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

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Br J Cancer

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. 2026 Jun 8.

doi: 10.1038/s41416-026-03491-1. Online ahead of print.

Real-world outcomes of immunotherapy in advanced NSCLC patients with comorbidities

H H Hektoen [1,2], K M Tsuruda [3], M T Mæhlen [4], Å Helland [5,6], B K Andreassen [3]

Affiliations Expand

- **PMID: 42259946**
- **DOI: 10.1038/s41416-026-03491-1**

Abstract

Background: Comorbidities are common in advanced non-small cell lung cancer (NSCLC) patients, yet their impact on systemic anti-cancer treatment (SACT) and survival in the era of immune checkpoint inhibitors (ICIs) remains unclear due to limited representation in clinical trials.

Methods: This nationwide registry-based study included 9178 patients with stage IIIB-IV NSCLC diagnosed before and after ICI introduction. Kaplan-Meier and multivariable Cox models were applied to calculate hazard ratios (HRs) and 95% confidence intervals (CIs).

Results: Common comorbidities included chronic obstructive pulmonary disease (COPD: 22%), cardiovascular disease (CVD: 21%), type 2 diabetes (T2D: 10%), and rheumatic and musculoskeletal diseases (RMD: 6%). Patients with comorbidities were less likely to receive SACT. Following ICI introduction, SACT use increased across all comorbidity groups and 2-year OS improved up to threefold. CVD patients had better 2-year OS when treated with ICI alone than ICI plus chemotherapy (38 vs 22%). Patients with CVD, T2D and RMD had higher risk of death when treated with ICI plus chemotherapy compared to patients without these comorbidities (HR = 1.36 (1.07-1.73), HR = 1.33 (0.99-1.78) and HR = 1.38 (0.97-1.95), respectively).

Conclusions: Survival among patients with comorbidities improved following ICI introduction, however the benefit varied by comorbidity and treatment modality, supporting more individualised treatment strategies.

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Conflict of interest statement

Competing interests: ÅH declares receiving research funding from Roche, AstraZeneca, Novartis, Incyte, Eli Lilly, Bristol-Myers Squibb, Ultimovacs, Merck, GlaxoSmithKline, Illumina, Nanopore, Johnson and Johnson, BeOne, advisory boards and honoraria from ABBVIE, Takeda, AstraZeneca, Roche, Pfizer, Janssen, EliLilly, Bristol-Myers Squibb, PierreFabre, Bayer, Merck Sharp & Dome, Novartis, Merck, Sanofi, Medicover. All funds go to Oslo University Hospital. The remaining authors declare no conflicts of interest. Ethics approval and consent to participate: Use and reporting of de-identified data from the CRN was covered by the CRN's regulations of collection and treatment of health information. Use, linkage and reporting of de-identified data from all other registries was approved by the regional ethics committee (2018/775/REK sør-øst B) and all involved registries. The study was performed in accordance with the Declaration of Helsinki.

- **48 references**

Supplementary info

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Eur J Appl Physiol

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. 2026 Jun 6.

doi: 10.1007/s00421-026-06244-3. Online ahead of print.

Mechanisms of dyspnoea and exercise intolerance in smokers with preserved ratio impaired spirometry

Alice Scussel [1], Nathalia Galvagni Rodrigues [1], Artur Zanelatto Santos [1], Laura Corrêa de Barros Trombin [1], Amanda Calage Pinto [1], Litiele Evelin Wagner [1], Marli Maria Knorst [1], James Dean [2 3], Dave Singh [2 3], Danilo Cortozi Berton [4]

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- DOI: 10.1007/s00421-026-06244-3

Abstract

Purpose: Smokers with preserved ratio impaired spirometry (PRISm) present reduced forced expiratory volume in the first second (FEV_1 < 80% predicted) but preserved FEV_1/forced vital capacity (FVC) ≥ 0.7. Although they do not meet diagnostic criteria for chronic obstructive pulmonary disease (COPD), they often report respiratory symptoms and exercise intolerance. We aimed to compare sensory and physiological responses to exercise between smokers with PRISm and matched healthy controls. Patients with mild-to-moderate COPD were included as a reference group.

Methods: In this cross-sectional study, smokers (> 10 pack-years) from a specialized outpatient clinic were evaluated. Thirteen participants (11 females; 62.4 ± 7.7 years) with PRISm and 13 age- and sex-matched patients with mild-to-moderate COPD (FEV_1/FVC < 0.7; FEV_1 > 50% predicted) underwent incremental cardiopulmonary exercise testing on a cycle ergometer. Data from healthy nonsmoking controls were obtained from previous studies.

Results: PRISm and COPD groups had similarly reduced FEV_1 (~ 72% predicted) compared to controls (97% predicted), whereas FVC was lower in PRISm (73% predicted) than in COPD and controls (~ 95% predicted). Both patient groups showed higher ventilation, reduced ventilatory reserve, and greater dyspnoea at a given submaximal workload versus controls. Increased tidal volume/inspiratory capacity ratios were also observed, contributing to greater dyspnoea for a given ventilation and lower peak work rate (42 ± 16 vs. 68 ± 11 vs. 94 ± 17% predicted, respectively; all P < 0.05).

Conclusion: Smokers with PRISm exhibit increased dyspnoea and reduced exercise tolerance compared to healthy controls, largely driven by excessive ventilatory demand and reduced ventilatory capacity during submaximal exercise.

Keywords: COPD; Exercise test; Preserved Ratio Impaired Spirometry (PRISm); Smokers; Spirometry; Dyspnoea.

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Conflict of interest statement

Declarations. Conflict of interests: All authors declare that they have no conflict of interest. Dave Singh has received sponsorship to attend and speak at international meetings, honoraria for lecturing or attending advisory boards from the following companies: Adovate, Almirall, Anaveon, Apogee, Arcutis Biotherapeutics, Arrowhead, AstraZeneca, Belenos Biosciences, Bial, Celldex, Chiesi, Cipla, CONNECT Biopharm, Covis, DevPro Biopharma LCC, Elpen, Empirico, EpiEndo, Generate Biomedicines, GlaxoSmithKline, Glenmark, Jasper, Kinaset Therapeutics, KOLON, Kymera, Lupin, Melodia, Menarini, MicroA, OM Pharma, OrientEuroPharma, Recipharm, Revolo, RIGImmune Inc, Roche, Roivant Sciences, Sanofi, Sitryx, Synairgen, Tetherex, UCB, Upstream, Verona Pharma, Winward, Zura Bio, Zymeworks. Danilo Berton has received honoraria for lecturing from the following companies: Chiesi, GlaxoSmithKline.

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Thorax

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. 2026 Jun 5:thorax-2026-224791.

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Establishing the top 10 research priorities for lung volume reduction treatment for people with COPD

Sara C Buttery [1 2], Richard Barraclough [3], Timothy J P Batchelor [4], Sofina Begum [2], Rocco Bilancia [5], Edward J Caruana [6], James W Dodd [7 8], Justin L Garner [9 2], Neil J Greening [10], Samuel V Kemp [4], Alan J B Kirk [5], Rod A Lawson [6], Babu Naidu [7], Christopher M Orton [9 2], Karen Redmond [8], Carole Ridge [2], Pallav L Shah [9 2], Jane S Watson [11], Nicholas S Hopkinson [9]; LVR-PSP steering group

Collaborators, Affiliations Expand

- **PMID: 42248680**

- **DOI: 10.1136/thorax-2026-224791**

Abstract

Lung volume reduction procedures are an established evidence-based aspect of chronic obstructive pulmonary disease (COPD) care. We conducted a research prioritisation exercise involving people with COPD and healthcare professionals across a range of disciplines, to identify a clear set of 10 questions to guide the development of research proposals in this area. Priorities were identified using an iterative approach based on the James Lind Alliance methodology. The final set of 10 priorities address the identification, assessment and optimisation of patients with COPD prior to any procedure, how lung volume reduction procedures are conducted and how care after the procedure has taken place should be organised.

Keywords: Emphysema; Lung Volume Reduction Surgery.

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Conflict of interest statement

Competing interests: SCBreports personal fees for educational lectures and travel from PulmonX Inc. TB received honoraria for lectures from Medtronic. RB reports honoraria for lectures from Intuitive and support for attending meetings and travel from PulmonX Inc and Intuitive. EC reports honoraria from AtriCure, PulmonX Inc and Intuitive. JWD reports support for travel and educational honoraria from PulmonX Inc. He is also the COPD lead for Respiratory Transformation Partnership NHSE/HIN and acting senior clinical lead/asthma clinical lead for National Respiratory Audit Program RCP. SK reports conference fees from Sanofi, personal consulting fees from Ambu and PulmonX Inc and personal lecture fees from PulmonX Inc. He is on the advisory board for Intuitive and Ambu and DSMB for Apreo Health. RAL reports he is a member of South Yorkshire Respiratory Specialist Advisory Group and Yorkshire and Humber Clinical Senate. CMO reports honoraria for lectures and consulting fees from PulmonX Inc. PLS reports consulting fees from Creo Medical, Olympus and Pulmonx advisory boards and honorarirahonoraria from PulmonX Inc and Olympus. JSW reports honoraria from AstraZeneca, GSK and Chiesi.

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Editorial

Thorax

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. 2026 Jun 4:thorax-2026-225166.

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Functional decline in COPD: looking beyond FEV_1

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Affiliations Expand

- PMID: 42242763

- DOI: 10.1136/thorax-2026-225166

No abstract available

Keywords: COPD epidemiology; Physical Conditioning, Human.

