^{5 6 12}, [Laurent Bertoletti](#)^{7 8 9}, [Marc Humbert](#)^{5 6 12}, [David Montani](#)^{5 6 12}

Affiliations Expand

- PMID: 42807362
- PMCID: [PMC13617601](#)
- DOI: [10.1183/23120541.01606-2025](#)

Abstract

Rationale: Severe pulmonary hypertension (PH) is a rare clinically significant complication of COPD. The prognostic relevance of acute pulmonary vasoreactivity is well defined in pulmonary arterial hypertension (PAH) but remains poorly understood in PH-COPD.

Methods: We reported in a retrospective cohort study the clinical, functional and haemodynamic characteristics, the response to PAH-approved drugs, and the overall survival of patients with severe PH-COPD from the French PH National Referral Centre, according to acute pulmonary vasoreactivity testing. The acute vasodilator response was defined as the per cent decrease in pulmonary vascular resistance (PVR) during nitric oxide (NO) testing (Δ PVR post-NO).

Results: 42 patients (female/male ratio 0.2, aged 65 (59-71) years) with severe PH-COPD (PVR 7.4 (6.2-9.3) WU, forced expiratory volume in 1 s 61 (50-84)%, diffusing capacity of the lung for carbon monoxide (D_{LCO}) 24 (18-38)%) underwent NO testing at diagnosis. During NO testing, PVR decreased significantly from 7.4 (5.1-9.3) to 6.1 (5.0-8.5) WU ($p < 0.0001$). An acute NO response (Δ PVR post-NO $\geq 19\%$) was associated with improved survival at 1, 3 and 5 years (93%, 70% and 61%) compared with patients with Δ PVR post-NO $< 19\%$ (44%, 38% and 19%; $p = 0.01$). Amongst 28

patients receiving PAH-approved drugs, Δ PVR post-NO correlated with PVR change at first reassessment.

Conclusion: In severe PH-COPD, acute pulmonary vasoreactivity is associated with improved long-term survival and a better response to PAH-approved therapies. Further studies are warranted to confirm that acute NO testing may help identify a specific PH-COPD subgroup likely to benefit from PAH-approved treatment.

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Conflict of interest statement

Conflict of interest: E-M. Jutant reports grants from Agence Nationale de la Recherche; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Boehringer, Chiesi, GSK, Merck MSD and AstraZeneca; and support for attending meetings from Janssen and MSD. B. Delarche reports payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Chiesi. M. Croquette reports receiving support for attending meetings from MSD. F. Caron reports payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events from GSK, Chiesi, AstraZeneca, CSL-Behring and ADS. M. Riou reports consultancy fees from Ferrer, MSD France and Boehringer Ingelheim; and payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from MSD France and Menarini. A. Boucly reports grants from Accelaron, Janssen and MSD; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Janssen, Merck, AOP Orphan, Ferrer, Gossamer, AstraZeneca and United Therapeutics; and support for attending meetings and/or travel from Janssen, MSD, Ferrer and AOP Orphan. X. Jaïs reports grants from Janssen, Bayer HealthCare; consultancy fees from MSD; and payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from MSD. L. Savale reports grants from Accelaron, Janssen and MSD; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events Janssen and Merck; and support for attending meetings from Janssen and MSD. O. Sitbon reports grants from AOP Orphan, Ferrer, Gossamer Bio, Janssen and MSD; consultancy fees from AOP Orphan, Ferrer, Gossamer Bio, Janssen, Liquidia, MSD, Pulmovant, Respira Therapeutics and United Therapeutics; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Aerovate, AOP Orphan, Janssen, Ferrer and MSD; and participation on a data safety monitoring or advisory board for Altavant/Enzyvant, Gossamer Bio and Respira Therapeutics. L. Bertoletti reports grants from Bayer and MSD; consultancy fees from BMS/Pfizer, MSD and Leo-Pharma; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from BMS/Pfizer, MSD and Leo-Pharma; support for attending meetings from BMS/Pfizer, MSD and Leo-Pharma; and participation on a data safety monitoring or advisory board for Bayer. M. Humbert reports grants from Merck and Gossamer; consultancy fees from 35 Pharma, AllRock, AOP Orphan, Chiesi, Ferrer, Gossamer, Inhibikase, Johnson & Johnson, Keros, Liquidia, Merck, Novartis, Regeneron, Respira, Pfizer, Pulmovant and United Therapeutics; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Merck; participation on a data safety monitoring or advisory board for 35 Pharma, Aerovate, Janssen, Inhibikase, Keros, Merck,

Novartis and United Therapeutics. D. Montani is an associate editor of this journal. The remaining authors have nothing to disclose.

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- [5 figures](#)

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. 2026 Sep 28;12(5):00195-2026.

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[Healthcare journey of preterm-born adults with respiratory disease: the EMPOWER survey](#)

[Federico Bianco](#)¹, [Lauren Ingledow](#)², [Silke Mader](#)³, [Laura Costa](#)¹, [Ulrica Scaffidi-Argentina](#)¹, [Xabier Murgia](#)⁴, [Anna Lavizzari](#)⁵, [Daiana Stolz](#)^{6,7}, [Alberto Papi](#)⁸, [Alvar Agustí](#)^{9,10}, [Eugenio Baraldi](#)¹¹

Affiliations Expand

- PMID: 42807378
- PMCID: [PMC13617606](#)
- DOI: [10.1183/23120541.00195-2026](#)

Abstract

Background: Preterm birth is a recognised risk factor for lung disease later in life. However, awareness of this risk among preterm-born adults and whether it is discussed with their treating physicians is unknown. The EMPOWER survey assessed awareness of the preterm status among preterm-born adults with asthma and COPD and evaluated its consideration in disease management.

Methods: Preterm-born subjects aged ≥ 18 years with physician-diagnosed asthma and/or COPD from France, Germany, Spain, the UK and the US completed a 34-item online questionnaire. The survey covered sociodemographics, medical history, awareness of perinatal events and interactions with healthcare providers.

Results: Of 3175 individuals who initiated the survey, 301 participants (median age 55 years, interquartile range 39-64 years) were included in the final analysis (9.5% response rate). Most respondents knew their gestational age (87%) and birthweight (89%), primarily from parents and caregivers (81%), with just 19% obtaining information from medical records. Over half (58%) reported receiving neonatal intensive care, most commonly assisted ventilation (35%) and nutritional support (24%). While 54% considered preterm birth relevant to respiratory management, 59% had not disclosed this history to their physician. Only 24% reported spontaneous disclosure and just 11% shared the history in response to physician inquiry. Paediatric monitoring was reported by 45%, but follow-up rarely extended into adulthood.

Conclusion: Although preterm-born adults with obstructive respiratory disease are aware of their neonatal history, it is seldom integrated into adult respiratory care. Limited patient disclosure, infrequent physician inquiry and lack of structured long-term follow-up likely contribute to this gap.

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Conflict of interest statement

Conflict of interests: F. Bianco, L. Costa and U. Scaffidi-Argentina are employees of Chiesi Farmaceutici. L. Ingledow reports no conflicts of interest. S. Mader has not received any personal honoraria or fees related to the EMPOWER study; the Global Foundation for the Care of Newborn Infants received financial contributions from Chiesi to support the questionnaire dissemination and participation in the project's Advisory Board. X. Murgia served as a consultant for Chiesi Farmaceutici in relation to the EMPOWER study. A. Lavizzari reports consultancy activities with Chiesi Farmaceutici, Vyaire Medical, ZOLL and Getinge. D. Stolz reports personal fees from Chiesi Farmaceutici related to this manuscript, and personal fees for lectures and/or advisory board participation from AstraZeneca AG, Sanofi, Novartis AG, GSK AG, Roche AG, Chiesi Farmaceutici S.p.A., Boehringer Ingelheim, Insmed, Pfizer and Vifor AG, outside the submitted work. A. Papi declares payments to his institution from Chiesi, AstraZeneca, GSK and Sanofi; consultancy fees from Chiesi, AstraZeneca, GSK, Sanofi/Regeneron, Iqvia, Avillion, Moderna and Zentiva; and payment or honoraria for lectures, presentations and speakers' bureaus from Chiesi, AstraZeneca, GSK, Zambon, Sanofi, Regeneron and Avillion. A. Agustí reports grants from AstraZeneca, GSK and Menarini; honoraria for lectures from AstraZeneca, Chiesi, Cipla, GSK, Glenmark, Kamada, Menarini, Roche, Sanofi and Zambon; and participation on scientific advisory boards for AstraZeneca, Chiesi, GSK and Menarini. E. Baraldi reports personal fees from Chiesi Farmaceutici for lectures and/or advisory board participation, as well as personal fees from Sanofi, AstraZeneca and MSD, outside the submitted work.

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- [4 figures](#)

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. 2026 Sep 28;12(5):00472-2026.

doi: 10.1183/23120541.00472-2026. eCollection 2026 Sep.

[Comment on: Rectifying COPD management: a critical analysis of the global initiative for chronic obstructive lung disease strategy](#)

[Umberto Semenzato](#)^{1,2}, [Ylenia Padrin](#)¹, [Daniele Previtero](#)¹, [Mariaenrica Tinè](#)¹, [Erica Bazzan](#)¹, [Graziella Turato](#)¹

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- PMID: 42807840
- PMCID: [PMC13617599](#)
- DOI: [10.1183/23120541.00472-2026](#)

Abstract

COPD diagnosis should move beyond spirometry toward a multidimensional framework integrating symptoms, imaging and biology, enabling better recognition of disease overlap and more precise, treatable trait-based management <https://bit.ly/4sKXmyv>.

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Conflict of interest statement

Conflict of interest: U. Semenzato has received honoraria for lectures or consultancy from AstraZeneca, Chiesi Farmaceutici, GlaxoSmithKline, Insmmed, MSD, Menarini, Sanofi, Sanofi Suisse and Zambon; and acknowledges financial support from AstraZeneca, Chiesi Farmaceutici, Insmmed and Menarini for registration and travelling to medical congresses. All other authors declare no conflicts of interest.

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Am J Respir Crit Care Med

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. 2026 Sep 30:aamag508.

doi: 10.1093/ajrccm/aamag508. Online ahead of print.

[Trends in Long-Term Oxygen Therapy Use and Modality Among Medicare Beneficiaries with COPD, ILD, and PH](#)

[Darshali A Vyas](#)^{1,2}, [Sydney B Montesi](#)², [Josanna Rodriguez-Lopez](#)², [ZhaoNian Zheng](#)¹, [Jennifer P Stevens](#)³, [Rishi K Wadhera](#)^{1,4,5}

Affiliations Expand

- PMID: 42813981
- DOI: [10.1093/ajrccm/aamag508](#)

No abstract available

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Cite

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Eur Radiol

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. 2026 Sep 30.

doi: 10.1007/s00330-026-12868-y. Online ahead of print.

[Radiologist and AI performance in detecting mucus plugs on chest CT](#)

[Soonho Yoon](#)¹, [Seth J Kligerman](#)², [Samuel R Friedlander](#)³, [Rūdolfs Latišenko](#)⁴, [Jean-Paul Charbonnier](#)⁴, [Harm Tiddens](#)^{4,5}, [David A Lynch](#)², [Stephen M Humphries](#)²

Affiliations Expand

- PMID: 42814120
- DOI: [10.1007/s00330-026-12868-y](#)

Abstract

Objectives: To compare automated mucus plug detection with radiologist evaluation, assess AI-assisted detection, and examine associations of algorithm-derived airway obstruction burden with COPD severity.

Materials and methods: This retrospective analysis included 278 COPD Gene participants selected across never-smokers, smokers with preserved ratio-impaired spirometry, and GOLD stages 0-4. An AI tool generated candidate plugs. Two thoracic radiologists independently identified plugs in unaided and AI-assisted sessions. A third thoracic radiologist adjudicated all candidates as the reference. Patient- and plug-level performance, observer agreement, false-positive detection, and rank-transformed associations with pulmonary function, CT parameters, and clinical severity were evaluated.

Results: Reference mucus plugs were present in 114/278 participants (41%). Patient-level AI sensitivity was lower than R1 (68.4% vs 86.8%; $p < 0.001$) but not different from R2 (68.4% vs 79.8%; $p = 0.141$), whereas specificity was similar across approaches (95.7% vs 98.8%-100.0%). Plug-level AI sensitivity was lower than both readers (34.8% vs 58.9% for R1 and 55.6% for R2; both $p < 0.001$). AI assistance improved readers' plug-level sensitivity (63.6-68.6%; $p \leq 0.004$). AI-reader agreement was good (κ , 0.62-0.69), and inter-reader agreement improved with AI (κ , 0.70 vs 0.78; $p < 0.001$). These non-reference-positive AI detections (0.396/scan) were mostly marked bronchial wall thickening or partially occlusive mucus. They were independently associated with worse airflow limitation, CT emphysema, Pi10, and clinical severity after accounting for true-positive burden, improving model fit (ΔR^2 , 0.03-0.05).

Conclusion: AI was less sensitive than radiologists but had similar specificity for mucus plug detection. AI assistance improved reader sensitivity and agreement. Additional algorithm-detected airway abnormalities remained associated with airway disease severity.

Key points: Question Automated mucus plug detection on chest CT may enable standardized COPD assessment, but independent validation against radiologist assessments remains limited. Findings Artificial intelligence showed lower sensitivity than radiologists but similar patient-level specificity on chest CT, and assistance improved sensitivity and inter-reader agreement. Clinical relevance Automated mucus plug analysis may support standardized airway obstruction burden assessment in COPD research and clinical trials while retaining radiologist oversight.

Keywords: Airway obstruction; Artificial intelligence; Chronic obstructive; Pulmonary disease; Tomography, X-ray computed.

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Conflict of interest statement

Compliance with ethical standards. Guarantor: The scientific guarantor of this publication is Soonho Yoon. **Conflict of interest:** R.L., J.-P.C., and H.T. are affiliated with Thirona, which developed the LungQ platform used in this study. S.Y. holds stocks in MEDICAL IP, outside this work. The remaining authors declare no competing interests. **Statistics and biometry:** One of the authors has significant statistical expertise. No complex statistical methods were necessary for this paper. **Informed consent:** Written informed consent was obtained from all participants in the COPDGene study. **Ethical approval:** Institutional Review Board approval was obtained at each participating COPDGene site. **Study subjects or cohorts overlap:** Because this project uses COPDGene data, there is potential subject overlap with prior COPDGene publications that have examined mucus plugs and related clinical outcomes. However, the present work is distinct in its specific aim and design: it focuses on independent validation of automated mucus plug detection against an adjudicated radiologist reference standard, direct comparison of AI and radiologist performance at both the patient and plug levels, and evaluation of AI-assisted reader performance. **Methodology:** Retrospective Observational diagnostic reader study Multicenter study/performed at one institution

Comment in

- [Artificial intelligence for mucus plug assessment: toward a new generation of airway imaging biomarkers.](#)

Lee JE.Eur Radiol. 2026 Oct 1. doi: 10.1007/s00330-026-12869-x. Online ahead of print.PMID: 42816589 No abstract available.

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Nature

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. 2026 Sep 30.

doi: 10.1038/s41586-026-11060-y. Online ahead of print.

[Type 2 immune history trains lung macrophages for viral disease tolerance](#)

[Payal Damani-Yokota](#)¹, [Yavor Yordanov](#)^{2 3 4}, [Eduardo D Bernier](#)¹, [Chaitra Sreenivasaiiah](#)⁵, [Alireza Khodadadi-Jamayran](#)⁵, [Matthias C Kugler](#)⁶, [Stephen T Yeung](#)^{1 7}, [Stacey Bartlett](#)⁸, [Valeria Mezzano](#)⁹, [Eric Bartnicki](#)¹, [Mingjun Liu](#)⁹, [Fei Chen](#)^{10 11}, [William C Gause](#)^{10 11}, [Aristotelis Tsirigos](#)^{5 12}, [Iannis Aifantis](#)^{9 13}, [Mila B Ortigoza](#)⁸, [Bettina Nadorp](#)¹², [Musa M Mhlanga](#)^{2 3 4}, [Kamal M Khanna](#)^{14 15}

Affiliations Expand

- PMID: 42816626
- DOI: [10.1038/s41586-026-11060-y](#)

Abstract

Severe respiratory viral disease varies widely among individuals and often reflects immunopathology rather than inadequate pathogen control, suggesting that previous immune history can prime the lungs towards disease tolerance. Here we show that nerve- and airway-associated macrophages (NAMs), a subset of interstitial macrophages, expand ephemerally after type 2 inflammation induced by *Nippostrongylus brasiliensis*. We therefore hypothesized that NAMs acquire epigenetically imprinted trained immunity and tested this using a heterologous challenge model in which mice that were previously infected with *N. brasiliensis* were challenged 4-6 weeks later with lethal H1N1 influenza. All of the *N. brasiliensis*-conditioned mice survived, whereas all of the unconditioned controls succumbed by days 5-6. Protection occurred without reduced viral burden or enhanced T cell responses, instead tracking with reduced immunopathology, amplified type 2 cues, increased efferocytosis and accelerated tissue repair. Using NAM-DTR mice, we show that conditioned NAMs are necessary and sufficient for protection: depletion or replacement with unconditioned NAMs abrogated survival, whereas adoptive transfer of conditioned NAMs conferred tolerance without enhancing viral clearance. Genomic analyses implicated an IL-4-STAT6-PPAR γ and ARG1 chromatin program that imprints a pro-resolving and reparative NAM state driving tissue repair, type 2 immunity and efferocytosis during lethal respiratory viral infections. Finally, meta-analysis of human lung single-cell atlases from cohorts of healthy individuals and individuals with IPF and COPD revealed context-dependent NAM-like repair programs. These findings establish local trained immunity in lung-resident macrophages as a mechanism of disease tolerance and a therapeutic entry point for severe inflammatory respiratory infections.

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Conflict of interest statement

Competing interests: P.D.-Y. and K.M.K. are listed as inventors on a patent application filed by New York University covering technologies described in this work. M.M.M. is scientific founder of Lemba Therapeutics and Myosotix Therapeutics.

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Observational Study

Pulmonology

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. 2026 Dec;32(1):2742051.

doi: 10.1080/25310429.2026.2742051. Epub 2026 Oct 1.

[A pilot study to assess the role of 12-week roflumilast treatment in non-CF bronchiectasis](#)[Wang Chun Kwok¹](#), [Kelvin Kai Wang To²](#), [Frankie Chi Fat Ko¹](#), [Herbert Pang³](#), [Isaac Sze Him Leung⁴](#), [Wai On Tam⁵](#), [Chi Hung Chau⁵](#), [Anthony Shing Yiu Yu⁶](#), [Hon Cheung Fan⁶](#), [Charles Wong⁷](#), [Flora Pui Ling Miu⁷](#), [James Chung Man Ho¹](#)Affiliations [Expand](#)

- PMID: 42821483
- DOI: [10.1080/25310429.2026.2742051](#)

Free article

Abstract

Background: Roflumilast demonstrated anti-inflammatory activity in COPD. While bronchiectasis is also characterised by neutrophilic inflammation, there is a lack of evidence on the use of roflumilast in bronchiectasis.

Methods: An open-label observation study with an exploratory nature was conducted in Hong Kong. The primary outcome measure was 24-hour sputum volume. The extent of airway inflammation was indicated by sputum leucocyte density, pro-inflammatory cytokines and neutrophil elastase. All eligible patients were treated with roflumilast, starting at 250 µg daily with possible escalation to 500 µg daily if tolerated.

Results: A total of 39 patients were started on roflumilast with 24 (61.5%) completed 12 weeks of treatment and 9 of them escalated to 500 µg daily. There were no significant changes in mean daily sputum volume. The median sputum leucocyte density and TNF-α significantly decreased from the recruitment visit to 12 weeks. In extrapolatory analyses, patients with a baseline daily sputum volume ≥ 20 mL might be more likely to respond with a reduction in sputum volume.

Conclusion: Roflumilast treatment in non-CF bronchiectasis could provide anti-inflammatory effects with a significant reduction in sputum leucocyte density and TNF- α level over 12 weeks of treatment. Extrapolatory analyses suggested potential benefits in sputum volume reduction among the subgroup with baseline daily sputum volume ≥ 20 mL.

Keywords: Bronchiectasis; neutrophilic inflammation; roflumilast.

Plain language summary

An open-label observation study was conducted to assess for the role of roflumilast in bronchiectasis. Roflumilast treatment resulted in a significant reduction in sputum leucocyte density and TNF- α level. Sputum volume also significantly decreased among the subgroup with baseline daily sputum volume ≥ 20 mL.

Supplementary info

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Medicine (Baltimore)

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. 2026 Oct 2;105(40):e50912.

doi: 10.1097/MD.00000000000050912.

[Systemic inflammation response index: A good predictor of 30-day all-cause mortality in patients with acute exacerbation of chronic obstructive pulmonary disease](#)

[Yahu Bai¹](#)

Affiliations [Expand](#)

- PMID: 42826271
- DOI: [10.1097/MD.00000000000050912](#)

Abstract

This study aims to explore the association between the systemic inflammation response index (SIRI) and the prognosis of patients with acute exacerbation of

chronic obstructive pulmonary disease (AECOPD) by retrospectively analyzing clinical data derived from the Medical Information Mart for Intensive Care-III (MIMIC-III) database. A total of 426 AECOPD patients were enrolled in this study, among whom 113 died during the 30-day follow-up period, resulting in a mortality rate of 26.6%. Compared with the survival group, patients in the deceased group had higher levels of SIRI (4.19 [2.19-7.68] versus 6.25 (3.09-15.57) $\times 10^9/L$, $P < .001$). X-tile software was utilized to determine the optimal SIRI cutoff value of $10.56 \times 10^9/L$ for predicting 30-day all-cause mortality. Patients were stratified into 2 groups based on this cutoff value: a low SIRI group ($< 10.56 \times 10^9/L$) and a high SIRI group ($\geq 10.56 \times 10^9/L$). Baseline characteristic comparisons demonstrated that patients in the high-SIRI group presented significantly higher 30-day, 90-day, 1-year, and in-hospital mortality than those in the low-SIRI group (all $P < .05$). After adjustment for potential confounders, the Cox proportional-hazards regression model identified elevated SIRI as an independent risk factor for 30-day all-cause mortality (HR = 1.743, 95%CI: 1.169-2.598, $P = .006$), and subgroup analyses confirmed the robustness of this correlation. Additionally, ROC curves showed that the area under the curve (AUC) for SIRI was greater than that for white blood cells and neutrophils (AUC 0.612 vs 0.584; 0.612 vs 0.557), but slightly smaller than that for sequential organ failure assessment (AUC 0.612 vs 0.619). Collectively, our findings indicate that SIRI represents a promising novel inflammatory biomarker for predicting 30-day all-cause mortality among patients with AECOPD.

Keywords: MIMIC-III database; acute exacerbation of chronic obstructive pulmonary disease; prognosis; systemic inflammation response index.

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Conflict of interest statement

The author has no funding and conflicts of interest to declares.

- [32 references](#)

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Observational Study

Medicine (Baltimore)

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. 2026 Oct 2;105(40):e50980.

doi: 10.1097/MD.00000000000050980.

Trends in mortality involving chronic obstructive pulmonary disease and obesity in the United States, 1999-2023: A population-based observational study

Ammaar Ali Khan¹, Syed Azfar Hussain¹, Zainab Binte Ahmad¹, Raqib Ali¹, Hasibullah Aminpoor^{2,3}, Laiba Hanif¹, Muhammad Sameer Khan¹, Arshalooz Mahfooz¹, Muhammad Salik Uddin¹, Shaheer Qureshi¹

Affiliations Expand

- PMID: 42826321
- DOI: [10.1097/MD.00000000000050980](https://doi.org/10.1097/MD.00000000000050980)

Abstract

Chronic obstructive pulmonary disease (COPD) and obesity are major US public health conditions that frequently coexist. Despite adverse respiratory and cardiometabolic effects of obesity, an apparent "obesity paradox," whereby obesity has been associated with lower mortality in some patients with COPD, has been described. National mortality trends involving concurrent COPD and obesity remain poorly characterized. We examined temporal, demographic, and geographic patterns from 1999 to 2023. We conducted a retrospective, population-based analysis of the Centers for Disease Control and Prevention Wide-ranging Online Data for Epidemiologic Research Multiple Cause of Death database. Deaths among adults aged ≥ 25 years listing COPD (International Classification of Diseases, 10th Revision: J40-J44) and obesity (International Classification of Diseases, 10th Revision: E66) were identified. Age-adjusted mortality rates per 100,000 were calculated using direct standardization to the 2000 US population. Joinpoint Regression Program version 5.3.0.0 estimated annual percent changes (APCs) and average annual percent changes with 95% confidence intervals (CIs). Analyses were stratified by age, sex, race/ethnicity, region, urbanization, and state. Among 1,30,958 deaths, the age-adjusted mortality rate increased from 0.78 (95% CI: 0.74-0.82) in 1999 to 2.63 (95% CI: 2.57-2.68) in 2023 (average annual percent change: +5.14%; 95% CI: 4.09-6.21; $P < .001$). After increasing significantly through 2013, mortality increased nonsignificantly during 2013 to 2018 (APC: +2.11%; 95% CI: -0.39 to 4.67), rose markedly during 2018 to 2021 (APC: +17.45%; 95% CI: 10.18-25.19), and declined significantly through 2023 (APC: -13.47%; 95% CI: -18.32 to -8.34). Males and adults aged ≥ 65 years had higher mortality burdens, with variation across racial/ethnic groups, urbanization levels, regions, and states. Interpretation is limited by unavailable individual-level factors, including smoking, COPD severity, comorbidities, and socioeconomic characteristics. Mortality involving concurrent COPD and obesity increased substantially from 1999 to 2023, with marked demographic and geographic variation and an increase during the COVID-19 pandemic. These population-level associations do not establish causality. Integrated pulmonary and metabolic care, targeted prevention, and improved access in underserved communities may help address observed disparities.

Keywords: CDC WONDER; age-adjusted mortality; chronic obstructive pulmonary disease; health disparities; mortality trends; obesity; temporal trends.

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Conflict of interest statement

The authors have no funding and conflicts of interest to declare.

- [50 references](#)

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31

Am J Respir Crit Care Med

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. 2026 Oct 1:aamag538.

doi: 10.1093/ajrccm/aamag538. Online ahead of print.

[Lung Health after Preterm Birth: Knowledge Gaps and Respiratory Care Across the Lifespan](#)

[Joseph M Collaco](#)¹, [Steven H Abman](#)², [Paul E Moore](#)³, [Leif D Nelin](#)⁴, [A Ioana Cristea](#)⁵, [Lauren Ingledow](#)⁶, [Annie Janvier](#)⁷, [Michelle M Kelly](#)⁸, [Stephen E Kirkby](#)⁴, [Sailesh Kotecha](#)⁹, [Enid R Neptune](#)¹, [Francesca Polverino](#)¹⁰, [Sharon A McGrath-Morrow](#)¹¹, [BPD Collaborative Outpatient Committee](#)

Collaborators, Affiliations [Expand](#)

- PMID: 42826512
- DOI: [10.1093/ajrccm/aamag538](#)

Abstract

Prematurity affects approximately 10% of live births worldwide and contributes to substantial short and long-term morbidity, particularly respiratory disease. Approximately 35% of infants born before 32 weeks gestation are diagnosed with bronchopulmonary dysplasia (BPD). Many preterm infants regardless of BPD

diagnosis also develop respiratory problems in both childhood and adulthood, more recently termed as prematurity-associated lung disease (PLD). As survival of preterm infants continues to improve, the lifetime burden of PLD and related health conditions remains high. Optimizing lung growth, minimizing the impact of comorbidities, and improving quality of life are ongoing challenges. Individuals born preterm are also at higher risk for being diagnosed with early-onset chronic obstructive pulmonary disease in adulthood. Despite these public health implications, outpatient management is often variable, and PLD remains underrecognized and heterogeneous across clinical settings. In this expert consensus statement from the BPD Collaborative, we summarize key knowledge gaps and provide pragmatic recommendations to help standardize outpatient care for PLD across the lifespan. Recommendations address models of care delivery, approaches to disease monitoring and management, and the evaluation and treatment of common comorbidities. Given limited high-quality evidence in several domains, many recommendations are necessarily based on expert opinion. Our objectives are to highlight priorities for future research, promote continuity between pediatric and adult care, and support development of evidence-based strategies to reduce underdiagnosis and undertreatment and to improve long-term outcomes for individuals born preterm.

Keywords: Bronchopulmonary dysplasia; adult; guidelines; long-term; prematurity associated lung disease; preterm; recommendations.

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Cite

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Lancet Glob Health

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doi: 10.1016/j.langlo.2026.104055. Online ahead of print.

[The burden and long-term outcomes of diagnosed and underdiagnosed COPD across diverse communities from high-income, middle-income, and low-income countries: the Prospective Urban Rural Epidemiology \(PURE\) study](#)

[MyLinh Duong](#)¹, [Ente Kang](#)², [Sumathy Rangarajan](#)², [Shameena Ramacham Parambath](#)², [Annika Rosengren](#)³, [Sanjeev Nair](#)⁴, [Fernando Lanas](#)⁵, [Xuedi Ma](#)⁶, [Zhiquang Liu](#)⁷, [Lap Ah Tse](#)⁸, [Prem K Mony](#)⁹, [Hassan Mir](#)¹⁰, [Marc Evans M](#)

[Abat¹¹](#), [P V M Lakshmi¹²](#), [Khalid F Alhabib¹³](#), [Batyrbek Assembekov¹⁴](#), [Alvaro Avezum¹⁵](#), [Ahmad Bahonar¹⁶](#), [Olga Barbarash¹⁷](#), [Jephat Chifamba¹⁸](#), [Maria Luz Diaz¹⁹](#), [Mirrakhimov Erkin²⁰](#), [Camilo Felix²¹](#), [Romaina Iqbal²²](#), [Rasha Khatib²³](#), [Patricio Lopez-Jaramillo²⁴](#), [Nafisa Mat-Nasir²⁵](#), [Aytekin Oguz²⁶](#), [Elisabeth Catherina Swart²⁷](#), [Karen Yeates²⁸](#), [Rita Yusuf²⁹](#), [Afzalhussein Yusufali³⁰](#), [Katarzyna Zatońska³¹](#), [Koon K Teo²](#), [Salim Yusuf²](#); [PURE investigators](#)

Collaborators, Affiliations Expand

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- DOI: [10.1016/j.langlo.2026.104055](https://doi.org/10.1016/j.langlo.2026.104055)

Abstract

Background: Airflow obstruction detected on spirometry is a hallmark of chronic obstructive pulmonary disease (COPD) and is needed for the diagnosis of COPD. Sparse data in high-income countries (HICs) have reported high prevalence of underdiagnosed COPD with poor clinical outcomes. Data are missing for low-income and middle-income countries (LMICs) to inform the burden and clinical outcomes of underdiagnosed COPD.

Methods: In this multinational, prospective cohort study, spirometry data were systematically collected from adults (aged 35-70 years) in urban and rural communities across 25 HICs and LMICs. Adults with spirometry airflow obstruction with physician-diagnosed airway diseases were categorised as diagnosed COPD and those without physician-diagnosed airway diseases were categorised as underdiagnosed COPD. Individuals with normal spirometry and no known airway diseases were categorised as no COPD. Data on baseline characteristics were collected via standardised interview questionnaires and follow-up data were collected every 3 years on vital status and clinical events. We examined the association between COPD status with baseline characteristics and follow-up clinical events.

Findings: Between July 11, 2002, and July 28, 2025, we collected data on 119 252 participants (baseline median age 51 years [IQR 43-59], 71 039 [59·6%] females and 48 213 (40·4%) males) with technically acceptable spirometry. The prevalence of airflow obstruction was 9·5% (11 306/119 252), of which 89·2% (10 080/11 306) constituted underdiagnosed COPD. The prevalence of airflow obstruction varied across geographical regions (6·1% [n=521/8601] in southeast Asia to 20·4% [n=785/3846] in sub-Saharan Africa) and was higher in LMICs (9·8% [n=10 120/103 758]) than in HICs (7·7% [n=1186/15 494]), with a prevalence of 90·7% (9175/10 120) for underdiagnosed COPD in LMICs. Baseline characteristics associated with underdiagnosis were younger age (≤ 50 years), low symptom burden, high lung function, being current or never smokers, and living in an LMIC. Compared with no COPD, underdiagnosed and diagnosed COPD were associated with higher mortality (hazard ratio 1·53 [95% CI 1·44-1·63] for underdiagnosed and 2·09 [1·83-2·40] for diagnosed COPD), respiratory events (1·97 [1·82-2·12] for underdiagnosed and 3·70 [3·25-4·21] for diagnosed COPD), and cardiovascular events (1·20 [1·13-1·27] for underdiagnosed and 1·35 [1·17-1·56] for diagnosed COPD). This association was consistent across country-income levels, age groups, smoking status, and symptom burden.

Interpretation: The high prevalence of underdiagnosed COPD and related poor outcomes suggest that a large burden of COPD is under-recognised. Since underdiagnosed COPD is mainly early and mild disease, this presents missed opportunities for early intervention that can modify disease trajectory and improve long-term health outcomes.

Funding: AstraZeneca, Population Health Research Institute, Hamilton Health Sciences Research Institute, the Canadian Institutes of Health Research, Heart and Stroke Foundation of Ontario, Canadian Institutes of Health Research's Strategy for Patient Oriented Research, Ontario SPOR Support Unit, and Ontario Ministry of Health and Long-Term Care.

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Conflict of interest statement

Declaration of interests SY is supported by the Marion W Burke endowed chair of the Heart and Stroke Foundation of Ontario. We declare no competing interests.

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

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Observational Study

Geroscience

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. 2026 Oct;48(5):6871-6885.

doi: 10.1007/s11357-025-02026-5. Epub 2025 Dec 4.

[Multimorbidity, frailty and polypharmacy in European and Asian patients with atrial fibrillation: a comparison of two regional prospective observational registries](#)

[Davide Antonio Mei^{1 2 3}, Marco Proietti^{4 5}, Giulio Francesco Romiti^{3 6}, Tommaso Bucci^{3 7}, Bernadette Corica^{1 3 4}, Alena Shantsila³, Hung-Fat Tse⁸, Giuseppe Boriani¹, Tze-Fan Chao^{9 10}, Gregory Y H Lip^{11 12 13}](#)

Affiliations Expand

- PMID: 41345290
- PMCID: [PMC13601450](#)
- DOI: [10.1007/s11357-025-02026-5](#)

Abstract

Multimorbidity, frailty, and polypharmacy are associated with worse outcomes in patients with atrial fibrillation (AF), leading to 'clinically complex' patient phenotypes. Possible differences between European and Asian patients regarding these aspects have not been studied. We studied AF patients derived from two large prospective observational AF registries, conducted in Europe and Asia. Multimorbidity and polypharmacy were defined according to the number of comorbidities and drugs at baseline. Frailty was defined according to a 40-items frailty index (FI). Prescription of OAC was assessed at baseline. The primary outcome was the composite of all-cause death and major adverse cardiovascular events. European patients had a higher burden of multimorbidity, frailty, and polypharmacy domains compared with Asians. Asian patients with these domains were less likely to be prescribed OAC than Europeans, especially those who were frail. After adjustments, being frail was associated with lower OAC prescription, with Asians less likely prescribed than Europeans (OR 0.34, 95% CI 0.25-0.45 vs. OR 0.47, 95% CI 0.40-0.55, $p_{\text{int}} = 0.037$). Adjusted Cox regression found that multimorbidity, frailty, and polypharmacy domains were associated with a higher risk of the composite outcome. On subgroup analysis, frail Asian patients had a higher risk of the composite outcome ($p_{\text{int}} = 0.007$) than Europeans. Multimorbidity, frailty and polypharmacy have different epidemiological characteristics amongst European and Asian AF patients. Being frail was associated with a higher likelihood of not being prescribed OAC, particularly in Asian patients. The adverse impact of 'clinically complex' patient phenotypes on risks of adverse outcomes was greater in Asian patients than in Europeans.

Keywords: Asia; Atrial fibrillation; Clinical complexity; Europe.

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Conflict of interest statement

Declarations. Ethics and consent to participate declarations: For the EURObservational Research Programme (EORP) Atrial Fibrillation General Long-Term Registry, ethical approval was obtained at both national and institutional levels, and the study complied with the Declaration of Helsinki and EU guidelines for Good Clinical Practice (CPMP/ECH/135/95). For the Asia-Pacific Heart Rhythm Society (APHRS) AF registry, the respective local ethics committees approved the study protocol. Conflict of interest: GFR reports consultancy for Boehringer Ingelheim and an educational grant from Anthos, outside the submitted work. No fees are directly received personally. GB is the Principal Investigator of the ARISTOTELES project (Applying. Artificial Intelligence to define clinical trajectories for personalized prediction and early detection of comorbidity and multimorbidity patterns that received funding from the European Union within the Horizon 2020 research and innovation program (Grant N. 101080189) and reports small speaker fees from Bayer, Boehringer Ingelheim, Boston, BMS, Daiichi, Sanofi, and Janssen outside the submitted work. GYHL: Consultant and speaker for BMS/Pfizer, Boehringer Ingelheim, Daiichi-Sankyo, Anthos. No fees are received personally. He is a National Institute for Health and Care Research (NIHR) Senior Investigator and co-PI of the AFFIRMO project on multimorbidity in AF (grant agreement No 899871), TARGET project on digital twins for personalised management of atrial fibrillation and stroke (grant agreement No 101136244), and ARISTOTELES project on artificial intelligence for the management of chronic long-term conditions (grant agreement No 101080189), which are all funded by the EU's Horizon Europe Research and

Innovation programme. MP: Italian national Principal Investigator of the AFFIRMO project on multimorbidity in atrial fibrillation, which has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 899871. The other authors do not have conflicts of interest to report.

- [Cited by 3 articles](#)
- [52 references](#)
- [5 figures](#)

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2

Geroscience

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. 2026 Oct;48(5):6915-6927.

doi: 10.1007/s11357-025-01980-4. Epub 2025 Dec 6.