Conflict of interest statement

Competing interests: None declared.

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Editorial

Thorax

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Preterm birth, disrupted lung growth and the road to COPD

Dinh Son Bui [1], Jiaxin Li [2], Shyamali Dharmage [2]

Affiliations Expand

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- DOI: 10.1136/thorax-2026-225167

No abstract available

Keywords: COPD epidemiology; Paediatric Lung Disease.

Conflict of interest statement

Competing interests: None declared.

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Eur Respir J

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doi: 10.1183/13993003.01431-2025. Online ahead of print.

Fentanyl or Morphine for Persistent Dyspnea in COPD: a multicenter randomised cross-over trial

Marlies van Dijk [1 2], Kris J M Mooren [3], Wendy van Beurden-Moeskops [4], Roxane Heller-Baan [5], Sander M de Hosson [6], Remge M Pieterman [7], Wai Yee Lam-Wong [8], Liesbeth Peters [9], Karin Pool [10], Jan-Willem K van den Berg [11], Huib A M Kerstjens [12 2]

Affiliations Expand

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Free article

Abstract

One of the most prevalent and impactful symptoms in COPD is persistent dyspnea, occurring in the majority of patient with advanced COPD. Opioids, mostly morphine, have been investigated and suggested as treatment in palliative care guidelines. However, in recent years multiple trials on morphine for persistent dyspnea have shown no clinical benefit, and there are concerns regarding adverse events. Transdermal fentanyl has not yet been investigated for this indication.We performed a multicenter, cross-over, double-dummy RCT, investigating transdermal fentanyl (12 mcg·h^{-1}), morphine (10 mg p.o. bid), and placebo, during three treatment periods of two weeks (including three days wash out). Patients with persistent dyspnea despite optimal therapy and mMRC score≥3 caused by COPD, FEV_1<50%, and stable disease were included. The primary endpoint was change in mean daily dyspnea score on a numeric rating scale (NRS). Secondary outcomes were change in worst daily dyspnea (NRS), health status (CCQ), anxiety (HADS-A), hypercapnia (capillary bloodgas), mastery (CRQ-M), and sleep quality (NRS).Between April 2019 and November 2024, 59 randomisations were performed in 58 participants (69±7 years, 54% female, FEV_1 33±10%), 37 participants completed the study. The main reasons for study discontinuation were exacerbations (n=13) and side effects (n=7). There were no significant differences between both fentanyl and morphine compared to placebo for mean and worst dyspnea, sleep, health status, mastery, anxiety, hypercapnia, or side effects (except for a possible difference in vomiting).This study demonstrated no positive effect of transdermal fentanyl nor oral morphine, compared to placebo in the treatment of persistent dyspnea in COPD.

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BMC Pulm Med

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doi: 10.1186/s12890-026-04375-z. Online ahead of print.

Comparative effectiveness of triple versus dual inhaled therapy (ICS/LABA or LABA/LAMA) for chronic obstructive pulmonary disease: a systematic review and network meta-analysis

Weimian Hu [1], Qinglin Li [2]

Affiliations Expand

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- DOI: 10.1186/s12890-026-04375-z

Free article

Abstract

Background: The optimal role of triple therapy (ICS/LAMA/LABA) versus dual therapy in COPD remains uncertain, particularly given the trade-off between modest efficacy gains and potential safety concerns. In particular, whether triple therapy provides additional benefit over dual regimens consisting of either ICS/LABA or LABA/LAMA remains an important clinical question. This study aimed to evaluate the comparative effectiveness and safety of triple versus dual inhaled therapies in COPD using a network meta-analysis.

Methods: A systematic search of PubMed, Embase, Cochrane Library, CNKI, Wanfang, and VIP databases was conducted from inception to July 2023. Randomized controlled trials comparing triple inhaled therapy with either ICS/LABA or LABA/LAMA dual inhaled therapy in COPD were eligible. Outcomes included moderate-to-severe exacerbations, forced expiratory volume in one second (FEV_1), St. George's Respiratory Questionnaire (SGRQ), Transition Dyspnea Index (TDI), and pneumonia incidence. Data were synthesized using a frequentist random-effects NMA. Treatment hierarchies were estimated using surface under the cumulative ranking curve (SUCRA).

Results: Seven RCTs (n = 9,968 participants) were included. Triple therapy did not consistently reduce exacerbation rates compared with dual therapy, while dual regimens such as FF/VI and BUD/FORM ranked favorably for exacerbation prevention (SUCRA 75.6% and 71.4%). Triple therapy and selected dual regimens improved lung function, though SUCRA rankings unexpectedly favored BUD/FORM. Improvements in SGRQ and TDI were modest and often below the minimal clinically important difference. Pneumonia risk tended to be higher with fluticasone-containing regimens, though differences did not reach statistical significance.

Conclusion: Triple therapy was associated with improvements in some outcomes, particularly lung function, but did not show consistent statistically significant superiority over dual therapy across all endpoints in this network meta-analysis. Given the small number of included trials and limited power for some comparisons, these findings should be interpreted cautiously and should not be taken as evidence of equivalence. Dual regimens remained effective options, while triple therapy may still be beneficial in selected high-risk patients. Personalized treatment based on exacerbation history, eosinophil count, and pneumonia risk remains essential.

Trial registration: Not applicable.

Keywords: Chronic obstructive pulmonary disease; dual therapy; inhaled corticosteroids; network meta-analysis; pneumonia; triple therapy.

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Conflict of interest statement

Declarations. Ethics approval and consent to participate: All data were obtained from publicly available databases; therefore, institutional review board approval and patient consent were not required. Consent for publication: Not applicable. Competing interests: The authors declare no competing interests.

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BMC Pulm Med

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Blood eosinophil count and clinical characteristics according to etiology in chronic obstructive pulmonary disease

Jeong Hyeon Seong [1], Hee-Young Yoon [2], Ye Jin Lee [3], Hyonsoo Joo [4], Joo Hun Park [5], Seong Yong Lim [6], Sang Yeub Lee [7], Hyoung Kyu Yoon [8], Kwang Ha Yoo [9], Chin Kook Rhee [10]

Affiliations Expand

- **PMID: 42237119**

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Free article

Abstract

Background: Chronic obstructive pulmonary disease (COPD) is a heterogeneous condition with multiple etiologies. We evaluated whether clinical characteristics differ according to COPD etiology.

Methods: Patients with infection as the sole etiology were classified as the infection-related group (COPD-I, Group I), whereas those with any smoking-related etiology were assigned to the smoking-related group (COPD-C, Group C).

Results: Of 873 patients included, 41 were classified as Group I and 832 as Group C. A significantly higher proportion of patients in Group I had a blood eosinophil count < 100 cells/μL compared to Group C (44.4% vs. 27.8%; p = 0.031). The inhaled corticosteroid (ICS) prescription rate was lower in Group I compared to Group C (25.7% vs. 41.5%; p = 0.063). Multivariable logistic regression confirmed that Group I was independently associated with a lower likelihood of ICS use (p = 0.018). In addition, Group I exhibited a significantly higher residual volume to total lung capacity ratio (48.88% vs. 43.28%; p = 0.030), indicating greater air trapping and small airway involvement.

Conclusions: These findings support the notion that infection-related COPD (COPD-I) represents a clinically distinct phenotype.

Keywords: Chronic obstructive pulmonary disease; Eosinophil; Etiology; Inhaled corticosteroids; Small airway disease.

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Conflict of interest statement

Declarations. Ethics approval and consent to participate: This study was approved by the ethics committee of Konkuk University Hospital. Written informed consent was obtained from all patients prior to enrollment. The study was conducted in accordance with the principles of the Declaration of Helsinki, and all procedures adhered to relevant institutional and international guidelines and regulations. Consent for publication: Not applicable. Competing interests: CK Rhee received consulting/lecture fees from MSD, AstraZeneca, GSK, Novartis, Takeda, Mundipharma, Boehringer-Ingelheim, Teva, Sanofi, Organon, Roche, and Bayer.

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J Med Internet Res

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. 2026 Jun 3:28:e90208.

doi: 10.2196/90208.

Forecasting the Impacts of Artificial Intelligence Assistance in Virtual Consultations for Chronic Obstructive Pulmonary Disease: Exploratory Futures Wheel Study

Pranavsingh Dhunnoo [1 2], Bertalan Meskó [2], Karen McGuigan [3], Vicky O'Rourke [4], Michael McCann [1]

Affiliations Expand

- PMID: 42234985
- PMCID: PMC13233008
- DOI: 10.2196/90208

Abstract

Background: While digital health technologies promise to reshape the medical journey, their potential might not be realized due to unforeseen implementation challenges. Notably, the future impact of artificial intelligence (AI) in virtual consultations has been poorly investigated.

Objective: This study aims to explore, across 8 areas, the future impacts of a bespoke, co-designed AI tool for remote chronic obstructive pulmonary disease care from the perspectives of patients and health care professionals (HCPs) with the Futures Wheel (FW) method. It provides practical recommendations for conducting FW activities involving novel digital health tools.