[The frailty mortality link in people with chronic diseases pertaining to 13 body organ systems: findings from the UK Biobank study](#)

[Justine Dastouet](#)¹, [Aurore Fayosse](#)¹, [Louis Jacob](#)^{1 2 3}, [Archana Singh-Manoux](#)^{1 4}, [S  verine Sabia](#)^{1 4}, [Benjamin Landr  ](#)⁵

Affiliations Expand

- PMID: 41351715
- PMCID: [PMC13601399](#)
- DOI: [10.1007/s11357-025-01980-4](#)

Abstract

Frailty in older adults, particularly those with chronic diseases, has a robust association with risk of mortality, but whether this is the case in middle-aged adults is unclear. We examined the frailty-mortality association in middle-aged adults with chronic diseases and multimorbidity. Data on Fried's frailty phenotype (robust,

prefrail, frail) and 47 chronic diseases, mapped to 13 body organ systems, was available on 230,960 participants of the UK Biobank study (mean age 57.8, range 38.0-72.0). The mortality follow-up was 13.3 ($\pm$ 2.1) years, and associations with mortality were examined using Cox regression, adjusted for socio-demographic factors and health behaviours. Compared to the robust group, frailty (HR, 2.32 (95% confidence intervals, 2.21; 2.43)) and prefrailty (1.35 (1.31; 1.39)) in those with diseases in any body organ system had a higher risk of mortality. Frailty was associated with a higher mortality risk for all 13 groups (all $p < 0.01$); estimates ranged from 2.25 (2.12; 2.39) for circulatory system diseases to 2.97 (2.60; 3.39) for the eye system. The same was the case for prefrailty; estimates ranged from 1.33 (1.23; 1.43) to 1.61 (1.03; 2.51). Between 19 and 34% of the mortality risk in the 13 disease groups could potentially be explained by frailty/prefrailty. Frailty ($p < 0.01$) and prefrailty ($p < 0.01$) had stronger associations with mortality in those with diseases affecting multiple organ systems. These findings highlight the importance of frailty in middle-aged adults with chronic diseases, suggesting that a third of the excess risk of mortality could potentially be addressed by improving frailty status.

Keywords: Ageing; Chronic disease; Frailty; Mortality; Multimorbidity; UK Biobank.

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Conflict of interest statement

Declarations. Competing interests: The authors declare no competing interests.

- [50 references](#)
- [3 figures](#)

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3

Geroscience

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. 2026 Oct;48(5):7277-7292.

doi: 10.1007/s11357-025-02044-3. Epub 2025 Dec 17.

[Genetic links between multimorbidity and human aging](#)

[Phuong-Anh Dinh¹](#), [HyeRim Han²](#), [Seungsoo Kim²](#), [Qinghua Guo²](#), [Zhengdong D Zhang³](#), [Jan Vijg³](#), [Yousin Suh^{4 5}](#)

Affiliations Expand

- PMID: 41405793
- PMCID: [PMC13601487](#)
- DOI: [10.1007/s11357-025-02044-3](#)

Abstract

The growing epidemiological burden of multimorbidity among older adults underscores an urgent need to develop interventions that can address multiple age-related diseases (ARDs) at once. Yet, the biological mechanisms driving their co-occurrence remain poorly understood. In this study, we conducted a multivariate genome-wide association analysis to dissect the shared genetic architecture of five common ARDs: heart attack, high cholesterol, hypertension, stroke, and type 2 diabetes. We defined this shared genetic component as the multivariate age-related disease factor (mvARD) and identified 263 independent variants across 180 genomic loci associated with mvARD. These variants were significantly enriched for associations with extreme human longevity, lending empirical support for the geroscience hypothesis in humans. Integrative gene prioritization using transcriptome-wide association studies, colocalization analysis, and Mendelian randomization identified four high-confidence genes in blood-DCAF16, PHF13, MGA, and GTF2B-with putative causal roles on mvARD. Using two-sample Mendelian randomization, we also found several modifiable lifestyle factors, including body mass index and dietary intake, that causally influenced the risk for multiple ARDs. Together, our findings revealed a shared genetic basis for common ARDs that overlapped with the biology of human aging and pointed to potential molecular and behavioral targets for delaying disease onset and promoting healthy aging.

Keywords: Age-related disease; Aging; Geroscience; Multimorbidity; Multivariate analysis.

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Conflict of interest statement

Declarations. Ethics statement: Our study exclusively used publicly available, de-identified summary-level data. No individual-level or personally identifiable information was accessed. As such, no ethical approval or informed consent was required. Competing interests: The authors declare no conflicts of interest.

- [Cited by 1 article](#)
- [68 references](#)
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. 2026 Oct 1;31(5):205-214.

doi: 10.1097/MBP.0000000000000807. Epub 2026 May 29.

[The effects of aerobic training on ambulatory blood pressure, blood pressure variability, and arterial stiffness in postmenopausal women with and without multimorbidity: a preliminary study](#)

[Juliene G Costa](#)^{1,2}, [Ana Luiza Amaral](#)^{1,3}, [Caroline P Garcês](#)¹, [Ana Clara R Cunha](#)¹, [Mateus de L Rodrigues](#)⁴, [Julia B Tavares](#)¹, [Victor Hugo V Carrijo](#)^{1,5}, [Cléria Rodrigues Ferreira](#)⁶, [Igor M Mariano](#)¹, [Sebastião Rodrigues Ferreira Filho](#)⁶, [Guilherme M Puga](#)¹

Affiliations Expand

- PMID: 42240036
- DOI: [10.1097/MBP.0000000000000807](#)

Abstract

Background: Multimorbidity represents significant public health challenges, particularly in postmenopausal women, who experience increased risks for cardiovascular and metabolic diseases because of hormonal changes. While exercise therapy has shown promise in enhancing health outcomes for individuals with multimorbidity, evidence of its effectiveness in this specific population remains limited.

Objective: This study investigated the effects of a 12-week aerobic training program on ambulatory blood pressure, blood pressure variability, and arterial stiffness in postmenopausal women with and without cardiometabolic multimorbidity.

Methods: A controlled, quasi-experimental study was conducted with 41 women divided into two groups: SINGLE (one cardiometabolic condition; n = 18) and MULTI (multimorbidity; n = 23). Participants underwent aerobic training three times a week. Ambulatory blood pressure, blood pressure variability, and arterial stiffness were assessed before and after the intervention.

Results: A significant reduction in diastolic nocturnal dipping was observed only in the MULTI group (interaction $P = 0.019$), decreasing from $10 \pm 12\%$ to $7 \pm 9\%$. Both groups showed a significant reduction in systolic (SINGLE: 21 to 8; MULTI: 19 to 7) and diastolic morning surge (SINGLE: 16 to 11; MULTI: 16 to 6) (time $P < 0.001$). No interaction effect was observed in arterial stiffness parameters. An exercise intervention effect ($P = 0.001$) indicated an increase in augmentation index (%) in both groups following aerobic training.

Conclusion: A 12-week aerobic program improved morning surge blood pressure in postmenopausal women. However, the MULTI group showed reduced nocturnal dipping.

Trial registration: ClinicalTrials.gov [NCT05075902](https://clinicaltrials.gov/ct2/show/study/NCT05075902).

Keywords: blood pressure; climacteric; hypertension; insulin resistance; physical training.

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- [61 references](#)

Supplementary info

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Cite

5

Bone

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. 2026 Oct;211:117974.

doi: 10.1016/j.bone.2026.117974. Epub 2026 Jun 13.

[Multimorbidity, physical function, and risk of falls in middle-aged adults](#)

[Phoebe George](#)¹, [Chrianna Bharat](#)², [Kevin Murray](#)¹, [Michael Hunter](#)³, [Mark A Hoey](#)⁴, [Kun Zhu](#)⁵

Affiliations Expand

- PMID: 42288171
- DOI: [10.1016/j.bone.2026.117974](https://doi.org/10.1016/j.bone.2026.117974)

Free article

Abstract

Background: Physical function and multimorbidity are key risk factors for falls in middle-aged adults, but few studies have evaluated these associations in a longitudinal manner. In 3561 participants (1968 females, aged 45-69 years) from the Busselton Healthy Ageing Study, a longitudinal cohort study, we studied the associations of baseline multimorbidity count and patterns with physical function and the subsequent risk of falls at six years.

Method: At baseline, 21 morbidities were assessed and four multimorbidity patterns were identified using latent class analysis. Physical function tests including hand grip-strength (HGS), timed up and go (TUAG) and five times sit to stand (5TSTS) were performed at Phase 1 (baseline) and Phase 2 (average six years) and falls occurring in the previous 12 months were captured through self-report at Phase 2. General linear models and logistic regression were used to evaluate associations, adjusting for sex and baseline covariates.

Results: Mean physical function measures worsened by 6.0% to 23.7% between phases; 950 (26.7%) participants reported at least one fall and 383 (10.7%) reported multiple falls. Increasing multimorbidity count was associated with lower physical function at both phases, greater decline over time (HGS: -0.13 kg, TUAG: +0.08 s, 5TSTS: +0.14 s per unit increase), and greater risk of falling and among fallers having multiple falls (odds ratio (OR): 1.14 and 1.15 per unit increase, respectively). Among the multimorbidity classes, the "cardiometabolic" class had the lowest physical function at both phases and the greatest decline over time (2.8-8.8% greater vs "healthy"), whereas the "non-cardiometabolic" class showed the highest risk of falling and having multiple falls (OR: 1.79 and 2.16 vs "healthy", respectively). Associations with falls risk remained significant after further adjustment of physical function measures of either phase.

Conclusion: Our study underscores the importance of identifying multimorbidity as a risk factor for physical function decline and fall risk in middle-age.

Keywords: Busselton Healthy Ageing Study; Fall; Multimorbidity; Physical function.

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Conflict of interest statement

Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Michael Hunter (BHAS) reports financial support was provided by Government of Western Australia. Michael Hunter (BHAS) reports financial support was provided by Western Australian Future Health Research and Innovation Fund. Michael Hunter (BHAS) reports financial support was provided by Commonwealth of Australia. Michael Hunter (BHAS) reports financial support was provided by City of Busselton. If there are other authors, they 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

MeSH termsExpand

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Cite

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Review

Am J Med Sci

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. 2026 Oct;372(4):291-296.

doi: 10.1016/j.amjms.2026.06.013. Epub 2026 Jun 13.

[Frailty and heart failure: Clinical impact, biomarkers, and phenotypic differences](#)

[Husam Katib](#)¹, [Naushira Pandya](#)², [Vincent Guida](#)², [Hady Masri](#)²

Affiliations Expand

- PMID: 42288260
- DOI: [10.1016/j.amjms.2026.06.013](#)

Abstract

Frailty is a multidimensional geriatric syndrome characterized by reduced physiologic reserve and increased vulnerability to stressors. Its prevalence is particularly high among patients with heart failure (HF), reflecting the interplay between aging, multimorbidity, and chronic cardiovascular disease. Frailty independently predicts poor outcomes, including higher hospitalization rates, mortality, and impaired quality of life. The Fried Frailty Phenotype defines frailty as the presence of three or more of the following five criteria: unintentional weight loss, exhaustion, weakness (grip strength), slow walking speed, and low physical activity. In this review, we explore the complex relationship between frailty and HF, with a focus on pathophysiology, clinical outcomes, biomarkers, and therapeutic considerations. We highlight differences across HF phenotypes-heart failure with reduced ejection fraction (HFrEF), preserved ejection fraction (HFpEF), and mildly reduced ejection fraction (HFmrEF)-underscoring the importance of tailored, phenotype-specific approaches. We also discuss emerging biomarkers including the stress hyperglycemia ratio (SHR) in HFpEF. Finally, we address limitations of current evidence and future directions for integrating frailty assessment into HF management.

Keywords: Biomarkers; Frailty; Geriatric cardiology; HFpEF; HFrEF; Heart failure.

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Conflict of interest statement

Declaration of competing interest The authors declare no conflicts of interest.

Supplementary info

Publication types, MeSH terms, SubstancesExpand

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Cite

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Observational Study

Eur Radiol

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. 2026 Oct;36(10):7928-7939.

doi: 10.1007/s00330-026-12677-3. Epub 2026 Jul 3.

[Body composition's effect on the bone-vascular axis of osteoporosis discovered in AI-based CT analysis of COPD patients](#)

[Bettina K Budai](#)^{1,2}, [Andreas Wagner](#)^{1,2}, [Ondrej Havlicek](#)^{1,2}, [Philip Konietzke](#)^{1,2,3,4,5}, [Franziska C Trudzinski](#)^{2,6}, [Jürgen Biederer](#)^{1,2,7,8}, [Claus P Heußel](#)^{1,2,3}, [Hans-Ulrich Kauczor](#)^{1,2,3}, [Viktoria Palm](#)^{9,10,11}; [COSYCONET study group](#)

Affiliations Expand

- PMID: 42399449
- PMCID: [PMC13574876](#)
- DOI: [10.1007/s00330-026-12677-3](#)

Abstract

Objectives: This study aimed to investigate the effect of body composition on the inverse relationship between vertebral bone density (T12 BMD) and total thoracic vascular calcification (TTVC) in patients with chronic obstructive pulmonary disease

(COPD). Moreover, we aimed to assess whether intermuscular adipose tissue (IMAT) affects the bone-vascular axis.

Materials and methods: Chest CT scans of 539 COPD patients from the multicentric prospective COSYCONET study were retrospectively analyzed using AI-based tools for T12 BMD, TTVC, and volumetric body composition. Multivariable linear regression models were built to investigate the effect of conventional body phenotypes (normal, sarcopenic, non-sarcopenic obesity, and sarcopenic obesity). Stepwise interaction model building included T12 BMD, IMAT, their interaction, adding BMI, clinical and metabolic covariates, lung function, physical performance, and age.

Results: The T12 BMD showed a consistent inverse association with TTVC in all phenotypes, with $\beta = -0.38$ ($p < 0.01$) in normal nutritional status, $\beta = -0.36$ ($p < 0.01$) in sarcopenia, and $\beta = -0.24$ ($p < 0.01$) in non-sarcopenic obesity. However, the phenotype's significant effect was not confirmed in the interaction model. Age and pack-years were associated with calcification, but IMAT remained independently associated ($\beta = 0.15$, 95% CI 0.015-0.28, $p = 0.029$), while the interaction between T12 BMD and IMAT lost significance once age was included.

Conclusion: IMAT index was independently associated with TTVC in COPD. The modifying effect of IMAT on the bone-vascular axis was most evident in models without age adjustment, suggesting that the observed interaction may be influenced by age.

Key points: Question The interactions between body composition, sarcopenia, arteriosclerosis, and osteoporosis are not fully understood. AI-based CT analysis provides a more holistic picture of multimorbidity in COPD. Findings Intermuscular adipose tissue (IMAT) was independently associated with vascular calcification in stepwise-adjusted models. The interaction of IMAT and bone density is demonstrated but showed age-dependence. Clinical relevance Increased IMAT can capture a vulnerable COPD patient group with metabolic dysregulation and physical frailty, besides vascular aging. Muscle fat infiltration may indicate impaired musculoskeletal health and serve as a marker of arteriosclerosis beyond possible effects of age or BMI.

Keywords: Artificial intelligence; Body composition; Chronic obstructive pulmonary disease; Comorbidity; Vascular calcification.

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Conflict of interest statement

Compliance with ethical standards. Guarantor: The scientific guarantor of this publication is Bettina Katalin Budai. Conflict of interest: Software support for this study was provided by Siemens Healthineers and Coreline Soft. F.C.T. reports receiving honoraria for lectures and presentations from Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Grifols, Novartis, CSL Behring, Streamed Up, and RG Gesellschaft für Information und Organisation mbH, as well as research funding from the E&H Knorr Stiftung. C.P.H. reports stock ownership in GSK, receiving consultation fees from Voiant from 2025, research funding from Exscientia between 2023 and 2024, and honoraria for lectures from AstraZeneca, Pfizer, Chiesi, and Sanofi, as well as being a patent holder of Method and Device for Representing the

Microstructure of the Lungs, IPC8 Class: AA61B5055FI, PAN: 20080208038. C.P.H. is a member of the European Radiology Editorial Board and, as such, has not participated in the review or selection processes for this article. H.U.K. reports receiving honoraria for lectures and presentations from Boehringer Ingelheim, Siemens, Philips, and Streamed Up, as well as research funding from Boehringer Ingelheim, Siemens, Philips, as well as serving on advisory boards for Contextflow and Median. H.U.K. is a member of the European Radiology Editorial Board and, as such, has not participated in the review or selection processes for this article. J.B. is a member of the European Radiology Editorial Board and, as such, has not participated in the review or selection processes for this article. The remaining authors declare no conflicts of interest. Statistics and biometry: One of the authors has significant statistical expertise. Informed consent: Written informed consent was obtained from all subjects (patients) in this study. Ethics approval: Institutional Review Board approval was obtained. The COSYCONET study was approved by the Ethical Committee of Philipps University Marburg (reference no. AZ 2010-28), as well as the ethics committees of each center. Study subjects or cohorts overlap: No study subjects or cohorts have previously been reported. Methodology: Prospective Diagnostic or prognostic study Performed at multiple institutions (multicentric study)

- [55 references](#)
- [4 figures](#)

Supplementary info

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Diabetes Obes Metab

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. 2026 Oct;28(10):9210-9221.

doi: 10.1111/dom.71115. Epub 2026 Jul 22.

[Joint Trajectories of Physical Activity and Depressive Symptoms and Incident Cardiometabolic Multimorbidity: A Multi-Cohort Study](#)

[Wenxuan Zhang](#)¹, [Yaping Wang](#)², [Xinhua Li](#)¹, [Le Peng](#)³, [Jing Wang](#)^{2,4,5}, [Bing Gao](#)²

Affiliations Expand

- PMID: 42483855
- PMCID: [PMC13538744](#)
- DOI: [10.1111/dom.71115](#)

Abstract

Background: Physical activity and depressive symptoms have each been associated with cardiometabolic multimorbidity (CMM), but evidence on their joint longitudinal trajectories across diverse ageing populations remains limited.

Methods: We used harmonized data from four population-based ageing cohorts, including ELSA, HRS, SHARE, and CHARLS. Among 29 523 adults aged 45 years or older, joint trajectories of physical activity and depressive symptoms were identified across three trajectory-defining survey waves using the KmL3D algorithm. Cox proportional hazards models were used to examine associations with incident CMM, defined as the coexistence of two or more of hypertension, diabetes, heart disease, and stroke. Sensitivity and supplementary analyses included proportional hazards diagnostics, time-stratified and extended Cox models, early-event exclusion analyses, conservative covariate adjustment, BMI exclusion, extended covariate models, Z-score-standardized trajectory re-analysis, and E-value calculation.

Results: Four joint trajectory phenotypes were identified within each cohort. Participants in trajectories characterised by lower physical activity and high depressive symptoms had the highest risk of incident CMM compared with the cohort-specific reference trajectory: ELSA, HR 2.15 (95% CI, 1.67-2.77); HRS, HR 1.46 (95% CI, 1.22-1.74); SHARE, HR 1.85 (95% CI, 1.69-2.03); and CHARLS, HR 2.28 (95% CI, 1.52-3.44). Findings were directionally consistent across sensitivity analyses.

Conclusions: Joint trajectories of physical activity and depressive symptoms were associated with incident CMM across four international ageing cohorts. Combined behavioural and psychological profiles may help inform CMM risk stratification in middle-aged and older adults.

Keywords: KmL3D; ageing cohorts; cardiometabolic multimorbidity; depressive symptoms; joint trajectories; physical activity.

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Conflict of interest statement

The authors declare no conflicts of interest.

- [57 references](#)
- [3 figures](#)

Supplementary info

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Practice Guideline

Eur J Intern Med

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. 2026 Oct:152:107121.

doi: 10.1016/j.ejim.2026.107121. Epub 2026 Aug 13.

[Identification and management of sarcopenia in patients with multimorbidity: An EFIM critically appraised and adapted guideline](#)

[M Bernabeu-Wittel](#)¹, [I Marín-León](#)², [C Angermann](#)³, [P Cubo-Romano](#)⁴, [Z Cvetković](#)⁵, [A Dima](#)⁶, [M Fissah](#)⁷, [J A García-García](#)⁸, [S García-Rubio](#)⁹, [E Kravvariti](#)¹⁰, [A Kurrle](#)¹¹, [O Lidove](#)¹², [Z Lys](#)¹³, [O Para](#)¹⁴, [L Santos](#)¹⁵, [A Tuttolomondo](#)¹⁶, [J Václavík](#)¹⁷, [J Voicehovska](#)¹⁸, [D Nieto-Martín](#)¹⁹

Affiliations Expand

- PMID: 42595648
- DOI: [10.1016/j.ejim.2026.107121](#)

Abstract

Background: Sarcopenia is highly prevalent among adults with multimorbidity and contributes substantially to frailty, disability, prolonged hospitalization, and mortality. International guidelines offer robust diagnostic and therapeutic frameworks for sarcopenia, but rarely incorporate the clinical complexity of patients with multimorbidity (MM). The European Federation of Internal Medicine (EFIM) undertook a guideline adaptation process to produce practical, evidence-based recommendations specifically tailored for internal medicine practice.

Methods: A multinational survey of European internists identified priorities and practice unsolved clinical questions (PICO) in older people with MM. This was followed by a critical appraisal of updated existing clinical practice guidelines (CPGs) and the selection of recommendations that were most applicable to specific clinical situations. Where direct evidence in multimorbid populations was limited, Good Practice Points were formulated considering pathophysiology, feasibility, and frailty safety concerns.

Results: A total of eight PICO questions were prioritized, covering case-finding, screening, diagnosis, prevention, iatrogenic complications, nutritional or exercise

interventions, and pharmacotherapy. The 37 adapted recommendations from 4 high quality CPG emphasize: proactive case-finding in adults ≥ 65 years and multimorbid adults < 65 years with specific risk factors; prioritization of muscle strength (handgrip or chair-stand) as the entry point to assessment; flexible diagnostic pathways, individualized multimodal physical activity, and nutritional interventions. The guideline also addresses treatment-induced risks (e.g., corticosteroids, Glucagon-Like Peptide-1 /Gastric Inhibitory Peptide agonists) in MM contexts. Of the 37 selected recommendations (30 strong and 7 weak), 8 were based on high, 12 on moderate, and 17 on low-quality evidence, built on consensus (best practice statements).

Conclusions: This EFIM-adapted clinical practice guideline provides a practical framework for the identification and management of sarcopenia in patients with MM. By integrating feasibility considerations, multimorbidity science, and functional assessment strategies, it offers a clinically relevant tool for improving outcomes in a population at high risk of frailty, disability, and mortality. Future research should prioritize MM populations to strengthen the evidence for integrated, patient-centered sarcopenia care.

Keywords: Clinical practice guidelines; Critical appraisal; Multimorbidity; Sarcopenia.

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Conflict of interest statement

Declaration of competing interest All authors declare that they have no financial relationships with any organizations that might have an interest in the submitted work in the previous three years, and they declare no other relationships or activities that could appear to have influenced the submitted work.

Supplementary info

Publication types, MeSH termsExpand

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Cite

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Observational Study

J Endocrinol Invest

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. 2026 Oct;49(10):3027-3038.

doi: 10.1007/s40618-026-02954-9. Epub 2026 Aug 24.

Muscle strength and HbA1c in geriatric patients with and without diabetes: a retrospective observational cohort study

Merve Yilmaz Kars¹, Orhan Cicek², Ilyas Akkar², Zeynep Iclal Turgut², Mustafa Hakan Dogan², Tunahan Yakar³, Muhammet Cemal Kizilarslanoglu²

Affiliations Expand

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- DOI: [10.1007/s40618-026-02954-9](https://doi.org/10.1007/s40618-026-02954-9)

Abstract

Background/aim: Handgrip strength (HGS) is a simple, reliable, and widely used biomarker of muscle strength and a key component in sarcopenia screening. Its potential role as an indicator of glycemic control has attracted increasing interest; however, the relationship between HGS and glycated hemoglobin (HbA1c) in older adults remains insufficiently understood, particularly in populations characterized by frailty and multimorbidity. This study aimed to explore the relationship between HGS and HbA1c levels in older adults with and without diabetes mellitus (DM) and to evaluate the potential of HGS as a clinically informative marker in the assessment of glycemic status within a comprehensive geriatric context.

Methods: In this retrospective study, 573 patients aged ≥ 60 years who underwent Comprehensive Geriatric Assessment (CGA) between May 2023 and October 2025 were included. HGS was measured using a dynamometer, and sarcopenia risk was assessed with SARC-F. Participants were stratified into sex-specific low and high HGS groups. HbA1c levels were compared across groups, and associations were examined using Spearman's correlation and multivariable linear regression analyses with stepwise adjustment for clinically relevant confounders.

Results: The study population had a median age of 78 years, with a high prevalence of frailty (72.8%) and sarcopenia risk (81.2%). Despite generally low HGS values, individuals in the higher HGS group demonstrated higher HbA1c levels across the overall cohort and SARC-F subgroups ($p < 0.05$). Correlation analyses showed statistically significant but very weak positive associations between HGS and HbA1c, particularly among individuals at risk of sarcopenia. Although these associations were consistent in direction, their magnitude was limited. Regression analyses showed that this association was maintained in an adjusted model for CCI, Yesavage geriatric depression scale, three-word recall test; however, it was no longer significant in another fully adjusted model for age, BMI, diabetes status, medications, renal function, and nutritional status.

Conclusion: The findings indicate that there may be a weak association between HGS and glycemic status in older adults; therefore, they should be interpreted with caution. HGS may provide limited complementary information within a comprehensive geriatric assessment, particularly in frail populations, but its clinical relevance for evaluating glycemic control remains uncertain and warrants further investigation in prospective studies.

Keywords: Comprehensive geriatric assessment; Diabetes mellitus; Geriatrics; Handgrip strength; HbA1c.

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Conflict of interest statement

Declarations. Conflict of interest: The authors report no conflict of interest.

- [24 references](#)

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Cite

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Comparative Study

Prim Care Diabetes

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. 2026 Oct;20(5):589-595.

doi: 10.1016/j.pcd.2026.08.007. Epub 2026 Aug 25.

[Beyond conventional lipid markers: Atherogenic index of plasma and triglyceride-glucose index in relation to cardiometabolic multimorbidity in older adults](#)

[Setor K Kunutsor¹](#), [Sae Young Jae²](#), [Jari A Laukkanen³](#)

Affiliations [Expand](#)

- PMID: 42642323
- DOI: [10.1016/j.pcd.2026.08.007](#)

Free article

Abstract

Purpose: This study aimed to compare the associations and predictive performance of atherogenic index of plasma (AIP) and the triglyceride-glucose (TyG) index for incident cardiometabolic multimorbidity (CMM).

Methods: Data was analyzed from 2261 adults (mean age 63 years; 45.0% men) in the English Longitudinal Study of Ageing without a history of cardiometabolic disease at baseline (2008-2009). CMM was defined as the occurrence of ≥ 2 of the following conditions by 2021-2023: hypertension, cardiovascular disease, diabetes, or stroke. Multivariable-adjusted odds ratios (ORs) with 95% CIs were estimated.

Results: Over 12-15 years of follow-up, 131 cases of CMM were recorded. Higher AIP increased the odds of CMM (per 1-SD increase: OR 1.41, 95% CI 1.15-1.73; highest vs lowest tertile: OR 2.10, 95% CI 1.22-3.60). Similar associations were observed for the TyG index (per 1-SD increase: OR 1.51, 95% CI 1.25-1.82; highest vs lowest tertile: OR 2.07, 95% CI 1.21-3.55). Incorporation of AIP into a conventional risk model resulted in a modest improvement in discrimination, with comparable results observed for the TyG index.

Conclusion: AIP and the TyG index showed similar positive linear associations with incident CMM and comparable modest predictive performance.

Keywords: Atherogenic index of plasma; Cardiometabolic multimorbidity; Cohort study; Triglyceride-glucose index.

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Conflict of interest statement

Declaration of Competing Interest None.

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Prim Health Care Res Dev

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. 2026 Sep 29:27:e112.

doi: 10.1017/S1463423626101832.

[Navigating life and health care. A qualitative study of the lived experience of complex multimorbidity in Denmark](#)

[Anne Grøndahl Poulsen^{1,2}](#), [Mia Fredens²](#), [Stina Lou^{2,3}](#), [Nasrin Tayyari Dehbarez^{2,4}](#), [Camilla Palmhøj Nielsen^{1,2}](#), [Lotte Groth Jensen²](#)

Affiliations Expand

- PMID: 42808657
- DOI: [10.1017/S1463423626101832](https://doi.org/10.1017/S1463423626101832)

Abstract

Aim: This study aimed to explore how individuals with complex multimorbidity perceive and experience the management of their health in everyday life and healthcare encounters.

Background: Patients with two or more health conditions may be challenging for general practitioners (GPs) who must provide adequate treatment(-s) in a healthcare system structured mainly around single-disease models. For patients, the lived experience of this multimorbidity can be demanding, as it often involves managing multiple appointments, medications, and medical advice alongside everyday life. This situation may be particularly challenging for patients who live with multiple physical and mental health conditions.

Methods: Semi-structured individual interviews with eight individuals with complex multimorbidity living in Denmark. Analysis was guided by thematic analysis.

Findings: The analysis resulted in two main themes. First, 'Multiple diagnoses - not multimorbidity' describes how the participants did not expect overall continuity *across* diagnoses but appreciated recognition of the cumulative burden of multimorbidity. They expected continuity *within* each speciality and developed agentic strategies to achieve this. Some were successful; others were not. Second, 'Managing treatment and illness in everyday life' describes how the participants navigated tensions between medical recommendations and personal priorities as they deliberately pursued valued activities at the expense of their long- or short-term health. A professional lifeline, was a significant support for the participant. This person was often the GP. These findings underscore the active role of patients and the GP's role in recognizing their resources to develop patient-centred care that is responsive to and realistic for the individual patient.

Keywords: chronic disease; experience; multimorbidity; patients; qualitative research.

Supplementary info

MeSH termsExpand

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. 2026 Sep 30:e264215.

doi: 10.1001/jamacardio.2026.4215. Online ahead of print.

[Cardiovascular-Kidney-Metabolic Overlap in Patients Hospitalized for Heart Failure](#)

[Veraprapas Kittipibul](#)^{1,2}, [Iyanuoluwa Ayodele](#)², [Gregg C Fonarow](#)^{3,4}, [Brooke Alhanti](#)², [Harriette G C Van Spall](#)^{5,6}, [Ambarish Pandey](#)⁷, [Sabra C Lewsey](#)⁸, [Stephen J Greene](#)^{1,2}

Affiliations Expand

- PMID: 42814450
- PMCID: PMC13628395 (available on 2027-09-30)
- DOI: [10.1001/jamacardio.2026.4215](#)

Abstract

Importance: Among patients with heart failure (HF) in contemporary US clinical practice, the burden of overlapping cardiovascular-kidney-metabolic (CKM) conditions and the associated impact on outcomes remain poorly characterized.

Objective: To evaluate the prevalence of CKM multimorbidity and the impact on clinical outcomes in patients hospitalized for HF across the spectrum of ejection fraction (EF).

Design, setting, and participants: This was a retrospective cohort study of patients hospitalized for HF at US hospitals participating in the Get With The Guidelines-Heart Failure (GWTG-HF) registry. The analysis included patients hospitalized for HF in the GWTG-HF registry between 2019-2025 and Medicare beneficiaries hospitalized for HF in the GWTG-HF registry between 2019-2023.

Exposures: Presence of up to 4 additional CKM conditions including atherosclerotic cardiovascular disease, chronic kidney disease, diabetes, and obesity (body mass index ≥ 30 ; calculated as weight in kilograms divided by height in meters squared).

Main outcomes and measures: In-hospital mortality, 1-year postdischarge all-cause mortality, and 1-year postdischarge HF readmission.

Results: This study included 725 205 patients (median [IQR] age, 72.0 [61.0-82.0] years; 386 886 male [53.3%]) hospitalized for HF between 2019 and 2025 and 123 271 Medicare beneficiaries (median [IQR] age, 80 [73-87] years; 64 375 female [52.2%]) hospitalized for HF between 2019 and 2023. Among 725 205 patients hospitalized for HF, 521 739 (71.9%) had 2 or more overlapping CKM conditions, and a minority of patients (48 732 [6.7%]) had HF only. CKM overlap was greatest in HF with preserved EF (HFpEF). Compared with HF only, increasing number of overlapping

CKM conditions was associated with stepwise increases in in-hospital mortality (4 CKM conditions: HF with reduced EF [HFrEF] adjusted odds ratio [aOR], 5.08; 95% CI, 4.43-5.83; HF with mildly reduced EF [HFmrEF] aOR, 2.37; 95% CI, 1.68-3.34; HFpEF aOR, 2.05; 95% CI, 1.77-2.38), and this association was strongest in HFrEF (P for interaction <.001). Among Medicare beneficiaries hospitalized for HF, compared with HF only, increasing CKM multimorbidity was associated with increasing risks of postdischarge all-cause mortality (4 CKM conditions: HFrEF adjusted hazards ratio [aHR], 2.10; 95% CI, 1.93-2.29; HFmrEF aHR, 1.38; 95% CI, 1.17-1.63; HFpEF aHR, 1.09; 95% CI, 1.03-1.17) and HF readmission (4 CKM conditions: HFrEF aHR, 2.33; 95% CI, 2.12-2.56; HFmrEF aHR, 2.20; 95% CI, 1.82-2.66; HFpEF aHR, 1.91; 95% CI, 1.77-2.06), with steepest increases in risk among patients with HFrEF (P for interaction <.001).

Conclusions and relevance: In this contemporary cohort of US patients hospitalized for HF, most patients had multiple additional overlapping CKM conditions. Increasing CKM multimorbidity was independently associated with stepwise increases in mortality and readmission risk. Although these associations spanned the EF spectrum, the prognostic impact of CKM multimorbidity was greatest in HFrEF and least in HFpEF.

Conflict of interest statement

Conflict of Interest Disclosures: Dr Fonarow reported receiving personal fees from Abbott, Amgen, AstraZeneca, Bayer, Boehringer Ingelheim, Cytokinetics, Eli Lilly, Johnson & Johnson, Medtronic, Merck, Novartis, and Pfizer outside the submitted work. Dr Pandey reported receiving research support from the National Institute of Health, American Heart Association, Applied Therapeutics, Roche, Ultromics, Gilead Sciences, Bayer, and AstraZeneca and advisor, consultant, and/or speaker honoraria from Tricog Health Inc, Lilly, Rivus, Roche Diagnostics, Axon Therapies, Edward Lifesciences, Science37, Novo Nordisk, Bayer, Medical AI, AstraZeneca, Baylor Scott and White Research Institute, Boehringer Ingelheim, iRhythm Technologies, Tourmaline Bio, Merck, Sarfez Pharmaceuticals, Ultromics, Kardigan, Tenax Pharma, Alynlyam, Abbott, Kieele Health, Anumana, Acorai, Novartis, and Antlia Biosciences. Dr Greene reported receiving personal fees from AstraZeneca, Amgen, Boehringer Ingelheim, Bayer, Cytokinetics, CSL Vifor, Corcept, Merck, Novartis, Otsuka, Idorsia, Sanofi, Bristol Myers Squibb, Roche Diagnostics, Chugai, Sumitomo, Novo Nordisk, Lilly, Tricog Health and grants from AstraZeneca, Boehringer Ingelheim, and Novartis outside the submitted work. No other disclosures were reported.

- [23 references](#)

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J Gerontol Nurs

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. 2026 Oct 2:1-11.

doi: 10.3928/00989134-20260925-05. Online ahead of print.

Association Between Physical Function and Cognitive Function Among Older Adults With Cardiometabolic Multimorbidity: The Mediating Role of Physical Activity

Mengying Deng¹, Chenming Guo², Hongdan Song², Mingming Yu²

Affiliations Expand

- PMID: 42821755
- DOI: [10.3928/00989134-20260925-05](https://doi.org/10.3928/00989134-20260925-05)

Abstract

Purpose: To examine the mediating effect of physical activity on the relationships between physical function (including upper and lower extremity functions) and cognitive function among older adults with cardiometabolic multimorbidity (CMM).

Method: The current descriptive cross-sectional study was conducted on a total of 526 older adults with CMM in three community health care centers in Beijing, China. Participants completed questionnaires including the Mini-Mental State Examination, Physical Activity Scale for the Elderly, and Pittsburgh Sleep Quality Index. Upper and lower extremity functions were measured by grip strength and the Short Physical Performance Battery (SPPB), respectively.

Results: Cognitive function had a positive correlation with physical activity and various physical functions ($p < .05$). Physical activity was also positively associated with various physical functions ($p < .05$). Indirect effect of physical activity on the association between grip strength and cognitive function was 0.034 and explained 13.93% of the total effect. Physical activity mediated 18.81% (effect = 0.038, 95% confidence interval [0.003, 0.077]) of the total effect of SPPB total score (overall lower extremity function) on cognitive function.

Conclusion: Physical function not only directly influences cognitive function but also exerts an indirect effect through physical activity in older adults with CMM. It is necessary to monitor physical function regularly and encourage older adults to engage in physical activity and other community activities, which may delay cognitive decline and slow the progression of CMM.

Full text links



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Cite

Review

Best Pract Res Clin Rheumatol

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. 2026 Oct 2:102204.

doi: 10.1016/j.berh.2026.102204. Online ahead of print.

[Are we at risk of increasing sarcopenia? Implications for osteoarthritis and osteoporosis](#)[Feng Pan¹](#), [Flavia M Cicuttini²](#)

Affiliations Expand

- PMID: 42827061
- DOI: [10.1016/j.berh.2026.102204](#)

Abstract

Sarcopenia is a progressive skeletal muscle disorder characterised by reduced muscle strength, impaired muscle quantity or quality, and declining physical performance, with important consequences for falls, fractures, disability, and loss of independence. Whether sarcopenia prevalence itself is rising remains difficult to quantify because diagnostic frameworks and surveillance methods vary, yet a growing burden is plausible. Population ageing, increasing multimorbidity, obesity, hospitalisation, surgery, and incomplete recovery after musculoskeletal events are likely to increase the absolute number of people living with low musculoskeletal reserve. Osteoarthritis (OA) and osteoporosis (OP) are central to this problem because they amplify the functional consequences of weakness and reduced loading. OA may lead to strength loss through pain, inflammation, altered movement, and activity restriction, while OP increases the likelihood that falls or loading errors will result in fracture and subsequent deconditioning. Shared mechanisms for sarcopenia include mechanical unloading, adiposity-related metabolic dysfunction, inflammageing, mitochondrial stress, endocrine change, and nutritional insufficiency, although the strength of evidence differs across pathways. New weight-loss approaches using glucagon-like peptide-1 receptor agonists (GLP-1 RAs) may substantially affect sarcopenia risk and therefore require careful consideration. Current diagnostic frameworks increasingly prioritise muscle strength and performance over lean mass alone, supporting pragmatic case-finding in older adults with severe OA, fragility fracture, recurrent falls, poor postoperative recovery, or weight loss. Current management should focus on progressive resistance and balance training, adequate energy and protein intake, guideline-based OP care, optimised OA treatment, and protection of mobility during transitions of care. The most immediate clinical gains are likely to come from integrating existing rheumatology, orthopaedic, fracture-prevention, rehabilitation,

and nutritional services rather than from any osteosarcopenia-specific drug therapy.