Methods: A pilot FW workshop was conducted with public and patient involvement members to gather feedback on the process. Subsequently, an exploratory, in-person FW workshop was conducted with 2 patients with chronic obstructive pulmonary disease and 2 HCPs who had previously been involved in the co-design of the bespoke AI tool. The central statement was as follows: "The bespoke AI tool is used in every virtual consultation." Participants identified first- and second-order consequences across the following 8 areas of impact: HCP-patient relationship impact, psychological impact, social impact, educational impact, legal impact, ethical impact, health care delivery impact, and technology impact. Each participant discussed their individual input to provide additional context.

Results: Regarding the HCP-patient relationship, patients foresee the tool's impact as redefining the remote care dynamic with enhanced patient involvement, while HCPs identify its meaningful communication assistance. On the psychological impact, patients expect an enhanced level of empowerment and confidence, and HCPs anticipate improved understanding of patients' emotional well-being with the AI tool's assistance. As for social impacts, patients view the AI support as beneficial for social patient-HCP interactions, and HCPs foresee their workflow being enhanced with flexibility and collaboration. The AI's educational impacts are expected to include, from patients' perspectives, better familiarization of HCPs with individual patient cases and, from HCPs' perspectives, improved support for training, upskilling, and administrative tasks. On the legal front, patients identify

limited risks associated with the tool, and HCPs expect its features to lead to safer practices, contingent on regulatory compliance. Provided integrity and ethical use, the tool's ethical impact is not perceived as significant by patients, while HCPs see its personalized features as leading to fair, individual remote assessments. Patients envision the AI tool's impact on health care delivery as fostering patient-centricity, and HCPs anticipate strengthened remote care processes. Technologically, patients forecast a significant improvement to the current system, requiring adequate investment and resources, while HCPs expect complementarity between human input, AI, and the current system.

Conclusions: The plausible AI-driven future of remote chronic care is a nuanced one. The FW method indicated that a bespoke, co-designed AI tool can positively support virtual care delivery and remote interactions while indicating potential risks. These insights can inform strategies related to early planning, governance, and implementation considerations.

Keywords: Futures Wheel; artificial intelligence; chronic conditions; digital health; foresight; futures studies; medical futures studies; remote care; telehealth; virtual consultation.

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Conflict of interest statement

Conflicts of Interest: Coauthor BM is one of the Guest Editors for JMIR's Theme Issue: "The Emergence of Medical Futures Studies." The other authors declare no conflicts of interest.

- 49 references
- 3 figures

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Pulm Ther

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. 2026 Jun 3.

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Impact of Single-Inhaler Triple Therapy FF/UMEC/VI on Disease Stability in COPD: A Real-World 12-Month Analysis

Chiara Lupia [1], Daniela Pastore [1], Antonio Giacalone [1], Federica Marrelli [1], Lucia Novelli [1], Debbie Riccelli [1], Angelantonio Maglio [2], Giuseppe Armentaro [3], Angela Sciacqua [3], Alessandro Vatrella [2], Girolamo Pelaia [1], Corrado Pelaia [4]

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Free article

Abstract

Introduction: Single-inhaler triple therapy with fluticasone furoate/umeclidinium/vilanterol (FF/UMEC/VI) is recommended for patients with chronic obstructive pulmonary disease (COPD) who remain symptomatic or experience exacerbations despite dual bronchodilation. However, real-world evidence on its ability to achieve multidimensional "disease stability", integrating symptoms, lung function, and exacerbation outcomes, remains limited. The aim of our study was therefore to evaluate, in a real-world cohort of exacerbating patients with COPD, the effects of once-daily FF/UMEC/VI on lung function, respiratory symptoms, health status, and exacerbation rates over 12 months.

Methods: This retrospective single-center study included 86 adults with COPD treated with FF/UMEC/VI 92/55/22 µg at the Respiratory Unit of "Magna Graecia" University Hospital (Catanzaro, Italy). Lung function tests (forced expiratory volume in the first second, FEV_1; forced vital capacity, FVC; forced mid-expiratory flow between 25% and 75% of FVC, FEF_{25-75}; residual volume, RV; total lung capacity, TLC; corrected single-breath diffusion lung capacity for carbon monoxide, DLCOcSB) were performed at baseline and after 12 months. Symptoms and health status were assessed using the COPD Assessment Test (CAT). Moderate and severe exacerbations were recorded within the previous 12 months and 12 months after treatment initiation. Safety and tolerability were monitored via monthly phone follow-up.

Results: Eighty-six patients were included (24 women, 28%; 62 men, 72%), with a mean age of 72.29 ± 9.20 years and a median BMI of 30 (26.00-36.50) kg/m^2. After 12 months of FF/UMEC/VI, lung function significantly improved: FEV_1 increased from 1.46 ± 0.51 l to 1.61 ± 0.60 l ($p < 0.01$), FEV_1/FVC from 0.65 ± 0.11 to 0.69 ± 0.11 ($p < 0.001$), and FEF_{25-75} from 0.84 (0.54-1.15) l/s to 0.99 (0.71-1.53) l/s ($p < 0.001$). Pulmonary hyperinflation decreased, with RV declining from 2.90 (2.25-3.80) l to 2.50 (1.72-3.20) l ($p < 0.0001$). DLCOcSB increased from 4.59 ± 1.36 to 4.86 ± 1.53 mmol/min/kPa ($p < 0.05$). CAT score improved from 25.99 ± 4.03 to 22.93 ± 5.76 ($p < 0.0001$). The number of moderate/severe exacerbations decreased from 2.08 ± 0.66 to 0.15 ± 0.36, and 63 patients (73%) met the composite criteria for COPD disease stability.

Conclusions: In this real-world cohort of exacerbating patients with COPD, once-daily single-inhaler FF/UMEC/VI was associated with improved lung function, reduced hyperinflation, better symptom control, enhanced quality of life, and a significant reduction in exacerbation frequency. These findings suggest that FF/UMEC/VI may be a useful therapeutic option for supporting multidimensional disease stability in high-risk patients with COPD, although prospective controlled studies are needed to confirm these observations.

Keywords: Chronic obstructive pulmonary disease; Exacerbations; Real-world; Stability; Triple inhaled therapy.

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Conflict of interest statement

Declarations. Conflict of interest: Chiara Lupia has nothing to disclose. Daniela Pastore has nothing to disclose. Antonio Giacalone has nothing to disclose. Federica Marrelli has nothing to disclose. Lucia Novelli has nothing to disclose. Debbie Riccelli has nothing to disclose. Angelantonio Maglio has nothing to disclose. Giuseppe Armentaro has nothing to disclose. Angela Sciacqua has nothing to disclose. Alessandro Vatrella has nothing to disclose. Girolamo Pelaia has nothing to disclose. Corrado Pelaia is an Editorial Board member of Pulmonary Therapy. Corrado Pelaia was not involved in the selection of peer reviewers for the manuscript nor any of the subsequent editorial decisions. Corrado Pelaia has nothing else to disclose. Ethical Approval: This study was authorized by the Ethics Committee of Calabria Region, Italy (Catanzaro, Italy; document no. 263–July 23, 2020). All participants signed written informed consent forms. The study was performed in accordance with the Declaration of Helsinki and its later amendments.

- **40 references**

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J Telemed Telecare

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. 2026 Jun 2:1357633X261456143.

doi: 10.1177/1357633X261456143. Online ahead of print.

Telerehabilitation versus face-to-face pulmonary rehabilitation in COPD: A systematic review and meta-analysis of comparative outcomes and delivery characteristics

Jenni De Luca Bamber [1], Matthew Cook [2], Reinie Cordier [1 2 3], Kenji Doma [4], Dave Parsons [5], Renée Speyer [1 6]

Affiliations Expand

- PMID: 42227853

- DOI: 10.1177/1357633X261456143

Abstract

ObjectiveTo compare the effects of pulmonary rehabilitation (PR) interventions delivered via telerehabilitation with face-to-face PR on functional capacity in individuals with chronic obstructive pulmonary disease (COPD). Despite increasing use of telerehabilitation, uncertainty remains regarding its effectiveness and the influence of intervention characteristics.MethodsSearches of four electronic databases identified studies for a systematic review and meta-analysis comparing telerehabilitation with face-to-face PR interventions. Two independent reviewers screened 2292 records, with 280 full-text articles assessed for eligibility. Methodological quality was evaluated using Cochrane risk of bias 2 (RoB-2). Heterogeneity was accounted for using random-effects models. Subgroup analyses were conducted using mixed-effects models to explore the influence of intervention characteristics, including supervision and delivery mode.ResultsTwenty-eight studies met the inclusion criteria. Eight studies were excluded from within-group meta-analysis (two secondary analyses, two studies with insufficient data, and four studies with high RoB). Insufficient between-group data in two further studies resulted in 18 studies included in the between-group meta-analysis. Telerehabilitation interventions produced significant improvements in functional capacity, with a small pooled effect. Between-group analyses demonstrated that telerehabilitation achieved outcomes comparable to face-to-face PR, although findings should be interpreted in the context of moderate heterogeneity and variability in intervention design. Only one subgroup moderator, type of telerehabilitation support, was statistically significant, suggesting broadly consistent effects across most intervention characteristics.ConclusionFindings support the potential integration of telerehabilitation into routine PR delivery, with potential benefits including improved access for rural and underserved populations, greater convenience for individuals living with COPD, and opportunities for cost savings. However, the magnitude of the effect should be interpreted with caution given variability in intervention design and limited statistical power in subgroup analyses, and further high-quality studies are required to optimise intervention design and confirm long-term effectiveness.

Keywords: COPD; Telerehabilitation; meta-analysis; pulmonary disease; pulmonary rehabilitation; service delivery; systematic review; telehealth.

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Ann Am Thorac Soc

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Association Between Chronic PM2.5 Exposure and CT-Detected Lung Abnormalities in the SPIROMICS Cohort

Christopher B Bosma [1], Lantian Xu [2], Susan Murray [2], Laura M Paulin [3], Joel D Kaufman [4], Nadia N Hansel [5], Neil E Alexis [6], R Graham Barr [7], Jessica Bon [8], Swaraj Bose [2], Alejandro P Comellas [9], Christopher B Cooper [10], David Couper [11], Jeffrey L Curtis [1], Craig J Galban [12], Charles R Hatt [12], Emilia A Hermann [7], Eric A Hoffman [13], Ella A Kazerooni [12], Abhilash S Kizhakke Puliyakote [9], Fernando J Martinez [14], Jill A Ohar [8], Robert Paine 3rd [15], Nirupama Putcha [5], Sarath Raju [5], Joseph M Reinhardt [13], Coralynn Sack [4], Wassim W Labaki [1], MeiLan K Han [1]

Affiliations Expand

- PMID: 42226013

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Free article

Abstract

Rationale: Air pollution contributes additively to COPD morbidity beyond tobacco exposure. Limited current data focuses on the impact of fine particulate matter ≤ 2.5 μm in aerodynamic diameter (PM2.5) on COPD pathogenesis and CT-detected lung abnormalities.

Objective: To test the association between long term PM2.5 and CT measures of lung disease.

Methods: We studied participants enrolled in the SPIROMICS cohort (age 40-80 years; > = 20 pack-years). As part of the SPIROMICS Air study, 10-year mean outdoor concentrations of PM2.5 prior to enrollment at each participant's home were estimated using a hierarchical high-resolution spatiotemporal model. Using baseline chest CT scans completed at study enrollment, functional small airway

disease and emphysema were quantified as percentages of total lung volume. We tested the association between PM2.5 and measures of emphysema (PRMEMPH), functional small airway disease (PRMfsad), and large airway disease (Pi10) using mixed effect regression models. Additional mixed effect regression models tested the association of PM2.5 with FEV1 and symptom scores. We stratified all analyses by baseline severity of airflow obstruction on spirometry: none (GOLD 0), mild-moderate (GOLD 1-2) and severe (GOLD 3-4), and non-tobacco exposed, healthy control participants.

Results: Among the 2,355 participants aged 40-80 years old included in this analysis, 176 were non-tobacco exposed control participants, 754 were GOLD 0, 982 GOLD 1-2 and 443 GOLD 3-4. Median 10-year average outdoor PM2.5 concentration for the entire cohort was 10.73 µg/m3 with an interquartile range of 3.52 µg/m3. In GOLD 0 participants, prior 10-year PM2.5 exposure was associated with greater baseline emphysema (1.33, 95% CI [1.12,1.59] per one IQR increase) and functional small airway disease (1.22, [95% CI 1.06, 1.40]); and lower FEV1 -68.8 ml [-126.3, -11.3]. Interaction analysis revealed an association between 10-year PM2.5 exposures and greater baseline symptom scores limited to women younger than 65 in the GOLD 0 and control group. No significant associations were found in participants with COPD.

Conclusion: PM2.5 exposure was associated with CT-detected emphysema and small airway disease as well as lower FEV1 among those with smoking history and no airflow obstruction. Additionally, PM2.5 exposure was associated with greater symptom scores in women younger than 65 years.

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Review

Expert Rev Med Devices

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Examining the need for positive airway pressure in patients with COPD-OSA overlap

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- PMID: 42165427

- DOI: 10.1080/17434440.2026.2678898

Abstract

Introduction: Chronic obstructive pulmonary disease (COPD)-obstructive sleep apnea (OSA) overlap is prevalent in patients with either COPD or OSA. Patients with COPD-OSA overlap are likely to have different pathophysiological endotypes and thus different clinical phenotypes, which are likely to lead to challenges in the management of this heterogenous population. This report examines current evidence for positive airway pressure therapy in COPD-OSA overlap, with an emphasis on outcomes and guidance gaps.

Areas covered: Current data outlining the risks of COPD-OSA overlap are explored with a particular emphasis on cardiovascular morbidity and mortality. Currently for available treatment, the evidence around this and national and international guidelines are considered. Novel trials are likely to bring further clarity in managing this patient population.

Expert opinion: It is clear that COPD-OSA overlap presents a synergistic profile leading to poorer outcomes compared to each individual condition alone. Moreover, patients with overlap syndrome are likely to have increased morbidity and mortality. In the symptomatic patient, continuous positive airway pressure (CPAP) therapy should be offered. However, the benefit in the asymptomatic population remains to be elucidated from future trials. There is little evidence beyond CPAP in this population, and further evidence and research is needed in this field.

Keywords: Chronic obstructive pulmonary disease; cardiovascular disease; obstructive sleep apneoa; positive airway pressure therapy; treatment.

Supplementary info

Publication typesExpand

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

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NPJ Prim Care Respir Med

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. 2026 Jun 8.

doi: 10.1038/s41533-026-00528-z. Online ahead of print.

The European respiratory society guideline for adult bronchiectasis 2025: summary and implementation guide for primary care

Fiona Mosgrove [1 2], Janwillem Wh Kocks [3], Eliza Kompatsiari [3], Alan Timothy [4], Tanja Hedberg [4], Merete B Long [5], Stefano Aliberti [6 7], James D Chalmers [5 8]

Affiliations Expand

• PMID: 42259823

• DOI: 10.1038/s41533-026-00528-z

Abstract

Bronchiectasis is a common chronic respiratory disease with rising prevalence, hospitalisation rates, and mortality. It is estimated to affect approximately 1 in 200 adults, imposing a substantial symptom burden and significant healthcare costs, largely driven by exacerbations. Although diagnosis and long-term management are usually led by respiratory specialists, most patient care interactions occur in primary care, including the management of multimorbidity and acute exacerbations. In December 2025, the European Respiratory Society (ERS) published updated global clinical practice guidelines for adult bronchiectasis. This article summarises the 2025 ERS recommendations with a specific focus on their implementation in primary care practice. Key priorities include improving early recognition and reducing diagnostic delay, undertaking standardised investigations to identify underlying causes and treatable traits, and recognising features associated with poor outcomes that warrant specialist referral. The guidance emphasises the importance of sputum microbiology, including testing for non-tuberculous mycobacteria, and targeted blood investigations such as immunoglobulins and allergic bronchopulmonary aspergillosis serology. Core management strategies relevant to primary care are reviewed, including airway clearance techniques, pulmonary rehabilitation, and evidence-based use of inhaled therapies. The article outlines best practice for the management of acute exacerbations, highlights differences from asthma and COPD care, and clarifies the limited role of inhaled corticosteroids in bronchiectasis. The identification and monitoring of patients who may benefit from long-term antibiotic therapy, including those with Pseudomonas aeruginosa infection, are also discussed. By translating specialist guideline recommendations into a primary care context, this summary aims to support timely diagnosis, optimise ongoing management, and improve outcomes for adults with bronchiectasis.

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Conflict of interest statement

Competing interests: J.D. Chalmers reports grants or contracts from AstraZeneca, Boehringer Ingelheim, Gilead Sciences, GlaxoSmithKline, Grifols, Novartis, Insmed,

and other industry partners; and consulting or personal fees from AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Insmed, Novartis, Janssen, Zambon, Antabio, and others, outside the submitted work.S. Aliberti reports receiving research grants and institutional funding from AstraZeneca, Chiesi, GlaxoSmithKline, Insmed, Zambon, Novartis, Boehringer Ingelheim, Menarini, and Pfizer; and personal fees or advisory board honoraria from AstraZeneca, Chiesi, GSK, Insmed, Zambon, Novartis, Boehringer Ingelheim, Menarini, and Pfizer, outside the submitted work.. Kochs reports receiving research funding from Insmed, Zambon, Chiesi, Novartis, AstraZeneca, GlaxoSmithKline, Menarini, and Boehringer Ingelheim; and personal fees or advisory board honoraria from Insmed, Zambon, Chiesi, Novartis, AstraZeneca, GSK, Menarini, and Boehringer Ingelheim, outside the submitted work.FM has received personal fees or advisory board honoraria from AstraZeneca, Chiesi, GSK, Insmed, Trudell and Viatris.

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Cardiol Res Pract

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Artificial Intelligence-Enhanced Electrocardiography for the Diagnosis of Heart Failure With Preserved Ejection Fraction: A Systematic Review and Meta-Analysis

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Affiliations Expand

- **PMID: 42253322**
- **PMCID: PMC13238258**
- **DOI: 10.1155/crp/4994662**

Abstract

Background: Accounting for approximately 50% of heart failure, heart failure with preserved ejection fraction (HFpEF) is becoming increasingly common as populations age and multimorbidity grows. Diagnosis remains challenging, requiring multimodal testing with echocardiography, biomarkers and sometimes invasive haemodynamics. Artificial intelligence applied to the electrocardiogram (AI-ECG) offers a low-cost, scalable means of detecting HFpEF by extracting patterns beyond human interpretation.

Methods: We conducted a systematic review and meta-analysis in accordance with PRISMA, registered prospectively with PROSPERO. PubMed, Embase, Web of Science, and IEEE Xplore were searched to 1 August 2025 for studies evaluating AI/ML models applied to ECGs for the diagnosis of HFpEF or left ventricular diastolic dysfunction (LVDD). Eligible studies reported diagnostic performance compared with a recognized reference standard. Risk of bias was assessed with QUADAS-AI. AUROC values were pooled using a logit transformation and random-effects model, with results back-transformed for interpretability.