Keywords: Fracture prevention; Frailty; Osteoarthritis; Osteoporosis; Osteosarcopenia; Sarcopenia.

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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

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

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J Asthma

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. 2026 Oct;63(10):1189-1198.

doi: 10.1080/02770903.2025.2562583. Epub 2025 Oct 31.

[Risk factors for uncontrolled asthma in a pediatric population with severe asthma: FRAMAG study](#)

[Elida Duenas-Meza](#)^{1 2}, [Sarah Pulido-Fentanes](#)³, [Monica Mendez-Moreno](#)^{4 5}, [Nadia Juliana Proaños-Jurado](#)^{4 6}

Affiliations Expand

- PMID: 40952380
- DOI: [10.1080/02770903.2025.2562583](https://doi.org/10.1080/02770903.2025.2562583)

Abstract

Objective: Severe asthma (SA) in children is associated with significant morbidity, increased healthcare utilization, and reduced quality of life. Despite appropriate treatment, achieving optimal asthma control remains challenging, particularly in pediatric populations. This study aimed to identify factors associated with poor asthma control in children with SA, focusing on clinical, functional, and caregiver-related variables.

Methods: This retrospective cohort study included children aged 6-17 years with SA followed for up to three years in the Asmaire-Rexpira Program in Bogota, Colombia. Asthma control was defined using a comprehensive composite score integrating symptom questionnaires, exacerbation history, corticosteroid use, hospitalizations, and spirometry. Multivariable logistic regression was used to identify independent risk factors for uncontrolled asthma.

Results: Of the 228 children included, 35.5% had uncontrolled asthma. Obstructive sleep apnea (OR: 2.16; 95% CI: 1.13-4.11; $p = .019$) and moderate to severe impairment in caregiver quality of life (OR: 12.35; 95% CI: 4.15-36.80; $p < .001$) were independently associated with uncontrolled asthma. Systemic corticosteroid use and hospitalization in the prior year were significantly more common in this group. Lung function was preserved in most children.

Conclusions: Uncontrolled asthma in children with SA is associated with comorbid sleep apnea and caregiver burden. These findings underscore the need for multidimensional evaluation, caregiver support, and longitudinal monitoring to optimize asthma control in high-risk pediatric populations.

Keywords: Severe asthma; adherence; conditional change; quality of life.

Supplementary info

MeSH terms, SubstancesExpand

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Cite

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Randomized Controlled Trial

J Asthma

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. 2026 Oct;63(10):1254-1266.

doi: 10.1080/02770903.2026.2660096. Epub 2026 Apr 25.

[Three years treatment with HDM allergen immunotherapy, omalizumab, or combination therapy in allergic asthma: clinical outcomes and biomarkers](#)

[Andrzej Bozek](#)^{1,2}, [Martyna Miodonska](#)¹, [Dominika Sadowska](#)¹, [Jolanta Zalejska](#)¹, [Fiolka](#)², [Janne Winterstein](#)³, [Giorgio Walter Canonica](#)⁴

Affiliations Expand

- PMID: 41983924
- DOI: [10.1080/02770903.2026.2660096](https://doi.org/10.1080/02770903.2026.2660096)

Abstract

Background: Allergen immunotherapy (AIT) and biologics such as omalizumab are established treatments for allergic asthma, but long-term data on their combined use are limited.

Objective: To compare long-term clinical and immunological outcomes of omalizumab, subcutaneous AIT for house dust mite (SCIT-HDM), and their combination in mild-to-moderate allergic asthma.

Methods: In this prospective, randomized, controlled study, 79 patients with HDM-driven allergic asthma were assigned to omalizumab (A), omalizumab plus SCIT-HDM (B), SCIT-HDM (C), or standard therapy (D). Patients were followed for 36 months. Primary outcomes were changes in inhaled corticosteroid (ICS) dose and annual exacerbations. Secondary outcomes included symptom and medication scores, Asthma Control Test (ACT), asthma quality of life (AQLQ), lung function, remission rates, and biomarkers.

Results: All groups showed significant reductions in ICS use, with greater reductions in groups A and B than in C and D ($p < 0.05$). Combination therapy (B) resulted in lower exacerbation rates and reduced oral corticosteroid use compared to other groups. Improvements in ACT, FEV₁, and AQLQ were observed across all groups, with more consistent benefits in A and B. Clinical remission occurred most often in group B (47%), followed by A (31%), C (29%), and D (14%). Biomarker changes indicated reduced type 2 inflammation and immunological responses to therapy. No serious adverse events or systemic hypersensitivity reactions were observed.

Conclusions: Omalizumab, SCIT-HDM, and their combination improved outcomes over 36 months. Combination therapy showed the most consistent benefits, but results should be interpreted cautiously due to the small sample size. Further studies are needed.

Keywords: Asthma; allergen immunotherapy; biologics; house dust mites allergy.

Supplementary info

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Cite

3

J Asthma

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. 2026 Oct;63(10):1233-1240.

doi: 10.1080/02770903.2026.2660094. Epub 2026 Apr 28.

Baseline blood eosinophil count does not predict short-term changes in oscillometric parameters in steroid-naïve asthma

Osamu Matsuno¹

Affiliations Expand

- PMID: 41995455
- DOI: [10.1080/02770903.2026.2660094](https://doi.org/10.1080/02770903.2026.2660094)

Abstract

Background: Peripheral blood eosinophil (PBE) count is widely used as a biomarker to guide treatment decisions in asthma. However, whether eosinophil levels predict early changes in airway mechanics assessed by oscillometry remains unclear, particularly in steroid-naïve patients.

Objective: To determine whether baseline PBE levels are associated with early changes in oscillometric indices of airway function in steroid-naïve asthma.

Methods: We retrospectively analyzed adult patients with steroid-naïve asthma who underwent oscillometry at baseline and after 12 wk of inhaled corticosteroid-based therapy. Patients were stratified according to baseline PBE count (≥ 300 vs < 300 cells/ μ L). Percentage changes in R5, R20, R5-R20, X5, resonant frequency (Fres), and area of low-frequency reactance (ALX) were compared using the Mann-Whitney *U* test. Effect sizes were estimated using the Hodges-Lehmann method with exact confidence intervals.

Results: A total of 57 patients were included ($n = 33$ with eosinophils ≥ 300 cells/ μ L; $n = 24$ with eosinophils < 300 cells/ μ L). No significant differences were observed between groups in percentage changes of oscillometric parameters. Hodges-Lehmann estimates of group differences were small, and all confidence intervals crossed zero, indicating no clinically meaningful association between baseline eosinophil levels and early oscillometric improvement.

Conclusions: In steroid-naïve asthma, baseline PBE count does not appear to predict early changes in oscillometric indices. These findings suggest that baseline PBE counts may be informative for spirometric responses to inhaled corticosteroid-based therapy, whereas their utility for anticipating early changes in oscillometric indices is limited. Spirometry and oscillometry may therefore provide complementary, rather than interchangeable, information when assessing early treatment responses in asthma.

Keywords: Inhaled Corticosteroid (ICS)-naïve; MostGraph; asthma; eosinophils; oscillometry; spirometry.

Supplementary info

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Cite

4

J Asthma

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. 2026 Oct;63(10):1267-1274.

doi: 10.1080/02770903.2026.2660098. Epub 2026 Apr 21.

[Clinician perspectives on the discontinuation of brand name Flovent in pediatric asthma care](#)

[Ashley L Saint-Fleur¹](#), [Robyn T Cohen²](#), [Michelle Trivedi^{3,4}](#), [Gregory S Sawicki¹](#)

Affiliations Expand

- PMID: 41995843
- PMCID: PMC13118861 (available on 2027-04-21)
- DOI: [10.1080/02770903.2026.2660098](https://doi.org/10.1080/02770903.2026.2660098)

Abstract

Objective: In 2024, brand-name Flovent (fluticasone propionate), the most widely prescribed inhaled corticosteroid (ICS) in the United States, was discontinued, eliminating a key treatment option for pediatric asthma. There have yet to be reports describing pediatric clinicians' experiences with this abrupt loss of a mainstay therapy for one of the most common chronic diseases in children. The study aimed to examine the experience of pediatric clinicians with the discontinuation of Flovent for asthma management.

Methods: A web-based survey was disseminated via pediatric and pediatric pulmonary networks, both regionally and nationally, to pediatric primary care and subspecialty physicians and advanced practice practitioners. The survey assessed clinician awareness, preparedness, and the clinical impact of Flovent discontinuation.

Results: Among 226 respondents, 71% were aware of the Flovent discontinuation in advance; however, 79% felt unprepared or very unprepared once it went into effect.

Clinicians reported significant disruptions in prescribing and clinical workflow, with 56% describing the impact on their practice as severe. Factors most frequently cited as causing moderate or severe burden included prescribing alternate ICS therapy, including insurance authorization requirements (90%), pharmacy shortages (85%), and difficulty finding age-appropriate alternatives (82%). In free-text responses, clinicians described perceived worsening asthma control and increased acute healthcare utilization following the discontinuation, particularly among younger patients.

Conclusions: Pediatric clinicians who care for children with asthma reported significant disruptions to patient care following the discontinuation of Flovent. These findings underscore the need for systems-level support of clinicians during major formulary transitions to minimize disruptions, particularly within pediatric asthma.

Keywords: Asthma; formulary change; inhaled corticosteroids; non-medical switching.

- [Cited by 1 article](#)
- [26 references](#)

Supplementary info

MeSH terms, Substances, Grants and fundingExpand

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Cite

5

Review

Allergol Int

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. 2026 Oct;75(4):511-520.

doi: 10.1016/j.alit.2026.04.001. Epub 2026 Apr 28.

[Update in childhood asthma](#)

[Andrew Bush](#)¹

Affiliations Expand

- PMID: 42055854

- DOI: [10.1016/j.alit.2026.04.001](https://doi.org/10.1016/j.alit.2026.04.001)

Free article

Abstract

The areas covered represent a personal selection in the field. Asthma is defined in this manuscript as a clinical syndrome of wheeze, breathlessness and chest tightness, sometimes with excess cough. No assumptions are made about underlying pathology, and asthma thus becomes a clinical description, not a diagnosis. The areas covered include the need never to forget the importance of getting the basics right, including correct diagnosis and appropriate management; most children with asthma do not need biologics. Recent advances in preschool wheeze are covered next, especially the beginnings of phenotype-driven treatment, and the difficult issue of understanding non-eosinophilic wheezing. It is becoming clearer that infection likely plays a big role, but management is very difficult with no evidence base. We are now coming to realize the importance of phenotyping acute asthma attacks; one size does not fit all, but whereas many are eosinophilic, some are infection driven and are non-eosinophilic, especially in the preschool years. A phenotypic approach may allow us to reduce the burden of repeated oral corticosteroid bursts. Furthermore, we need to move beyond mere cell counting to assessing functional status. We are increasingly appreciating the importance of replacing short-acting β -2 agonist reliever therapy with combined inhaled corticosteroid and a fast acting short- and especially long-acting β -2 agonists. Finally, the use of biologicals in severe asthma is discussed. The possibility that early use of biologics may induce remission or even cure asthma.

Keywords: Asthma attack; Eosinophil; Exhaled nitric oxide; Prednisolone; Preschool wheeze.

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Conflict of interest statement

Conflict of interest The author has no conflict of interest to declare.

- [Cited by 1 article](#)

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Cite

6

Ann Allergy Asthma Immunol

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. 2026 Oct;137(4):477-482.e1.

doi: 10.1016/j.anai.2026.05.020. Epub 2026 May 18.

[Impact of dupilumab on Sino-Nasal Outcome Test-22 \(SNOT-22\) domains: Focus on the ear](#)

[Philipp Suter](#)¹, [Robert Greig](#)², [Kirsten Stewart](#)³, [Brian J Lipworth](#)²

Affiliations Expand

- PMID: 42155863
- DOI: [10.1016/j.anai.2026.05.020](https://doi.org/10.1016/j.anai.2026.05.020)

Free article

Abstract

Background: Chronic rhinosinusitis with nasal polyposis (CRSwNP) is frequently associated with otologic symptoms because of Eustachian tube dysfunction. However, the clinical relevance of otologic symptoms in patients with CRSwNP and their response to biologic therapy remains poorly characterized.

Objective: To investigate baseline determinants of ear-related symptoms and evaluate the impact of dupilumab treatment.

Methods: This post-hoc analysis of the Dupilumab In Severe Asthma (DISA) study included 23 adults with CRSwNP and severe uncontrolled asthma. Participants underwent a 12-week treatment with dupilumab followed by a 12-week washout period. Symptom burden was assessed using the 22-item Sino-Nasal Outcome Test (SNOT-22), including domain-specific analyses. Correlations between the ear/face domain, and endoscopic nasal polyp score (NPS), peak nasal inspiratory flow (PNIF), and type 2 biomarkers, were examined.

Results: At baseline, ear/face symptoms were common, with ear fullness representing the principal complaint. At baseline, the ear/face domain correlated with other SNOT-22 domains and patient-reported outcomes, but not with NPS, PNIF, or type 2 biomarkers. In response to dupilumab, all SNOT-22 domains improved ($P < .001$), including ear-related symptoms. There was a disconnect in terms of improvements in the ear/face domain being associated with nasal symptoms, but not with NPS, PNIF, or type 2 biomarkers. During washout, symptom deterioration was observed across all SNOT-22 domains.

Conclusion: Ear-related symptoms are common in CRSwNP and more closely reflect the overall quality-of-life burden than the degree of nasal airway obstruction, as measured by NPS and PNIF, or type 2 biomarkers. Dupilumab significantly improved these symptoms, with relapse after washout suggesting a link to type 2 inflammation. These findings support that otologic symptoms are important in CRSwNP assessment and management.

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Conflict of interest statement

Disclosures Dr Suter reports receiving speaking and lecture fees from AstraZeneca UK Limited and GSK; funding grants and lecture fees from Lung League Fribourg; and funding grants from the Swiss Lung Foundation. Dr Greig reports receiving speaking fees, lecture fees, and travel reimbursement from AstraZeneca UK Limited and institutional grants (equipment) from Chiesi Pharmaceutical. Dr Lipworth reports receiving advisory, grants, and lecture fees from AstraZeneca UK Limited, Sanofi/Regeneron, and Chiesi Pharmaceutical; travel reimbursement from Sanofi/Regeneron and Chiesi Pharmaceutical; lecture fees from Lupin Pharmaceuticals Inc; consulting and lecture fees from Glenmark Pharmaceuticals Limited; consulting fees from Sandoz, Inc; and equipment funding from Vitalograph, Ltd and Thorasys. The son of Dr Lipworth is also presently employed at AstraZeneca. Dr Stewart has no conflicts of interest to report.

Supplementary info

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Allergol Int

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. 2026 Oct;75(4):640-643.

doi: 10.1016/j.alit.2026.04.006. Epub 2026 May 20.

[Recent systemic corticosteroid exposure and mild cognitive impairment in elderly asthma: A prospectively collected cross-sectional study](#)

[Kai Ryu](#)¹, [Eiji Nakatani](#)², [Yuma Fukutomi](#)³, [Yuto Nakamura](#)³, [Yosuke Kamide](#)³, [Kiyoshi Sekiya](#)³, [Shunsuke Minagawa](#)⁴, [Takeo Ishikawa](#)⁴, [Takanori Numata](#)⁴, [Jun Araya](#)⁴, [Masami Taniguchi](#)⁵

Affiliations Expand

- PMID: 42161697
- DOI: [10.1016/j.alit.2026.04.006](#)

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No abstract available

Conflict of interest statement

Conflict of interest KR received payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Sanofi, AstraZeneca, and Glaxo Smith Kline. YF received support for the present manuscript from the Ministry of Health, Labour and Welfare of Japan (19FE1002). YF received payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Thermo Fisher Diagnostics, Torii, Novartis Pharma., Kyorin, and Sanofi. YK received payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from AstraZeneca. And Glaxo Smith Kline. KS received payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Kyorin, Sanofi, GlaxoSmithKline, and AstraZeneca. TI received payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from AstraZeneca and Glaxo Smith Kline. JA received research grant for the present manuscript from Boehringer Ingelheim Japan, Kowa Company, and Kyorin. JA received payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Boehringer Ingelheim Japan, Kowa Company, Kyorin, Glaxo Smith Kline., and AstraZeneca. JA received patents planned, issued or pending from Kowa Company, JA received the receipt of equipment, materials, drugs, medical writing, gifts or other services from Sumitomo Pharma, and Kowa Company. MT received a research grant for the present manuscript from the Ministry of Health, Labour and Welfare of Japan (19FE1002), and a private donation from Eiji Mitsuhashi. MT received grants or contracts from any entity from Glaxo Smith Kline (UK). MT received payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Glaxo Smith Kline, Sanofi, and AstraZeneca. EN, YN, SM, and TN have stated that no potential conflicts of interest exist with any companies/organizations whose products or services may be discussed in this publication.

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Review

Expert Rev Respir Med

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. 2026 Oct;20(10):1215-1221.

doi: 10.1080/17476348.2026.2688299. Epub 2026 Jun 13.

Effect of depemokimab on asthma control and clinical outcomes: a systematic review and meta-analysis of randomized controlled trials

Shun Nakahara¹, Maria Júlia Hallack Moura², Sumeyye K Cengiz³, Manoel F Filho⁴, Jafar Aljazeera^{5 6 7}

Affiliations Expand

- PMID: 42268259
- DOI: [10.1080/17476348.2026.2688299](https://doi.org/10.1080/17476348.2026.2688299)

Abstract

Introduction: Patients with eosinophilic asthma are at increased risk of poor asthma control despite optimized standard therapy. Depemokimab, a novel long-acting anti-interleukin-5 monoclonal antibody, has shown efficacy in reducing exacerbations; however, its effects across clinical outcomes have not been comprehensively synthesized.

Methods: PubMed, Embase, Cochrane databases, and ClinicalTrials.gov were searched for randomized controlled trials (RCTs) comparing depemokimab with placebo. Outcomes included Asthma Control Questionnaire-5 (ACQ-5), asthma exacerbation rate, quality of life assessed by St. George's Respiratory Questionnaire (SGRQ), and adverse events. Results were reported as mean differences (MDs) or incidence rate ratios (IRRs) with 95% confidence intervals (CIs), and heterogeneity was assessed using the I^2 statistic.

Results: Four RCTs ($n = 954$) were included. Depemokimab did not significantly improve ACQ-5 (MD -0.30; 95% CI -0.92 to 0.32; $I^2 = 73.6\%$; $p = 0.23$), but reduced exacerbation rates (IRR 0.47; 95% CI 0.36 to 0.59; $I^2 = 0\%$; $p < 0.001$) and modestly improved SGRQ scores without reaching the MCID (MD -2.80; 95% CI -5.38 to -0.23; $I^2 = 0.0\%$; $p = 0.033$). Safety was comparable to placebo.

Conclusions: Depemokimab reduced exacerbations and had a comparable safety profile, but did not improve symptom control or achieve the MCID for health-related quality-of-life.

Registration: The study protocol was prospectively registered in the International Prospective Register of Systematic Reviews (PROSPERO; registration number CRD420261282685).

Keywords: Asthma; depemokimab; eosinophilic asthma; meta-analysis; rhinosinusitis.

Supplementary info

Publication types, MeSH terms, SubstancesExpand

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Cite

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Editorial

Ann Emerg Med

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. 2026 Oct;88(4):492-493.

doi: 10.1016/j.annemergmed.2026.04.008. Epub 2026 Jun 11.

[Should Nebulized Ipratropium Bromide Be Added to Standard Treatments of Pediatric Asthma Exacerbations in the Emergency Department?](#)

[Juliet Jacobson](#)¹, [Sangil Lee](#)²

Affiliations Expand

- PMID: 42274434
- DOI: [10.1016/j.annemergmed.2026.04.008](#)

No abstract available

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Cite

10

Am J Respir Crit Care Med

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. 2026 Oct 1;212(10):2567-2591.

doi: 10.1093/ajrccm/aamag303.

[Depression and asthma across the lifespan](#)

[Daniela Rodriguez](#)¹, [Melissa A Rosenkranz](#)^{2 3}, [Yueh-Ying Han](#)¹, [Juan C Celedón](#)¹

Affiliations Expand

- PMID: 42289968
- PMCID: PMC13624786 (available on 2027-10-01)
- DOI: [10.1093/ajrccm/aamag303](#)

No abstract available

Conflict of interest statement

All authors (D.R., M.R., Y-Y.H. and J.C.C.) declare no conflicts of interest. Please see the ICMJE disclosure forms, which have been provided as supplementary material.

- [89 references](#)

Supplementary info

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Cite

11

Ann Allergy Asthma Immunol

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. 2026 Oct;137(4):466-470.

doi: 10.1016/j.anai.2026.06.036. Epub 2026 Jun 28.

[Small airway dysfunction and prior exacerbations are common in primarily well-controlled pediatric asthma](#)

[Preethi Balagani](#)¹, [Yela Jung](#)², [Sarah S Field](#)³, [Zarah Chhoet](#)³, [Tricia Morpew](#)⁴, [Lennart K A Lundblad](#)⁵, [Stanley P Galant](#)⁶

Affiliations Expand

- PMID: 42365876
- DOI: [10.1016/j.anai.2026.06.036](https://doi.org/10.1016/j.anai.2026.06.036)

Abstract

Background: Although current asthma guidelines are effective, many children experience poor asthma control. A possible explanation is the failure to identify small airway dysfunction (SAD), a known risk factor for exacerbation.

Objective: To assess SAD prevalence by means of oscillometry, its association with previous exacerbations, and whether consideration of SAD and/or previous exacerbations as risk factors aligns with current therapy patterns.

Methods: This is a post hoc, retrospective, cross-sectional analysis of 53 primarily mild, well-controlled children with asthma (ages 2-7 years) using the C100 Airwave Oscillometer. SAD was defined for R7-R19, AX, and X7 as a Z score greater than 1.645. High-risk status was defined by SAD and/or more than 1 exacerbation in the previous 12 months. Therapy patterns were compared with risk status.

Results: SAD is seen in 49.1% of the cohort, and 43.3% had previous exacerbations, whereas 74.0% met the criteria for high-risk status. There were no significant differences in demographics, previous-year exacerbations, or treatment patterns among any of these at-risk categories. Only 41% of the children classified as high risk were receiving step 2 or higher therapy.

Conclusion: Our data suggest that SAD and/or previous exacerbation biomarkers are common in primarily symptom-based mild, well-controlled young children with asthma, identifying a phenotype that is potentially at risk for future exacerbations and is frequently unrecognized, as reflected by current therapy patterns.

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Conflict of interest statement

Disclosures The authors have no conflicts of interest to report.

Supplementary info

MeSH terms, SubstancesExpand

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Cite

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Allergol Int

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. 2026 Oct;75(4):630-639.

doi: 10.1016/j.alit.2026.05.003. Epub 2026 Jul 1.

Sustained clinical remission and relapse of severe eosinophilic asthma following long-term mepolizumab treatment

[Rejoy Sabin Thomas](#)¹, [Dennis Thomas](#)², [Vanessa M McDonald](#)³, [Erin S Harvey](#)¹, [Philip Bardin](#)⁴, [Jeffrey J Bowden](#)⁵, [Simon Bowler](#)⁶, [Jimmy Chien](#)⁷, [Li Ping Chung](#)⁸, [Andrew Gillman](#)⁹, [Mark Hew](#)¹⁰, [Constance H Katelaris](#)¹¹, [Gregory P Katsoulotos](#)¹², [David Langton](#)¹³, [Joy Lee](#)¹⁴, [John W Upham](#)¹⁵, [Peter A B Wark](#)¹⁶, [Michael Fricker](#)¹, [Peter G Gibson](#)³

Affiliations Expand

- PMID: 42386477
- DOI: [10.1016/j.alit.2026.05.003](#)

Free article

Abstract

Background: While clinical remission occurs in some patients receiving biologics for severe asthma after one year of treatment, sustaining remission and frequency of relapse are unclear. This study evaluated sustained clinical remission, relapse, and its predictors over two to four years among people with severe asthma receiving mepolizumab.

Methods: Data from 208 patients (median age 59.6 years [52.0, 68.9], 41.3% male) in the Australian Mepolizumab Registry, a real-world prospective severe asthma registry, were analysed. Clinical remission was defined as: mean Asthma Control Questionnaire-5 score ≤ 1.0 , no exacerbations, and no oral corticosteroid use over a 12-month period. Remission and relapse were assessed from 12 to 48 months at 12-month intervals.

Results: Of 184 with data available at 24 months, 29.9% (n = 55) achieved remission. 20.1% (35 of 174 with data from baseline to 24 months) sustained remission showing certain degree of stability since treatment initiation, while 9.2% (16/174) relapsed during treatment. Older age, severe disease, obesity, and depression significantly reduced the odds of achieving remission at 24 months. When assessed longitudinally (n = 47 with data from baseline to 48 months), remission increased from 36.1% at 12 months to 48.9% at 48 months. However, 17% relapsed over four years. Patterns of persistent non-remission, stable, delayed and unstable remission were also observed.

Conclusions: Although remission rates may be overestimated in a cohort skewed toward treatment-responsive patients, clinical remission is achievable and sustained in a subgroup of patients with asthma, while remaining transient in some patients who risk relapsing and transitioning between disease states during continued mepolizumab treatment.

Keywords: Asthma; Eosinophils; Mepolizumab; Relapse; Remission.

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Conflict of interest statement

Conflict of interest D.Thomas reports grants from GlaxoSmithKline. V.M. McDonald reports grants from NHMRC and Medical Research Futures Fund, consulting fees from GlaxoSmithKline, payment or honoraria from GlaxoSmithKline, and Boehringer Ingelheim, travel support from GlaxoSmithKline, and Boehringer Ingelheim. E. S. Harvey reports grants from GlaxoSmithKline that were paid to her employer, during the conduct of the study. P. Bardin reports per patient trial participation fees from Monash Lung and Sleep during the conduct of the study. C. H. Katelaris reports grants from GlaxoSmithKline during the conduct of the study. G. Katsoulotos reports payment or honoraria from GlaxoSmithKline, AstraZeneca, Chiesi and Sanofi. D. Langton has received fees from GlaxoSmithKline for participation in severe asthma advisory boards. J. W. Upham reports grants and honoraria from GlaxoSmithKline. P. A. B. Wark reports grant from GlaxoSmithKline. M. Fricker reports grants from GlaxoSmithKline. P.G. Gibson reports grants from GlaxoSmithKline and NHMRC, and payment or honoraria from GlaxoSmithKline, AstraZeneca, Orion and Sanofi. The rest of the authors declare that they have no relevant conflicts of interest.

Supplementary info

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Editorial

Ann Am Thorac Soc

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. 2026 Oct 1;23(10):1432-1434.

doi: 10.1093/annalsats/aaoag185.

[From guidelines to practice: the PuSHCon health-coach model for COPD and asthma](#)

[Arianne K Baldomero](#)¹

Affiliations Expand

- PMID: 42402212
- DOI: [10.1093/annalsats/aaoag185](https://doi.org/10.1093/annalsats/aaoag185)

Free article

No abstract available

Comment on

- [Pulmonary specialist health coach consultation model: a randomized controlled trial.](#)

Willard-Grace R, Cabrera A, Tsao S, Potter MB, Hessler D, Kong M, Thom DH, Hilton JF, Su G. Ann Am Thorac Soc. 2026 Oct 1;23(10):1455-1465. doi: 10.1093/annalsats/aaoag097. PMID: 42150017 Free PMC article. Clinical Trial.

Supplementary info

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Cite

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Review

Adv Ther

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. 2026 Oct;43(10):4344-4354.

doi: 10.1007/s12325-026-03683-4. Epub 2026 Jul 9.

[An Eight-Century Evolution of Asthma Therapeutics in Western Countries: From Medieval Regimens to Anti-inflammatory Reliever Therapy and Precision Biologics](#)

[Nestor A Molfino](#)¹, [Paul M O'Byrne](#)²

Affiliations Expand

- PMID: 42423946
- PMCID: [PMC13619785](#)

- DOI: [10.1007/s12325-026-03683-4](https://doi.org/10.1007/s12325-026-03683-4)

Abstract

The changes in our understanding of asthma etiopathogenesis has led to new therapies and a significant reduction in asthma exacerbations as well as mortality. The management of asthma has evolved over several centuries from constitutional/environmental palliation, to the recognition of recurrent reversible airway obstruction and to the recognition of inflammatory changes in the lung compartment. The therapeutic armamentarium has also shifted from using alternative therapies at first, to bronchodilator rescue alone and then to inflammation-directed controller therapy with corticosteroids. In the 2000s, biomarker- and endotype-guided therapy with biologics started a major shift in our understanding of asthma which has generated new treatments and outcomes. This review summarizes how clinicians approached patients with the therapeutic armamentarium available in each era, and how those changes translated into success or failure in reducing exacerbations, hospitalizations, relapses, and mortality. The emphasis is on Western countries, where clinicians described, implemented, and quantified the principal modern therapeutic shifts.

Keywords: Anti-inflammatory reliever therapy; Asthma; Asthma history; Biologics; Bronchodilators; Hospitalization; Inhaled corticosteroids; Mortality.

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Conflict of interest statement

Declarations. Conflict of Interest: Nestor A. Molino is an employee of Amgen Inc. Paul M. O'Byrne has obtained grants in aid of research from Novartis, AstraZeneca, Biohaven, Merck, and Jasper for research, and received personal fees for consulting or speaker fees from AstraZeneca, GSK, and Sonafi/Regeneron. **Ethical Approval:** This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors.

- [23 references](#)
- [1 figure](#)

Supplementary info

Publication types, MeSH terms, SubstancesExpand

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Cite

15

Ann Allergy Asthma Immunol

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. 2026 Oct;137(4):459-465.e1.

doi: 10.1016/j.anai.2026.07.007. Epub 2026 Jul 11.

Small airway dysfunction: A key predictor of exacerbation risk in adolescents with mild, well-controlled asthma

Pasquale Comberiati¹, Marcello Cottini², Laura Ventura³, Carlo Lombardi⁴, Rory Chan⁵, Alvise Berti⁶, Gustavo Wandalsen⁷, Corrado Pelaia⁸, Daniel Munblit⁹, Francesco Menzella¹⁰, Massimo Landi¹¹, Diego Peroni¹², Stanley Galant¹³

Affiliations Expand

- PMID: 42435849
- DOI: [10.1016/j.anai.2026.07.007](https://doi.org/10.1016/j.anai.2026.07.007)

Abstract

Background: Mild asthma is considered a low-risk condition because symptoms are infrequent and lung function is preserved. However, severe exacerbations may still occur in such patients. Small airway dysfunction (SAD) is recognized as an important contributor to exacerbation risk, even in adults with mild asthma. Less is known in adolescents, a vulnerable population because of transition-related issues.

Objective: To investigate whether SAD, identified by impulse oscillometry, is associated with prior exacerbations in adolescents with Global Initiative for Asthma (GINA)-defined mild asthma, good symptom control, and normal spirometry.

Methods: SAD was determined by the concomitant presence of abnormal z-score values for peripheral airway resistance between 5 and 20 Hz (R5-R20) and the area under the reactance curve (>+1.645) and peripheral airway reactance at 5 Hz (<-1.645). Associations between SAD, fractional exhaled nitric oxide (FeNO), and blood eosinophil count (BEC) with previous exacerbations were assessed using multivariable logistic regression.

Results: SAD was present in 28% of participants. Adolescents with SAD exhibited higher type-2 inflammatory biomarkers and significantly more frequent exacerbations than those without SAD (79% vs 20%, $P < .0001$). In multivariable analysis, SAD, FeNO greater than or equal to 25 parts per billion, and BEC greater than or equal to 300 cells/ μ L were independently associated with previous exacerbations; SAD remained an independent predictor even after adjusting for both elevated FeNO and BEC (adjusted odds ratio, 5.07; 95% CI, 1.52-18.43; $P = .008$). Mediation analysis suggested that SAD significantly mediated the association between type-2 inflammation and exacerbations.

Conclusion: Among adolescents with mild, controlled asthma and normal spirometry, impulse oscillometry-defined SAD is strongly associated with

exacerbation susceptibility. Objective assessment of peripheral airway function may help refine risk stratification in this population.

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Conflict of interest statement

Disclosures Dr Cottini reports receiving personal fees (talks) from Chiesi, Menarini, and GlaxoSmithKline (GSK); and support in attending meetings from Chiesi. Dr Lombardi reports receiving personal fees (talks) from GSK, Chiesi, AstraZeneca, and Sanofi-Regeneron. Dr Berti reports receiving grants and personal fees (consulting, talks, and advisory board) from GSK, AstraZeneca, UCB, AbbVie, and Vifor. Dr Chan reports receiving institutional grants awarded from Asthma+Lung UK, Chiesi, AstraZeneca, GSK, and Sanofi-Regeneron; reports serving on advisory boards for Vitalograph, Chiesi, and AstraZeneca; received personal fees from AstraZeneca, Chiesi, Vitalograph, Jaeger, Thorasys, and Sanofi-Regeneron; and received support in attending conferences from AstraZeneca, Chiesi, NIOX, Sanofi-Regeneron, and Vitalograph. Dr Pelaia has received lecture fees and advisory board fees from AstraZeneca, GSK, and Sanofi-Regeneron. The remaining authors have no conflicts of interests to report.

Supplementary info

MeSH terms, SubstancesExpand

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16

Review

Am J Respir Crit Care Med

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. 2026 Oct 1;212(10):2592-2606.

doi: 10.1093/ajrccm/aamag373.

[Peripubertal changes in asthma](#)

[Alexandra E Silva](#)^{1,2}, [Giuliana Ferrante](#)^{3,4}, [Patricia Silveyra](#)⁵, [Adnan Custovic](#)⁶, [Stefania La Grutta](#)⁴, [Erick Forno](#)^{1,2}

Affiliations Expand

- PMID: 42447233
- DOI: [10.1093/ajrccm/aamaq373](https://doi.org/10.1093/ajrccm/aamaq373)

Abstract

Asthma is a heterogeneous disease affecting nearly 300 million people around the world. It is the most common chronic respiratory disease of childhood. There are significant sex differences in asthma incidence, severity, and morbidity around the time of puberty. The reasons for these peripubertal changes are still not fully understood, but they are likely multifactorial. In this review, we will discuss several proposed contributing mechanisms, including sex differences in anatomy and development, the effects of sex hormones on airway inflammation and reactivity, the immunomodulatory effects of sex hormones, differences in mucociliary function, and sex differences in genetic and epigenetic factors.

Keywords: asthma; asthma phenotypes; dysanapsis; puberty; sex hormones.

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Cite

17

Clinical Trial

Adv Ther

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. 2026 Oct;43(10):4730-4748.

doi: 10.1007/s12325-026-03721-1. Epub 2026 Jul 20.

[Clinical Remission with FF/UMEC/VI Versus ICS/LABA in Uncontrolled Asthma: The PERFORM Pragmatic Randomized Controlled Trial](#)

[Stephen G Noorduy](#)^{1,2}, [John J Oppenheimer](#)³, [Alison C Moore](#)⁴, [Hiroyuki Nagase](#)⁵, [Jodie Crawford](#)⁶, [Amila Poddar](#)⁷, [Victoria Boon](#)⁸, [Nicola Brown](#)⁹, [David Slade](#)¹⁰, [Gabriel Garcia](#)¹¹, [Alan P Baptist](#)¹², [Erika Penz](#)^{13,14}

Affiliations Expand

- PMID: 42474701
- PMCID: [PMC13619735](#)
- DOI: [10.1007/s12325-026-03721-1](#)

Abstract

Introduction: Prospective, randomized evidence for clinical remission, an ambitious treatment goal relevant for all patients with asthma, with single-inhaler triple therapy (SITT) in routine care is lacking. Significant improvement in lung function and asthma control with SITT versus inhaled corticosteroid/long-acting β_2 -agonist (ICS/LABA) was demonstrated in PERFORM at week 24.

Methods: PERFORM (GSK 219912/NCT06372496), a randomized, open-label, active-controlled, global pragmatic trial, evaluated the effectiveness and safety of fluticasone furoate/umeclidinium/vilanterol (FF/UMEC/VI) versus usual care ICS/LABA in adults (18-75 years) with uncontrolled, infrequently exacerbating asthma. Secondary outcomes related to clinical remission (no oral corticosteroid use, no severe exacerbations, optimized lung function [change from baseline (CFB) in forced expiratory volume in 1 second (FEV₁) $\geq$ 100 mL], asthma control [Asthma Control Questionnaire total score $<$ 1.50]) were assessed at week 52, following prespecified analysis plans. Alternative clinical remission definitions using stabilized lung function (CFB FEV₁ $\geq$ 0 mL) and those within Japanese guidelines were also assessed. Clinical remission responder analyses are presented as multiplicity-adjusted odds ratios. Safety was assessed throughout.

Results: Overall, 1236 participants (mean age 48.9 years; 68.6% [n = 848/1236] female) were included (FF/UMEC/VI: N = 619/1236; ICS/LABA: N = 617/1236). Participants receiving FF/UMEC/VI had statistically significantly greater odds of achieving clinical remission (including optimized lung function) at week 52 versus usual care ICS/LABA (adjusted odds ratio [95% confidence interval] 2.13 [1.54, 2.94], P $<$ 0.0001). Similar results were observed for alternative definitions. Week 52 safety profile aligned with previous studies.

Conclusions: In a broad patient population with uncontrolled asthma, treatment with FF/UMEC/VI resulted in statistically significantly greater odds of achieving clinical remission versus usual care ICS/LABA in a setting reflecting routine practice, a secondary outcome of PERFORM. These findings were consistent irrespective of clinical remission definitions and provide evidence informing the use of FF/UMEC/VI in an underserved group of symptomatic patients with infrequent exacerbations and minimal lung function impairment.

Trial registration: GSK 219912/NCT06372496.

Keywords: Asthma control; Clinical remission; Lung function; Pragmatic randomized controlled trial; Routine practice setting; Single-inhaler triple therapy.

Conflict of interest statement

Declarations. Conflict of Interest: Stephen G Noorduyn, Alison C Moore, Jodie Crawford, Amila Poddar, Nicola Brown, and David Slade are employed by GSK and hold financial equities in GSK. Stephen G Noorduyn is a PhD candidate at McMaster University, Hamilton, ON, Canada. John J Oppenheimer has served on adjudication committees or data and safety monitoring boards for AstraZeneca, GSK, Novartis, and Sanofi-Regeneron; received consultancy fees from AstraZeneca, Amgen, Regeneron, ARS, Aquestive, GSK, and Sanofi; and received grants and personal fees from GSK. Hiroyuki Nagase has received speaker and consultation fees from AstraZeneca and GSK, and speaker fees from Kyorin Pharmaceutical, and Sanofi. Victoria Boon is an employee of GSK. Gabriel Garcia has participated in advisory boards for GSK, AstraZeneca, Sanofi, Novartis, and Boehringer Ingelheim; he has received honoraria for speaking at sponsored meetings from GSK, Boehringer Ingelheim, AstraZeneca, Sanofi, Phoenix, and Novartis; and is a principal investigator in trials sponsored by GSK, Boehringer Ingelheim, AstraZeneca, Novartis, Sanofi, PPD, Zambon, Parexel, Covance, IQVIA, and Chiesi. Alan P Baptist reports grant support from GSK, AstraZeneca, Genentech, and Teva. Erika Penz has grant funding from the Canadian Institute Health Research, Lung Saskatchewan, Saskatchewan Health Research Foundation, AstraZeneca, GSK, and Sanofi; has served as a consultant for AstraZeneca, GSK, Roche, Sanofi, and Saskatchewan Cancer Agency; has received speaker honoraria from AstraZeneca, Boehringer Ingelheim, Canadian Thoracic Society, Covis Pharma, GSK, Lung Saskatchewan, Sanofi-Genzyme, and Valeo Pharma; serves as the Past-President of the Canadian Thoracic Society and is a board member of the Canadian Institutes of Health Research- Institute for Cancer Research; has served as co-chair of the COPD Assembly for the Canadian Thoracic Society; and her institution has previously received equipment from AstraZeneca. She is Associate Editor of the COPD section of the CHEST Journal and has received honoraria and travel expenses from CHEST journal. **Ethical Approval:** PERFORM was sponsored by GSK (219912/NCT06372496) and conducted in accordance with the Declaration of Helsinki and the International Conference on Harmonisation Guideline for Good Clinical Practice, as well as applicable local regulations. Trial documents and protocol amendments received approval by relevant local institutional review boards and/or independent ethics committees. All participants provided physically or digitally signed, informed consent.

- [29 references](#)
- [2 figures](#)

Supplementary info

Publication types, MeSH terms, Substances, Associated data, Grants and fundingExpand

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Observational Study

Adv Ther

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. 2026 Oct;43(10):4749-4765.

doi: 10.1007/s12325-026-03714-0. Epub 2026 Jul 21.

Uncontrolled Status, Disease Burden, and Associated Risk Factors Among Patients with Asthma Receiving Medium-to-High Dose ICS or ICS/LABA: A Retrospective Analysis

Honglei Shi¹, Ying Wang¹, Min Wang², Dan Shen², Kewu Huang³

Affiliations Expand

- PMID: 42479096
- PMCID: [PMC13619787](#)
- DOI: [10.1007/s12325-026-03714-0](#)

Abstract

Introduction: There is limited information on the uncontrolled status and burden of asthma among patients using inhaled corticosteroids (ICS) combined or not with long-acting β 2-agonists (LABA) in China. This study aims to characterize the disease burden among these patients and identify risk factors for unfavorable outcomes.

Methods: This retrospective observational study utilized data from a regional Electronic Medical Record (EMR) database in China. Patients (≥ 12 years) with asthma having at least two prescriptions for medium-to-high dose ICS or ICS/LABA within any 6 months were identified from the Shanghai Medical Database between 2016 and 2020. Data on characteristics and treatment patterns 1-year pre-index (baseline) and disease burden 1-year post-index (follow-up) were obtained from the database. Uncontrolled asthma was defined based on exacerbations and specific treatment. A multivariate logistic regression model was used to identify risk factors associated with the follow-up adverse outcomes.

Results: A total of 35,900 patients with asthma receiving medium-to-high dose ICS or ICS/LABA were included. Of these, 10,842 (30.2%) were uncontrolled at baseline, exhibiting higher proportions of follow-up uncontrolled asthma (32.3% vs. 10.7%), corticosteroids use (16.8% vs. 3.9%), emergency room (ER) visits and hospitalizations due to exacerbations (22.3% vs. 5.2%), and total medical costs (9303.9 CNY vs. 8621.4 CNY) compared to patients who were controlled, all with $p < 0.001$. Type 2 (T2) biomarkers detection rates were less than 10% during follow-up. Uncontrolled asthma, older age, T2-related comorbidities, use of ≥ 2 controllers, a

short-acting β 2-agonist (SABA), and corticosteroids at baseline were significantly related to follow-up adverse outcomes.

Conclusion: A significant proportion of patients with asthma using medium-to-high dose ICS or ICS/LABA in China remain uncontrolled, resulting in greater disease and economic burden. Insufficient assessment of T2 inflammation and suboptimal treatment patterns represent the challenges in asthma management in China, potentially resulting in long-term adverse outcomes.

Keywords: Asthma; Disease burden; Electronic medical record; Risk factors; Uncontrolled.

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Conflict of interest statement

Declarations. Conflict of interest: Kewu Huang, Honglei Shi, and Ying Wang: nothing to disclose. Min Wang, Dan Shen, Sanofi employees, may hold stock and/or stock options in the company. Min Wang is currently affiliated with AstraZeneca. **Ethical Approval:** The study protocol and its amendments were approved by medical ethics committee of Beijing Chao-Yang Hospital (2023-KE-332). This study was conducted in accordance with the Ethical Guidelines for Biomedical Research Involving Human Subjects, the ethical principles of the Declaration of Helsinki, and all relevant regulations applicable to noninterventional studies. The need for informed consent was waived as data available in the database are standardized and anonymized.

- [45 references](#)
- [4 figures](#)

Supplementary info

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Lancet Respir Med

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. 2026 Oct;14(10):859-868.

doi: 10.1016/S2213-2600(26)00144-X. Epub 2026 Jul 28.

Global economic burden attributable to asthma, 2025-50: a global modelling analysis of 154 countries and territories

Zhong Cao¹, Xunliang Tong², Zhoutao Zheng³, Hexi Sun³, Yuheng Luo⁴, Ke Huang⁵, Klaus Prettner⁶, Michael Kuhn⁷, Till Winfried Bärnighausen⁸, David E Bloom⁹, Ting Yang⁵, Chen Wang², Simiao Chen¹⁰

Affiliations Expand

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- DOI: [10.1016/S2213-2600\(26\)00144-X](https://doi.org/10.1016/S2213-2600(26)00144-X)

Free article

Abstract

Background: Asthma is a major chronic respiratory disease with substantial health and economic consequences worldwide; however, there is little evidence for the long-term macroeconomic effects of asthma across countries. We aimed to estimate the global economic burden attributable to asthma from 2025 to 2050 across 154 countries and territories.

Methods: We estimated the long-term economic burden of asthma using a health-augmented macroeconomic model covering 154 countries and territories from 2025 to 2050. Projected labour losses were captured through reductions in the workforce due to premature death and reduced labour force participation due to disability. Physical capital accumulation was affected by asthma-related medical spending, which reduces savings and investment, measured as asthma-attributable health expenditure. In the model, this spending reduced disposable income and savings, thereby lowering investment and slowing capital accumulation over time **FINDINGS:** Between 2025 and 2050, our model predicted that asthma would incur costs of approximately US\$863 billion (95% uncertainty interval [UI] 615-1396; 2024 US\$), corresponding to an annual gross domestic product (GDP) decline of 0·036% (0·026-0·058). The projected economic burden differed markedly across the 154 countries. The USA bore the largest burden (US\$471 billion [371-655]), followed by the UK (US\$45 billion [28-84]) and China (US\$44 billion [27-81]). Across income groups, high-income countries accounted for the greatest absolute losses (US\$712 billion [525-1105]) and highest proportional GDP losses (0·054% [0·039-0·083]), whereas low-income countries incurred absolute losses of US\$5 billion (2-11). In low-income and middle-income countries (LMICs), labour-related losses accounted for a larger share of total costs and declines in disease burden were slower.

Interpretation: Our findings suggest that asthma imposes a substantial and uneven macroeconomic burden across countries, with differences by income level and region. Productivity reductions dominate in LMICs, whereas physical capital-related effects are more important in high-income settings. Improving asthma prevention and control could yield economic gain.

Funding: Noncommunicable Chronic Diseases-National Science and Technology Major Project; Non-profit Central Research Institute Fund of Chinese Academy of Medical Sciences; European Commission Horizon Europe.

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Conflict of interest statement

Declaration of interests TWB reports research funding to his institution from multiple public and philanthropic funders (including the EU, National Institutes of Health, Wellcome, and the Bill & Melinda Gates Foundation), personal payments as Editor-in-Chief of PLoS Medicine, travel support from WHO and other organisations, and serves on unpaid advisory boards. All other authors declare no competing interests.

Supplementary info

MeSH termsExpand

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Lancet Respir Med

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. 2026 Oct;14(10):839-840.

doi: 10.1016/S2213-2600(26)00224-9. Epub 2026 Jul 28.

[From the cost of asthma to the economic dividends of asthma control](#)

[Jagruati Yenpure](#)¹, [Sundeep Salvi](#)²

Affiliations Expand

- PMID: 42520826
- DOI: [10.1016/S2213-2600\(26\)00224-9](#)

No abstract available

Conflict of interest statement

ChatGPT (GPT-5.5, OpenAI) was used to assist with manuscript structuring and language editing. The authors take full responsibility for the scientific content and conclusions. We declare no competing interests.

Full text links



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Cite

21

Review

J Natl Med Assoc

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. 2026 Oct;118(5):868-871.

doi: 10.1016/j.jnma.2026.06.011. Epub 2026 Jul 2.

[Artificial intelligence and asthma: Pros, cons, and potential impact on community outcomes](#)

[Cleavon Covington](#)¹, [Karl S Mueller](#)², [Joanne Acevedo](#)³

Affiliations Expand

- PMID: 42521561
- DOI: [10.1016/j.jnma.2026.06.011](#)

No abstract available

Keywords: Allergy and immunology; Artificial intelligence; Asthma; Health disparities.

Supplementary info

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Allergol Int

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. 2026 Oct;75(4):654-656.

doi: 10.1016/j.alit.2026.07.002. Epub 2026 Aug 3.

[Airway mucus plugs are associated with exacerbation risk in biologic-naïve but not biologic-treated asthma: A prospective cohort study](#)

[Naoya Tanabe](#)¹, [Yusuke Hayashi](#)², [Hironobu Sunadome](#)², [Ryo Sakamoto](#)³, [Atsuyasu Sato](#)², [Toyohiro Hirai](#)²

Affiliations Expand

- PMID: 42547341
- DOI: [10.1016/j.alit.2026.07.002](#)

No abstract available

Conflict of interest statement

Conflict of interest The authors have no conflict of interest to declare.

Supplementary info

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Cite

23

Respir Med

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. 2026 Oct:262:109078.

doi: 10.1016/j.rmed.2026.109078. Epub 2026 Aug 6.

[Expert consensus on the management of mild and moderate asthma](#)

[Matteo Martini](#)¹, [Lorenzo Cecchi](#)², [Antonino Musarra](#)³, [Kliljeda Jaubashi](#)⁴, [Alessandro Maria Marra](#)⁵, [Francesco Murzilli](#)⁶, [Francesco Papia](#)⁷, [Giuseppe Valenti](#)⁷, [Baoran Yang](#)⁸, [Mario Cazzola](#)⁹, [Adriano Vaghi](#)¹⁰, [Maria Beatrice Bilò](#)¹¹

Affiliations Expand

- PMID: 42562236
- DOI: [10.1016/j.rmed.2026.109078](https://doi.org/10.1016/j.rmed.2026.109078)

Free article

Abstract

Background: Mild and moderate asthma are the most common forms of asthma, but they often remain poorly controlled due to inappropriate treatment strategies and low adherence. Formal consensus on best practices for managing mild-to-moderate asthma is still lacking.

Objectives: To achieve formal consensus on the management of mild-to-moderate asthma and validate the appropriateness and clinical feasibility of the recommendations in clinical practice.

Methods: A modified Delphi process involving a panel of respiratory experts was employed to formulate consensus statements across the following key domains identified through a cross-sectional survey administered to Italian allergists and immunologists: definition of asthma control, tools for assessment of asthma control, patient phenotyping, personalized treatment, and patient education and empowerment. The appropriateness and clinical feasibility of the agreed statements were validated with a RAND/UCLA method.

Results: Full consensus was reached on asthma control in mild-to-moderate asthma, defined as the absence of symptoms, exacerbations, limitation of daily activities, and the need for oral corticosteroids, together with the optimization of lung function. Assessment of control, future risk, and phenotype should be performed with appropriate tools and timing, to implement proactive management especially in patients at risk of exacerbations and disease progression.

Conclusion: This study provides a comprehensive, expert-driven consensus for the management of mild-to-moderate asthma, formally validated for appropriateness despite variability in real-world implementation. The findings support a patient-centric, proactive approach and offer practical recommendations to bridge the gap between guidelines and clinical practice.

Keywords: Asthma control; Asthma phenotyping; Consensus; Mild asthma; Mild-to-moderate asthma; Moderate asthma; Patient adherence.

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Conflict of interest statement

Declaration of competing interest LC reports personal fees from Chiesi Farmaceutici (consulting), Thermofisher (consulting, talks), GSK (consulting, talks), AstraZeneca (consulting, talks), Menarini (talks, consulting), Novartis (consulting, talks), and Sanofi (consulting, talks). AM reports personal fees from Sanofi (talks), Menarini (consulting), and GSK (consulting). FM reports personal fees from GlaxoSmithKline (talks) and Blueprint (consulting, talks). KJ reports personal fees from Sanofi (talks), Menarini (consulting), and GSK (consulting). AMM reports personal fees from GlaxoSmithKline (consulting) and Menarini (consulting). MM reports personal fees from Chiesi Farmaceutici (consulting), GlaxoSmithKline (consulting, talks), AstraZeneca (consulting), Menarini (consulting), and Sanofi

(talks). MC has no financial or nonfinancial relationships or activities concerning this article. He is the deputy editor of Respiratory Medicine but was not involved in selecting peer reviewers for the manuscript or making any subsequent editorial decisions. AV reports personal fees from Chiesi Farmaceutici (talks), GlaxoSmithKline (talks), AstraZeneca (talks), and Menarini (talks). MBB reports personal fees from ALK (consulting), AstraZeneca (talks), BluePrint (advisory board, talk), Gentili (talk), GSK (talks), Menarini (talks), and Sanofi (advisory board, talks). FP, GV, and BY report personal fees from Menarini (consulting) and GSK (talks).

Supplementary info

Publication types, MeSH terms, SubstancesExpand

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Cite

24

Multicenter Study

Respir Med

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. 2026 Oct:262:109075.

doi: 10.1016/j.rmed.2026.109075. Epub 2026 Aug 6.

[Early and continued asthma control up to week 24 in patients with severe, uncontrolled asthma treated with tezepelumab: Initial results of the real-world ASCENT study](#)

[Katrin Milger](#)¹, [Del Dorscheid](#)², [Christian Gessner](#)³, [Ole Hilberg](#)⁴, [Jean-Pierre Llanos](#)⁵, [Jonatan Nåtman](#)⁶, [Hannah Urbanski](#)⁷, [Deborah L Clarke](#)⁷, [Benjamin Emmanuel](#)⁸, [Neda Stjepanovic](#)⁹

Affiliations Expand

- PMID: 42562237
- DOI: [10.1016/j.rmed.2026.109075](#)

Free article

Abstract

Introduction: Tezepelumab has demonstrated efficacy in patients with severe, uncontrolled asthma in randomized controlled trials (RCTs). Real-world studies assessing patient-reported outcomes are required to complement RCT findings.

Methods: ASCENT is an ongoing, multi-country, single-arm, prospective, real-world study assessing asthma symptom control in participants (≥ 12 years old) with severe, uncontrolled asthma initiating tezepelumab as routine standard of care in Europe and Canada. This interim analysis assessed changes from baseline in Asthma Control Questionnaire-6 (ACQ-6) score, St George's Respiratory Questionnaire (SGRQ) total score, and pre-bronchodilator forced expiratory volume in 1 s (FEV₁) at weeks 4, 12, and 24, and the annualized asthma exacerbation rate (AAER) in the 52-week baseline and 24-week follow-up periods.

Results: Overall, 211 participants were included in this analysis. ACQ-6 and SGRQ total scores improved from baseline to week 4 (least-squares mean [95% CI] change: -0.99 [-1.13, -0.84] and -13.2 [-15.6, -10.8], respectively) and further improved to week 24 (-1.28 [-1.44, -1.12] and -19.8 [-22.6, -17.0], respectively). AAER decreased by 65% (95% CI: 55, 73) between baseline (1.75) and follow-up (0.61) periods. Least-squares mean changes from baseline in pre-bronchodilator FEV₁ at weeks 4 and 24 were 0.09 L (0.03, 0.14) and 0.12 L (0.06, 0.18), respectively. These changes were observed across asthma phenotypes and biomarker levels.

Conclusion: Patients with severe, uncontrolled asthma treated with tezepelumab had clinically meaningful improvements in asthma control, health-related quality of life, lung function, and exacerbations as early as week 4 through to week 24, irrespective of asthma phenotype.

Clinical trial number: [NCT05677139](#).

Keywords: Asthma; Asthma control; Biologic; Health-related quality of life; Real-world; Severe asthma; Tezepelumab.

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Supplementary info

Publication types, MeSH terms, Substances, Associated dataExpand

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Cite

25

Contemp Clin Trials Commun

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. 2026 Jul 31:53:101677.

doi: 10.1016/j.conctc.2026.101677. eCollection 2026 Oct.

Single maintenance and reliever therapy strategies for Implementation and effectiveness trial (SMART & SIMPLE Trial): study protocol for a type II hybrid effectiveness-implementation cluster-randomized controlled trial

Jordan I Wood^{1,2}, **Alisa J Stephens-Shields**³, **Dawei Xie**³, **Dean J Karavite**⁴, **Jeritt G Thayer**^{1,4,5}, **Robert W Grundmeier**^{1,4,5}, **Christopher P Bonafide**^{1,5}, **Alexander G Fiks**^{1,5}, **Tyra C Bryant-Stephens**^{5,6}, **Laura M Huertas**^{1,2}, **Chén C Kenyon**^{1,2,5,6}

Affiliations Expand

- PMID: 42602550
- PMCID: [PMC13475240](#)
- DOI: [10.1016/j.conctc.2026.101677](#)

Abstract

Background: Asthma is a leading cause of childhood morbidity. In 2020, the National Heart, Lung, and Blood Institute codified a different paradigm of asthma management, single maintenance and reliever therapy (SMART), as guideline-recommended care for children ages 5 and above requiring Step 3-4 asthma therapy. Strategies for implementing SMART and its real-world effectiveness-have not been studied in U.S. children.

Methods: This hybrid type-II effectiveness-implementation trial will compare effects of two successive, cumulative implementation strategies to usual care using a clinic-level, cluster-randomized design in a large pediatric primary care network. Participating clinics will be randomized to usual care or active implementation strategies. Active implementation strategy clinics will first receive electronic health record-based clinical decision support plus education. After one year, nurse care coordinator and community health worker support will be added in active strategy clinics to help families overcome system-level barriers (e.g., insurance prior authorization, social needs support) for one year, followed by a 6-month sustainment phase. The primary implementation outcome will be visit-level SMART adoption among SMART-eligible children in a repeated cross-sectional sample assessed using difference-in-differences. The study will also assess real-world clinical effectiveness of SMART in reducing severe asthma exacerbations using target trial emulation and mechanisms of SMART implementation and effectiveness using mediation analyses.

Discussion: This pragmatic hybrid effectiveness-implementation trial will test strategies for improving SMART adoption and evaluate SMART's impact on asthma outcomes. Findings will inform efforts to scale implementation and dissemination strategies nationally and build real-world evidence base for SMART effectiveness in U.S. pediatric populations.

Trial registration: ClinicalTrials.gov identifiers: [NCT07137923](#); [NCT07138027](#). There are two ClinicalTrials.gov records, one to evaluate each implementation strategy. Registration dates: August 22, 2025.

Keywords: Asthma; Children; Cluster-randomized; Hybrid design.

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Conflict of interest statement

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Chen C Kenyon reports financial support was provided by National Heart Lung and Blood Institute. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

- [63 references](#)
- [3 figures](#)

Supplementary info

Associated data, Grants and fundingExpand

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Cite

26

Review

Lancet Respir Med

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. 2026 Oct;14(10):869-882.

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[Symptom burden to characterise, predict, and prevent asthma attacks: a patient-level meta-analysis of randomised trials and translational prospective studies](#)

[Simon Couillard](#)¹, [Fleur L Meulmeester](#)², [Pascal Charland](#)³, [Samuel Lemaire-Paquette](#)⁴, [Imran Howell](#)⁵, [Carlos Celis-Preciado](#)⁶, [Philippe Lachapelle](#)³, [Liam G Heaney](#)⁷, [Peter Bradding](#)⁸, [Samuel Mailhot-Larouche](#)³, [Sanjay Ramakrishnan](#)⁹, [Michael E Wechsler](#)¹⁰, [Guy Brusselle](#)¹¹, [Sarah E Diver](#)⁸, [Christopher E Brightling](#)⁸, [Mario Castro](#)¹², [Nicola A Hanania](#)¹³, [David J Jackson](#)¹⁴, [Neil Martin](#)¹⁵, [Alison Moore](#)¹⁶, [Peter Howarth](#)¹⁶, [Megan E Hardin](#)¹⁷, [Rebecca Gall](#)¹⁸, [Cecile T J Holweg](#)¹⁹, [Vennila Dharman](#)²⁰, [Richard W](#)

Affiliations Expand

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Abstract

Background: Asthma symptoms often guide disease assessment and management, but their prognostic and predictive value is unclear. We evaluated the extent to which symptom burden measured by the 5-item Asthma Control Questionnaire (ACQ-5) predicts future severe asthma attacks and response to anti-inflammatory therapy.

Methods: We conducted an individual participant data meta-analysis of selected randomised controlled trials and translational observational cohort studies of asthma of varying severity. Primary analyses used the ORACLE2 patient-level meta-analysis (n=6513) of control-group participants from 22 randomised controlled trials. Additional datasets from studies assessing type 2 targeting anti-inflammatory therapies were included on the basis of availability of data, to provide insight into the association between ACQ-5 and sputum cell counts or mediator data. Additional datasets were the DREAM intravenous mepolizumab group (n=461); a cross-sectional severe asthma cohort (SA-OT, n=74); and two acute asthma cohorts (PRISMA, biologic-naïve, n=53; BOOST, anti-interleukin-5-treated, n=60). Associations between baseline ACQ-5 scores and clinical, physiological, and inflammatory profiles, asthma attack risk, and anti-inflammatory treatment responses were examined.

Findings: Across five datasets encompassing 7161 distinct participants, asthma severity, lung function, inflammatory profiles, comorbidities, and ACQ-5 results varied widely. The proportion of patients with high symptom burden (ACQ-5 score >1·5) ranged from 39% to 100%. Baseline ACQ-5 showed no consistent cross-sectional association with other clinical, physiological, or inflammatory asthma features. Each 0·5-point increase in baseline ACQ-5 score was associated with a modest increase in future asthma attack risk (adjusted rate ratio [aRR] 1·09 [95% CI 1·06-1·12]; $\Delta R^2=0\cdot02$ vs multivariable prediction model without ACQ-5). Baseline ACQ-5 score did not alter relative and absolute attack risk reduction from intravenous mepolizumab in DREAM. By contrast, patients with high blood eosinophil counts and high fractional exhaled nitric oxide (FeNO) had the highest relative and absolute risk reduction (2·81 vs 1·17 attacks; aRR 0·38 [95% CI 0·25-0·57]). In the PRISMA and BOOST datasets, ACQ-5 was not associated with post-corticosteroid lung function change. Across studies, relative and absolute treatment effects showed consistent associations with blood eosinophil counts and FeNO.

Interpretation: In a large, individual patient-level meta-analysis of randomised controlled trials and translational prospective observational cohort studies, we observed little alignment of symptom burden with other clinical, physiological, or biological features of asthma and modest prognostic value for severe attacks. Conversely, type 2 biomarkers more reliably identified patients at high risk and

those likely to respond to treatment. Symptoms might require contextual interpretation to guide anti-inflammatory escalation in asthma.

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Conflict of interest statement

Declaration of interests SC has received non-restricted research grants from the National Institute for Health and Care Research Oxford Biomedical Research Centre, the Quebec Respiratory Health Research Network, the Association Pulmonaire du Québec, the Academy of Medical Sciences, AstraZeneca, bioMérieux, Circassia Niox Group, and Sanofi-Genzyme-Regeneron; is the holder of the Association Pulmonaire du Québec's Research Chair in Respiratory Medicine and is a clinical research scholar of the Fonds de recherche du Québec; has received speaker honoraria from AstraZeneca, GlaxoSmithKline, Sanofi-Regeneron, Circassia Niox Group, and Valeo Pharma; has received consultancy fees from FirstThought, Apogee Therapeutics, Connectio biopharma, Upstream Bio, AstraZeneca, GlaxoSmithKline, Sanofi-Regeneron, Access Biotechnology and Access Industries; has received sponsorship to attend or speak at international scientific meetings by or for AstraZeneca and Sanofi-Regeneron; is an advisory board member and holds stock options for Biometry (a company developing a fractional exhaled nitric oxide device called myBiometry); is co-inventor for the patent filed as Method for alleviating dyspnoea with neuromodulation; advised the Institut national d'excellence en santé et services sociaux for an update of the asthma general practice information booklet for general practitioners as well as therapeutic indications for Enerzair; and is a member of the asthma steering committee of the Canadian Thoracic Society. CC-P received an education scholarship from the Université de Sherbrooke within the submitted work, and outside the submitted work, received speaker honoraria from AstraZeneca, GlaxoSmithKline, and Sanofi-Regeneron, and consultancy fees from AstraZeneca, GlaxoSmithKline, and Sanofi-Regeneron. PL reports an investigator-initiated unrestricted research grant from Sanofi-Regeneron for the submitted work; outside the submitted work, he reports consulting fees from AstraZeneca, GlaxoSmithKline, and Sanofi-Regeneron, and speaker honoraria from AstraZeneca, GlaxoSmithKline, Sanofi-Regeneron, Boehringer Ingelheim, and Novartis. LGH has received grant funding, participated in advisory boards, and given lectures at meetings supported by Amgen, AstraZeneca, Boehringer Ingelheim, Circassia, Hoffmann la Roche, GlaxoSmithKline, Novartis, Theravance, Evelo Biosciences, Sanofi, and Teva; has received grants from MedImmune, Novartis UK, Roche Genentech, Glaxo Smith Kline, Amgen, Astra Zeneca, MedImmune, Glaxo Smith Kline, Aerocrine, and Vitalograph; has received sponsorship for attending international scientific meetings from AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, and Napp Pharmaceuticals; has taken part in asthma clinical trials sponsored by AstraZeneca, Boehringer Ingelheim, Hoffmann la Roche, and GlaxoSmithKline for which his institution received remuneration; and is the Academic Lead for the Medical Research Council Stratified Medicine UK Consortium in Severe Asthma, which involves industrial partnerships with a number of pharmaceutical companies including Amgen, AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Hoffmann

la Roche, and Janssen. PB has received research funding from Genentech via the University Hospitals of Leicester NHS Trust and DEShawResearch via the University of Leicester, consultancies for Genentech and DEShawResearch via the University of Leicester, one honorarium from AstraZeneca, and support to attend scientific meetings from GSK and Sanofi Genzyme. SR reports grants from the Charities Research Foundation, the National Health and Medical Research Council, the Medical Research Future Fund, and the Raine Medical Research Foundation paid to his institution; consulting fees from Connect BioPharma; speaker honoraria from AstraZeneca, GlaxoSmithKline, Chiesi, Boehringer Ingelheim, and Sanofi; travel support from AstraZeneca, Boehringer Ingelheim, and Sanofi; and advisory board participation for GlaxoSmithKline, Sanofi-Regeneron, and AstraZeneca, outside the submitted work. MEW has received consulting, advisory, or speaking honoraria from Abbvie, Allakos, Amgen, Apogee, Areteia Therapeutics, Arrowhead Pharmaceutical, AstraZeneca, Avalo Therapeutics, Belenos Bio, Celldex, Connect Biopharma, Cytoreason, Eli Lilly, Enveda, Equillium, General Medicines, Gilead, GlaxoSmithKline, Jasper, Kinaset, Kymera, Merck, MyBiometry, Pharming, Phylaxis, Pfizer, Pulmatrix, Rapt Therapeutics, recludix Pharma, Regeneron, Roche Genentech, Sanofi Genzyme, Sentien, Sound Biologics, SpiroMedical, Tetherex Pharmaceuticals, Uniquity Bio, Upstream Bio, Verona Pharma, and Zurabio. He is on the data safety and monitoring board for Sentien. He holds stock options for Upstream Bio and Cellergy. GB has received speaker honoraria from AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Merck Sharp & Dohme, Novartis, and Sanofi-Regeneron, and is past president of the Belgian Respiratory Society. SED received consultancy fees from AstraZeneca. CEB has received grants and consultancy fees from 4D Pharma, Areteia, AstraZeneca, Chiesi, Genentech, GSK, Mologic, Novartis, Regeneron Pharmaceuticals, Roche, and Sanofi. MC has received grants or contracts from American Lung Association, Apogee, AstraZeneca, Celldex, Connect BioPharma, Enveda, Gala Therapeutics, Genentech, GSK, Kymera, National Institutes of Health, Nacion, Novartis, PCORI, Pfizer, Pulmatrix, Sanofi-Aventis, Shionogi, Teva, and Theravance Biopharma. He has also received consulting fees from Allakos, Amgen, Apogee, Apreo Health, Arrowhead Pharmaceuticals, Blueprint Medicines, Connect BioPharma, Evommune, Genentech, Generate Biomedicines, GSK, Jasper, Johnson & Johnson, Kinaset, Merck, Novartis, OM Pharma, Pfizer, Pioneering Medicines, Sanofi-Aventis, Teva, Third Rock Ventures, Upstream Bio, Verona Pharmaceuticals, and VIDA; honoraria from Amgen, AstraZeneca, Med Learning Group, Regeneron Pharmaceuticals, and Sanofi; and stock options from Aer Therapeutics. NAH has received honoraria for serving as a consultant or advisor to GSK, AstraZeneca, Genentech, Sanofi, Regeneron, Verona, and Amgen and research grant support from GSK, AstraZeneca, Genentech, Regeneron, and Sanofi. DJJ has received advisory board and speakers' fees from AstraZeneca, Boehringer Ingelheim, Novartis, Teva, GSK, Sanofi-Regeneron, and Chiesi. NM is an employee and shareholder of AstraZeneca. AM is an employee of GlaxoSmithKline. PH is an employee of GlaxoSmithKline and holds shares in GSK. MEH is an employee of Sanofi. RG is an employee of Regeneron and holds shares in the company. CTJH is a former employee of Genentech and no longer holds stock, and is a current employee of AbbVie and owns AbbVie stock. VD is an employee of Novartis. RWB has received institutional research funding from AstraZeneca, Teva, Health Research Council, Cure Kidz, and Perpetual Guardian; personal fees from AstraZeneca, Avillion, and Teva; and is chair of the Asthma Foundation of New Zealand adolescent and adult asthma guidelines, a reviewer for the Global Initiative for Asthma, and a former member of the Global Initiative for Chronic Obstructive

Lung Disease board. JKS has received non-restricted research grants from AstraZeneca, European Respiratory Society Severe Heterogeneous Asthma Research collaboration—Patient Centred Clinical Research Collaboration, Register of Adult Patients with Severe Asthma for Optimal Disease Management Foundation, and ZonMw. EWS received consultancy fees from GSK and holds royalties from Springer for the book Clinical Prediction Models. IDP received speaker honoraria, advisory panel honoraria, educational event payments, and meeting sponsorship from AstraZeneca, Aretriea, Circassia, Amgen, Novartis, Chiesi, Sanofi-Regeneron, Menarini, GSK, Teva, Merck, and Genentech, and holds stock options for Upstream Bio and Mybiometry. All other authors declare no competing interests.

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Lancet Respir Med

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. 2026 Oct;14(10):e58-e59.

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[Identifying the residual unmet need in severe asthma](#)

[Jessica Gates](#)¹, [Joanne E Kavanagh](#)², [Grainne d'Ancona](#)³, [Jaideep Dhariwal](#)³, [Alexandra M Nanzer](#)¹, [David J Jackson](#)⁴

Affiliations Expand

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No abstract available

Conflict of interest statement

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Respir Med

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. 2026 Oct:262:109127.

doi: 10.1016/j.rmed.2026.109127. Epub 2026 Aug 27.

[Adherence to inhaled treatment is associated with better disease control and quality of life in mild-to-moderate asthma](#)

[Nicola Scichilone¹, Giulia Genduso², Diego Bagnasco³, Alessandro Barone⁴, Salvatore Battaglia², Alida Benfante², Benedetta Bondi³, Matteo Bonini⁵, Luisa Brussino⁶, Giovanna Elisiana Carpagnano⁷, Cristiano Caruso⁸, Francesca Cefaloni⁹, Miriam De Francesco¹⁰, Stefano Del Giacco¹¹, Alessandro Farsi¹², Sebastian Ferri¹³, Laura Franceschini¹², Manuela Latorre¹⁰, Francesca Puggioni¹⁴, Vitaliano Nicola Quaranta⁶, Erminia Ridolo⁴, Pierachille Santus¹⁵, Fabio Selvi⁹, Paolo Serra¹⁶, Antonio Spanevello¹⁷, Alessandra Tomasello², Martina Zappa¹⁸, Francesco Blasi¹⁹, Pierluigi Paggiaro²⁰, Giorgio Walter Canonica¹⁴, Fulvio Braido³](#)

Affiliations Expand

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Erratum in

- [Corrigendum to "Adherence to inhaled treatment is associated with better disease control and quality of life in mild-to-moderate asthma" \[Respir. Med. 262, \(2026\), 109127\].](#)

Scichilone N, Genduso G, Bagnasco D, Barone A, Battaglia S, Benfante A, Bondi B, Bonini M, Brussino L, Carpagnano GE, Caruso C, Cefaloni F, De Francesco M, Del Giacco S, Farsi A, Ferri S, Franceschini L, Latorre M, Puggioni F, Quaranta VN, Ridolo E, Santus P, Selvi F, Serra P, Spanevello A, Tomasello A, Zappa M, Blasi F, Paggiaro P, Canonica GW, Braido F. *Respir Med.* 2026 Sep 10:109153. doi: 10.1016/j.rmed.2026.109153. Online ahead of print. PMID: 42722517 No abstract available.

Abstract

Background: Asthma is a common chronic disease worldwide, with most patients presenting with mild to moderate forms. Poor adherence to inhaled therapy is a recognized determinant of worse outcomes in chronic respiratory diseases. The aim of this study was to evaluate adherence to inhaled medications in a large cohort of adults with mild to moderate asthma and identify factors associated with suboptimal adherence.

Methods: This cross-sectional real-world study analyzed data from the Mild-Moderate Asthma Network of Italy (MANI) database. Adult patients (≥ 18 years) with a confirmed diagnosis of asthma according to Global Initiative for Asthma (GINA) criteria were eligible. Data from the first visit in which the Test of Adherence to Inhalers (TAI) questionnaire was available were extracted. Patient-reported outcomes included the Asthma Control Test (ACT), the Asthma Quality of Life Questionnaire (AQLQ), and TAI adherence categories. Patients were classified into three classes according to TAI score as follows: adherents (score ≥ 50), intermediate adherents (score 46-49), and non-adherents (score < 46).

Results: A total of 832 patients were included. Adherent patients were older than intermediate and non-adherent subjects ($p < 0.001$). Current smoking was less frequent among adherent patients (11% vs 16%). Type 2 diabetes and anxiety were more prevalent among non-adherent individuals (5.3% vs 0.8% and 1.8%, $p = 0.014$; 10.7% vs 7.1% and 3.8%, $p = 0.003$, respectively). Higher adherence levels were associated with better asthma control ($\chi^2 (2) = 47.706$, $p < 0.001$) and quality of life ($\chi^2 (2) = 42.068$, $p < 0.001$).

Conclusion: In adults with mild to moderate asthma, better adherence to inhaled therapy is associated with improved disease control and quality of life. Demographic factors, smoking status, and comorbidities may influence adherence behaviors. Routine assessment of adherence and targeted interventions addressing modifiable barriers may improve outcomes in this large asthma population.

Keywords: Asthma; Asthma control; Inhaled therapy; Medication adherence; Mild-to-moderate asthma.

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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.