Results: Ten studies (2021-2025) met inclusion criteria, encompassing > 270,000 participants across diverse populations. Seven studies provided sufficient data for pooling, contributing 11 independent cohorts. The pooled AUROC was 0.84 (95% CI 0.78-0.88), indicating good discriminatory ability, though heterogeneity was extreme (I^2 = 100%). Three additional studies reported diagnostic metrics without AUROC variance and were synthesized narratively. Risk of bias was moderate to high in several domains, driven by selective cohorts, inconsistent reference standards, and incomplete reporting.

Conclusions: AI-ECG shows promise for the detection of HFpEF, but the current evidence base is predominantly retrospective, methodologically heterogeneous, and limited by variable reference standards and insufficient external validation. No prospective, outcome-based studies have yet established its clinical utility, and real-world implementation remains untested.

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Conflict of interest statement

The authors declare no conflicts of interest.

- 27 references
- 2 figures

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Review

Lancet

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. 2026 Jun 3:S0140-6736(26)00653-7.

doi: 10.1016/S0140-6736(26)00653-7. Online ahead of print.

Chronic kidney disease, complex conditions, and advancing therapeutics: new hope and challenges

Jennifer S Lees [1], Andrej Škoberne [2], Luxia Zhang [3], Christina Wyatt [4], June Fabian [5], Angela Y Wang [6], Louise Oni [7], Adeera Levin [8]

Affiliations Expand

- PMID: 42235560

- DOI: 10.1016/S0140-6736(26)00653-7

Abstract

Chronic kidney disease (CKD) is increasingly recognised as a complex, multisystem condition that rarely occurs in isolation. This Series paper outlines major advances in therapeutics that target shared inflammatory, metabolic, and fibrotic pathways across CKD, cardiovascular disease, diabetes, obesity, and infection. Novel therapeutics, including SGLT2 inhibitors, non-steroidal mineralocorticoid receptor antagonists, and GLP receptor agonists, show substantial benefits for slowing CKD progression and improving cardiovascular outcomes, with combination strategies showing additive potential. This Series paper discusses complexities for therapeutic decision-making in CKD, highlighting multimorbidity, frailty, and polypharmacy care as major challenges for implementation in general or primary care settings. We identify under-recognised, groups of patients at high risk with infection and cancer-related CKD, in whom early detection and integrated care could markedly improve outcomes. Finally, we call for more inclusive and representative evidence generation, improved CKD screening within other disease pathways, and coordinated implementation of emerging therapies to reduce the global burden of CKD.

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Conflict of interest statement

Declaration of interests JSL is personally funded by a Wellcome Trust Early Career Award (301005/Z/23/Z); and reports personal lectureship honoraria from AstraZeneca; and consulting fees from Boehringer Ingelheim, all outside the submitted work. AŠ reports lectureship honoraria from AstraZeneca, Bayer, Baxter,

Boehringer Ingelheim, Johnson & Johnson, Novartis, and Stada; and consulting fees from Astellas, AstraZeneca, and Genesis Pharma, all outside the submitted work. LZ is personally funded by the National Natural Science Foundation of China (no. 72125009); and reports grants from Bayer, outside the submitted work. AYW reports honoraria from AstraZeneca, Bayer, Fresenius Kabi, and Vitaflo; and support for attending meetings from Bayer, AstraZeneca, Fresenius Kabi, and Consun Pharma; and is a scientific advisor for Consun Pharma, all outside the submitted work. JF reports a contract with Variant Bio; grants from UK Research and Innovation, and the International Society of Nephrology, outside the submitted work. LO reports consultancy fees claimed from Biocryst Pharmaceuticals, Boehringer Ingelheim, Novartis, and Roche; honoraria from Sandoz and Travere Therapeutics; an educational grant from Vifor; and advisory or leadership roles for Aurinia Pharmaceuticals, Biocryst Pharmaceuticals, Boehringer Ingelheim, Roche, and Travere Therapeutics; these have not influenced the production of this manuscript. AL receives salary support from the University of British Columbia, and Provincial Health Services Authority in British Columbia Canada; and reports honoraria, consulting fees, and grant funding from Bayer, AstraZeneca, NovoNordisk, Boehringer Ingelheim, and Novartis; and has participated in advisory boards for Novartis, AstraZeneca, and Bayer, all of which are donated to educational and research organisations.

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Intern Emerg Med

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. 2026 Jun 2.

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HFpEF overclassification in older adults

Maria Giulia Bellicini [1]

Affiliations Expand

- PMID: 42228230

- DOI: 10.1007/s11739-026-04404-z

Abstract

Current HFpEF diagnostic criteria frequently identify age-related and potentially para-physiological cardiac abnormalities rather than a true congestive cardiomyopathy. Many elderly patients currently labeled as HFpEF may instead represent a phenotype of age-related exertional dyspnea with limited intrinsic tendency toward acute heart faiulre. Findings from both the cohort by Presta et al. and our recent acute heart failure cohort support the need for more specific and congestion-oriented diagnostic approaches in older multimorbid populations.

Keywords: Acute heart failure; Diagnostic algorithms; HFpEF; Multimorbidity; NT-proBNP; Older adults.

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

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Pediatr Res

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doi: 10.1038/s41390-026-05166-2. Online ahead of print.

The impact of obesity-related asthma on neurodevelopmental disorders in children: a cross-sectional study

Yichen Wu [1 2], Ruixue Xu [2], Qing Long [2], Yun Wang [2], Yingmin Cao [2], Shan Chen [2], Shiqi Qiu [2], Wenhan Yang [3 4], Mingyang Yuan [5 6]

Affiliations Expand

- PMID: 42260306

- DOI: 10.1038/s41390-026-05166-2

Abstract

Background: Although asthma and obesity are independently associated with neurodevelopmental disorders, whether their co-occurrence is associated with a higher burden of these disorders remains unclear.

Methods: Using NHIS data from children and adolescents aged 10-17 years with complete BMI and neurodevelopmental data, 42,444 participants were stratified into four categories according to their asthma and obesity status: obesity-related asthma (OA), asthma without obesity (NOA), obesity without asthma (ONA), and neither condition (NC).

Results: Compared with the NC group, the adjusted odds ratios for attention-deficit/hyperactivity disorder, learning disability, autism spectrum disorder, and developmental delay were, respectively, 1.84 (95% CI 1.57-2.14), 1.87 (95% CI 1.57-2.22), 2.20 (95% CI 1.57-3.07), and 2.29 (95% CI 1.79-2.94) in the OA group; 1.56 (95% CI 1.40-1.74), 1.51 (95% CI 1.34-1.69), 1.12 (95% CI 0.87-1.43), and 1.50 (95% CI 1.26-1.79) in the NOA group; 1.23 (95% CI 1.10-1.38), 1.32 (95% CI 1.17-1.48), 1.53 (95% CI 1.21-1.93), and 1.31 (95% CI 1.10-1.56) in the ONA group.

Conclusions: This study demonstrated a significant association between obesity-related asthma and neurodevelopmental disorders in children. The co-occurrence of obesity and asthma is associated with stronger associations than either condition alone.

Impact: Our study showed that there was a significant association between obesity-related asthma and neurodevelopmental disorders in children. Our study also suggested that the co-occurrence of obesity and asthma is associated with stronger associations than either condition alone. Our study filled the research gap regarding the association between obesity-related asthma and childhood neurodevelopmental disorders. Our findings highlight the need for further longitudinal studies to examine whether integrated management of obesity and asthma is related to neurodevelopmental outcomes in children. These findings may help identify children with co-occurring obesity and asthma as a subgroup warranting closer developmental assessment.

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Conflict of interest statement

Competing interests: The authors declare no competing interests. Consent statement: The authors declare that the patient's consent was not required for this paper.

- **30 references**

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NPJ Prim Care Respir Med

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. 2026 Jun 8.

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The European respiratory society guideline for adult bronchiectasis 2025: summary and implementation guide for primary care

Fiona Mosgrove [1 2], Janwillem Wh Kocks [3], Eliza Kompatsiari [3], Alan Timothy [4], Tanja Hedberg [4], Merete B Long [5], Stefano Aliberti [6 7], James D Chalmers [5 8]

Affiliations Expand

- PMID: 42259823

- DOI: 10.1038/s41533-026-00528-z

Abstract

Bronchiectasis is a common chronic respiratory disease with rising prevalence, hospitalisation rates, and mortality. It is estimated to affect approximately 1 in 200 adults, imposing a substantial symptom burden and significant healthcare costs, largely driven by exacerbations. Although diagnosis and long-term management are usually led by respiratory specialists, most patient care interactions occur in primary care, including the management of multimorbidity and acute exacerbations. In December 2025, the European Respiratory Society (ERS) published updated global clinical practice guidelines for adult bronchiectasis. This article summarises the 2025 ERS recommendations with a specific focus on their implementation in primary care practice. Key priorities include improving early recognition and reducing diagnostic delay, undertaking standardised investigations to identify underlying causes and treatable traits, and recognising features associated with poor outcomes that warrant specialist referral. The guidance emphasises the importance of sputum microbiology, including testing for non-tuberculous mycobacteria, and targeted blood investigations such as immunoglobulins and allergic bronchopulmonary aspergillosis serology. Core management strategies relevant to primary care are reviewed, including airway clearance techniques, pulmonary rehabilitation, and evidence-based use of inhaled therapies. The article outlines best practice for the management of acute exacerbations, highlights differences from asthma and COPD care, and clarifies the limited role of inhaled corticosteroids in bronchiectasis. The identification and monitoring of patients who may benefit from long-term antibiotic therapy, including those with Pseudomonas aeruginosa infection, are also discussed. By translating specialist guideline recommendations into a primary care context, this summary aims to support timely diagnosis, optimise ongoing management, and improve outcomes for adults with bronchiectasis.