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Review

Respir Med

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[Differential diagnosis of asthma and COPD: Established and emerging biomarkers and technologies](#)

[Joan Cabot](#)¹, [Xavier Busquets](#)¹, [Joan B Soriano](#)²

Affiliations Expand

- PMID: 42665061
- DOI: [10.1016/j.rmed.2026.109124](#)

Free article

Abstract

Asthma and chronic obstructive pulmonary disease (COPD) represent the two most prevalent chronic respiratory conditions worldwide, affecting hundreds of millions of individuals and imposing substantial morbidity and mortality. Despite their distinct biological mechanisms, these diseases frequently exhibit overlapping clinical features-including dyspnea, cough, and wheezing-that complicate differential diagnosis, particularly in smoking adults, older patients, and those with mild or fluctuating airflow obstruction. Spirometry remains the cornerstone of diagnostic evaluation, yet its limitations, including dependence on patient effort, reduced sensitivity for early disease, and inability to fully capture small airways involvement, contribute to persistent underdiagnosis and overdiagnosis in clinical practice. This review examines current diagnostic approaches for asthma and COPD, their inherent limitations, and the emerging biomarkers and functional technologies that may improve diagnostic precision. Established biomarkers, including blood eosinophils, fractional exhaled nitric oxide (FeNO), and induced sputum analysis, provide complementary information that refines clinical

characterization but lack sufficient disease specificity for standalone use. Novel approaches, including lipidomics, metabolomics, and extracellular vesicle profiling, demonstrate potential for identifying disease-specific molecular signatures and biologically distinct phenotypes, particularly in asthma-COPD overlap. Concurrently, new functional tools-including novel spirometric indices such as Parameter D or FEV3/FEV6, respiratory oscillometry, and artificial intelligence-driven tidal breathing analysis-are enabling more sensitive, effort-independent, and multidimensional assessment of airway disease. The integration of these clinical, functional, inflammatory, and molecular approaches supports a transition toward multimodal diagnostic frameworks that may substantially improve the recognition and differential diagnosis of asthma and COPD, particularly in challenging clinical scenarios and early disease states.

Keywords: Asthma; Biomarkers; COPD; STARD; Spirometry.

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Conflict of interest statement

Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: JBS has received pharmaceutical company grants from 2022 to 2026 from Chiesi, GSK, Linde and Novartis via Hospital Universitario de La Princesa. Participated in speaking activities, advisory committees, and consultancies from 2022 to 2026 sponsored by Air Liquide, Almirall, AstraZeneca, Boehringer Ingelheim, CHEST, Chiesi, CNPT, ERS, FTH, Gebro, Grifols, GSK, IHME, Laminar Pharma, Linde, Lipopharma, Menarini, Mundipharma, Novartis, OMS/WHO, Pfizer, ResApp, RiRL, ROVI, SEPAR, SAPIO, Seqirus, WHO EUR, Takeda and Zambon. Finally, JBS declares never received, directly or indirectly, any funding from tobacco manufacturers or their affiliates. JC and XB declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

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Proc Natl Acad Sci U S A

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Promotion of long-term health in early life

[Martin Stocker](#)^{1 2 3}, [Claus Klingenberg](#)^{4 5}, [John A Rogers](#)⁶, [Neil Patel](#)⁷, [Davide Morgillo](#)¹, [Andrea Peitler](#)^{1 2}, [Martin Christmann](#)⁸, [Ferdinand von Meyenn](#)⁹, [Magnus Domellöf](#)¹⁰, [Shuai Xu](#)⁶, [Sarah McDonald](#)¹¹, [Petter Brodin](#)¹², [Elisabeth F C van Rossum](#)¹³, [Annemarie van Rossum](#)¹⁴, [Debby Bogaert](#)^{15 16}, [Isabelle Boucoiran](#)¹⁷, [Stefania Ronzoni](#)¹⁸, [Stefan Boes](#)², [Patricia Lannen](#)¹⁹, [Thomas Pilgrim](#)^{# 20}, [Salhab El Helou](#)^{# 21}

Affiliations Expand

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- PMCID: [PMC13624632](#)
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Abstract

Noncommunicable chronic diseases (NCDs) are on the rise in high-income countries, leading to substantial morbidity and mortality and contributing to increased resource demands and healthcare costs. Early-life exposures can initiate trajectories that culminate in NCDs later in life. Examples include the metabolic-endocrine pathway to obesity, diabetes, and cardiovascular diseases; the immune-mediated pathway to asthma and allergies; or the neurodevelopmental-psychological pathway to mental health problems. The interconnected trajectories involving microbiome composition, epigenetic signatures, nutrition, and psychological factors in early life can establish a basis for long-term health. While universal vaccination programs are in place to prevent infectious diseases, a coordinated effort to mitigate the rise of NCDs is missing. Examples of how to balance short- and long-term effects in early life include the use of appropriate medications, balanced healthcare interventions, optimized nutrition, and a nurturing care in early life. While these examples will not provide simple answers, they may stimulate important discussions and research into the overarching question: How can we deliver care in early life that achieves optimal short-term outcomes while promoting long-term health trajectories and well-being? While it is imperative to underscore the significance of subsequent periods to circumvent a deterministic conceptualization of a singular period as the primary catalyst for the development of physical and mental health, early life remains an underexploited window of opportunity fostering long-term health and mitigating the growing resource challenges faced by healthcare systems.

Keywords: epigenome; microbiome; neonates; nurturing care; nutrition.

Conflict of interest statement

Competing interests statement: EFCvR receives royalties from publisher Ambo Anthos for a book for lay and professional audiences: *FAT, the secret organ* (2020), in Dutch: *VET Belangrijk* (2019) and *VET Belangrijk 2.0* (2026).

- [139 references](#)

- [1 figure](#)

Supplementary info

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Review

Curr Opin Pulm Med

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. 2026 Nov 1;32(6):568-574.

doi: 10.1097/MCP.0000000000001315. Epub 2026 Oct 1.

[Eosinophils in bronchiectasis](#)

[Megan Trieu](#)¹, [Praveen Akuthota](#), [Jeffrey Barry](#)

Affiliations Expand

- PMID: 42755272
- DOI: [10.1097/MCP.0000000000001315](#)

Abstract

Purpose of review: Bronchiectasis has traditionally been viewed as a predominantly neutrophil-driven airway disease. Recognition of eosinophilic inflammation in a substantial subset of patients has challenged this paradigm. This review summarizes emerging evidence regarding its pathogenesis, clinical significance, and therapeutic implications.

Recent findings: Eosinophilic bronchiectasis is identified using blood or sputum eosinophilia, although optimal biomarkers and thresholds are unclear. Eosinophilic inflammation occurs in bronchiectasis and overlapping disease states characterized by type 2 immune activation, including asthma, allergic bronchopulmonary aspergillosis, and cystic fibrosis, complicating diagnosis but potentially informing disease severity, prognosis, and treatment options. Evidence for targeted therapies is limited to largely observational data. Patients with elevated eosinophil counts may derive greater benefit from inhaled corticosteroids. Early studies of biologics appear promising, particularly in patients with coexisting ABPA or asthma, although

their benefit in eosinophilic bronchiectasis independent of these conditions remains uncertain.

Summary: Eosinophilic bronchiectasis represents a distinct inflammatory endotype that may enable a more personalized approach to disease management. Future studies should identify clinically relevant biomarkers to standardize its definition, clarify its relationship with overlapping type 2 airway diseases, and guide the use of inhaled corticosteroids and biologics.

Keywords: biologic therapy; bronchiectasis; eosinophils; inhaled corticosteroids; type 2 inflammation.

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J Investig Allergol Clin Immunol

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. 2026 Sep 28:0.

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[Comparative Usefulness of Bronchial Cryobiopsy vs Conventional Incisional Biopsy in Severe Asthma: Histopathological Evaluation](#)

[Alberto Caballero-Vázquez^{1 2 3}](#), [Bélgica Márquez-Lobo^{2 4}](#), [Javier L López-Hidalgo^{2 5}](#), [Susana Rojo-Tolosa^{2 3 6}](#), [Concepción Morales-García^{2 3}](#)

Affiliations Expand

- PMID: 42803755
- DOI: [10.18176/jiaci.1207](#)

Free article

Abstract

Background: Histopathological analysis of bronchial tissue in patients with severe asthma makes it possible to characterize inflammatory and remodeling phenomena that are not identifiable using noninvasive biomarkers. Although bronchial cryobiopsy is considered an advantageous technique, its diagnostic utility compared with conventional forceps biopsy has not been clearly established. The objective of the present study was to compare the diagnostic performance of bronchial cryobiopsy and forceps biopsy in the histopathological evaluation of severe asthma.

Methods: A prospective comparative study was conducted in 27 patients with severe asthma who underwent bronchoscopy. Samples were obtained using both techniques, and histological and immunohistochemical findings were compared.

Results: Both techniques confirmed the high prevalence of remodeling, highlighting smooth muscle hyperplasia (85.2% with incisional biopsy, 81.4% with cryobiopsy) and basement membrane thickening (59.3% with incisional biopsy, 55.6% with cryobiopsy). Nonsignificant differences were observed between the techniques, although diagnostic sensitivity was greater with incisional biopsy. Cryobiopsy showed lower rates of epithelial denudation overall. However, in patients with bronchial obstruction, epithelial loss was consistently observed in cryobiopsy samples, possibly reflecting a technical limitation. The correlation between peripheral eosinophilia and submucosal tissue infiltrate was weak and nonsignificant with both techniques ($r=0.168$; $P=.403$).

Conclusions: Bronchial cryobiopsy is an effective tool with a yield comparable to that of incisional biopsy for the assessment of deep structural remodeling. However, incisional biopsy maintains superior diagnostic sensitivity and diagnostic yield. The discordance observed between peripheral and tissue eosinophilia underscores the need for histological evaluation to complement peripheral biomarkers for the stratification and personalization of biological therapies in obstructive disease.

Keywords: Asthma; Bronchial biopsy; Cryobiopsy; Type 2 inflammation.

Full text links



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Cite

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J Allergy Clin Immunol

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Mepolizumab long-term remodeling effect in severe asthma responders: the MESILICO study

[Konstantinos Porpodis](#)¹, [Ioanna Tsiouprou](#)¹, [Petros Bakakos](#)², [Stratakos Grigoris](#)², [Tzouvelekis Argyrios](#)³, [Paschalis Steiropoulos](#)⁴, [Konstantinos Katsoulis](#)⁵, [Konstantinos Kostikas](#)⁶, [Katerina M Antoniou](#)⁷, [Andriana I Papaioannou](#)², [Nikoletta Rovina](#)², [Paraskevi Katsaounou](#)⁸, [Nicoleta Pastelli](#)⁹, [Stavros Tryfon](#)¹⁰, [Evangelia Fouka](#)¹¹, [Nikolaos Tzanakis](#)⁷, [Stelios Loukides](#)¹¹, [Kalliopi Domvri](#)¹²

Affiliations Expand

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Abstract

Background: MESILICO study has provided evidence on the effect of mepolizumab, an anti-IL-5 biologic, on airway remodeling in severe asthma at 12 months post-treatment ([NCT04612556](#)).

Objective: We continued to investigate the longer-term effect of mepolizumab on airway structural remodeling.

Methods: Forty-seven patients were recruited, who initiated mepolizumab, of whom 41 were enrolled in the bronchoscopy sub-study. At 3-years the participants underwent further bronchoscopic airway sampling and remodeling indices were measured, along with sub-mucosal eosinophils, tissue immunoexpression of Muc-5AC, E-cadherin and number of FOXP3+ regulatory-like cells.

Results: Thirty-five patients of the initial 47 cohort completed 3 years of treatment, associated with significant improvements in lung function, in biomarkers and a decrease in exacerbation events ($p<0.05$). Twenty-five of the 41 patients enrolled in the sub-study were submitted to bronchoscopy post 3-years of treatment. There was a significant sustained reduction from baseline in sub-basement membrane thickness, airway smooth muscle area and layer thickness and epithelial damage, as well as a decrease in tissue eosinophil numbers (all $p<0.001$). Additional improvements were seen at 3 years for Muc-5AC and E-cadherin histoscores and FOXP3+ regulatory-like cells.

Conclusions: This is the first study supporting the possibility that sustained IL-5 blockade may contribute to long-term structural airway improvement and may be consistent with disease modification in severe eosinophilic asthma.

Keywords: Severe asthma; airway remodeling; bronchoscopy; eosinophilic; long-term; mepolizumab; obstructive pattern.

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Respir Med

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. 2026 Sep 28:263:109188.

doi: 10.1016/j.rmed.2026.109188. Online ahead of print.

[Quantitative CT parameters as surrogate markers of small airway dysfunction and discriminators of COPD from asthma](#)

[Sanggyeong Lee](#)¹, [Kwang-Nam Jin](#)², [Kwonhyung Hyung](#)³, [Sang Hyuk Kim](#)⁴, [Heemoon Park](#)³, [Jung-Kyu Lee](#)³, [Eun Young Heo](#)³, [Deog Kyeom Kim](#)³, [Hyun Woo Lee](#)⁵

Affiliations Expand

- PMID: 42805317
- DOI: [10.1016/j.rmed.2026.109188](#)

Abstract

Background: The structural chest computed tomography (CT) correlates of impulse oscillometry (IOS)-defined small airway dysfunction (SAD) and the utility of CT parameters in differentiating COPD from asthma remain incompletely characterized.

Methods: This cross-sectional study included patients diagnosed with COPD or asthma at a single center. Quantitative CT parameters included parenchymal indices (LAA%, PRM^{fSAD%}) and airway wall indices derived by two methods (Pi10-BAND, WA%-BAND, Pi10-FWHM, WA%-FWHM). SAD was defined as R5-R20 > 0.07 kPa/L/s. The study outcomes were the associations between CT and IOS parameters, the discriminatory performance of CT parameters for IOS-defined SAD, and their utility in differentiating COPD from asthma.

Results: Among 250 patients (COPD n = 166, asthma n = 84), SAD was identified in 198 (79.2%). CT airway wall parameters were independently associated with small airway IOS parameters. Pi10-BAND (odds ratio [OR] = 5.85) and WA%-BAND (OR = 1.09) were independently associated with SAD and showed the highest discriminatory performance (area under the curve [AUC] = 0.746 and 0.738), outperforming LAA% and PRM^{fSAD%}. Discriminatory performance was particularly pronounced in asthma (Pi10-BAND AUC = 0.850; WA%-BAND AUC = 0.844), whereas all CT parameters showed only modest performance in COPD. Only parenchymal CT parameters were independently associated with COPD over asthma (PRM^{fSAD%}: OR

= 1.10; LAA%: OR = 1.14), despite comparable IOS and spirometric indices between the two conditions.

Conclusions: CT airway wall parameters serve as surrogate markers of airway remodeling associated with IOS-defined SAD, with the greatest utility in asthma, whereas parenchymal CT parameters differentiate COPD from asthma. These findings support the complementary use of quantitative CT and IOS in the evaluation of obstructive lung disease.

Keywords: Asthma; Chronic obstructive pulmonary disease; Impulse oscillometry; Quantitative computed tomography; Small airway dysfunction.

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Conflict of interest statement

Declaration of competing interest The authors report no relevant conflicts of interest.

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Observational Study

BMJ Open

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. 2026 Sep 28;16(9):e105671.

doi: 10.1136/bmjopen-2025-105671.

[Predictors of response to mepolizumab for severe asthma: a REDES study post hoc analysis](#)

[Marina Blanco-Aparicio¹](#), [Teresa Carrillo-Diaz^{2,3}](#), [Eva Martinez-Moragon⁴](#), [David Bañas-Conejero⁵](#), [M-Guadalupe Sánchez-Herrero⁶](#), [Christian Domingo-Ribas^{7,8,9}](#); [REDES study group](#)

Affiliations Expand

- PMID: 42805641
- DOI: [10.1136/bmjopen-2025-105671](#)

Free article

Abstract

Objective: To identify predictors of treatment response to help target mepolizumab to patients with severe asthma with type 2 inflammation (SA-T2) who are most likely to respond to therapy.

Design and setting: The REal-world Effectiveness and Safety of mepolizumab (REDES), a multicentre, observational cohort study, investigated the effectiveness and safety of mepolizumab in Spanish patients with SA-T2.

Participants: We conducted a post hoc analysis of data from REDES to examine relationships between patient characteristics and response to mepolizumab to identify predictive markers of response. Outcomes included annualised clinically significant exacerbations (primary), lung function (forced expiratory volume in 1 s), maintenance oral corticosteroid (OCS) dose and Asthma Control Test (ACT) score. Outcomes after 12 months' treatment with mepolizumab were assessed and stratified by demographic and clinical characteristics. Analyses were descriptive; changes from baseline were summarised as mean (SD) and prespecified two-tailed unpaired t-tests were applied for comparisons ($p < 0.05$).

Primary and secondary outcome measures: These were stratified by various demographic and clinical characteristics collected during the study.

Results: In total, 318 patients with SA-T2 were included in the analysis. Mepolizumab was effective in patients with a diverse range of demographic and clinical characteristics. Baseline blood eosinophil count ≥ 150 or ≥ 300 cells/ μL or fraction of exhaled nitric oxide (FeNO) ≥ 25 or ≥ 50 ppb resulted in a 77%-88% reduction in exacerbations compared with 51%-55% in patients with lower baseline levels of these biomarkers (descriptive). Baseline factors of sex, body mass index, smoking status, atopic sensitisation and forced expiratory volume in 1 s had no appreciable effects on exacerbations, maintenance OCS use, lung function or asthma symptoms.

Conclusions: This post hoc analysis indicates mepolizumab is likely to provide clinical benefit in patients with SA-T2 across a broad range of patient characteristics. Patients with baseline blood eosinophils of ≥ 150 cells/ μL and/or FeNO ≥ 25 ppb are likely to derive more benefit.

Trial registration number: 213172.

Keywords: asthma; biomarkers; eosinophils; mepolizumab; nitric oxide.

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Conflict of interest statement

Competing interests: M. Blanco-Aparicio has received speaker or consulting fees from ALK, AstraZeneca, Chiesi, GSK, Novartis, Teva, and Zambón. T. Carrillo has received speaker fees from ALK, Diater, GSK, LETI, and Novartis. E. Martínez-Moragón has received speaker or consulting fees from ALK, AstraZeneca, BIAL, Boehringer Ingelheim, Chiesi, GSK, Novartis, Sanofi, and Teva. D. Bañas-Conejero is a GSK employee and holds GSK stocks/shares. M-G Sánchez-Herrero was a GSK employee at the time of this analysis and holds GSK stocks/shares. C. Domingo has

received funding for travel or speaker fees from ALK, Almirall, AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Menarini, Novartis, Pfizer, and Stallergenes. All other authors have no competing interest to declare.

Supplementary info

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ERJ Open Res

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. 2026 Sep 28;12(5):00116-2026.

doi: 10.1183/23120541.00116-2026. eCollection 2026 Sep.

[Airway inflammation and asthma control in patients using salbutamol or budesonide/formoterol reliever: a randomised, controlled study](#)

[Matthew J Martin](#)¹, [Ian D Pavord](#)², [James D Chalmers](#)³, [Dinesh Saralaya](#)⁴, [Kay G Roy](#)⁵, [Manish Patel](#)⁶, [Graham W Clarke](#)^{7,8}, [Laura Belton](#)⁹, [Annika Rutgersson](#)¹⁰, [Per Gustafson](#)¹¹, [Vieshal Raja Gopal](#)¹², [Tim Harrison](#)^{12,13}

Affiliations Expand

- PMID: 42807346
- PMCID: [PMC13617593](#)
- DOI: [10.1183/23120541.00116-2026](#)

Abstract

Background: Maintenance and reliever therapy (MART) with budesonide/formoterol (BUD/FORM) may offer asthma control with a single inhaler. This 6-month exploratory study monitored asthma symptoms, reliever use, lung function, airway inflammation and exacerbation events to determine treatment effectiveness in patients receiving BUD/FORM MART or BUD/FORM maintenance therapy plus short-acting β_2 -agonist (SABA).

Methods: In the open-label STIFLE study ([NCT03924635](#)), patients were randomised to BUD/FORM MART (100 μ g/6 μ g or 200 μ g/6 μ g per inhalation, *pro re nata* (PRN)) or the same dose of BUD/FORM BID as maintenance therapy plus SABA

(salbutamol) reliever PRN (100 µg per inhalation). Data were captured at home each day using devices connected to a smartphone *via* the STIFLE application. Occurrence of pre-defined exacerbation events required patients to attend hospital for assessment.

Results: 42 patients were randomised. Adherence to daily measurements exceeded 80% in both treatment groups. The proportion of patients experiencing an exacerbation was 27.8% in the BUD/FORM MART *versus* 70.8% in the BUD/FORM maintenance plus SABA group. A similar trend was observed in patients who experienced ≥1 day with ≥6 reliever uses (3 (16.7%) *versus* 9 (37.5%) patients, respectively). Patients treated with BUD/FORM MART showed less variation in airway inflammation, asthma symptom scores, lung function parameters and reliever use, *versus* BUD/FORM maintenance therapy plus SABA. No unexpected safety findings were observed.

Conclusions: Patients with moderate asthma treated with BUD/FORM MART recorded less variation in asthma outcomes and lower rates of exacerbation events than those treated with BUD/FORM maintenance therapy plus SABA, suggesting improved asthma control.

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Conflict of interest statement

Conflict of interest: M.J. Martin has received support from AstraZeneca and Chiesi for attending scientific meetings and/or travel. I.D. Pavord has received research grants from Chiesi; consulting fees from Aritrea, AstraZeneca, Chiesi, Circassia, Genetech, GlaxoSmithKline, Kymera, Merck, MSD, Novartis, Pfizer, Regeneron Pharmaceuticals Inc., Sanofi, Schering-Plough and Upstream Bio; payment or honoraria from AstraZeneca, Chiesi, GlaxoSmithKline, Novartis, Regeneron Pharmaceuticals Inc. and Sanofi; and support for attending meetings from AstraZeneca, Chiesi, GlaxoSmithKline, Regeneron Pharmaceuticals Inc. and Sanofi. J.D. Chalmers has received research grants from AstraZeneca, Boehringer Ingelheim, Gilead Sciences, GlaxoSmithKline, Grifols, Insmed, Novartis and Trudell; consultancy or speaker fees from Antabio, AstraZeneca, Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Insmed, Janssen, Novartis, Pfizer, Trudell and Zambon; and is an associate editor of this journal. D. Saralaya has received speaker fees for meetings from Sanofi-Aventis and AstraZeneca; and was supported by Sanofi and AstraZeneca to attend the European Respiratory Society Congress. K.G. Roy has received support from AstraZeneca and Chiesi for attending scientific meetings. M. Patel has received speaker's honoraria from AstraZeneca and GlaxoSmithKline at sponsored educational meetings; and support from GlaxoSmithKline for attending scientific meetings. G.W. Clarke is an employee of AstraZeneca and may hold stock and/or stock options in the company. L. Belton is a contractor for AstraZeneca. A. Rutgersson is an employee of Evinova, an AstraZeneca subsidiary, and holds stock and/or stock options in the company. P. Gustafson is an employee of Alexion, an AstraZeneca subsidiary, and holds stock and stock options in the company. V.R. Gopal and T. Harrison are employees of AstraZeneca; they hold stock and/or stock options in the company.

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. 2026 Sep 28;12(5):00195-2026.

doi: 10.1183/23120541.00195-2026. eCollection 2026 Sep.

[Healthcare journey of preterm-born adults with respiratory disease: the EMPOWER survey](#)

[Federico Bianco](#)¹, [Lauren Ingledow](#)², [Silke Mader](#)³, [Laura Costa](#)¹, [Ulrica Scaffidi-Argentina](#)¹, [Xabier Murgia](#)⁴, [Anna Lavizzari](#)⁵, [Daiana Stolz](#)^{6,7}, [Alberto Papi](#)⁸, [Alvar Agustí](#)^{9,10}, [Eugenio Baraldi](#)¹¹

Affiliations Expand

- PMID: 42807378
- PMCID: [PMC13617606](#)
- DOI: [10.1183/23120541.00195-2026](#)

Abstract

Background: Preterm birth is a recognised risk factor for lung disease later in life. However, awareness of this risk among preterm-born adults and whether it is discussed with their treating physicians is unknown. The EMPOWER survey assessed awareness of the preterm status among preterm-born adults with asthma and COPD and evaluated its consideration in disease management.

Methods: Preterm-born subjects aged ≥ 18 years with physician-diagnosed asthma and/or COPD from France, Germany, Spain, the UK and the US completed a 34-item online questionnaire. The survey covered sociodemographics, medical history, awareness of perinatal events and interactions with healthcare providers.

Results: Of 3175 individuals who initiated the survey, 301 participants (median age 55 years, interquartile range 39-64 years) were included in the final analysis (9.5% response rate). Most respondents knew their gestational age (87%) and birthweight (89%), primarily from parents and caregivers (81%), with just 19% obtaining information from medical records. Over half (58%) reported receiving neonatal intensive care, most commonly assisted ventilation (35%) and nutritional support

(24%). While 54% considered preterm birth relevant to respiratory management, 59% had not disclosed this history to their physician. Only 24% reported spontaneous disclosure and just 11% shared the history in response to physician inquiry. Paediatric monitoring was reported by 45%, but follow-up rarely extended into adulthood.

Conclusion: Although preterm-born adults with obstructive respiratory disease are aware of their neonatal history, it is seldom integrated into adult respiratory care. Limited patient disclosure, infrequent physician inquiry and lack of structured long-term follow-up likely contribute to this gap.

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Conflict of interest statement

Conflict of interests: F. Bianco, L. Costa and U. Scaffidi-Argentina are employees of Chiesi Farmaceutici. L. Ingledow reports no conflicts of interest. S. Mader has not received any personal honoraria or fees related to the EMPOWER study; the Global Foundation for the Care of Newborn Infants received financial contributions from Chiesi to support the questionnaire dissemination and participation in the project's Advisory Board. X. Murgia served as a consultant for Chiesi Farmaceutici in relation to the EMPOWER study. A. Lavizzari reports consultancy activities with Chiesi Farmaceutici, Vyaire Medical, ZOLL and Getinge. D. Stolz reports personal fees from Chiesi Farmaceutici related to this manuscript, and personal fees for lectures and/or advisory board participation from AstraZeneca AG, Sanofi, Novartis AG, GSK AG, Roche AG, Chiesi Farmaceutici S.p.A., Boehringer Ingelheim, Insmmed, Pfizer and Vifor AG, outside the submitted work. A. Papi declares payments to his institution from Chiesi, AstraZeneca, GSK and Sanofi; consultancy fees from Chiesi, AstraZeneca, GSK, Sanofi/Regeneron, Iqvia, Avillion, Moderna and Zentiva; and payment or honoraria for lectures, presentations and speakers' bureaus from Chiesi, AstraZeneca, GSK, Zambon, Sanofi, Regeneron and Avillion. A. Agusti reports grants from AstraZeneca, GSK and Menarini; honoraria for lectures from AstraZeneca, Chiesi, Cipla, GSK, Glenmark, Kamada, Menarini, Roche, Sanofi and Zambon; and participation on scientific advisory boards for AstraZeneca, Chiesi, GSK and Menarini. E. Baraldi reports personal fees from Chiesi Farmaceutici for lectures and/or advisory board participation, as well as personal fees from Sanofi, AstraZeneca and MSD, outside the submitted work.

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Editorial

Clin Exp Allergy

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. 2026 Sep 29.

doi: 10.1111/cea.70443. Online ahead of print.

[Sublingual House Dust Mite \(HDM\) Immunotherapy Comes to UK Children: Equity of Access and the Unanswered Question of Asthma](#)

[Prasad Nagakumar](#)^{1,2}, [Adel H Mansur](#)^{2,3}, [Mamidipudi Thirumala Krishna](#)^{2,3}

Affiliations Expand

- PMID: 42810718
- DOI: [10.1111/cea.70443](#)

No abstract available

- [9 references](#)

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Nutr Health

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. 2026 Sep 30:2601060261489297.

doi: 10.1177/02601060261489297. Online ahead of print.

[Famine exposure in childhood and multimorbidity risk in older adults](#)

[Qianwen Yang](#)¹, [Panpan He](#)¹, [Zhiwei Zhang](#)¹, [XiaoMing Liu](#)¹, [Xuejiao Zeng](#)¹, [Lipeng Jing](#)¹

Affiliations Expand

- PMID: 42813732
- DOI: [10.1177/02601060261489297](https://doi.org/10.1177/02601060261489297)

Abstract

Background Previous research on multimorbidity focused on patterns, prevalence, and correlation and studies on famine have primarily focused on single diseases, with limited research on its effect on multimorbidity, especially in China. **Aims** Our study aimed to examine the association between famine exposure and the risk of multimorbidity through a cross-sectional survey in older adults. **Methods** A total of 1580 community-dwelling older people were included in this study. Famine exposure was classified as nonexposed, toddlers exposed (1-3 years old exposed), preschool-age children exposed (4-6 years old exposed), school-age children exposed (7-13 years old exposed), adolescent exposed (14 to 19 years old exposed), adult exposed (20 years and older exposed). Multimorbidity was defined as "the co-occurrence of at least two chronic conditions in the same individual" based on the data of 39 common diseases. The associations were presented using adjusted odds ratio (aOR) with corresponding 95% confidence intervals (CI), and statistical significance was determined at $p < 0.05$. **Results** The results indicated that famine exposure substantially elevated the risk of multimorbidity. Compared with the nonexposed group, the risks of Cardiometabolic and Complex/multisystem multimorbidity were increased in the preschool (OR: 2.03, 95%CI: 1.01, 4.08) and school-age exposed groups (OR: 2.27, 95%CI: 1.06, 4.88), respectively. Specifically, early-life exposure to Chinese famine was associated with an increased risk of developing high blood pressure (OR: 1.46, 95%CI: 1.00-2.11), chronic pulmonary diseases/asthma (OR: 1.78, 95%CI: 1.02-3.12), fractures (OR: 1.865, 95%CI: 1.14, 3.04), and cataracts (OR: 2.26, 95%CI: 1.22, 4.19) in older adults. **Summary** Individuals exposed to famine in early childhood, especially during preschool and school-age years, significantly increased their risk of multimorbidity in adulthood. These findings highlight the need for targeted health interventions and long-term disease prevention strategies for individuals who experienced early-life nutritional deprivation.

Keywords: Chinese older adults; Famine; Northwestern China; multimorbidity; older adults.

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Review

Int Arch Allergy Immunol

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. 2026 Sep 30:1.

doi: 10.1159/iaa/adfag019. Online ahead of print.

Inflammatory comorbidity of upper and lower airways: epidemiology, mechanism and therapeutic Advances of Rhinitis Combined with Asthma

Kang Wang, Yan Qin, Jun Liu

- PMID: 42814648
- DOI: [10.1159/iaa/adfag019](https://doi.org/10.1159/iaa/adfag019)

Abstract

Asthma and rhinitis are respectively the most common chronic inflammatory diseases of the lower airway and the upper airway. These two conditions often coexist as inflammatory disorders of the upper and lower airways. Clinical data generally show that the comorbidity of asthma patients with rhinitis or of patients with rhinitis having asthma significantly increases the disease burden of the patients. The core mechanism involves type 2 inflammatory pathways, neural reflex linkage, and systemic inflammatory dissemination. Currently, the treatment for the co-occurrence of rhinitis and asthma has shifted to an integrated approach. The combination of nasal and inhaled glucocorticoids serves as the basic treatment, while leukotriene receptor antagonists are the advantageous drugs for the comorbidity. Targeted biological agents such as anti- immunoglobulin E and anti-interleukin-4 receptor α monoclonal antibodies achieve precise intervention on key pathways, while allergen immunotherapy offers the potential for etiological treatment. This review comprehensively elaborates on the epidemiological characteristics, pathophysiological mechanisms and treatment progress of this comorbidity, with the aim of providing a theoretical basis for future treatment of comorbidities.

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Editorial

Allergol Int

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. 2026 Oct;75(4):509-510.

doi: 10.1016/j.alit.2026.09.001.

[Childhood asthma as a life-course disease: Recent advances, environmental determinants, and biomarkers](#)

[Takumi Takizawa](#)¹

Affiliations Expand

- PMID: 42816029
- DOI: [10.1016/j.alit.2026.09.001](#)

No abstract available

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42

J Allergy Clin Immunol

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. 2026 Oct 1:S0091-6749(26)00629-9.

doi: 10.1016/j.jaci.2026.08.020. Online ahead of print.

[SERPINE1 promoter variants and differential airway responses to virus and biological therapy](#)

[Ariel Helms Thames](#)¹, [Madeline Schutt](#)², [Samantha Gadd](#)², [Leonardo Barrera](#)², [Seong Cho](#)³, [William Wentworth-Sheilds](#)⁴, [Jacqueline Pongracic](#)², [Andrew H Liu](#)⁵, [Rebecca Gruchalla](#)⁶, [Carolyn Kercsmar](#)⁷, [Gurjit Khurana Hershey](#)⁷, [Edward Zoratti](#)⁸, [Christine Johnson](#)⁸, [Stephen Teach](#)⁹, [Meyer Kattan](#)¹⁰, [Michael Nodzenski](#)¹¹, [Courtney Gaberino](#)¹², [Leonard Bacharier](#)¹³, [George T O'Connor](#)¹⁴, [James Gern](#)¹², [Cynthia Visness](#)¹¹, [Amaziah Coleman](#)¹⁵, [Peter](#)

[Gergen¹⁵](#), [Patrice Becker¹⁵](#), [Carole Ober⁴](#), [Daniel Jackson¹²](#), [Matthew Altman¹⁶](#), [Rajesh Kumar¹⁷](#)

Affiliations Expand

- PMID: 42820896
- PMCID: [PMC13632648](#)
- DOI: [10.1016/j.jaci.2026.08.020](#)

Abstract

Background: A common functional promoter polymorphism (4G4G/4G5G) in the SERPINE1 gene, which encodes the plasminogen activator inhibitor 1 (PAI-1) protein, is associated with more frequent asthma exacerbations.

Objective: We examined genotype-specific airway transcriptomic responses during viral illness and how genotype modulates these responses in asthma exacerbations with and without mepolizumab treatment.

Methods: Nasal lavage samples from a subset of children aged 6-17 years with exacerbation-prone asthma from the type 2-enriched urban asthma MUPPITS-1 and MUPPITS-2 cohorts were used for RNA sequencing and genetic studies. Expression quantitative trait locus (eQTL) analysis and weighted gene coexpression network analysis were performed to determine PAI-1 genotype modulation of gene expression during viral illness and genotype associations with mean expression levels of coexpressed networks of genes (modules). Linear regression analysis was performed to evaluate interactions between mepolizumab and the PAI-1 promoter variants.

Results: Risk genotypes were associated with lower SERPINE1 expression at baseline but higher levels over the course of viral illness ($P < .02$). In those with the risk allele at times of viral illness, there was increased expression of 4 coexpressed networks of genes including immune/Toll-like receptor signaling, and decreased expression of one network (ribosome). Subjects with the risk allele receiving mepolizumab with nonexacerbation viral illness had higher expression of eosinophil and mucus hypersecretion gene networks. In subjects with the risk allele receiving mepolizumab who experienced exacerbation, eosinophilic signaling networks were decreased, but gene networks involved in TGF- β /SMAD3 and perturbed epithelial integrity were increased compared to placebo. A number of drug-gene interactions were significant ($P < .05$, false discovery rate).

Conclusions: Nasal lavage SERPINE1 transcripts increase during viral illness in children with asthma who have the risk allele but not in children without this allele. In asthma exacerbations, the risk allele is associated with augmentation of TGF- β /SMAD3 and epithelial pathways as well as a differential airway transcriptomic response to the type 2 modulator mepolizumab.

Keywords: PAI-1; Transcriptomics; asthma; differential gene expression.

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Conflict of interest statement

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Heart Lung

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. 2026 Oct 1:80:102959.

doi: 10.1016/j.hrtlng.2026.102959. Online ahead of print.

[Disproportionality analysis of cardiovascular adverse events reported to the FDA adverse event monitoring system with monoclonal antibodies targeting type 2 inflammation](#)

[Melike Nur Akbas¹](#), [Zinnet Şevval Aksoyalp²](#)

Affiliations Expand

- PMID: 42822247
- DOI: [10.1016/j.hrtlng.2026.102959](https://doi.org/10.1016/j.hrtlng.2026.102959)

Abstract

Background: Type 2 inflammation leads to changes in the airways pathophysiology and several monoclonal antibodies targeting type 2 inflammation have been developed for allergic and eosinophilic diseases. However, long-term safety data for these medications are limited. Among the medications, only omalizumab has a safety warning for potential serious cardiovascular and cerebrovascular adverse events (AEs).

Objective: The aim was to analyse the disproportionality of cardiovascular AEs reported to the FDA Adverse Event Monitoring System (AEMS) database with these medications.

Methods: AEs related to "palpitations", "myocardial infarction", "tachycardia", "atrial fibrillation", "cardiac failure", "hypertension", "flushing", "hypotension", "haemorrhage", and "thrombosis" were collected in the AEMS database during 2022-2025. AE cases reported with "omalizumab", "mepolizumab", "benralizumab", "reslizumab", "dupilumab", and "tezepelumab" as the solely primary suspected medication were included. The following ratios were calculated: reporting odds ratio (ROR), proportional reporting ratio (PRR), and information component (IC).

Results: The highest number of selected cardiac and vascular disorder AEs cases was reported with dupilumab (n = 3636), and the lowest number was reported with reslizumab (n = 52). The majority of selected AEs reported with monoclonal antibodies other than dupilumab are serious. Tezepelumab was revealed to have the highest number of AE signals, whereas signal for haemorrhage was detected with dupilumab in the patients with asthma. The primary AEs signals identified with these medications are myocardial infarction, hypertension, flushing, and thrombosis.

Conclusions: Post-marketing data are valuable for determining the long-term safety of medications, and further studies confirming the cardiovascular AE signals identified in this study may yield insights into the cardiovascular safety of these monoclonal antibodies.

Keywords: Adverse event; Biologics; Cardiac; Safety; Signal; Vascular.

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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.

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Davos@home: Integrating Objective Home Monitoring into eHealth Self-management Support After Alpine Altitude Climate Treatment for Severe Asthma

Fleur L Meulmeester¹, Femke Paanakker², Lianne Ten Have³, Kim de Jong⁴, Anneke Ten Brinke³, Jacob K Sont², Karin B Fieten⁵

Affiliations Expand

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- DOI: [10.1016/j.rmed.2026.109191](https://doi.org/10.1016/j.rmed.2026.109191)

Abstract

Background: Severe asthma imposes substantial burden, and many patients remain uncontrolled despite guideline-based therapy. Alpine Altitude Climate Treatment (AACT) improves asthma control and quality of life, yet benefits often attenuate after returning home. eHealth-supported self-management may help sustain AACT gains and prevent post-rehabilitation relapse, though the added value of objective home monitoring devices remains unclear.

Methods: In this 12-month pragmatic trial, adults with severe asthma completing AACT in Davos were randomised to eHealth self-management support with or without home monitoring devices measuring airway inflammation, lung function and activity. Randomisation was stratified by baseline fractional exhaled nitric oxide (FeNO; <25 vs ≥25 ppb). The pre-specified primary outcome was time-to-first severe exacerbation; secondary outcomes included annualised exacerbation and hospitalization rates and patient-reported outcomes.

Results: Between 2022-2024, 143 patients were randomised; 130 received the allocated intervention (66 intervention, 64 control), and 105 completed follow-up. Time-to-first severe exacerbation did not differ between groups (median [IQR] intervention: 16.5 [13-23], control: 20 [16-30] weeks; log-rank p=0.93). There was a non-significant trend toward fewer annualised severe exacerbations in the intervention group (aRR 0.68, 95%CI 0.45-1.03; p=0.07). Slower ACQ-6 decline (baseline-6 months) was observed in the intervention group (β -0.50, 95%CI -0.95;-0.05; p=0.03), though this did not persist to 12 months. No effect modification by FeNO strata was observed; no intervention-related serious adverse events occurred.

Conclusions: Adding home monitoring devices to eHealth self-management did not prolong time-to-first severe exacerbation or sustain clinical benefits after AACT. More personalised, clinically integrated strategies could support the transition to independent self-management.

Keywords: Pragmatic randomised controlled trial; Pulmonary Rehabilitation; Self-management; Severe asthma; eHealth.

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Conflict of interest statement

Declaration of Competing Interest ☒ The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Jacob K. Sont reports financial support was provided by Stichting Astma Bestrijding (SAB). Jacob K. Sont reports financial support was provided by astmaVereniging Nederland en Davos (VND). Anneke ten Brinke reports a relationship with AstraZeneca NL that includes: funding grants. Anneke ten Brinke reports a relationship with Teva The Netherlands that includes: funding grants. Anneke ten Brinke reports a relationship with Academy Medical Centre Leeuwarden that includes: funding grants. Anneke ten Brinke reports a relationship with RAPSODI Foundation that includes: funding grants and paid expert testimony. Anneke ten Brinke reports a relationship with ZonMW that includes: funding grants. Jacob K. Sont reports a relationship with AstraZeneca NL that includes: funding grants. Jacob K. Sont reports a relationship with ERS SHARP CRC that includes: funding grants. Jacob K. Sont reports a relationship with RAPSODI Foundation that includes: funding grants. Jacob K. Sont reports a relationship with ZonMW that includes: funding grants. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Eur Arch Otorhinolaryngol

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. 2026 Oct 3.

doi: 10.1007/s00405-026-10647-5. Online ahead of print.

[Real-world two-year outcomes of mepolizumab in patients with chronic rhinosinusitis with nasal polyps and coexisting severe asthma](#)

[Juan Riestra-Ayora](#)^{1,2}, [Carlos Fernández-Navarro](#)³, [Cristina Vaduva](#)^{1,2}, [Beatriz Rodríguez Jiménez](#)⁴, [Lorena Martín Zaragoza](#)⁵, [Eduardo Martín-Sanz](#)^{1,2}, [Zully Vásquez Gambasica](#)⁶

Affiliations Expand

- PMID: 42827160
- DOI: [10.1007/s00405-026-10647-5](https://doi.org/10.1007/s00405-026-10647-5)

Abstract

Purpose: Chronic rhinosinusitis with nasal polyps (CRSwNP) and severe asthma frequently coexist as manifestations of type 2 airway inflammation. Although mepolizumab has demonstrated efficacy in both conditions, long-term real-world data on integrated airway disease control remain limited. We evaluated the long-term effectiveness of mepolizumab in patients with CRSwNP and coexisting severe asthma over 2 years.

Methods: We conducted a longitudinal real-world observational cohort study at a tertiary referral center. Baseline data were collected retrospectively, and follow-up assessments were prospectively recorded at 6, 12, and 24 months. Response-based endpoints assessed longitudinal improvement, whereas disease control reflected stabilization of disease burden at each follow-up, including dual airway disease control.

Results: 48 patients were included. Mepolizumab induced sustained improvement across both airway compartments. SNOT-22 scores improved from 65.2 to 22.1, while NPS decreased from 4.8 to 1.8 at 2 years. ACT scores increased from 16.6 to 22.7, exacerbation rates decreased from 0.7 to 0.1 events per patient-year, and systemic corticosteroid exposure decreased from 95.8% to 31%. Combined clinical-endoscopic CRSwNP response was achieved in 60.0%, 75.0%, and 70.6% at 6 months, 1 year, and 2 years, respectively. Dual airway disease control increased from 24.2% to 42.1%.

Conclusions: Mepolizumab provides sustained long-term benefit in patients with CRSwNP and severe asthma. While clinical response occurs early and frequently, integrated dual airway disease control is achieved progressively and in a smaller proportion of patients.

Keywords: Asthma; Chronic rhinosinusitis with nasal polyps; Mepolizumab; Real-world data; Type 2 inflammation; Unified airway disease.

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Conflict of interest statement

Declarations. Competing interests: J. Riestra has received advisory board fees and speaker honoraria from GlaxoSmithKline (GSK) and Sanofi. C. Vaduva has received speaker honoraria from GlaxoSmithKline (GSK) and Sanofi. These activities were unrelated to the present study. The remaining authors declare no conflicts of interest. **Artificial intelligence statement:** Artificial intelligence-assisted tools were used only for language editing. All scientific content and final revisions were performed and approved by the authors.

- [18 references](#)

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

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. 2026 Oct;105(10):629-634.

doi: 10.1177/01455613241232879. Epub 2024 Feb 24.

[Predictors of Success of Adenoidectomy in the Treatment of Pediatric Chronic Rhinosinusitis](#)

[Amani Kais](#)¹, [Norman Orabi](#)¹, [Ruifeng Cui](#)¹, [Hassan H Ramadan](#)¹

Affiliations Expand

- PMID: 38400707
- DOI: [10.1177/01455613241232879](#)

Free article

Abstract

Objectives: There is consensus for adenoidectomy as treatment of chronic rhinosinusitis (CRS) in children younger than 6 years but less consensus for those aged 6 years and older. The present clinical research study investigated predictors of adenoidectomy success for pediatric CRS. **Methods:** A retrospective chart review was conducted for 107 children who presented to an otolaryngology clinic and had an adenoidectomy for CRS after failure of maximal medical therapy. **Results:** The majority of sample was male ($N = 63$; 58.9%) with mean age of 4.88 (SD = 2.54) and mean Lund-Mackay score of 7.76 (SD = 3.87). Patients who had success with adenoidectomy were older on average [mean (M) = 5.46; SD = 2.83] than patients who failed the procedure ($M = 4.36$; SD = 2.40; $F = 4.06$, $P = .047$). This equated to 67.9% of children aged 6 years and older and 39.2% of children younger than 6 years succeeding with the surgery. **Conclusions:** Adenoidectomy is a good first-line surgery for children aged 12 years and younger, especially in the 6 to 12 years group which had a high rate of success with 68% experiencing remission of symptoms after surgery.

Keywords: Lund-Mackay; adenoidectomy; chronic rhinosinusitis; pediatric.

Conflict of interest statement

Declaration of Conflicting InterestsThe author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Allergol Int

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. 2026 Oct;75(4):549-561.

doi: 10.1016/j.alit.2026.02.005. Epub 2026 Mar 12.

[Dual clinical remission in patients treated with biologics for severe asthma and eosinophilic chronic rhinosinusitis](#)

[Naoko Takahashi](#)¹, [Ayako Kojima](#)¹, [Takanori Numata](#)², [Keitaro Okuda](#)¹, [Hanae Miyagawa](#)¹, [Masahiro Yoshida](#)¹, [Saburo Ito](#)¹, [Shunsuke Minagawa](#)¹, [Takeo Ishikawa](#)¹, [Hiromichi Hara](#)¹, [Nobuyoshi Otori](#)³, [Jun Araya](#)¹

Affiliations Expand

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Free article

Abstract

Background: Severe asthma (SA) and eosinophilic chronic rhinosinusitis (ECRS) are characterized by type 2 inflammation, and several biological agents are available. Data on dual clinical remission (CR) in patients with both conditions are limited.

Methods: To elucidate the proportion of patients achieving dual CR and its predictors among patients with both SA and ECRS, 67 patients (24 males) with both conditions who received biologics for ≥ 12 months from July 2009 to February 2025 at Jikei University Hospital were retrospectively evaluated.

Results: The mean age at biologics initiation was 53.9 years. After switching biologics, the final biologics were omalizumab (1 patient), mepolizumab (13),

benralizumab (23), dupilumab (25), tezepelumab (3), and a combination (2). CR for SA occurred in 37 % of patients according to four criteria, i.e., no exacerbation, no systemic corticosteroids (SCS), no symptoms, and stabilization of pulmonary function. For ECRS, 54 patients underwent surgery (mean: 1.6 times). Of the 47 patients who received biologics following surgery, the median time from surgery to biologics initiation was 44 months. CR for ECRS occurred in 60 % of patients according to four criteria, i.e., no symptoms, no SCS, no endoscopic findings, and no need for additional surgery. Dual CR occurred in 25 % of patients, and the predictors included age ≥ 65 years ($P < 0.0001$) and the presence of nonsteroidal anti-inflammatory drug-exacerbated respiratory disease (N-ERD) as a comorbidity ($P = 0.0003$).

Conclusions: Dual CR with biologics treatment may be achieved in elderly patients and in those with N-ERD among patients with both SA and ECRS.

Keywords: Biologics; Clinical remission; Eosinophilic chronic rhinosinusitis; Nasal polyps; Severe asthmas.

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Conflict of interest statement

Conflict of interest The authors have no conflict of interest to declare.

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Randomized Controlled Trial

J Asthma

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. 2026 Oct;63(10):1254-1266.

doi: 10.1080/02770903.2026.2660096. Epub 2026 Apr 25.

[Three years treatment with HDM allergen immunotherapy, omalizumab, or combination therapy in allergic asthma: clinical outcomes and biomarkers](#)

[Andrzej Bozek](#)^{1,2}, [Martyna Miodonska](#)¹, [Dominika Sadowska](#)¹, [Jolanta Zalejska Fiolka](#)², [Janne Winterstein](#)³, [Giorgio Walter Canonica](#)⁴

Affiliations Expand

- PMID: 41983924
- DOI: [10.1080/02770903.2026.2660096](https://doi.org/10.1080/02770903.2026.2660096)

Abstract

Background: Allergen immunotherapy (AIT) and biologics such as omalizumab are established treatments for allergic asthma, but long-term data on their combined use are limited.

Objective: To compare long-term clinical and immunological outcomes of omalizumab, subcutaneous AIT for house dust mite (SCIT-HDM), and their combination in mild-to-moderate allergic asthma.

Methods: In this prospective, randomized, controlled study, 79 patients with HDM-driven allergic asthma were assigned to omalizumab (A), omalizumab plus SCIT-HDM (B), SCIT-HDM (C), or standard therapy (D). Patients were followed for 36 months. Primary outcomes were changes in inhaled corticosteroid (ICS) dose and annual exacerbations. Secondary outcomes included symptom and medication scores, Asthma Control Test (ACT), asthma quality of life (AQLQ), lung function, remission rates, and biomarkers.

Results: All groups showed significant reductions in ICS use, with greater reductions in groups A and B than in C and D ($p < 0.05$). Combination therapy (B) resulted in lower exacerbation rates and reduced oral corticosteroid use compared to other groups. Improvements in ACT, FEV₁, and AQLQ were observed across all groups, with more consistent benefits in A and B. Clinical remission occurred most often in group B (47%), followed by A (31%), C (29%), and D (14%). Biomarker changes indicated reduced type 2 inflammation and immunological responses to therapy. No serious adverse events or systemic hypersensitivity reactions were observed.

Conclusions: Omalizumab, SCIT-HDM, and their combination improved outcomes over 36 months. Combination therapy showed the most consistent benefits, but results should be interpreted cautiously due to the small sample size. Further studies are needed.

Keywords: Asthma; allergen immunotherapy; biologics; house dust mites allergy.

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Clinical Trial

Ann Otol Rhinol Laryngol

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. 2026 Oct;135(10):796-800.

doi: 10.1177/00034894261449672. Epub 2026 May 9.

The Effect of Radiofrequency Ablation of Posterior Nasal Nerves on Inflammatory Cytokines, Peak Nasal Inspiratory Flow, and Subjective Symptom Scores in Chronic Rhinitis: A Prospective Clinical Trial

David Z Allen¹, Elena E Skaribas², Ashwini Bandi², Sameer Siddiqui², Panayiotis Kontoyiannis², Jerril Jacob², Ella Hawes², Sun Hua³, Kunal Shetty¹, William Yao¹, Martin J Citardi¹, Amber U Luong¹

Affiliations Expand

- PMID: 42105251
- PMCID: [PMC13525177](#)
- DOI: [10.1177/00034894261449672](#)

Abstract

Background: Chronic rhinitis (CR) is inflammation of the nasal mucosa, causing a multitude of symptoms. Temperature-controlled radiofrequency neurolysis (RFN) of the posterior nasal nerve (PNN) is a treatment for CR. In allergic rhinitis (AR), Type 2 cytokines are drivers of symptom severity. This study explores whether RFN's symptomatic improvements are linked to changes in nasal airflow and local cytokine levels.

Methods: This prospective, single-arm study was conducted at the Texas Sinus Institute at The University of Texas Health Science Center at Houston. Patients with ≥6 months of CR symptoms, a reflective total nasal symptom score (rTNSS) ≥6, and refractory to medical management were included. Follow-ups occurred at 4 and 12 weeks, with the primary endpoint at 12 weeks. Symptom improvement, peak nasal inspiratory flow (PNIF) and cytokine changes were assessed.

Results: Seventeen patients were enrolled with 15 patients undergoing the treatment. The procedure was well tolerated with no major adverse events. The rTNSS improved from a median of 7.5 to 4 at 12 weeks ($P < .01$). Median NOSE scores improved from 52.5 to 17.5 at week 12 ($P < .05$). Minimal clinically important differences (MCID) were achieved by 67% of patients for rTNSS and 50% for NOSE. There were no significant changes in PNIF. Patient-level change in IL-10 was significantly associated with improvement in NOSE score ($r = -.70$, $P = .011$).

Conclusions: RFN of the PNN is a safe, effective in-office treatment for CR. While PNIF and group-level cytokines were not consistent indicators of improvement, the correlation between IL-10 and symptom relief suggests a potential link between neural ablation and the local mucosal microenvironment. This investigation shows the feasibility of cytokine monitoring to further investigate the mechanisms of rhinitis treatment.

Keywords: chronic rhinitis; cytokines; posterior nasal nerve; radiofrequency ablation; rhinitis; rhinorrhea.

Conflict of interest statement

Declaration of Conflicting InterestsThe authors declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: MJC: Consultant for 3-D Matrix, Acclarent (Integra Life Sciences, Latica, Medtronic, Polyganics; prior consultant for Neurent); AUL: Consultant for Lyra Therapeutics, Medtronic, NeuroENT Medical, Sanofi and Stryker; serves on the scientific advisory board for Maxwell Biosciences and SoundHealth; and participated in advisory boards for AstraZeneca, GSK and Sanofi/Regeneron. WY: Consultant for Acclarent, Medical Metrics Inc; scientific advisory board for Sanofi, Inc; speaker for Optinose.

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Review

Ann Allergy Asthma Immunol

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. 2026 Oct;137(4):430-435.

doi: 10.1016/j.anai.2026.05.005. Epub 2026 May 9.

Biologics vs endoscopic surgery in the management of chronic rhinosinusitis with nasal polyps

Matthew Scott¹, Natalie Eidson², Maria Amelia Perozo², Spencer Payne³, Larry Borish⁴

Affiliations Expand

- PMID: 42114718
- DOI: [10.1016/j.anai.2026.05.005](https://doi.org/10.1016/j.anai.2026.05.005)

Abstract

Chronic rhinosinusitis with nasal polyposis is a heterogeneous inflammatory condition typically characterized by type 2 inflammatory responses. Patients who fail medical therapy (ie, nasal saline irrigation and topical steroids) have historically been managed with functional endoscopic sinus surgery (FESS), but the availability of biologic therapies has upended this paradigm. This presents an important decision for the allergist in managing refractory disease. FESS is a minimally invasive procedure to dissect the paranasal sinuses, allowing for medication access and debridement of retained secretions. This procedure alone does not modify the underlying inflammation but instead augments the delivery of medical therapy. This combination improves both objective and subjective outcomes. As such, patients who are unable or unwilling to continue topical medical therapies may not benefit from this approach. Currently, there are 4 biologics approved by the US Food and Drug Administration to treat chronic rhinosinusitis with nasal polyposis-dupilumab, omalizumab, mepolizumab, and tezepelumab. Each has been found to also improve objective and subjective outcomes. However, dupilumab is seemingly most effective at improving patient-reported outcomes and sense of smell (though tezepelumab has not been included in comparative studies). These therapies may be most appropriate for patients with comorbid atopic diseases. In addition, cost comparison analyses in the United States reveal that biologic therapy is less cost-effective than FESS, even in the setting of revision surgery. Ultimately, there are some patients who will benefit from the combination of both FESS and biologic therapies. Additional evidence is needed to evaluate the head-to-head outcomes of these 2 important management pathways.

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Conflict of interest statement

Disclosures Dr Borish has received research funding from Adovate and Regeneron Pharmaceuticals and is an advisory board member for AstraZeneca, Novartis, and Sanofi. Dr Payne is a member of the Regeneron/Sanofi speakers bureau, serves as a consultant for Aventix Medical, and is the owner of RefluxRaft. The remaining authors have no conflicts of interest to report.

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Laryngoscope

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. 2026 Oct;136(10):4183-4188.

doi: 10.1002/lary.70616. Epub 2026 May 22.

[Longitudinal SNOT-22 Symptom Changes With Sublingual Immunotherapy \(SLIT\)](#)

[Wynne Zheng](#)¹, [Jolie L Chang](#)¹, [Anna Butrymowicz](#)¹

Affiliations Expand

- PMID: 42174398
- PMCID: [PMC13569683](#)
- DOI: [10.1002/lary.70616](#)

Abstract

Objective: Despite widespread use of nasal corticosteroids and oral antihistamines, many patients with allergic rhinitis (AR) have persistent nasal congestion/obstruction and rhinorrhea with associated sleep disturbance and daytime fatigue. Sublingual immunotherapy (SLIT) is associated with reducing symptom burden and medication use. This study aims to evaluate time to clinical benefit and magnitude of first-year benefit after SLIT initiation.

Methods: Adult AR patients confirmed by skin or IgE testing who initiated allergen-directed SLIT were included. Sinonasal Outcome Test-22 (SNOT-22) and Rhinitis Control Assessment Test (RCAT) surveys were recorded at baseline, 1-6, and 6-12 months after SLIT. Longitudinal changes were assessed using repeated measures analysis of variance and minimal clinically important difference (MCID) thresholds. Exploratory analysis at 3 months was performed for a subset of patients.

Results: A total of 43 SLIT patients (mean age 42.1 ± 12.0 years; 40% female) were included and demonstrated significant reductions in total SNOT-22 scores at 1-6 months (-12.1 points; -35%) and 6-12 months (-12.5 points; -36%) (p < 0.01 from baseline). Nasal, sleep, and function SNOT-22 subscores each improved significantly from baseline, whereas the ear/face subscore did not. MCID for total SNOT-22 was achieved by 54.3% of patients at 1-6 months. RCAT scores improved significantly at 1-6 months and 6-12 months. The proportion of patients with normal SNOT-22 score (≤ 8) increased from 4.7% at baseline to 24.1% at 6-12 months.

Conclusions: SLIT was associated with symptom improvement within the first 6 months of therapy based on SNOT-22 and RCAT scores. Symptom score improvements persisted to 12 months, and findings support evidence of early nasal, sleep, and function symptom alleviation with SLIT.

Keywords: SNOT-22; allergic rhinitis; patient-reported outcomes; sublingual immunotherapy.

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Conflict of interest statement

This research was presented as a poster on January 22–24, 2026 at the 2026 Combined Sections Meeting for The Triological Society in Orlando, Florida, USA.

Dr. Jolie Chang is a consultant for Inspire Medical, Livanova, and Aerin Medical. All other authors declare no conflicts of interest.

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- [2 figures](#)

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Meta-Analysis

Int J Infect Dis

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. 2026 Oct:171:108762.

doi: 10.1016/j.ijid.2026.108762. Epub 2026 May 28.

[A systematic review and meta-analysis of bacterial pathogen prevalence in acute and chronic rhinosinusitis: implications for empiric antibiotic therapy and antimicrobial stewardship](#)

[Hye Ok Kim](#)¹, [Suhyeon Ha](#)², [Jung Jae Shim](#)¹, [Eunyoung Tak](#)³, [Jung-Man Namgoong](#)⁴

Affiliations Expand

- PMID: 42214663
- DOI: [10.1016/j.ijid.2026.108762](https://doi.org/10.1016/j.ijid.2026.108762)

Free article

Abstract

Objectives: To systematically compare the bacterial pathogen profiles of acute rhinosinusitis (ARS) versus chronic rhinosinusitis (CRS).

Methods: We searched PubMed, Web of Science, and Cochrane Library (1980-2024) for studies reporting sinusitis bacteriology. Fifty-seven studies (16 on ARS, 41 on CRS) met inclusion criteria. Pooled pathogen prevalence was estimated using a random-effects meta-analysis with 95% confidence intervals, with heterogeneity assessed by I^2 and τ^2 .

Results: In ARS, the five most prevalent bacteria were methicillin-susceptible *Staphylococcus aureus* (MSSA, 20.5%), coagulase-negative staphylococci (16.9%), *Streptococcus pneumoniae* (16.3%), viridans streptococci (13.0%), and *Haemophilus influenzae* (12.2%). In CRS, coagulase-negative staphylococci were most common (24.3%), followed by MSSA (22.5%), viridans streptococci (12.1%), *H. influenzae* (11.9%), and *S. pneumoniae* (9.4%). Notably, MSSA was the single most prevalent ARS isolate, surpassing traditional respiratory pathogens, whereas staphylococcal species (MSSA and coagulase-negative strains) together dominated CRS; pneumococcus was relatively infrequent in CRS.

Conclusion: ARS and CRS are microbiologically distinct syndromes. ARS infections are now often dominated by *S. aureus* alongside classical respiratory bacteria, whereas CRS harbors a broader polymicrobial flora with staphylococci predominating and a lower prevalence of *S. pneumoniae*. These differences underscore the need for distinct clinical management and antibiotic strategies for acute vs. chronic sinusitis.

Keywords: Acute rhinosinusitis; Bacterial pathogen; Chronic rhinosinusitis; Meta-analysis; Rhinosinusitis.

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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.

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Allergol Int

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. 2026 Oct;75(4):619-629.

doi: 10.1016/j.alit.2026.05.002. Epub 2026 Jun 6.

[Heparin-like compounds improve the biophysical properties of eosinophilic mucus](#)

[Misaki Arima](#)¹, [Tomoe Abe](#)², [Sahoko Kodama](#)¹, [Keisuke Ito](#)¹, [Keinosuke Hizuka](#)¹, [Hiroki Tomizawa](#)², [Yui Miyabe](#)², [Mineyo Fukuchi](#)³, [Rossana C N Melo](#)⁴, [Yoshinori Matsuwaki](#)⁵, [Shigeharu Ueki](#)⁶

Affiliations Expand

- PMID: 42248766
- DOI: [10.1016/j.alit.2026.05.002](#)

Free article

Abstract

Background: In eosinophilic chronic rhinosinusitis (ECRS), eosinophil extracellular traps (EETs) formed via extracellular trap-forming cell death contribute to abnormal mucus properties, including increased viscosity and hydrophobicity, which exacerbate disease progression. This study aimed to determine the modulatory effects of heparin-like compounds on the viscosity, hydrophilicity, and water content of EET-rich mucus in ECRS, and to assess their potential as adjunctive agents in enhancing mucolytic efficacy.

Methods: Mucus samples obtained from six patients with ECRS were treated with heparin-like compounds, including unfractionated heparin, mucopolysaccharide polysulfate (MPS), and dalteparin. Shear viscosity was measured using a rotational viscometer, hydrophobicity was assessed by contact-angle measurements, and water content was determined by thermogravimetric analysis based on time-dependent weight changes and final dry weight. The effects of these compounds on EETs were evaluated using peripheral blood-derived eosinophils in vitro.

Results: Treatment with heparin-like compounds, similar to unfractionated heparin, reduced the viscosity of ECRS mucus and EET aggregates while increasing both the water content and hydrophilicity. These compounds also promoted the relaxation of EET structures, and co-treatment with DNase further enhanced mucus dissolution. Increased turbidity upon mixing with histones indicated a direct interaction between heparin-like compounds and histones.

Conclusions: These findings suggest that heparin-like compounds interact with EET-associated histones and alter the mucus polymer network, thereby improving the biophysical properties of pathological mucus by reducing its viscosity and enhancing its hydrophilicity.

Keywords: Chronic rhinosinusitis; Eosinophil; Extracellular traps; Heparin; Mucus.

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Conflict of interest statement

Conflict of interest SU received grants and honoraria for lectures from AstraZeneca. The rest of the authors have no conflict of interest.

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Ann Allergy Asthma Immunol

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. 2026 Oct;137(4):492-497.

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[Nasal and inhaled steroid use does not influence treatment response outcomes in eosinophilic esophagitis](#)

[Langley Barnes](#)¹, [Evan S Dellon](#)², [Craig C Reed](#)³

Affiliations Expand

- PMID: 42251964
- PMCID: [PMC13317818](#)
- DOI: [10.1016/j.anai.2026.06.003](#)

Abstract

Background: Eosinophilic esophagitis (EoE) guidelines suggest that nasal or inhaled steroids for rhinitis, sinusitis, or asthma may obscure the outcomes of EoE treatment. Few data support this assertion.

Objective: To assess whether EoE treatment outcomes vary by nasal or inhaled steroid use or concomitant allergic rhinitis.

Methods: We conducted a retrospective cohort study of newly diagnosed patients with EoE treated with a topical corticosteroid, with follow-up endoscopy and biopsy. Extracted variables included a diagnosis of allergic rhinitis, treatment with nasal and/or inhaled steroids, and post-treatment symptoms, endoscopic data, and pathology results. Patients with and without treatment with nasal and/or inhaled steroids were compared. We also compared outcomes by diagnosis of allergic rhinitis and season at follow-up.

Results: Of the 473 patients, 185 (39%) had allergic rhinitis. Post-treatment symptom response (83% vs 77%; $P = .37$), EoE endoscopic reference score (1.9 ± 1.9 vs 2.3 ± 1.9 ; $P = .07$), and eosinophil counts (25.5 ± 41.8 vs 23.0 ± 32.4 ; $P = .38$) did not differ by allergic rhinitis status. No differences in histologic responses were found by nasal/inhaled steroid use (adjusted odds ratio for <15 eosinophil/high-power field: 0.96; 95% CI: 0.53-1.74) or in patients with asthma who were on inhaled steroids. Patients with allergic rhinitis had higher post-treatment eosinophil counts in the spring (41.3 ± 7.4 vs 20.5 ± 3.3 in other seasons; $P = .01$).

Conclusion: Treatment responses did not differ by nasal/inhaled steroid use or by concurrent allergic rhinitis. Patients with allergic rhinitis had a higher post-treatment eosinophil count in the spring. These data support the use of nasal/inhaled steroids in patients with EoE but suggest caution when assessing responses in the spring months.

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Conflict of interest statement

Disclosures Dr Dellon reports receiving research funding from Adare/Ellodi, Allakos, Arena/Pfizer, AstraZeneca, Celldex, Dr Falk Pharma, Eupraxia, Ferring, GlaxoSmithKline, Meritage, Miraca, Nutricia, Celgene/Receptos/BMS, Phantom, Regeneron, Revolo, Sanofi, Shire/Takeda, and Uniquity; consulting fees from Abbvie, Adare/Ellodi, Alfasigma, ALK, Allakos, Amgen, Anaptysbio, Apogee, Apollo, Aqilion, Arena/Pfizer, AstraZeneca, Bethanamist, Biocryst, Bryn, Calypso, Celgene/Receptos/BMS, Celldex, Cyted, Domain, EsoCap, Eupraxia, Dr Falk Pharma, Ferring, GI Reviewers, GlaxoSmithKline, Holoclara, Invea, Knightpoint, LucidDx, Nexstone Immunology/Uniquity, Nutricia, Parexel/Calyx, Phathom, Regeneron, Revolo, Robarts/Alimentiv, Roivant, Sanofi, Shire/Takeda, Target RWE, Third Harmonic Bio, and Upstream Bio; and educational grants from Allakos, Aqilion, Holoclara, and Invea. Dr Reed reports receiving consulting fees from AstraZeneca and GI Reviewers. Ms Barnes has no conflicts of interest to report.

- [31 references](#)

Supplementary info

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Review

Ann Allergy Asthma Immunol

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. 2026 Oct;137(4):441-448.

doi: 10.1016/j.anai.2026.06.025. Epub 2026 Jun 27.

[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 evaluate remission and related meaningful outcomes in chronic rhinitis and rhinosinusitis, with a particular focus on chronic rhinosinusitis with nasal polyps. We summarize current conceptual frameworks that distinguish treatment response, disease control, and remission, emphasizing durability, the absence of clinically relevant disease activity, and freedom from escalation, such as systemic corticosteroids or surgery. Real-world studies of biologic therapy in chronic rhinosinusitis with nasal polyps demonstrate that remission is achievable in a subset of patients, although reported rates vary widely because of heterogeneous definitions and predominantly observational evidence. The 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 is 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 pharmacologic and surgical treatment modalities.

Supplementary info

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Cite

11

Review

Expert Rev Respir Med

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. 2026 Oct;20(10):1183-1191.

doi: 10.1080/17476348.2026.2699459. Epub 2026 Jul 6.

[Upper and lower airway crosstalk in acute exacerbations of COPD: a clinical and biological overview](#)

[Simone Ielo](#)¹, [Lorenzo Carriera](#)^{2,3}, [Pier-Valerio Mari](#)⁴, [Roberto Barone](#)², [Francesca Cefaloni](#)², [Antonella Loperfido](#)⁵, [Angelo Coppola](#)^{6,7}, [Stefano Baglioni](#)³, [Eugenio De Corso](#)⁸, [Raffaele Scala](#)¹

Affiliations Expand

- PMID: 42403302
- DOI: [10.1080/17476348.2026.2699459](https://doi.org/10.1080/17476348.2026.2699459)

Free article

Abstract

Introduction: Acute exacerbations of chronic obstructive pulmonary disease (AE-COPD) are acute worsening events characterized by increased dyspnea, cough, and sputum production. Although traditionally viewed as lower airway events, growing evidence suggests that AE-COPD may reflect broader pan-airway dysfunction involving both upper and lower respiratory compartments.

Areas covered: This overview examines upper - lower airway crosstalk in AE-COPD across three domains: pan-airway inflammation, epithelial alarmin/cytokine networks, and the continuous airway microbiome. We discuss the coexistence of

COPD with sinonasal inflammation, chronic rhinitis, and chronic rhinosinusitis, and their possible contribution to symptom burden, impaired quality of life, and exacerbation risk. We also review mechanisms linking upper and lower airways, including epithelial barrier dysfunction, impaired antiviral responses, innate immune activation, alarmin release, and microbiome-driven dysbiosis.

Expert opinion: Recognizing AE-COPD as a manifestation of pan-airway dysfunction may have relevant clinical implications. Systematic assessment of upper airway symptoms and comorbidities could improve phenotyping, risk stratification, and therapeutic targeting, particularly in frequent exacerbators. Future longitudinal and multi-omic studies are needed to validate upper airway biomarkers and determine whether targeted treatment of upper airway disease can modify COPD outcomes.

Keywords: Chronic obstructive pulmonary disease; acute exacerbation; airway microbiome; chronic rhinosinusitis; united airway disease.

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Cite

12

Review

Ann Allergy Asthma Immunol

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. 2026 Oct;137(4):436-440.

doi: 10.1016/j.anai.2026.07.020. Epub 2026 Jul 28.

[Cellular and immune mechanisms of acute exacerbations of chronic rhinosinusitis](#)

[Robert M Frederick](#)¹, [Kent Lam](#)¹, [Joseph K Han](#)²

Affiliations Expand

- PMID: 42520889
- DOI: [10.1016/j.anai.2026.07.020](https://doi.org/10.1016/j.anai.2026.07.020)

Abstract

Acute exacerbations of chronic rhinosinusitis (AECRS) represent an important and distinct phenotype of chronic rhinosinusitis (CRS) about which much remains to be learned. The widely adopted definition of AECRS consists of a flare-up of distinctly worsened symptoms lasting 3 days or more from a chronic inflammatory baseline, which prompts an escalation of treatment. Patients with worse baseline CRS symptomatology have been shown to experience more frequent AECRS episodes. In addition, characteristics of patients who experience more frequent AECRS episodes include comorbid asthma, a high body mass index, and longer-term CRS status. As both asthma and AECRS are type 2 inflammatory responses, many parallels can be drawn between the 2 airway diseases to help elucidate the pathophysiologic mechanism driving AECRS. Thus far, the mainstay of treatment has been oral antibiotics and systemic corticosteroids; however, several biological therapies have shown promising efficacy in reducing AECRS frequency through their ability to control baseline CRS inflammation. Novel studies can focus on measuring the effect of specific interventions on AECRS frequency to better delineate the full efficacy of the drug in question.

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Conflict of interest statement

Disclosures The authors have no conflicts of interest to report.

Supplementary info

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Cite

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Eur Arch Otorhinolaryngol

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. 2026 Sep 29.

doi: 10.1007/s00405-026-10606-0. Online ahead of print.

[Effects of dupilumab on nasal mucociliary clearance in severe CRSwNP: evaluation of the saccharin test as an objective outcome measure](#)

[Giulio Pagliuca](#)¹, [Veronica Clemenzi](#)², [Salvatore Martellucci](#)³, [Edoardo Covelli](#)¹, [Andrea Stolfi](#)³, [Vanessa Di Stefano](#)³, [Andrea Gallo](#)³, [Valentina Terenzi](#)^{4 5}

Affiliations Expand

- PMID: 42806130
- DOI: [10.1007/s00405-026-10606-0](https://doi.org/10.1007/s00405-026-10606-0)

Abstract

Objective: Chronic rhinosinusitis with nasal polyps (CRSwNP) is a chronic, relapsing condition associated with a significant impairment in quality of life. Persistent inflammation contributes to dysfunction of mucociliary clearance. Dupilumab (IL-4R α inhibitor) is a well-established therapeutic agent that has demonstrated significant efficacy in reducing type 2 inflammation and improving quality of life in patients with severe CRSwNP refractory to medical and/or surgical treatment. This study aimed to evaluate whether dupilumab therapy improves mucociliary clearance in patients with CRSwNP.

Methods: Twenty-one patients with severe CRSwNP were enrolled. All received dupilumab (300 mg subcutaneously every 2 weeks) according to prescribing criteria. At baseline and after 4, 8, and 12 weeks, patients underwent evaluation with SNOT-22, nasal endoscopy with Nasal Polyp Score (NPS), and assessment of mucociliary clearance using the saccharin test (ST). Nasal mucociliary clearance time (NMCT) values were compared across time points..

Results: Significant improvements were observed in SNOT-22, NPS, and NMCT. Mean NMCT values measured using the ST values decreased from 14.3 minutes at baseline to 10.1 minutes at 4 weeks ($p < .01$), 7.75 minutes at 8 weeks, and 5.84 minutes at 12 weeks, indicating a progressive and statistically significant enhancement of mucociliary clearance.

Conclusions: Short-term dupilumab therapy was associated with a significant improvement in nasal mucociliary clearance in patients with severe CRSwNP. These preliminary findings support the potential role of the saccharin test as a simple, objective tool for monitoring response to biologic therapy.

Keywords: Dupilumab; Monoclonal antibodies; Mucociliary clearance; Nasal polyps; Rhinitis; Rhinosinusitis; Saccharin test.

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Conflict of interest statement

Declarations. Ethical consideration: This study was approved by the Institutional Ethics Committee (Comitato Etico Lazio2) (protocol number 0082270/2022). The research was conducted ethically, with all study procedures being performed in accordance with the requirements of the World Medical Association's Declaration of Helsinki. Written informed consent was obtained from each participant/patient for study participation and data publication. Conflict of interest: The authors declare no conflict of interest.

- [20 references](#)

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Cite

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Pediatr Res

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. 2026 Sep 28.

doi: 10.1038/s41390-026-05524-0. Online ahead of print.

[Beyond eosinophils: systemic inflammation in pediatric allergic rhinitis](#)

[Maria V Medeleanu](#)^{1,2}, [Olivia Fairfield](#)¹, [Julia E M Upton](#)^{3,4}

Affiliations Expand

- PMID: 42806139
- DOI: [10.1038/s41390-026-05524-0](#)

No abstract available

Conflict of interest statement

Competing interests: JEMU reports grants or contracts from DBV Technologies, Regeneron, Sanofi, RAPT Therapeutics, ALK-Abelló, the Canadian Institutes of Health Research, the SickKids Food Allergy and Anaphylaxis Program, and Innovation Fund Denmark; honoraria from Viatris, and Pfizer; participation on the advisory board for Pfizer, Pharming, and ALK-Abelló, Health Care Advisory for Food Allergy Canada, Board of Directors of the Canadian Society of Allergy and Clinical Immunology, and editorial roles in journals of Pediatric Research (Allergy section editor), Allergy (editorial board), Annals of Allergy, Asthma & Immunology (editorial board), and Allergy, Asthma & Clinical Immunology (associate editor); and receipt of drug (omalizumab) from Novartis for research study, all outside the submitted work.

- [10 references](#)

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Cite

15

Review

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. 2026 Sep 30:1.

doi: 10.1159/iaa/adfag019. Online ahead of print.