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Conflict of interest statement

Competing interests: J.D. Chalmers reports grants or contracts from AstraZeneca, Boehringer Ingelheim, Gilead Sciences, GlaxoSmithKline, Grifols, Novartis, Insmed, and other industry partners; and consulting or personal fees from AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Insmed, Novartis, Janssen, Zambon, Antabio, and others, outside the submitted work.S. Aliberti reports receiving research grants and institutional funding from AstraZeneca, Chiesi, GlaxoSmithKline, Insmed, Zambon, Novartis, Boehringer Ingelheim, Menarini, and Pfizer; and personal fees or advisory board honoraria from AstraZeneca, Chiesi, GSK, Insmed, Zambon, Novartis, Boehringer Ingelheim, Menarini, and Pfizer, outside the submitted work.. Kochs reports receiving research funding from Insmed, Zambon, Chiesi, Novartis, AstraZeneca, GlaxoSmithKline, Menarini, and Boehringer Ingelheim; and personal fees or advisory board honoraria from Insmed, Zambon, Chiesi, Novartis, AstraZeneca, GSK, Menarini, and Boehringer Ingelheim, outside the submitted work.FM has received personal fees or advisory board honoraria from AstraZeneca, Chiesi, GSK, Insmed, Trudell and Viatris.

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. 2026 Jun 5:24.

doi: 10.18332/tid/219365. eCollection 2026.

Impact of smoking on the treatment cycle and health economics of acute exacerbations of chronic obstructive pulmonary disease

Shanna Li [# 1], Li Yin [# 2], Mingze Lan [3], Gui Huang [1]

Affiliations Expand

- **PMID: 42254599**
- **PMCID: PMC13241959**
- **DOI: 10.18332/tid/219365**

Abstract

Introduction: Acute exacerbations of chronic obstructive pulmonary disease (COPD) increase disease progression and mortality. Smoking influences treatment and health economics. This study examines how smoking status affects medical costs, hospital stays, and outcomes in acute COPD exacerbations.

Methods: We included 658 patients with acute COPD exacerbations, excluding those with asthma, allergic diseases, bronchiectasis, or tuberculosis. Participants were divided into never smokers (n=218) and smokers (n=440). Smokers were further classified as early smokers (age ≤24 years, n=70) or late smokers (age >24 years, n=370), and as current (n=164) or former smokers (n=276). We used Mann-Whitney U tests, chi-squared tests, and univariate logistic regression ($p<0.05$).

Results: Median hospital stay was 11 days (IQR: 8-16) for smokers versus 10 days (IQR: 7-15) for never smokers ($p=0.179$). Median daily cost was 1280.63 versus 1182.01 RMB (1000 Chinese Renminbi about US$151.4, mean exchange rate 2018) ($p=0.217$). However, total treatment costs were higher for smokers (median=13477.81 [IQR: 9096.81-22651.91] vs 12296.95 RMB [7954.42-20392.61]; Hodges-Lehmann difference: 1068.87 RMB, $p=0.045$). Medicare (government health insurance program in China) payments were higher (12389.82 [7528.24-20366.10] vs 10216.77 RMB [4691.43-17742.65]; difference: 2349.09 RMB, $p<0.001$), while out-of-pocket payments were lower for smokers (1005.00 [100.00-2500.00] vs 1527.03 RMB [960.00-4686.97]; difference: -600 RMB, $p<0.001$). Early smokers had higher costs, longer stays (difference: 1.0 day, $p=0.019$), higher daily costs (difference: 173.2 RMB, $p=0.001$), and greater out-of-pocket payments (difference: 328.5 RMB, $p=0.008$) than late smokers. Current smokers had higher Medicare and total expenditures than former smokers ($p=0.011$ and $p=0.010$, respectively).

Conclusions: Smoking, especially early smoking, significantly increases the economic burden of acute COPD exacerbations without affecting hospital stay duration.

Keywords: chronic obstructive pulmonary disease acute exacerbation; health economics; smoking; treatment cycle.

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Conflict of interest statement

The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none was reported.

- 33 references

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Respir Med

. 2026 Jun 6:108951.

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Infertility in women with asthma - does asthma also exist in the uterus?

Anne Vejen Hansen [1], Casper Tidemandsen [2], Henriette Svarre Nielsen [3], Reza Serizawa [4], Antje Johanne Katrine Stubsgaard [4], Elisabeth Juul Gade [5], Pia Egerup [6], Lea Langhoff Thuesen [3], Agnete Troen Lundgaard [6], Thomas Hartvig Lindkær Jensen [7], Paul S Foster [8], Vanessa M McDonald [9], Peter G Gibson [9], Charlotte Suppli Ulrik [10], Vibeke Backer [11], Nina la Cour Freiesleben [3]

Affiliations Expand

- PMID: 42251918

- DOI: 10.1016/j.rmed.2026.108951

Free article

Abstract

Prolonged time to pregnancy, increased need for fertility treatment, and increased pregnancy loss have been reported in women with asthma. However, it is unknown whether uterine inflammatory cells negatively affects fertility in this group. We explored whether women with asthma undergoing fertility treatment have increased inflammatory cells in the endometrium compared to women without asthma. Thirty women with and without asthma (1:1) undergoing fertility treatment were included in this explorative observational study. Asthma was defined by symptoms and a positive bronchial challenge test. Participants underwent questionnaires, fractional exhaled nitric oxide measurement, blood sampling, spirometry, methacholine challenge, induced sputum, and 2/3D ultrasound scan of the uterus followed by endometrial biopsy near ovulation. Endometrial biopsies revealed no significant differences in inflammatory cell types between women with asthma versus women without asthma. Women with asthma had higher airway responsiveness, atopy, IgE, and eosinophil counts, as expected, but similar reproductive history and treatment characteristics. No differences were observed in plasma cells/mm2 (median(IQR) 0.15(0.14-0.65); 0.33(0.21-0.92), ns), mast cells/mm2 (median(IQR) 2.99(1.31-3.47); 3.72(3.25-9.57), ns) nor CD3+ or CD20+ lymphocytes or eosinophils. Biomarker analysis across tissues showed no significant association with asthma after multiple testing correction. This exploratory study found no evidence of differences in endometrial inflammatory cells between infertile women with and without asthma. However, the small sample size limits statistical power and a Type II error cannot be excluded.

Keywords: Asthma; Endometrium; In Vitro Fertilization; Infertility; Meso Scale; Reproduction.

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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

Nat Rev Dis Primers

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. 2026 Jun 4;12(1):36.

doi: 10.1038/s41572-026-00703-z.

Atopic dermatitis

Stephan Weidinger [1], Valeria Aoiki [2], Sandipan Dhar [3], Ncoza C Dlova [4], Kenji Kabashima [5], Lin Ma [6 7 8], Carsten Flohr [9], Alan D Irvine [10]

Affiliations Expand

- PMID: 42243136

- DOI: 10.1038/s41572-026-00703-z

Abstract

Atopic dermatitis (AD) is the most common inflammatory skin disease and carries the highest disability-adjusted life-years burden, ranking 15th among all non-fatal diseases globally. It is characterized by intensely itchy skin and is associated with multiple comorbidities, such as food allergy, asthma, allergic rhinitis and eosinophilic oesophagitis, which are mainly driven by type 2 immune responses. Other comorbidities include mental health disorders, disordered bone health, and cutaneous and extracutaneous infections. AD is also associated with other immune-mediated inflammatory diseases, including alopecia areata, vitiligo and

inflammatory bowel disease. AD most often starts in the first 2 years of life but can occur at any life stage and onset at >60 years of age is increasingly common. The twenty-first century has brought greater insights into disease pathology, with an understanding of the complex interplay between the skin barrier, cutaneous and systemic immune pathways, cutaneous microbiome and neural networks. This improved mechanistic understanding has enabled rational drug design and a shift from non-specific broad immunomodulation to targeted biologic therapies and small molecules for severe disease and from topical corticosteroids to next-generation therapies for mild and moderate disease. Yet, considerable global inequity remains in access to these novel therapeutics.