Inflammatory comorbidity of upper and lower airways: epidemiology, mechanism and therapeutic Advances of Rhinitis Combined with Asthma

Kang Wang, Yan Qin, Jun Liu

- PMID: 42814648
- DOI: [10.1159/iaa/adfag019](https://doi.org/10.1159/iaa/adfag019)

Abstract

Asthma and rhinitis are respectively the most common chronic inflammatory diseases of the lower airway and the upper airway. These two conditions often coexist as inflammatory disorders of the upper and lower airways. Clinical data generally show that the comorbidity of asthma patients with rhinitis or of patients with rhinitis having asthma significantly increases the disease burden of the patients. The core mechanism involves type 2 inflammatory pathways, neural reflex linkage, and systemic inflammatory dissemination. Currently, the treatment for the co-occurrence of rhinitis and asthma has shifted to an integrated approach. The combination of nasal and inhaled glucocorticoids serves as the basic treatment, while leukotriene receptor antagonists are the advantageous drugs for the comorbidity. Targeted biological agents such as anti-immunoglobulin E and anti-interleukin-4 receptor α monoclonal antibodies achieve precise intervention on key pathways, while allergen immunotherapy offers the potential for etiological treatment. This review comprehensively elaborates on the epidemiological characteristics, pathophysiological mechanisms and treatment progress of this comorbidity, with the aim of providing a theoretical basis for future treatment of comorbidities.

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Review

Immunology

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. 2026 Sep 30.

doi: 10.1111/imm.70202. Online ahead of print.

[The Role of Innate Lymphoid Cells in Autoimmune, Allergic and Infectious Diseases: A Systematic Review](#)

[Luan F Lückmann](#)^{1,2}, [Henrique R Dal-Pizzol](#)³, [Louise M Lückmann](#)⁴, [Davi E Salini](#)³, [Bruna C Hasckel](#)², [Mikaeli Minati](#)², [Bruno Kluwe-Schiavon](#)⁵, [Tatiana Barichello](#)^{1,5}

Affiliations Expand

- PMID: 42816751
- DOI: [10.1111/imm.70202](#)

Abstract

Innate lymphoid cells (ILCs) are tissue-resident immune cells that functionally mirror CD4⁺ T helper (Th)1, Th2 and Th17 cells, and are accordingly classified as ILC1, ILC2 and ILC3. Additional members of the ILC family include lymphoid tissue inducer (LTi) cells and natural killer (NK) cells. Abundant at barrier surfaces, ILCs are among the first responders to pathogens, contributing to tissue homeostasis and adaptive immunity. This systematic review, conducted following PRISMA guidelines, synthesises human clinical evidence on ILCs in autoimmune, allergic and infectious diseases. Relevant peer-reviewed articles published up to December 2025 were identified across major databases. From 2545 initial records, 170 were selected for full-text evaluation and 135 were ultimately included. Findings were heterogeneous, with the most consistent evidence demonstrating: (i) in inflammatory bowel disease (IBD), a plasticity-driven shift from protective IL-22⁺ ILC3s to pathogenic IFN- γ ⁺ ILC1s compromises mucosal barrier integrity; (ii) in multiple sclerosis, enrichment of regulatory CD56bright NK cells marks clinical success, while Group 3 ILCs are implicated in meningeal ectopic lymphoid neogenesis; (iii) in systemic lupus erythematosus, expanded IFN- γ ⁺ ILC1s correlate with disease severity and amplify pathogenic Type I interferon responses; and (iv) in allergic diseases (asthma, allergic rhinitis and chronic rhinosinusitis), activated ILC2s drive self-perpetuating inflammatory circuits and tissue remodelling. Future studies should address potential sources of heterogeneity and establish a consensus regarding the role of ILCs in disease pathogenesis to enhance their potential as targets for novel diagnostic and therapeutic strategies.

Keywords: allergic diseases; autoimmune disease; infections; innate immunity; innate lymphoid cells.

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- [181 references](#)

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Review

Clin Rev Allergy Immunol

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. 2026 Oct 1;69(1):81.

doi: 10.1007/s12016-026-09200-3.

[Rethinking Monospecific Antibody Therapy in Chronic Rhinosinusitis with Nasal Polyps: Dual- and Multispecific Antibodies](#)

[Yingying Dai](#)¹, [Tong Guo](#)¹, [Muhan Shi](#)¹, [Deyun Wang](#)², [Min Wang](#)³

Affiliations Expand

- PMID: 42821054
- PMCID: [PMC13630790](#)
- DOI: [10.1007/s12016-026-09200-3](#)

Abstract

Chronic rhinosinusitis with nasal polyps (CRSwNP) is a heterogeneous inflammatory disorder in which type 2 inflammation predominates but varies in its local organization, clinical context, and downstream tissue effects. Biologics targeting interleukin-4 receptor alpha, immunoglobulin E, the interleukin-5/interleukin-5 receptor axis, and thymic stromal lymphopoietin have expanded treatment options for severe disease and can improve polyp burden, nasal obstruction, olfactory function, quality of life, and corticosteroid- or surgery-related outcomes. However, responses remain variable across patients and clinical domains, and incomplete control may reflect target mismatch, persistent parallel inflammatory pathways, comorbid airway disease, or established tissue remodeling

rather than insufficient pathway coverage alone. In this review, we summarize the mechanisms and clinical evidence for current monospecific antibodies and examine biological contexts that may contribute to variable treatment responses, including local IgE activity, microbial and antigenic amplification, nonsteroidal anti-inflammatory drug-exacerbated respiratory disease (N-ERD), comorbid asthma, and persistent epithelial remodeling. We then discuss biomarkers, multidimensional response assessment, and clinical positioning of biologic therapy before evaluating the rationale, boundaries, molecular design, and current pipeline of dual- and multispecific antibodies. Attention is given to whether broader pathway targeting can provide incremental benefit over optimized monospecific therapy, while maintaining acceptable long-term safety, treatment practicality, and economic value. The future role of multispecific biologics in CRSwNP will depend on rational target pairing, comparative clinical evidence, and improved identification of patients most likely to benefit.

Keywords: Biologics; Chronic Rhinosinusitis with Nasal Polyps; Dual-Specific Antibodies; Multispecific Antibodies; Type 2 Inflammation.

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Conflict of interest statement

Declarations. Ethical Approval: Not applicable. This article is a narrative review of previously published literature and does not involve human participants, human data, or animal experiments. **Competing Interests:** The authors declare no competing interests.

- [107 references](#)
- [2 figures](#)

Supplementary info

Publication types, MeSH terms, Substances, Grants and fundingExpand

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Review

Immunol Res

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. 2026 Oct 2;74(1):119.

doi: 10.1007/s12026-026-09854-3.

Vitamin D status and supplementation as potential modifiers of allergen immunotherapy outcomes in respiratory allergy: A structured narrative review

Selda Ali^{1,2}, Denisa-Mihaela Iordan^{3,4}, Andreea-Iulia Vlădulescu-Trandafir^{1,5}, Roxana Silvia Bumbăcea^{1,2}

Affiliations Expand

- PMID: 42825850
- DOI: [10.1007/s12026-026-09854-3](https://doi.org/10.1007/s12026-026-09854-3)

Abstract

Allergen immunotherapy (AIT) represents a cornerstone in managing IgE-mediated allergic diseases, such as allergic rhinitis and asthma. By administering controlled doses of allergens over time, AIT aims to readjust immune tolerance, thereby modifying allergic responses. However, clinical responses to AIT remain heterogeneous, with a subset of patients achieving only partial benefit. This heterogeneity underlines the need for novel adjunctive approaches to potentiate the immunomodulatory effects of AIT. In this context, vitamin D has gained considerable interest, given its well-established role in immune homeostasis and regulation, as well as its emerging relevance in modulating allergic disease. This structured narrative review aims to assess the potential role of vitamin D supplementation during AIT on clinical outcomes as well as the significance of endogenous vitamin D levels on AIT clinical efficacy. A total of 18 studies were reviewed, 13 evaluating the impact of vitamin D supplementation during AIT and 5 assessing the influence of endogenous vitamin D levels on AIT outcomes. Most supplementation studies reported clinical outcomes favoring the addition of vitamin D to AIT, but three found no additional benefit, and two reported a benefit only at an earlier time point, respectively in vitamin D-deficient patients. Of the five studies examining endogenous status, three reported that higher 25-hydroxyvitamin D (25(OH)D) levels were associated with better AIT outcomes. Other findings that were reported as secondary outcomes included favorable immunologic changes, such as IL-10 production, decreased allergen-specific IgE levels, and enhanced regulatory Treg-cell activity, without formal assessment of their contribution to clinical benefit. Nevertheless, findings remain inconsistent across studies due to heterogeneity in study design, supplementation regimens, and outcome measures. While the available evidence suggests that adequate vitamin D status or supplementation may be associated with better clinical responses to AIT, the current findings remain limited by heterogeneity in study design, supplementation regimens, outcome measures, and generally small sample sizes. Therefore, the evidence should be considered suggestive rather than conclusive. Although correction of vitamin D deficiency is appropriate on general clinical grounds, its specific use as an adjunct to improve AIT outcomes cannot yet be routinely recommended. Further adequately powered, standardized, placebo-controlled studies are needed to clarify its role and inform clinical recommendations.

Keywords: Allergen immunotherapy; Allergic rhinitis; Asthma; Vitamin D.

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Conflict of interest statement

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

- [44 references](#)

Supplementary info

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Cite

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Medicine (Baltimore)

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. 2026 Oct 2;105(40):e50904.

doi: 10.1097/MD.00000000000050904.

[Relationship between serum albumin and blood eosinophils in adolescents with allergic triad: A Cross-sectional study from NHANES](#)

[Yanyan Zhang](#)¹, [Jingzhi Jiang](#)², [Zuming Yang](#)¹, [Xuli Wang](#)¹, [Danfeng Gu](#)¹

Affiliations Expand

- PMID: 42826276
- DOI: [10.1097/MD.00000000000050904](#)

Abstract

While the association between serum albumin and eosinophils has been investigated in adult asthma, its role in any pediatric atopic triad - asthma, allergic rhinitis, or atopic dermatitis - remains unclear. We assessed the association between serum albumin and blood eosinophil counts in adolescents presenting with any atopic triad, using data from a 2-year National Health and Nutrition Examination Survey (NHANES) cycle. We analyzed data from 658 participants aged 12-18 years with any atopic triad condition from the 2005-2006 NHANES cycle. Multivariate linear regression models were employed to assess the potential association between serum albumin levels and blood eosinophil counts (BEOC). Trend tests, smooth curve fitting, and threshold effect models were applied to confirm this relationship, and stratified analyses were conducted to assess its

consistency across subgroups. A significant negative association was observed between serum albumin and BEOC in the fully adjusted model ($\beta = -0.08 \times 10^3$ cells/ μ L, 95% CI: -0.15, -0.01, $P = .018$). Moreover, curve fitting and threshold effect analyses confirmed a nonlinear relationship between serum albumin and BEOC, with an inflection point for threshold and saturation effects of 4.4 g/dL, beyond which the association attenuated. Stratified analyses confirmed robustness across key subpopulations. Our study identified a nonlinear association between serum albumin levels and BEOC in adolescents with any atopic triad, exhibiting an L-shaped relationship. These findings highlight albumin as a potential biomarker for nutritional-immunological interplay in allergic inflammation and support targeted nutritional strategies in at-risk pediatric populations.

Keywords: NHANES; Serum albumin; adolescents; allergic triad; eosinophils.

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Conflict of interest statement

The authors have no funding and conflicts of interest to declare.

- [47 references](#)

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Cite

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Pediatr Allergy Immunol

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. 2026 Oct;37(10):e70502.

doi: 10.1111/pai.70502.

[Comment on "Environmental risk factors for allergic rhinitis differ by income level: A global asthma network survey"](#)

[Madhuri Tribhuvan](#)¹, [Shashikant N Phatke](#)²

Affiliations Expand

- PMID: 42827271

- DOI: [10.1111/pai.70502](https://doi.org/10.1111/pai.70502)

No abstract available

Keywords: E-value; allergic rhinitis; antibiotics; confounding by indication; multilevel analysis; paracetamol.

- [6 references](#)

Supplementary info

Publication typesExpand

chronic cough

1

Clin Exp Allergy

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. 2026 Oct;56(10):1264-1266.

doi: 10.1111/cea.70373. Epub 2026 Jun 18.

[Age-Dependent Role of Cough Hypersensitivity in Transition to Refractory Chronic Cough](#)

[Sung-Yoon Kang¹, Ha-Kyeong Won², Mi-Yeong Kim³, Ji-Hyang Lee⁴, Jin An⁵, Ji-Yoon Oh⁶, Jiung Jeong⁷, Young-Chan Kim⁸, So-Young Park⁹, Hwa Young Lee¹⁰, Eun-Jung Jo¹¹, Kyung-Min Ahn¹², Min-Hye Kim¹², So Ri Kim¹³, Sae-Hoon Kim¹⁴, Sang-Heon Kim¹⁵, Yoon-Seok Chang¹⁴, Byung-Jae Lee¹⁶, Surinder S Birring¹⁷, Woo-Jung Song¹⁸, Korean Chronic Cough Registry investigators](#)

Affiliations Expand

- PMID: 42315315
- PMCID: [PMC13630505](#)
- DOI: [10.1111/cea.70373](https://doi.org/10.1111/cea.70373)

Abstract

• During a one-year follow-up, approximately 20% of patients with aetiology-explained chronic cough transitioned to refractory cough.

• Cough hypersensitivity showed an age-dependent association with transition to refractory chronic cough.

Keywords: age; chronic cough; refractory chronic cough; registry; transition.

Conflict of interest statement

W.J.S. declares grants from Merck Sharp & Dohme Corp. and AstraZeneca, consulting fees from Merck, Bellus, AstraZeneca, Shionogi, and G.S.K., and lecture fees from Immunotek/Thermo Fisher, Merck, AstraZeneca, G.S.K., Sanofi, and Novartis. Other authors have none to declare.

- [8 references](#)
- [1 figure](#)

Supplementary info

Grants and fundingExpand

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Review

Pain Manag

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. 2026 Oct;16(10):1161-1169.

doi: 10.1080/17581869.2026.2694372. Epub 2026 Jun 29.

[Does gabapentin add value to multimodal analgesia in thoracic surgery? A procedure-specific meta-analysis](#)

[Gabriel Lemos González¹](#), [Vitor Alves Felipe²](#), [Bruno Francisco Minetto Wegner³](#), [Gustavo Roberto Minetto Wegner⁴](#), [Iaci Luisa Lopes de Mattos¹](#), [Tatiana Souza do Nascimento⁵](#), [Lucas Arêa Leão Barreto⁶](#), [Carlos Darcy Alves Bersot⁷](#), [Fani Nhuch⁸](#), [Marcos Adriano Lessa⁵](#)

Affiliations Expand

- PMID: 42371403
- DOI: [10.1080/17581869.2026.2694372](#)

Abstract

Aims: Thoracic surgery is associated with severe acute and chronic pain, high opioid use, and other adverse outcomes. Gabapentin is commonly used

perioperatively, but its effectiveness remains uncertain. This systematic review and meta-analysis evaluated the efficacy and safety of perioperative gabapentin versus placebo after thoracic surgery.

Patients and methods: Cochrane, Embase, PubMed, and Web of Science were searched through 29 August 2025 for randomized controlled trials comparing gabapentin with placebo in adults undergoing thoracic surgery. The primary outcome was pain at 24 hours. Secondary outcomes included pain at other time points, opioid consumption, chronic pain, and adverse events. Data were pooled using random-effects models.

Results and conclusions: Six trials including 748 patients were analyzed. Gabapentin had no significant effect on rest pain at 24 hours (MD -0.13; 95% CI -1.17 to 0.91). A non-significant trend toward worse cough-evoked pain at 24 hours was observed with gabapentin (MD 0.53; 95% CI 0.00 to 1.07). Gabapentin also did not significantly affect opioid consumption, pain chronification, or adverse events such as nausea, sedation, or delirium. Based on low-certainty evidence, perioperative gabapentin does not appear to provide meaningful benefit after thoracic surgery.

Protocol registration: The www.crd.york.ac.uk/prospero identifier is CRD420251136259.

Keywords: Gabapentin; meta-analysis; pain management; postoperative pain; thoracic surgery.

Plain language summary

Chest surgery often causes strong pain. This pain can last for months. Doctors sometimes give a drug called gabapentin to help reduce pain and to use less opioid medicine. We looked at six studies with 748 patients who had chest surgery. The studies compared gabapentin with a placebo (a fake treatment with no drug). Gabapentin did not lower short-term or long-term pain. It also did not lower how much opioid medicine people used. It did not clearly reduce side effects like nausea, sleepiness, itching, or confusion. The studies were small. Because of this, future studies may find different results. But right now, there is no clear proof that gabapentin helps with pain after chest surgery. In summary, gabapentin may not help and may not be needed for most patients.

Supplementary info

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Cite

3

Review

Expert Rev Respir Med

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. 2026 Oct;20(10):1183-1191.

doi: 10.1080/17476348.2026.2699459. Epub 2026 Jul 6.

[Upper and lower airway crosstalk in acute exacerbations of COPD: a clinical and biological overview](#)

[Simone Ielo](#)¹, [Lorenzo Carriera](#)^{2,3}, [Pier-Valerio Mari](#)⁴, [Roberto Barone](#)², [Francesca Cefaloni](#)², [Antonella Loperfido](#)⁵, [Angelo Coppola](#)^{6,7}, [Stefano Baglioni](#)³, [Eugenio De Corso](#)⁸, [Raffaele Scala](#)¹

Affiliations Expand

- PMID: 42403302
- DOI: [10.1080/17476348.2026.2699459](#)

Free article

Abstract

Introduction: Acute exacerbations of chronic obstructive pulmonary disease (AE-COPD) are acute worsening events characterized by increased dyspnea, cough, and sputum production. Although traditionally viewed as lower airway events, growing evidence suggests that AE-COPD may reflect broader pan-airway dysfunction involving both upper and lower respiratory compartments.

Areas covered: This overview examines upper - lower airway crosstalk in AE-COPD across three domains: pan-airway inflammation, epithelial alarmin/cytokine networks, and the continuous airway microbiome. We discuss the coexistence of COPD with sinonasal inflammation, chronic rhinitis, and chronic rhinosinusitis, and their possible contribution to symptom burden, impaired quality of life, and exacerbation risk. We also review mechanisms linking upper and lower airways, including epithelial barrier dysfunction, impaired antiviral responses, innate immune activation, alarmin release, and microbiome-driven dysbiosis.

Expert opinion: Recognizing AE-COPD as a manifestation of pan-airway dysfunction may have relevant clinical implications. Systematic assessment of upper airway symptoms and comorbidities could improve phenotyping, risk stratification, and therapeutic targeting, particularly in frequent exacerbators. Future longitudinal and multi-omic studies are needed to validate upper airway biomarkers and determine whether targeted treatment of upper airway disease can modify COPD outcomes.

Keywords: Chronic obstructive pulmonary disease; acute exacerbation; airway microbiome; chronic rhinosinusitis; united airway disease.

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Cite

4

Review

Respir Med

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. 2026 Oct:262:109124.

doi: 10.1016/j.rmed.2026.109124. Epub 2026 Aug 28.

[Differential diagnosis of asthma and COPD: Established and emerging biomarkers and technologies](#)

[Joan Cabot](#)¹, [Xavier Busquets](#)¹, [Joan B Soriano](#)²

Affiliations Expand

- PMID: 42665061
- DOI: [10.1016/j.rmed.2026.109124](#)

Free article

Abstract

Asthma and chronic obstructive pulmonary disease (COPD) represent the two most prevalent chronic respiratory conditions worldwide, affecting hundreds of millions of individuals and imposing substantial morbidity and mortality. Despite their distinct biological mechanisms, these diseases frequently exhibit overlapping clinical features-including dyspnea, cough, and wheezing-that complicate differential diagnosis, particularly in smoking adults, older patients, and those with mild or fluctuating airflow obstruction. Spirometry remains the cornerstone of diagnostic evaluation, yet its limitations, including dependence on patient effort, reduced sensitivity for early disease, and inability to fully capture small airways involvement, contribute to persistent underdiagnosis and overdiagnosis in clinical practice. This review examines current diagnostic approaches for asthma and COPD, their inherent limitations, and the emerging biomarkers and functional technologies that may improve diagnostic precision. Established biomarkers, including blood eosinophils, fractional exhaled nitric oxide (FeNO), and induced sputum analysis, provide complementary information that refines clinical characterization but lack sufficient disease specificity for standalone use. Novel approaches, including lipidomics, metabolomics, and extracellular vesicle profiling,

demonstrate potential for identifying disease-specific molecular signatures and biologically distinct phenotypes, particularly in asthma-COPD overlap. Concurrently, new functional tools-including novel spirometric indices such as Parameter D or FEV3/FEV6, respiratory oscillometry, and artificial intelligence-driven tidal breathing analysis-are enabling more sensitive, effort-independent, and multidimensional assessment of airway disease. The integration of these clinical, functional, inflammatory, and molecular approaches supports a transition toward multimodal diagnostic frameworks that may substantially improve the recognition and differential diagnosis of asthma and COPD, particularly in challenging clinical scenarios and early disease states.

Keywords: Asthma; Biomarkers; COPD; STARD; Spirometry.

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Conflict of interest statement

Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: JBS has received pharmaceutical company grants from 2022 to 2026 from Chiesi, GSK, Linde and Novartis via Hospital Universitario de La Princesa. Participated in speaking activities, advisory committees, and consultancies from 2022 to 2026 sponsored by Air Liquide, Almirall, AstraZeneca, Boehringer Ingelheim, CHEST, Chiesi, CNPT, ERS, FTH, Gebro, Grifols, GSK, IHME, Laminar Pharma, Linde, Lipopharma, Menarini, Mundipharma, Novartis, OMS/WHO, Pfizer, ResApp, RiRL, ROVI, SEPAR, SAPIO, Seqirus, WHO EUR, Takeda and Zambon. Finally, JBS declares never received, directly or indirectly, any funding from tobacco manufacturers or their affiliates. JC and XB declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

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5

Review

Neuroimmunomodulation

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. 2026 Sep 29:1.

doi: 10.1159/nim/adxag009. Online ahead of print.

Peripheral and central neuroinflammatory mechanisms regulating vagal sensory circuit processing and cough in lung disease

Stuart B Mazzone, Alexandria K Driessen, Nathalie A J Verzele

- PMID: 42809490
- DOI: [10.1159/nim/adxag009](https://doi.org/10.1159/nim/adxag009)

Free article

Abstract

Background: The pulmonary system can be exposed to a diverse range of injurious insults which drive pathological events including inflammation, tissue damage and structural remodelling within the airways and lungs.

Summary: Patients with lung inflammation and injury often experience sensory neurological complications, suggesting that the pathological processes in the lung either impact or extend into the nervous system.

Key messages: Cough is a common presenting neurological symptom in patients with lung disease and there is growing evidence that neuroinflammation, either within the vagal nerves innervating the airways and lungs or within the central sensory neural circuits regulating cough, is involved in the development of cough disorders. We review and summarise the evidence that lung inflammation and injury drive regional neuroinflammation along peripheral and central vagal sensory pathways, co-ordinated by inflammatory cell recruitment and activation, resulting in altered gene and protein expression, vascular disruption and neurophysiological changes. We also discuss the current therapies in development for chronic cough and highlight the need to consider disease modifying therapeutics that target neuroinflammation.

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Supplementary info

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**"bronchiectasis"[MeSH Terms] OR
bronchiectasis[Text Word]**

1

Review

Arch Bronconeumol

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. 2026 Oct;62(10):717-726.

doi: 10.1016/j.arbres.2025.12.008. Epub 2026 Jan 9.

[New Perspectives in the Treatment of Bronchiectasis](#)

[Article in English, Spanish]

[Angela Tramontano](#)¹, [Mariagiovanna Caporaso](#)², [Giulia Macciocchi](#)², [Edoardo Simonetta](#)¹, [Mattia Nigro](#)², [Stefano Aliberti](#)³

Affiliations Expand

- PMID: 41617588
- DOI: [10.1016/j.arbres.2025.12.008](#)

Abstract

Bronchiectasis is a chronic, heterogeneous respiratory disease. Its pathogenesis involves airway inflammation, chronic infection, impaired mucociliary clearance, and progressive lung damage. Despite recent approval of Brensocatib, current management relies mostly on off-label therapies, highlighting the need for evidence-based strategies. Given the heterogeneity of bronchiectasis, precision medicine approaches that integrate patient phenotypes, endotypes, and disease severity are crucial. Mapping the current landscape of randomized clinical trials (RCTs) highlights the efforts to improve patient outcomes and translate mechanistic insights into clinical practice. This review underscores the shift toward individualized, mechanism-based therapy in bronchiectasis management providing a comprehensive overview of current and emerging therapeutic approaches in bronchiectasis, focusing on ongoing and recent RCTs.

Keywords: Airway infection; Airway inflammation; Bronchiectasis; Clinical trials; Emerging therapies; Precision medicine.

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Case Reports

Radiol Case Rep

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. 2026 Jul 9;21(10):4437-4441.

doi: 10.1016/j.radcr.2026.06.087. eCollection 2026 Oct.

[Atypical Kartagener syndrome in a 40-year-old woman: Computed Tomography findings of situs inversus with bronchiectasis and infertility](#)

[Yohannes Girma Zewdie](#)¹, [Biniyam Beyene Tabor](#)², [Ermias Fikru Yesuf](#)³, [Hana Yeshewas Genetirune](#)⁴

Affiliations Expand

- PMID: 42491480
- PMCID: [PMC13376977](#)
- DOI: [10.1016/j.radcr.2026.06.087](#)

Abstract

Primary ciliary dyskinesia is a rare inherited disorder characterized by impaired mucociliary clearance leading to recurrent respiratory infections. Kartagener syndrome represents a subset of this condition classically defined by the triad of bronchiectasis, chronic sinusitis, and situs inversus, although atypical presentations lacking one component of the triad may occur. We report the case of a 40-year-old female who presented with productive cough, shortness of breath, chest pain, and fever, with a long-standing history of recurrent respiratory infections since adolescence that showed only temporary response to antibiotic therapy. The patient also reported primary infertility. Computed tomography of the chest demonstrated dextrocardia with complete situs inversus, bilateral bronchiectasis predominantly involving the middle and lingular lobes, mucus impaction, and associated tree-in-bud nodularity with ground-glass opacities. There was no clinical or radiologic evidence of sinusitis. These findings are consistent with an atypical presentation of Kartagener syndrome. This case highlights the importance of recognizing characteristic imaging features and considering underlying ciliary disorders in patients with recurrent respiratory infections and situs anomalies, even in the absence of sinus disease.

Keywords: Bronchiectasis; Computed tomography; Infertility; Kartagener syndrome (atypical); Primary ciliary dyskinesia; Situs inversus.

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- [8 references](#)

- [4 figures](#)

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3

Observational Study

Respir Med

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. 2026 Oct;262:109116.

doi: 10.1016/j.rmed.2026.109116. Epub 2026 Aug 24.

[Radiographic outcome and impact factors in children with bronchiectasis](#)

[Jianchuan Chen](#)¹, [Lingjian Zeng](#)², [Jianhua Wei](#)³, [Ying Li](#)⁴, [Na Zang](#)⁵

Affiliations Expand

- PMID: 42636990
- DOI: [10.1016/j.rmed.2026.109116](#)

Free article

Abstract

Background: This study aims to investigate the radiological outcomes in children with bronchiectasis under current treatment strategies through a real-world prospective observational study, and to conduct a preliminary analysis of potential influencing factors.

Methods: A total of 492 pediatric patients with bronchiectasis who underwent chest HRCT were enrolled from the Children's Hospital of Chongqing Medical University between January 2018 and December 2022, with follow-up extending until June 2024. Reversible imaging changes in bronchiectasis were determined by comparing changes in chest HRCT and modified Reiff scores (MRS). Univariable logistic regression models were used to preliminarily screen for factors related to imaging prognosis; variables with a significance level of $P < 0.05$ were subsequently included in multivariable logistic regression models for further analysis.

Results: Ultimately, 273 eligible pediatric patients were included in the final analysis, after excluding those lost to follow-up, those without follow-up chest HRCT, and those who underwent lobectomy. Reversible imaging changes were observed in 125 patients (45.8%), comprising 72 cases (26.4%) of complete radiological remission and 53 cases (19.4%) of improvement. Conversely, 148 patients (54.2%) exhibited stable or progressive disease. Multivariable logistic regression analysis revealed that localized radiological changes were significantly associated with radiological reversibility (OR = 1.82, 95% CI 1.11-3.00; P = 0.018). Bronchiectasis associated with a genetic condition and any acute exacerbation of respiratory symptoms during follow-up showed a significant negative association with radiological reversibility (OR = 0.48, 95% CI 0.25-0.91; P = 0.028 and OR = 0.58, 95% CI 0.35-0.97; P = 0.038, respectively).

Conclusion: Pediatric bronchiectasis is partially reversible with appropriate treatment within a reasonable follow-up period. Patients with localized radiological changes are most likely to exhibit reversible imaging changes, whereas those with comorbid genetic diseases and recurrent infections are the least likely to do so.

Keywords: Bronchiectasis; Impact factors; Radiographic outcome; Reversibility.

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Conflict of interest statement

Declaration of competing interest All the authors of this original article report NO financial or personal relationships with other people or organizations that could inappropriately influence or bias our work. Including all the following potential competing interests: Employment. Consultancies. Stock ownership. Honoraria. Paid expert testimony. Patent applications or registrations. Grants or any other funding Affiliation with the journal as an Editor or Advisory Board Member.

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Ann Allergy Asthma Immunol

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. 2026 Oct;137(4):524-525.

doi: 10.1016/j.anai.2026.06.015. Epub 2026 Sep 1.

[Co-occurrence of bronchiectasis among patients with chronic rhinosinusitis based on associated asthma](#)

[Qingqing Shan](#)¹

Affiliations Expand

- PMID: 42678325
- DOI: [10.1016/j.anai.2026.06.015](#)

No abstract available

Conflict of interest statement

Disclosures The author has no conflicts of interest to report.

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Ann Am Thorac Soc

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. 2026 Oct 1;23(10):1568-1569.

doi: 10.1093/annalsats/aaoag224.

[Reply to Dournes: PRAGMA-CF versus bronchus-artery pairs to assess the reversibility of bronchiectasis: which one is correct or wrong?](#)

[Paul McNally](#)¹, [Daan Caudri](#)², [Thomas Semple](#)³, [Jane C Davies](#)⁴, [Harm A W M Tiddens](#)⁵

Affiliations Expand

- PMID: 42695275
- DOI: [10.1093/annalsats/aaoag224](#)

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No abstract available

Comment in

- [PRAGMA-CF versus bronchus-artery pairs to assess the reversibility of bronchiectasis: which one is correct or wrong?](#)

Dournes G. Ann Am Thorac Soc. 2026 Oct 1;23(10):1566-1567. doi: 10.1093/annalsats/aaog222. PMID: 42695276 No abstract available.

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Editorial

Ann Am Thorac Soc

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. 2026 Oct 1;23(10):1566-1567.

doi: 10.1093/annalsats/aaog222.

[PRAGMA-CF versus bronchus-artery pairs to assess the reversibility of bronchiectasis: which one is correct or wrong?](#)

[Gael Dournes](#)^{1,2}

Affiliations Expand

- PMID: 42695276
- DOI: [10.1093/annalsats/aaog222](#)

Free article

No abstract available

Comment on

- [Impact of 2 years of treatment with elexacaftor/tezacaftor/ivacaftor on longitudinal changes in structural lung disease in people with cystic fibrosis: results from the RECOVER trial.](#)

McNally P, Lester K, Cregan R, Elnazir B, Persaud T, Rea D, Twomey E, Williamson M, Cox DW, Linnane B, McGrane S, Kirwan L, O'Regan P, Bonte M, Makani P, Caudri D, Dodd JD, McKone EF, Saunders C, Semple T, Davies JC, Tiddens HAWM;

RECOVER Study Group. Ann Am Thorac Soc. 2026 Jun 1;23(6):894-907. doi: 10.1093/annalsats/aaoag021. PMID: 41973991 Free PMC article. Clinical Trial.

- [Reply to Dournes: PRAGMA-CF versus bronchus-artery pairs to assess the reversibility of bronchiectasis: which one is correct or wrong?](#)

McNally P, Caudri D, Semple T, Davies JC, Tiddens HAWM. Ann Am Thorac Soc. 2026 Oct 1;23(10):1568-1569. doi: 10.1093/annalsats/aaoag224. PMID: 42695275 No abstract available.

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Cite

7

Physiother Res Int

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. 2026 Oct;31(4):e70338.

doi: 10.1002/pri.70338.

[Web-Based Physiotherapy Resources for Bronchiectasis: Evaluation of Content, Quality, and Implementation Evidence](#)

[Carly A Turner](#)^{1,2}, [Anne B Chang](#)^{3,4}, [Kathleen Hall](#)^{5,6}, [Annemarie L Lee](#)^{1,7}

Affiliations [Expand](#)

- PMID: 42717469
- PMCID: [PMC13558845](#)
- DOI: [10.1002/pri.70338](#)

Abstract

Background and purpose: For people with bronchiectasis, health information, including guidance on physiotherapy management, is readily accessible online. However, the content and quality of web-based resources, and the enablers and barriers to implementing this information into clinical care, remain unclear. This study aimed to: (1) identify web-based resources providing information on the

physiotherapy management of bronchiectasis; (2) evaluate their quality; and (3) explore enablers and barriers to applying web-based information in clinical practice.

Methods: A three-stage study was undertaken. Stage 1 involved a search of the World Wide Web using common search engines, during which 3600 web-based resources were screened. Stage 2 evaluated eligible resources using the Health Information Website Evaluation Tool. Stage 3 comprised a nested scoping review of electronic databases to identify published studies evaluating the use or implementation of web-based resources for bronchiectasis in clinical practice.

Results: Nine web-based resources met the inclusion criteria and consistently included information relevant to the physiotherapy management of bronchiectasis, particularly airway clearance techniques and exercise. Six were rated as good quality; two were moderate and one was poor. Three studies met the inclusion criteria for the nested scoping review, including one conference abstract. Across these studies, enablers included comprehensive content, engaging resources, and ease of use, whereas barriers included access difficulties, technology limitations, and limited time for clinical implementation.

Discussion: The identified web-based resources provide physiotherapy-specific information that may assist clinicians in selecting resources to complement individualised physiotherapy care, reinforce airway clearance and exercise instruction, and support patient education, and self-management in bronchiectasis. Findings from the nested scoping review suggest that addressing access and technology limitations, together with allowing sufficient time for implementation, may facilitate the integration of these resources into clinical care.

Keywords: bronchiectasis; health education; internet; physical therapy modalities.

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Conflict of interest statement

The authors declare no conflicts of interest.

- [58 references](#)
- [1 figure](#)

Supplementary info

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Review

MedComm (2020)

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. 2026 Sep 15;7(10):e70974.

doi: 10.1002/mco2.70974. eCollection 2026 Oct.

Post-Tuberculosis Lung Disease: Clinicopathologic Insights, Diagnosis, Prevention, and Management

Radha Gopalaswamy¹, Selvakumar Subbian²

Affiliations Expand

- PMID: 42746233
- PMCID: [PMC13575780](#)
- DOI: [10.1002/mco2.70974](#)

Abstract

Post-tuberculosis lung disease (PTLD) encompasses a spectrum of chronic pulmonary abnormalities arising from tuberculosis (TB)-associated tissue injury and maladaptive repair, and is emerging as a major contributor to long-term respiratory disability among TB survivors. In this review, we position PTLD within the broader continuum of TB pathobiology, from initial host-pathogen interactions to chronic structural and functional lung sequelae. We examine current definitions, epidemiology, and clinical burden, and present mechanistic insights into the inflammatory, proteolytic, fibrotic, immunometabolic, and vascular pathways that drive persistent lung damage. We further discuss the heterogeneous clinical phenotypes of PTLD, including airflow obstruction, bronchiectasis, restrictive lung disease, pleural complications, chronic pulmonary aspergillosis, and nontuberculous mycobacterial disease, highlighting practical approaches to diagnosis, risk stratification, and management across diverse healthcare settings. We discuss PTLD in children and adolescents, prevention opportunities throughout the TB care cascade, and health-system strategies for integrating post-TB care. Finally, we identify key knowledge gaps in PTLD nosology, biomarkers, therapeutic development, clinical trial design, and implementation science. Recognition of PTLD as a continuation rather than an endpoint of TB is essential for advancing survivorship-focused care and reducing the global burden of chronic respiratory disease after TB.

Keywords: NTM diseases; antibiotics; aspergillosis; biomarkers; lung fibrosis; mycobacterium; oscillometry; pulmonary function; tuberculosis.

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Conflict of interest statement

The authors declare no conflicts of interest.

- [212 references](#)
- [4 figures](#)

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Cite

9

Review

Curr Opin Pulm Med

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. 2026 Nov 1;32(6):582-586.

doi: 10.1097/MCP.0000000000001310. Epub 2026 Oct 1.

[Bronchiectasis in immunodeficiency](#)

[Jordon L Jagers](#) ¹, [James M Fernandez](#)

Affiliations Expand

- PMID: 42755263
- DOI: [10.1097/MCP.0000000000001310](#)

Abstract

Purpose of review: As the field of bronchiectasis continues to advance, so does the recognition of undiagnosed immunodeficiency as a potential contributor. This review aims to highlight what is currently known about bronchiectasis in immunodeficiency as well as explore future therapeutics and needs.

Recent findings: Guidelines emphasize the need for evaluation for underlying immunodeficiency in patients with known bronchiectasis. Despite this known association, evaluation continues to be variable in clinical practice resulting in potentially missed therapeutic options, such as immunoglobulin replacement therapy in the setting of immunodeficiency. While the mainstay treatment for those with bronchiectasis and immunodeficiency continues to be immunoglobulin

replacement therapy and prophylactic antibiotics, the future is hopeful with more directed therapy for the underlying pathophysiology of bronchiectasis with targeted agents such as brensocatib.

Summary: This review highlights the need for ongoing research to improve detection of bronchiectasis in immunodeficiency and include patients with immunodeficiency and bronchiectasis in trial designs for therapeutics in bronchiectasis.

Keywords: IgG-RT; bronchiectasis; immunodeficiency.

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- [26 references](#)

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10

Review

Curr Opin Pulm Med

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. 2026 Nov 1;32(6):568-574.

doi: 10.1097/MCP.0000000000001315. Epub 2026 Oct 1.