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Conflict of interest statement

Competing interests: S.W. has received consulting fees, honoraria, grant support and/or lecture fees from AbbVie, Almirall, Apogee, Astria, Boehringer, Eli Lilly, Galderma, GSK, LEO Pharma, Pfizer, Regeneron Pharmaceuticals, Sanofi and UCB. V.A. has acted as an advisor for Galderma and Sanofi; and an investigator for AMGEN and Abbvie. N.C.D. received an honorarium or conducted clinal trials, and/or was a member of the advisory board, for Beiersdorf, L'oréal, Galderma, Piere Fabre, Sanofi and Aventis. S.D. was a member of the advisory board of Galderma, Sanofi and Cipla Immunology, with honoraria. K.K. has received consulting fees, honoraria, grant support and/or lecture fees from AbbVie, Amgen, Eli Lilly, Kyowa Kirin, Japan Tobacco, LEO Pharma, Maruho, Mitsubishi Tanabe, Ono Pharmaceutical, Pfizer, Procter & Gamble, Sanofi, Regeneron Pharmaceuticals, Taiho and Torii Pharmaceutical. L.M. has received research support and fees for consulting or as a speaker on atopic dermatitis from Regeneron Pharmaceuticals, Sanofi, Pfizer, Galderma, Leo Pharma, Janssen, Abbvie, Batanee and thederma, and declares no patents, ownership or financial gain from any atopic dermatitis drug. C.F. has received consulting fees, honoraria, grant support, and/or lecture fees from AbbVie, Almirall, Amgen, Apogee, Bioderma, LEO Pharma, Medac, Pfizer, Sanofi and Regeneron Pharmaceuticals. A.D.I. has acted as a consultant for AbbVie, Arena Pharmaceuticals, Dermavant, Eli Lilly, LEO Pharma, Menlo Therapeutics, Novartis, Pfizer, Regeneron Pharmaceuticals, Sanofi, Sitryx and UCB; has received speaker fees from AbbVie, Eli Lilly, LEO Pharma, Novartis, Pfizer, Regeneron Pharmaceuticals and Sanofi; has acted as an investigator for AbbVie, Novartis and Sanofi-Regeneron Pharmaceuticals and Sanofi; and is a patent holder with Regeneron Pharmaceuticals.

- **308 references**

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BMJ Open Respir Res

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. 2026 Jun 4;13(1):e004041.

doi: 10.1136/bmjresp-2025-004041.

Applying spirometry phenotypes to a longitudinal cohort born very preterm

Tiffany K Bradshaw [1 2], Sanja Stanojevic [3], Shannon J Simpson [4 2]

Affiliations Expand

- PMID: 42242831

- PMCID: PMC13239583

- DOI: 10.1136/bmjresp-2025-004041

Abstract

Background: To better characterise prematurity-associated lung disease, adult spirometry phenotype classifications (obstructive lung disease, preserved ratio impaired spirometry and dysanapsis) have been applied to children born preterm. It is unknown how these phenotypes track over time.

Aim: Apply spirometry phenotype classifications to a longitudinal cohort born very preterm (≤32 weeks gestation) and track changes in classifications from early childhood to adolescence.

Methods: This retrospective longitudinal cohort study included children born very preterm in Western Australia between 1997 and 2003, followed up between 2007 and 2022. Spirometry testing and a modified International Study of Asthma and Allergies in Childhood questionnaire were completed at early childhood (4-8 years), middle childhood (9-12 years) and adolescence (16-23 years). Spirometry phenotype classifications were applied to each participant with acceptable spirometry at each time point.

Results: 200 participants completed 311 acceptable spirometry measurements. Abnormal spirometry phenotypes were observed in 29% of participants at early childhood, 41% at middle childhood and 43% at adolescence. Of those with spirometry measurements across at least two time points, 36% changed phenotypes (e.g. from normal to abnormal, from abnormal to normal or changed between the abnormal groups). Many of those that changed phenotype

classification had a forced expiratory volume in 1 s (FEV_1) z-score or FEV_1 to forced vital capacity (FVC) ratio z-score sitting near the lower limits.

Conclusion: It remains unclear whether changes in phenotype reflects the biological variability of the measure or disease progression. The instability of adult spirometry classifications across serial spirometry measurements suggests this approach does not adequately capture the complexity of prematurity-associated lung disease during the growth period.

Keywords: Lung Physiology; Paediatric Lung Disease; Paediatric Physician; Pulmonary Disease, Chronic Obstructive; Respiratory Function Test; Respiratory Measurement.

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Conflict of interest statement

Competing interests: SS has received speaker fees from Vyaire Medicine and GOLD and travel support for attending meetings from GOLD. They have participated on a Medical Advisory board for Ndd technologiest, are a part of the American Thoracic Society Pulmonary Function Testing Committee and are chair of the European Respiratory Society Global Lung Function Initiative Clinical Research Collaboration. They are a statistical editor for Thorax and an Editorial Board Member for the European Respiratory Journal. TKB received PhD scholarship funding from Curtin University and the Stan Perron Charitable Foundation. SJS is supported by a people fellowship from the Stan Perron Charitable Foundation.

- **17 references**
- **2 figures**

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Editorial

Thorax

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. 2026 Jun 4:thorax-2026-225211.

doi: 10.1136/thorax-2026-225211. Online ahead of print.

When the reliever becomes the risk

Chloe I Bloom [1]

Affiliations Expand

- PMID: 42242767

- DOI: 10.1136/thorax-2026-225211

No abstract available

Keywords: Asthma; Asthma Epidemiology; Asthma Pharmacology.

Conflict of interest statement

Competing interests: CIB has received research funding from National Institute for Health and Care Research (NIHR), Asthma + Lung UK, AstraZeneca and the European Respiratory Society outside the scope of this work.

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Eur Respir J

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. 2026 Jun 4:2502196.

doi: 10.1183/13993003.02196-2025. Online ahead of print.

A self-controlled case series to evaluate the effects of clinical trial eligibility criteria on biologic-associated reductions in severe asthma exacerbations: an analysis of the CHRONICLE Study

Ernest Boakye-Dankwa [1], Steven J Kiddle [2], Hyewon Nina Koo [3], Andrew R Harper [4], Christopher S Ambrose [5], Ian J Douglas [6], Jennifer K Quint [7]

Affiliations Expand

- PMID: 42242757

- DOI: 10.1183/13993003.02196-2025

Free article

Abstract

Background: The trade-offs between regulatory preferences, trial success probability, and patient exclusion by eligibility criteria in randomised controlled trials (RCTs) of biologics for severe asthma remain poorly understood. We assessed biologic effectiveness and effect modification by nine RCT-derived criteria in a large real-world cohort of subspecialist-treated patients with severe asthma.

Methods: CHRONICLE was a multicentre, prospective, noninterventional cohort of US adults (aged ≥18 years) with severe asthma (NCT03373045). We performed a meta-analysis of six RCTs to estimate pooled rate ratios (RRs) for FDA-approved biologics and compared with incidence rate ratios (IRRs) from a self-controlled case-series (SCCS) using CHRONICLE data, analysing severe asthma exacerbation rates during biologic-exposed and unexposed periods. Subgroup analyses examined between-group comparisons (inclusion *versus* exclusion) across nine RCT-based criteria.

Findings: Biologics reduced exacerbation rates in both RCT meta-analysis (RR 0.53, 95% CI 0.47-0.60) and real-world SCCS of 480 patients from 85 sites (enrolled February 28, 2018-October 28, 2024) (IRR 0.43, 0.39-0.48). Significant effect modification (ratio of ratios, ratio of IRR, 95% CI), with exclusion as the reference) was observed for smoking history (0.50, 0.38-0.66), exacerbation history (0.49, 0.36-0.65), FeNO (0.63, 0.42-0.92), and BEC (0.65, 0.51-0.82). No significant differences were observed for COPD, bronchiectasis, or FEV_1-based criteria, which excluded the most patients in the cohort.

Interpretation: Criteria based on elevated type 2 biomarkers, minimal smoking, and exacerbation history enrich trial populations likely to benefit from biologics. Spirometry-based exclusions appear to have limited influence on treatment response, and there is a risk that they unduly restrict generalisability.

Funding: AstraZeneca.

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Editorial

Eur Respir J

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doi: 10.1183/13993003.01873-2025. Print 2026 Jun.

Ensuring continued access to essential inhaled respiratory medications: a call to action from the Inhaled Respiratory medicine Innovation and environmental Sustainability (IRIS) group

John R Hurst [1], Alan Kaplan [2], Job F M van Boven [3], Mohit Bhutani [4], MeiLan K Han [5], Ema Paulino [6], Richard E K Russell [7], Matt Sawyer [8], Franziska C Trudzinski [9], Bennard van Ravenzwaay [10], Tonya Winders [11], Arzu Yorgancioglu [12]

Affiliations Expand

- **PMID: 42242746**
- **PMCID: PMC13234408**
- **DOI: 10.1183/13993003.01873-2025**

Abstract

The supply of pMDIs for our patients is about to be switched off. IRIS calls for greener next generation propellants (HFA-152a and HFO-1234ze) used in pMDIs to be excluded from the EU F-gas regulation and the proposed PFAS restriction. https://bit.ly/3OxQ2ry