[Eosinophils in bronchiectasis](#)

[Megan Trieu](#)¹, [Praveen Akuthota](#), [Jeffrey Barry](#)

Affiliations Expand

- PMID: 42755272
- DOI: [10.1097/MCP.0000000000001315](#)

Abstract

Purpose of review: Bronchiectasis has traditionally been viewed as a predominantly neutrophil-driven airway disease. Recognition of eosinophilic inflammation in a substantial subset of patients has challenged this paradigm. This review

summarizes emerging evidence regarding its pathogenesis, clinical significance, and therapeutic implications.

Recent findings: Eosinophilic bronchiectasis is identified using blood or sputum eosinophilia, although optimal biomarkers and thresholds are unclear. Eosinophilic inflammation occurs in bronchiectasis and overlapping disease states characterized by type 2 immune activation, including asthma, allergic bronchopulmonary aspergillosis, and cystic fibrosis, complicating diagnosis but potentially informing disease severity, prognosis, and treatment options. Evidence for targeted therapies is limited to largely observational data. Patients with elevated eosinophil counts may derive greater benefit from inhaled corticosteroids. Early studies of biologics appear promising, particularly in patients with coexisting ABPA or asthma, although their benefit in eosinophilic bronchiectasis independent of these conditions remains uncertain.

Summary: Eosinophilic bronchiectasis represents a distinct inflammatory endotype that may enable a more personalized approach to disease management. Future studies should identify clinically relevant biomarkers to standardize its definition, clarify its relationship with overlapping type 2 airway diseases, and guide the use of inhaled corticosteroids and biologics.

Keywords: biologic therapy; bronchiectasis; eosinophils; inhaled corticosteroids; type 2 inflammation.

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- [87 references](#)

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Review

Curr Opin Pulm Med

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. 2026 Nov 1;32(6):559-567.

doi: 10.1097/MCP.0000000000001314. Epub 2026 Oct 1.

[Medical issues and pulmonary outcomes in cystic fibrosis and bronchiectasis](#)

[George Doumat](#)¹, [Manya Iyer](#), [Raksha Jain](#)

Affiliations [Expand](#)

- PMID: 42755280
- DOI: [10.1097/MCP.0000000000001314](#)

Abstract

Purpose of review: Bronchiectasis from cystic fibrosis and noncystic fibrosis causes include a spectrum of chronic suppurative airway conditions that share key pathophysiologic mechanisms but differ substantially in genetic basis, epidemiology, and clinical course. Recent therapeutic advances, particularly highly effective CFTR modulators in cystic fibrosis and emerging anti-inflammatory therapies in bronchiectasis, have reshaped disease management and prompted re-evaluation of treatment paradigms, outcome measures, and approaches to long-term monitoring.

Recent findings: In cystic fibrosis, highly effective CFTR modulator therapy, including elexacaftor/tezacaftor/ivacaftor and the recently approved once daily vanzacaftor/tezacaftor/deutivacaftor, has produced sustained increase in lung function, reduced frequency of pulmonary exacerbations, and improved quality of life, while highlighting the limitations of FEV 1 as a sole future marker of treatment response. In noncystic fibrosis bronchiectasis, the phase 3 ASPEN trial demonstrated that brensocatib, a dipeptidyl peptidase-1 inhibitor, significantly reduces exacerbation frequency and slows lung function decline at the higher dose, representing a potential disease-modifying therapy. Emerging evidence also underscores the prognostic importance of comorbidities and disease modifiers, including *Pseudomonas aeruginosa* and gastroesophageal reflux disease.

Summary: Management of all forms of bronchiectasis is increasingly shifting toward individualized, endotype-directed care. Integration of disease-modifying therapies, systematic assessment of comorbidities, validated severity stratification tools, and patient-reported outcomes will be essential to optimizing long-term clinical outcomes and advancing precision medicine approaches across this heterogeneous disease spectrum.

Keywords: brensocatib; bronchiectasis; cystic fibrosis; cystic fibrosis transmembrane conductance regulator modulators; pulmonary exacerbations.

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- [78 references](#)

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Cite

12

Review

Expert Rev Clin Pharmacol

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. 2026 Oct 1:1-11.

doi: 10.1080/17512433.2026.2739561. Online ahead of print.

[Brensocatib in non-cystic fibrosis bronchiectasis: neutrophil serine protease modulation, clinical evidence, and therapeutic positioning](#)

[Muhammad Saeed Akhtar](#)¹

Affiliations Expand

- PMID: 42788768
- DOI: [10.1080/17512433.2026.2739561](#)

Abstract

Introduction: Non-cystic fibrosis bronchiectasis (NCFB) is a chronic airway disease characterized by recurrent infection, mucus retention, neutrophilic inflammation, and pulmonary exacerbations. Brensocatib is an oral, selective, reversible dipeptidyl peptidase 1 (DPP1) inhibitor that reduces neutrophil serine protease activation and has received regulatory approval for non-cystic fibrosis bronchiectasis in patients aged 12 years and older.

Areas covered: This review evaluates the mechanism, clinical pharmacology, efficacy, safety, regulatory status, and therapeutic positioning of brensocatib. Literature published through 30 June 2026 was identified through PubMed, Scopus, and SciFinder-n, supplemented by prescribing information, regulatory documents, bronchiectasis guidelines, and evidence from the phase 2 WILLOW and phase 3 ASPEN trials.

Expert opinion: Brensocatib is a mechanism-directed preventive therapy for NCFB; the evidence base is strongest in patients with recent pulmonary exacerbations, while exact sequencing relative to macrolides and inhaled antibiotics remains uncertain. It should be integrated with airway-clearance and infection-directed management rather than viewed as a stand-alone intervention. Its long-term value will depend on appropriate patient selection, dermatologic and periodontal monitoring, affordability, comparative effectiveness, and real-world evidence on exacerbations, antibiotic use, lung-function trajectories, and patient-centered outcomes.

Keywords: Brensocatib; DPP1 inhibition; bronchiectasis; dipeptidyl peptidase 1; neutrophil elastase; neutrophil serine proteases; pulmonary exacerbation.

Supplementary info

Publication typesExpand

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Cite

13

Radiol Med

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. 2026 Sep 28.

doi: 10.1007/s11547-026-02288-9. Online ahead of print.

[A preliminary evaluation of chest magnetic resonance imaging in adult patients with non-cystic fibrosis bronchiectasis](#)

[Federica Volpi](#)¹, [Roberto Castellana](#)², [Beatrice Vivaldi](#)³, [Roberta Pancani](#)⁴, [Federico Dente](#)⁴, [Giacomo De Nicola](#)⁵, [Laura Carrozzi](#)^{3,6}, [Annalisa De Liperi](#)¹, [Emanuele Neri](#)⁷, [Chiara Romei](#)^{8,9}

Affiliations Expand

- PMID: 42804146
- DOI: [10.1007/s11547-026-02288-9](#)

Abstract

Objectives: To evaluate the feasibility of MRI in the assessment of adult patients with non-cystic fibrosis bronchiectasis (NCFB), in comparison with CT, in a retrospective pilot cohort. The potential contribution of diffusion-weighted imaging (DWI) for detecting pulmonary alterations was also investigated.

Materials and methods: In this single-center retrospective study, 21 patients with NCFB underwent unenhanced chest MRI. Two radiologists (A and B) independently scored MRI and CT images using the modified Helbich (Bhalla) score. DWI sequences were acquired with b values of 0, 400, and 800 s/mm² and assessed visually and semi-quantitatively.

Results: MRI and CT scores showed a positive correlation between the two readers (p < 0.05), with moderate-to-good inter-reader consistency (ICC_{MRI-A,B} = 0.71; ICC_{CT-}

$r_{A,B} = 0.77$; $p < 0.05$). MRI and CT scores were significantly correlated for both readers, although within-reader MRI-CT agreement was higher for Reader A ($ICC_{A-MRI,CT} = 0.86$; $p < 0.05$) and lower for Reader B ($ICC_{B-MRI,CT} = 0.31$; $p > 0.05$). DWI and T2-weighted images revealed three hyperintense patterns: triangular-lamellar, pseudonodular-spot, and linear. As b-values increased, fewer findings were detectable, particularly for linear patterns, and signal intensity became more heterogeneous compared to the spinal cord.

Conclusions: In this preliminary pilot study, MRI appeared feasible for assessing morphological changes in adult patients with NCFB through a short imaging protocol. The qualitative DWI findings described provide preliminary observations that may contribute to generating hypotheses regarding pulmonary abnormalities but require validation in larger prospective studies with quantitative imaging and clinical correlation. However, further studies on larger and more heterogeneous cohorts are needed to improve the generalizability of the results, and adequate training is required for the assessment of thoracic MRI to ensure consistent and reproducible interpretation.

Keywords: Imaging; Lung; Magnetic resonance imaging; Non-cystic fibrosis bronchiectasis.

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Conflict of interest statement

Declarations. Conflict of interest: The authors declare no competing interests.

Ethical standards: Approval was obtained from the ethics committee of Azienda Ospedaliero Universitaria Pisana. The procedures used in this study adhere to the tenets of the Declaration of Helsinki. Informed consent was obtained, in accordance with the ethics committee's protocol.

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. 2026 Sep 28;12(5):01674-2025.

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[Blood DNA methylation profile is altered in severe bronchiectasis](#)

[Lidia Perea](#)^{1,2}, [Julieta Viglino](#)^{1,3,2}, [Belén Solarat](#)⁴, [Pau Marrades](#)^{4,5}, [Sandra Casas-Recasens](#)¹, [Núria Mendoza](#)^{1,6}, [Pilar Martínez-Olondris](#)⁴, [Rosanel Amaro](#)⁴, [Alvar Agustí](#)^{1,4,5,6}, [Amelia Shoemark](#)⁷, [Stefano Aliberti](#)^{8,9}, [James D Chalmers](#)⁷, [Oriol Sibila](#)^{1,4,5,6,10}, [Rosa Faner](#)^{1,3,6,10}

Affiliations Expand

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- PMCID: [PMC13617582](#)
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Abstract

Rationale: Bronchiectasis is a chronic lung respiratory disease whose systemic aspect is poorly understood. We aimed to characterise the blood DNA methylation profiles of bronchiectasis patients and to determine the relationship of these profiles with disease severity and their functional relevance to circulating immune cells.

Methods: Whole-genome DNA methylation was measured in blood from 165 bronchiectasis patients (Illumina 850k). The cohort was divided into discovery (n=94) and validation (n=71) sets. Differentially methylated positions (DMPs) associated with the Bronchiectasis Severity Index (BSI) were determined using sex-adjusted linear models. To explore functional relevance, whole-blood RNA sequencing was performed in a subset of patients. Blood immune cell proportions deconvoluted from methylation data were identified, clustered with gene expression and linked to BSI variables. An elastic net model was constructed to validate the results.

Results: We identified 100 BSI-associated DMPs, 98% of which were hypomethylated in severe patients (BSI score ≥ 9). BSI-associated DMPs were enriched in leukocyte activation, secretion, immunoglobulin production and tissue remodelling. Of these DMPs, 15 (annotated to 16 genes) exhibited significant correlations between methylation and gene expression levels. Three of them (*PLXNC1*, *IL4R* and *MAP3K20*) were associated with neutrophils and BSI. Deconvoluted blood neutrophil proportions were correlated with chronic *Pseudomonas aeruginosa* infection, hospitalisations and dyspnoea, and negatively with forced expiratory volume in 1 s and female sex. The elastic net validated the BSI-associated DMPs in the second dataset.

Conclusion: Severe bronchiectasis patients presented an altered blood epigenetic profile, which was influenced by blood neutrophils. These findings suggest that bronchiectasis has systemic implications, especially for the most severely affected patients.

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Conflict of interest statement

Conflict of interest: A. Agustí reports consultancy fees from GSK, AstraZeneca (AZ), Chiesi, Roche and Menarini; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from GSK, AZ, Chiesi, Roche, Menarini, Zambon and Glenmark; support for attending meetings from

Roche; and a leadership role with the Global Initiative for Chronic Obstructive Lung Disease (Chairman of the Board of Directors). A. Shoemark reports grants from AZ and LifeArc; consultancy fees from ReCode Therapeutics; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Insmed; and leadership roles with European Respiratory Society (ERS) Clinical Research Collaborations (EMBARC and BEATPCD). S. Aliberti reports grants from GSK; consultancy fees from Insmed Incorporated, Insmed Italy, Insmed Ireland Ltd, Insmed Netherlands BV, Zambon Spa, AZ, 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; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from GlaxoSmithKline Spa, Fondazione Internazionale Menarini, Insmed Italy, Insmed Ireland Ltd, Boehringer Ingelheim, Zambon and Vertex Pharmaceuticals; and participation on a data safety monitoring or advisory board for Insmed Incorporated, Insmed Italy, AstraZeneca UK Limited, MSD Italia S.r.l. and Verona pharma plc. J.D. Chalmers reports grants from AZ, Genentech, Gilead Sciences, GSK, Insmed, Grifols, Novartis and Boehringer Ingelheim; consultancy fees from AZ, Chiesi, GSK, Insmed, Grifols, Novartis, Boehringer Ingelheim, Pfizer, Janssen, Antabio and Zambon; leadership roles with European Respiratory Society Clinical Research Collaborations (EMBARC and BEATPCD); and is an associate editor of this journal. O. Sibila reports consultancy fees from Insmed and Boehringer Ingelheim. R. Faner reports grants from Menarini, GSK, AZ, Sanofi, Chiesi, ERC, ISC-III, Agaur, ICREA, H2020, SEPAR, ERS and Serra Húnter; consultancy fees from AZ; and payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from AZ and Chiesi. The remaining authors have nothing to disclose.

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Sputum cathepsin G activity predicts exacerbations and hospitalisations in bronchiectasis

[Mattia Nigro](#)^{1,2}, [Andrea Gramegna](#)^{3,4}, [Emma Johnson](#)⁵, [Lidia Perea](#)⁶, [Martina Contarini](#)^{3,4}, [Sofia Misuraca](#)^{3,4}, [Morven Shuttleworth](#)⁵, [Amelia Shoemark](#)⁵, [Belen Solarat](#)⁶, [Rosa Faner](#)⁶, [Edoardo Simonetta](#)², [Paola Scarano](#)², [Oriol Sibila](#)⁶, [Francesco Blasi](#)^{3,4}, [James D Chalmers](#)⁵, [Stefano Aliberti](#)^{1,2}

Affiliations Expand

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Abstract

Background: Bronchiectasis is a neutrophil-driven inflammatory chronic respiratory disease. While neutrophil elastase has been deeply investigated, other neutrophil serine proteases are less studied. The association between airway cathepsin G and clinical outcomes in bronchiectasis has not been described. Is cathepsin G sputum activity associated with clinical outcomes in bronchiectasis?

Methods: This international, multicentre, prospective cohort study enrolled bronchiectasis patients from three bronchiectasis programmes in Milan (Italy), Dundee (UK) and Barcelona (Spain). Participants were stratified into three groups based on sputum cathepsin G activity measured using immunoassays. Data on clinical features, sputum characteristics, exacerbations, hospitalisations and mortality were collected over a 3-year follow-up period.

Results: The median (interquartile range) activity of cathepsin G in sputum was 45.1 ng·mL⁻¹ (1.3-128.8 ng·mL⁻¹). Patients with higher sputum cathepsin G activity demonstrated significantly worse clinical outcomes in terms of disease severity (measured by the Bronchiectasis Severity Index, E-FACED, the modified Reiff score, % predicted forced expiratory volume in 1 s and the prevalence of chronic bacterial infections, particularly *Pseudomonas aeruginosa*) and disease activity (daily produced sputum volume and quality of life scores). Additionally, high cathepsin G activity was linked to more frequent exacerbations during the 3-year follow-up (incidence rate ratio 1.62, 95% CI 1.29-2.07) and a greater risk of hospitalisation due to severe exacerbations (incidence rate ratio 2.32, 95% CI 1.03-5.21). A strong correlation was found between sputum cathepsin G and neutrophil elastase activities.

Conclusion: Sputum cathepsin G activity relates to disease severity, disease activity and prognosis in bronchiectasis. High cathepsin G levels are associated with more severe clinical outcomes and could serve as a target for future therapeutic interventions, including dipeptidyl peptidase 1 inhibitors.

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Conflict of interest statement

Conflict of interest: A. Gramegna reports consultancy fees from Vertex Italia and Vertex International; payment or honoraria for lectures, presentations, speakers'

bureaus, manuscript writing or educational events from Vertex Italia, Vertex International and Chiesi Italia; support for attending meetings and/or travel from Neupharma; participation on a data safety monitoring or advisory board for Vertex Italia; leadership role with the Italian Association for People with Bronchiectasis and the ECFS Standards of Care committee; and is a European Respiratory Society (ERS) Officer. A. Shoemark reports that this work was supported by the ERS through the EMBARC3 consortium (EMBARC3 is supported by project partners Armata, AstraZeneca, Boehringer Ingelheim, Chiesi, CSL Behring, Grifols, Insmmed, Janssen, Lifearc, Novartis and Zambon); grants or contracts from AstraZeneca and Lifearc; consultancy fees from Spirovant, Translate Bio and ReCode Therapeutics; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Translate Bio, Ethris and Insmmed; and leadership roles with ERS Clinical Research Collaborations (EMBARC, BEATPCD and AMR Lung). F. Blasi reports grants from AstraZeneca, Insmmed and GSK; consultancy fees from Menarini, OM Pharma and Boehringer; and payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from AstraZeneca, Chiesi, GSK, Grifols, Insmmed, Menarini, OM Pharma, Pfizer, Sanofi, Vertex, Viatrix and Zambon. J.D. Chalmers reports support for the present manuscript from the Innovative Medicines Initiative and The European Federation of Pharmaceutical Industries and Associations companies under the European Commission-funded Horizon 2020 Framework Program, and by Inhaled Antibiotic for Bronchiectasis and Cystic Fibrosis (grant 115721); grants from AstraZeneca, Boehringer Ingelheim, Genentech, Gilead Sciences, GlaxoSmithKline, Grifols, Biologicals, Inc., Insmmed, Inc. and Novartis; consultancy fees from Zambon and Insmmed, Inc.; leadership roles with the ERS, British Thoracic Society and the Scottish Government Chief Scientist Office Translational Clinical Studies Committee; and is an associate editor of this journal. S. Aliberti reports grants from Insmmed Incorporated, Chiesi, Fisher & Paykel and GSK; royalties or licences from McGraw Hill; consultancy fees from Insmmed Incorporated, Insmmed Italy, Insmmed Ireland Ltd, Insmmed Netherlands BV, Zambon S.p.A., AstraZeneca UK Limited, AstraZeneca, Pharmaceutical LP, CSL Behring GmbH, Grifols, Fondazione Internazionale, Menarini, Moderna Italy, Moderna TX, Boehringer Ingelheim, Chiesi Farmaceutica S.p.A., MSD Italia S.r.l., Vertex Pharmaceuticals, Brahms GmbH, Physioassist SAS, AN2 Therapeutics and GlaxoSmithKline S.p.A.; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from GlaxoSmithKline S.p.A., Thermofisher Scientific, Insmmed Italy, Insmmed Ireland Ltd, Boehringer Ingelheim, Zambon, Vertex Pharmaceuticals and Fondazione Internazionale Menarini; and participation on a data safety monitoring or advisory board for Insmmed Incorporated, Insmmed Italy, AstraZeneca UK Ltd., MSD Italia S.r.l and Verona Pharma plc. The remaining authors have nothing to disclose.

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Adjudication of exacerbations in bronchiectasis using modified EMBARC criteria in the CLEAR Trial

Brenda O'Neill¹, Rohan Anand², Jeremy S Brown³, Frances Butler⁴, Lorcan McGarvey², Cecilia M O'Kane², Mike Clarke^{5,6}, Danny F McAuley², Adam T Hill⁷, Anthony De Soyza⁸, James D Chalmers^{9,10}, Andrew Jackson⁶, Ben McCullough¹¹, Fiona Copeland¹², J Stuart Elborn^{2,13}, Judy M Bradley^{2,11,13}, CLEAR Investigator team

Affiliations Expand

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Abstract

Introduction: The EMBARC consensus criteria can be used to identify and categorise pulmonary exacerbations (PEs) in clinical trials. This paper describes methods used to independently adjudicate PEs using modified EMBARC criteria in a large multicentre bronchiectasis trial (CLEAR ISRCTN89040295).

Methods: The Respiratory and Systemic Symptoms Questionnaire was used to objectively collect signs and symptoms at the onset of a PE. A mEMBARC PE was defined as ≥3 symptoms, with symptoms present for ≥48 h and prescription of an antibiotic. Individual sites recorded antibiotic use for PEs. An adjudication panel independently adjudicated and then agreed on PEs according to mEMBARC criteria. Data required to determine PEs using modified Fuchs criteria was also collected.

Results: Sites reported 462 PEs from 203 patients reported in the CLEAR trial. The adjudication panel categorised these exacerbations as: 239 out of 462 (52%) fully qualifying mEMBARC PEs (meeting all mEMBARC criteria), 32 out of 462 (7%) partially qualifying mEMBARC PEs (≤3 symptoms present for ≥48 h or ≥3 symptoms present for <48 h and antibiotics prescribed) and 191 out of 462 (41%) non-mEMBARC PEs (antibiotics prescribed but symptoms and duration not met). When data were classified using modified Fuchs criteria a sensitivity analysis produced results that were consistent with the main trial results.

Conclusion: PEs are increasingly used as the primary outcome in bronchiectasis trials, making accuracy in their identification essential. More rigorous capture of exacerbation symptoms and implementation of a standardised and reproducible decision-making process, supported by an independent adjudication panel, is important for capturing PEs and ensuring the integrity of trial outcomes.

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Conflict of interest statement

Conflict of interest: For work unrelated to this manuscript the following conflicts of interest are noted for transparency. D.F. McAuley has received grants from the National Institute of Health and Care Research (NIHR), Medical Research Council (MRC), Northern Ireland Health and Social Care Research and Development division, Randox, Wellcome Trust for acute respiratory distress syndrome (ARDS) and/or COVID-19 studies; fees from Bayer, Aptarion, Direct Biologics, Healios, Novartis and MSD for treatment for ARDS; has a Queen's University Belfast patent for novel treatment for inflammatory disease (USB962032); is MRC/NIHR Director of Efficacy and Mechanism Evaluation Programme, and NIHR Scientific Director for Programmes; and his spouse has received consultancy fees from Insmmed for management of nontuberculous mycobacterial pulmonary infection and from the California Institute for Regenerative Medicine for participation in grant review panel. A.T. Hill is Chair of the British Thoracic Society Standards of Care Committee. J.D. Chalmers is an associate editor of this journal. A. De Soyza has received grants from Bayer, Gilead, Pfizer, AstraZeneca, Insmmed and Novartis; fees from Boehringer, Bayer, Gilead, Pfizer GSK, Insmmed AstraZeneca, Novartis, Sanofi and 30T; speaker's fees from Bayer, Gilead, Pfizer GSK, Insmmed, AstraZeneca, Innogen, Sanofi and Fisher&Paykel; support for meetings from AstraZeneca, Chiesi, GSK and Insmmed; and participated on a data safety monitoring or advisory board for Bayer. B. McCullough received an individual honorarium from the British Council International Science Partnerships Fund. C. O'Kane has received grant funding from MRC, Wellcome Trust and NI HSC R&D Office; fees for educational session unrelated to this paper from INSMED (relating to NTM infection); participated in a grant working group for the California Institute for Regenerative Medicine, and honoraria for sitting on grant panels for MRC UK; and spouse has received consultancy fees from a range of pharmaceutical companies in relation to ARDS (unrelated to this manuscript); her spouse is scientific director for NIHR programmes. B. O'Neill has received funding from NIHR for research in respiratory health and critical care. All other authors have no other conflict of interest to declare.

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[Systematic review of artificial intelligence and digital-automated tools for screening, diagnosis and characterisation of primary ciliary dyskinesia](#)

[Panayiotis Kouis](#)¹, [Mathieu Bottier](#)^{2 3 4}, [Nisreen Rumman](#)^{5 6 4}, [Mia Shanks](#)⁷, [Joren Buekers](#)^{8 9 10}, [Dimitrios Megaritis](#)¹¹, [Andreas Protopapas](#)¹, [Amelia Shoemark](#)⁷, [Myrofora Goutaki](#)¹², [Claire Jackson](#)^{13 14}

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Abstract

Background: Primary ciliary dyskinesia (PCD) is a rare, multigenic disorder of impaired mucociliary clearance leading to a spectrum of disease including chronic respiratory infection and bronchiectasis. PCD is phenotypically variable causing diagnostic challenges. PCD is underdiagnosed, and when it is made, diagnosis is often delayed. We describe evidence for use of digital-automated applications and/or artificial intelligence (AI) to improve PCD screening, diagnosis and characterisation.

Methods: A systematic literature search (2004-2025) was conducted across PubMed, Embase and BioRxiv/MedRxiv (PROSPERO:CRD42024605689) by members of the ERS BEAT-PCD Clinical Research Collaboration (CRC). Screening and data extraction was performed by two independent reviewers and findings summarised qualitatively. In collaboration with the digital health ERS CONNECT CRC network, a narrative discussion focused on steps to real-world implementation.

Results: Of 770 screened abstracts, 73 full-texts were assessed and 28 PCD-relevant studies with automated digital and/or AI-driven tools were included in the qualitative synthesis. Tools for enhanced ciliary function, ciliary ultrastructure and ciliary protein immunofluorescence analysis were presented in 17 studies. 11 papers presented tools to screen e-health records for PCD, stratify patients by genotype and phenotype, or characterise computed tomography parameters.

Conclusions: Tools are available that could improve PCD diagnostic accuracy and reduce time-to-diagnosis. Studies were often single-centre, retrospective and of small sample size. The development of automated-digital tools or AI-driven tools requires representative patient datasets, human expert judgement to interpret and continual safety auditing. External validation is paramount before adaptation of healthcare systems, with adherence to EU AI Act framework to ensure accountability and safeguard against misuse. Simplified tools and philanthropic partnerships could facilitate implementation of new systems in resource limited settings.

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Conflict of interest statement

Conflict of interest: The authors declare the following financial interests/personal relationships that may be considered as potential competing interests. A. Shoemark reports grants from AstraZeneca, Lifearc and Insmed; consulting fees from Spirovent, Translate Bio and ReCode Therapeutics; and honoraria from Translate Bio, Ethris and Insmed. M. Goutaki reports grants from the Swiss National Science Foundation and the Swiss Lung Association; and is an associate editor of this journal. A. Shoemark and M. Goutaki are co-chairs of the ERS BEAT-PCD Clinical Research Collaboration (CRC), and C. Jackson is the Diagnostics Work Package lead for ERS BEAT-PCD CRC. All other 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.

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Review

[Cystic Fibrosis](#)

[Adrienne Savant](#)¹, [Christine M Bojanowski](#)², [Jariya Upadia](#)¹

[Margaret P Adam](#), [Sarah Bick](#), [Ghayda M Mirzaa](#), [Stephanie E Wallace](#), [Anne Amemiya](#)

, editors.

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- PMID: 20301428
- Bookshelf ID: [NBK1250](#)

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Excerpt

Clinical characteristics: Cystic fibrosis (CF) is a multisystem disease affecting epithelia of the respiratory tract, pancreas, intestine, hepatobiliary system, and exocrine sweat glands. Morbidities include progressive obstructive pulmonary disease with bronchiectasis, recurrent sinusitis and bronchitis, exocrine pancreatic deficiency and malnutrition, pancreatitis, gastrointestinal manifestations (meconium ileus, rectal prolapse, distal intestinal obstructive syndrome), liver disease, diabetes, osteopenia/osteoporosis, male infertility due to hypoplasia or aplasia of the vas deferens, and reduced fertility or infertility in some women. By 2025, 95% of individuals with CF were eligible for targeted therapies, which has significantly altered the long-term course of the disease with a reduced overall disease burden. The impact is most evident in fewer hospitalizations, reduced clinic visits, and a decreased need for lung transplantation, all of which are associated with improved survival. While the CF disease phenotype has overall become less severe and more heterogeneous in the era of highly effective CF transmembrane conductance regulator (CFTR) modulator therapy, pulmonary disease is the major cause of morbidity and mortality in CF.

Diagnosis/testing: The diagnosis of CF is established in a proband with (1) elevated immunoreactive trypsinogen on newborn screening, signs and/or symptoms suggestive of CF, or family history of CF; AND (2) evidence of an abnormality in CFTR function: sweat chloride ≥ 60 mmol/L on sweat chloride testing, biallelic *CFTR* CF-causing pathogenic variants, or nasal transmembrane epithelial potential difference measurement consistent with CF.

Management: *Targeted therapies:* CFTR modulator therapy is available for individuals with responsive *CFTR* variants. These should be prescribed and managed by a clinician with CF expertise, particularly when initiating therapy.

Supportive care: Newborns – management by a CF specialist or CF care center; airway clearance instruction; encouraging feeding with breast milk; routine vaccinations; contact precautions with every clinical encounter; antibiotics for bacterial suppression and treatment; nutrition management; pancreatic enzyme replacement; nutrient-dense food and supplements; fat-soluble vitamin supplements; laxative treatment as needed with surgical management for bowel obstruction; salt supplementation as needed.

After the newborn period – airway clearance; pulmonary treatment (bronchodilator, hypertonic saline, dornase alfa, airway clearance, and aerosolized antibiotic); standard treatments for pneumothorax or hemoptysis; double lung transplant for those with advanced lung disease; routine vaccinations including influenza; contact precautions; antibiotics for bacterial suppression and treatment; antibiotics and/or surgical intervention for nasal/sinus symptoms; nutrition management; pancreatic enzyme replacement; nutrient-dense food and supplements; fat-soluble vitamin supplements; laxative treatment as needed with surgical management for bowel obstruction; standard treatments for gastroesophageal reflux disease; liver

transplant when indicated; management of CF-related diabetes mellitus by an endocrinologist; assisted reproductive technologies (ART) for infertility; salt supplementation; standard treatments for associated mental health issues.

Surveillance: Frequent assessment by a CF specialist to monitor for new or worsening manifestations; pulmonary function testing frequently after age five years; consider chest CT to assess for bronchiectasis every two years or as needed; cultures of respiratory tract secretions at least every three months; non-tuberculosis mycobacterium culture and measurement of serum immunoglobulin E annually or as indicated; annual complete blood count with differential; ENT assessment as needed; monitor growth and gastrointestinal manifestations at each visit; fecal elastase as needed; annual serum vitamin A, D, E, and prothrombin time (as a marker of vitamin K); colon cancer screening at least every five years beginning at age 40 years (beginning at age 30 years in transplant recipients); annual liver function tests; liver ultrasound with Doppler every two years starting at age three years; annual measurement of random blood glucose; annual two-hour glucose tolerance test beginning at age ten years; dual-energy x-ray absorptiometry scan in adolescence in those with risk factors for osteopenia, then every one to five years; infertility assessment as needed; annual electrolytes, blood urea nitrogen, and creatinine; annual assessment for depression and anxiety.

Agents/circumstances to avoid: Environmental smoke and inhalants including electronic nicotine delivery products, exposure to respiratory infections, and dehydration.

Evaluation of relatives at risk: Sweat chloride testing is recommended for all at-risk sibs of a proband to identify as early as possible those who should be referred to a CF center for initiation of early treatment.

Genetic counseling: CF is inherited in an autosomal recessive manner. If both parents are known to be heterozygous for a *CFTR* pathogenic variant, each sib of an affected individual has at conception a 25% chance of being affected, a 50% chance of being heterozygous, and a 25% chance of inheriting neither of the familial pathogenic variants. Heterozygotes may be at increased risk for respiratory manifestations and/or pancreatitis. Once the *CFTR* pathogenic variants have been identified in an affected family member, targeted heterozygote testing for at-risk relatives and prenatal/preimplantation genetic testing for CF are possible.

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Observational Study

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[A pilot study to assess the role of 12-week roflumilast treatment in non-CF bronchiectasis](#)

[Wang Chun Kwok](#)¹, [Kelvin Kai Wang To](#)², [Frankie Chi Fat Ko](#)¹, [Herbert Pang](#)³, [Isaac Sze Him Leung](#)⁴, [Wai On Tam](#)⁵, [Chi Hung Chau](#)⁵, [Anthony Shing Yiu Yu](#)⁶, [Hon Cheung Fan](#)⁶, [Charles Wong](#)⁷, [Flora Pui Ling Miu](#)⁷, [James Chung Man Ho](#)¹

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- DOI: [10.1080/25310429.2026.2742051](https://doi.org/10.1080/25310429.2026.2742051)

Free article

Abstract

Background: Roflumilast demonstrated anti-inflammatory activity in COPD. While bronchiectasis is also characterised by neutrophilic inflammation, there is a lack of evidence on the use of roflumilast in bronchiectasis.

Methods: An open-label observation study with an exploratory nature was conducted in Hong Kong. The primary outcome measure was 24-hour sputum volume. The extent of airway inflammation was indicated by sputum leucocyte density, pro-inflammatory cytokines and neutrophil elastase. All eligible patients were treated with roflumilast, starting at 250 µg daily with possible escalation to 500 µg daily if tolerated.

Results: A total of 39 patients were started on roflumilast with 24 (61.5%) completed 12 weeks of treatment and 9 of them escalated to 500 µg daily. There were no significant changes in mean daily sputum volume. The median sputum leucocyte density and TNF-α significantly decreased from the recruitment visit to 12 weeks. In extrapolatory analyses, patients with a baseline daily sputum volume ≥ 20 mL might be more likely to respond with a reduction in sputum volume.

Conclusion: Roflumilast treatment in non-CF bronchiectasis could provide anti-inflammatory effects with a significant reduction in sputum leucocyte density and TNF- α level over 12 weeks of treatment. Extrapolatory analyses suggested potential benefits in sputum volume reduction among the subgroup with baseline daily sputum volume ≥ 20 mL.

Keywords: Bronchiectasis; neutrophilic inflammation; roflumilast.

Plain language summary

An open-label observation study was conducted to assess for the role of roflumilast in bronchiectasis. Roflumilast treatment resulted in a significant reduction in sputum leucocyte density and TNF- α level. Sputum volume also significantly decreased among the subgroup with baseline daily sputum volume ≥ 20 mL.

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Am J Respir Crit Care Med

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. 2026 Oct 1:aamag536.

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[Abundance vs. Architecture: The Dual Dimensions of Pseudomonas Ecology in Bronchiectasis](#)

[Keshav Mangalick](#)¹, [Leopoldo N Segal](#)¹

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- PMID: 42821634
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Barriers and Facilitators to Timely Detection and Optimal Management of Chronic Wet Cough in Aboriginal Children Across Australia From the Perspectives of Carers of Aboriginal Children: A Qualitative Study

[Gloria T Y Lau^{1 2 3}](#), [Pam Laird^{1 2}](#), [Robyn Aitken⁴](#), [Melanie Barwick^{5 6}](#), [Liam Bedford⁷](#), [Emily R Bowden⁸](#), [Jamie Everingham¹](#), [Angela Fuery¹](#), [Reece Griffin⁹](#), [Neha Jain^{1 2}](#), [Mina Kinghorn¹⁰](#), [Renae Knapp⁹](#), [Gabrielle B McCallum⁸](#), [Peter Morris^{8 11}](#), [Richard Norman¹²](#), [Peter C Richmond³](#), [Aarti Saiganesh¹](#), [Slade Sibosado¹³](#), [Cameron Taylor¹⁴](#), [Maree Toombs¹⁵](#), [Roz Walker¹⁶](#), [Joan Wilson¹⁷](#), [Anne B Chang^{8 18}](#), [André Schultz^{1 2 3}](#)

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Abstract

Objective: To identify barriers and facilitators to the timely detection and optimal management of chronic wet cough (CWC) in children from the perspectives of carers, across multiple, diverse First Nations Australian communities.

Study type: Qualitative participatory action research study.

Setting and participants: Eight Australian communities across three states and territories. Semi-structured interviews and focus groups with 167 parents and carers of Aboriginal children were conducted between May 2021 and July 2023.

Main outcome measures: Barriers to and facilitators of detection and management of CWC in Aboriginal children in a primary care setting.

Results: Key barriers identified included inadequate health promotion, the common perception that CWC is normal and high turnover among health staff, leading to mistrust of newly onboarded health staff. The overarching facilitator identified was knowledge dissemination through health promotion, delivered in person by Aboriginal health staff using culturally secure resources, supplemented by posters

placed in the community and the use of radio and social media. Individual communities expressed varied preferences regarding specific health promotion methods and designs. Communities valued staff who had spent considerable time within the community, allowing for the development of trust and rapport.

Conclusion: The barriers and facilitators to detecting and managing CWC in children were generally consistent across the settings we studied. Implementation approaches to facilitate care require tailoring to local settings. Further, to reduce identified barriers for the detection and management of CWC in children, the incorrect perception that CWC is normal must be addressed and the potential harms of staff turnover need to be recognised.

Keywords: child health; childhood diseases; primary care; respiratory tract infections.

Plain language summary

The Known: Chronic wet cough (CWC), a symptom of several chronic respiratory diseases, is prevalent among First Nations children and can lead to bronchiectasis if untreated. **The New:** Families from eight communities across three states and territories identified limited health promotion as a major barrier to health seeking for CWC. Families wanted knowledge dissemination through culturally secure health promotion tailored to each community. Communities valued and were more likely to trust regular (as opposed to transient) health staff. **The Implications:** Tailored approaches that reflect each community's unique characteristics are essential. Reducing staff turnover is vital to improve CWC outcomes.

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Conflict of interest statement

The authors declare no conflicts of interest.

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Vasculitis and Risk of Bronchiectasis in Alpha-1 Antitrypsin Deficiency Subjects from the EARCO Registry

Reem Alluhibi^{1 2 3}, Nina Heyer-Chauhan⁴, Aileen Marshall⁵, David A Lomas⁴, Maria Torres-Duran^{6 7}, Alice M Turner^{8 9}, Hanan Tanash¹⁰, Carlota Rodríguez-García¹¹, Miriam Barrecheguren¹², Angelo Corsico^{13 14}, José Luis López-Campos^{15 16}, Jens-Ulrik Stæhr Jensen^{17 18}, Kenneth R Chapman¹⁹, Beatriz Lara²⁰, Juan Luis Rodriguez-Hermosa^{21 22}, Eva Bartošovská²³, Jean-François Mornex²⁴, Vincent Bunel-Gourdy^{25 26}, Marc Miravittles¹², John R Hurst⁴

Affiliations Expand

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