Conflict of interest statement

Conflict of interest: The authors are active in several academic respiratory organisations and have disclosed relations with commercial companies in the respiratory field, but the views expressed in this article reflect their personal view only and not necessarily the organisations they represent and/or work with. J.R. Hurst reports grant support, personal payment and payment to his institution (UCL) for educational, advisory work from AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Regeneron, Sanofi and Takeda, and is an Associate Editor for the European Respiratory Journal. A. Kaplan reports participation on an advisory board or speakers bureau for ALK, AstraZeneca, GSK, Merck Frosst, Metapharma, Moderna, Pfizer, Roche, Sanofi, Trudel and Valeo. J.F.M. van Boven reports research grants and/or consultancy fees from ALK, AstraZeneca, Chiesi, the European Commission, GSK, Novartis, Pfizer, Sanofi, Teva, Trudell Medical, Vertex and World Health Organization, all paid to his institution. M. Bhutani reports honoraria for advisory

boards and speaking fees from AstraZeneca, GSK, Sanofi, Roche, Takeda, Trudell and Pfizer, and is the Past President of the Canadian Thoracic Society. M.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, Owkin, Bristol Myers Squibb, Zymeworks, Medscape, NACE, MDBriefcase and Integrity, 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, participation on data safety monitoring boards for Novartis and Medtronic with funds paid to the institution, stock options from Meissa Vaccines and Altesa Biopharma, and is a member of the European Respiratory Journal editorial board. E. Paulino reports speaker honoraria or travel reimbursements from Angelini Pharma, AstraZeneca, Mylan and Servier. R.E.K. Russell reports speaker honoraria from Sanofi, GlaxoSmithKline, Chiesi and AstraZeneca, and research funding from Vernona Pharma. F.C. Trudzinski reports speaker honoraria or travel reimbursements from Novartis AG, GlaxoSmithKline, Chiesi, Boehringer Ingelheim GmbH, Grifols, AstraZeneca, CSL Behring, Grifols Deutschland GmbH, Streamed Up and RG Gesellschaft für Information und Organisation mbH, and research funding from the Innovation Fund of the Federal Joint Committee (G-BA) and the Knorr Foundation. T. Winders reports being a paid advisor and speaker for unbranded disease awareness and education for AstraZeneca, Chiesi, Eli Lilly, GSK, Insmed, Novartis, Roche and Sanofi Regeneron. A. Yorgancioglu reports consultancy fees and speaker honoraria from AstraZeneca, Chiesi, GSK and Bilim. The remaining authors have no potential conflicts of interest to disclose.

- 15 references
- 1 figure

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. 2026 Jun 3;21(6):e0349553.

doi: 10.1371/journal.pone.0349553. eCollection 2026.

Magnesium in acute pediatric asthma in the emergency department (MAGICIAN)-A multicentre randomized controlled clinical trial protocol

Suzanne Schuh [1 2], Sunita O'Shea [2], Stephen B Freedman [3], Mohamed Eltorki [3], Jocelyn Gravel [4], Francine M Ducharme [5], Waleed Alqurashi [6], Roger Zemek [6], George Wells [7], Jesse Elliott [7], April Kam [8], Sarah Curtis [9], Allan L Coates [2], Terry Klassen [10], Mark Bedford [11], Yaron Finkelstein [1 2]; Pediatric Emergency Research Canada (PERC) network

Affiliations Expand

- PMID: 42234723
- PMCID: PMC13232952
- DOI: 10.1371/journal.pone.0349553

Abstract

Background: While guidelines recommend intravenous magnesium (IVMg) for refractory pediatric acute asthma, evidence for benefit is scant and disparate. IVMg therapy is resource-intensive and can cause hypotension. To determine if IVMg alters the exacerbation course, it must be given early, and the clinical effect measured at the peak effect of routine co-interventions.

Primary aim: In children with acute asthma remaining in moderate-severe respiratory distress after initial ED therapy, to determine if early IVMg therapy is associated with a significantly greater improvement in respiratory distress at 2 hours after starting IVMg, compared to placebo.

Hypothesis: IVMg will yield significantly greater Pediatric Respiratory Assessment Measure (PRAM) improvement of ≥1.0 point than placebo.

Study design: A randomized double-blind placebo-controlled trial in 6 Canadian pediatric EDs of otherwise healthy children 2-17 years old with acute asthma and PRAM ≥5 after initial 1 hour therapy with systemic corticosteroids and 3 inhaled salbutamol ± ipratropium treatments.

Intervention: IVMg sulfate (75 mg/kg, max 2.5 g) or normal saline placebo over 30 minutes.

Primary outcome: PRAM 2 hours post-intervention start. Secondary: PRAM ≤3 at 2 hours; change in PRAM and vital signs over 3 hours; hospitalization; asthma re-visits by 72 hours.

Sample size: With 192 patients, a two-sided test and alpha 0.05 have 80% power to achieve statistical significance if IVMg yields a difference in PRAM changes ≥1.0 point between groups.

Primary analysis: Student's t test comparing a difference in PRAM changes between groups.

Expected outcomes: This trial will clarify if there is an incremental clinical benefit of IVMg in pediatric refractory asthma. A positive result will establish a proven routine standard of care for this indication; a negative result will lead to de-implementation of IVMg which may also lead to cost savings.

Status: Enrolling at SickKids and McMaster, start of other sites pending. No results generated yet.

Study title: Magnesium Trial in Acute Asthma in Emergency Department.

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Conflict of interest statement

The authors have declared that no competing interests exist.

- **77 references**

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Review

Climacteric

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. 2026 Jun 3:1-11.

doi: 10.1080/13697137.2026.2671756. Online ahead of print.

Menopausal hormone therapy and pulmonary diseases

Márcio Alexandre Hipólito Rodrigues [1], Anne Gompel [2]

Affiliations Expand

- **PMID: 42234514**

- **DOI: 10.1080/13697137.2026.2671756**

Abstract

Menopause is accompanied by loss of ovarian estrogen and progesterone production and by age-related changes in circulating androgens, with implications for respiratory physiology and chronic pulmonary disease. Sex steroids influence lung development, immune responses, airway tone, vascular remodeling and pathways involved in lung carcinogenesis. Epidemiological evidence linking menopausal hormone therapy (MHT) to asthma is heterogeneous; some cohorts show increased incident asthma or exacerbations, particularly with estrogen therapy and in specific subgroups, whereas others suggest preserved lung function or reduced late-onset asthma. Data on chronic obstructive pulmonary disease remain limited and inconsistent. In pulmonary hypertension, evidence is conflicting, and clinical decisions must weigh thrombotic risk, strongly influenced by the route of estrogen administration. Studies on obstructive sleep apnea and sleep-disordered breathing suggest possible modest benefits of MHT in selected populations but are methodologically heterogeneous. For lung cancer, large cohorts, meta-analyses and randomized trials essentially show no clear increase in incidence with MHT and suggest potential survival advantages in some subgroups. Overall, MHT use in women with or at risk for pulmonary disease should be individualized, integrating symptom burden, cardiometabolic and respiratory risk, disease phenotype and formulation/route.

Keywords: Menopause transition; asthma; chronic obstructive pulmonary disease; estrogen, progestogen; lung cancer; obstructive sleep apnea; pulmonary hypertension.

Plain language summary

Menopause is defined as the cessation of menstruation for 1 year. During menopause, levels of estrogen, progesterone and other sex hormones decrease. These hormones are involved in the development and function of the lungs, in the immune system's response, in how airways tighten or relax and in how blood vessels in the lungs change over time. Menopausal hormone therapy (MHT) consists of estrogen and progestogen in women with a uterus or estrogen alone in women who have undergone hysterectomy. MHT remains the most effective therapy for vasomotor symptoms and other climacteric manifestations, preventing osteoporosis and improving quality of life in postmenopausal women complaining of vasomotor symptoms. Menopause and hormone therapy may affect the course of lung diseases. This review of the scientific evidence on the impact of MHT on asthma, chronic obstructive pulmonary disease, pulmonary hypertension and sleep apnea shows that, in most cases, MHT is not contraindicated and may offer benefits for some of these respiratory diseases. In women with asthma, however, exacerbations can be observed, and the clinical response has to be monitored. However, in most cases, robust evidence is lacking and high-quality studies are missing. In addition, extensive studies and clinical trials show that MHT does not increase the risk of lung cancer and may even improve survival in some women. Overall, the decision to use MHT in women who have lung disease or are at risk for it should be individualized, considering the severity of menopausal symptoms and the medical context.

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. 2026 Jun 3.

doi: 10.1186/s13643-026-03215-9. Online ahead of print.

Benralizumab in severe eosinophilic asthma: a comprehensive systematic review and meta-analysis of randomized controlled trials evaluating lung function, asthma control, and safety outcomes

Abbas Al Mutair [1 2 3 4], Yasmine Alabbasi [5], Hanan F Alharbi [5], Hanan Alyami [6], Haifa Mohmmed Al-Shammari [7], Abdullah Awad Al-Omari [8], Eman A Bomozah [9], Faiza Aljarameez [10 11 12], Muhammad Daniyal [13]

Affiliations Expand

- PMID: 42231456

- DOI: 10.1186/s13643-026-03215-9

Free article

Abstract

Background: Benralizumab, a monoclonal antibody, targets eosinophils by blocking an interleukin-5 receptor, improving severe allergic asthma. Severe eosinophilic asthma affects about 10% of asthma patients and often requires high-dose corticosteroids, which are linked to adrenal insufficiency and poor outcomes. This study will perform a detailed review and meta-analysis to evaluate the effectiveness and safety of benralizumab in eosinophilic asthma.

Method: The analysis included relevant RCTs identified through systematic searches of PubMed, EMBASE, and the Cochrane Central Register of Controlled Trials (CENTRAL) from April 2013 to January 2024. The study included variables such as exacerbation, Asthma Control Questionnaire (ACQ), forced expiratory volume (FEV_1), and adverse events.

Results: A total of 5502 patients with eosinophilic asthma were enrolled across 15 randomized-controlled trials; 3061 received benralizumab and 2441 received placebo. A meta-analysis showed that benralizumab significantly improved FEV_1 compared with control, with a pooled mean difference of 0.107 L (95% CI 0.059, 0.155; p < 0.001). Using a random-effects model with Hartung-Knapp adjustment, the pooled mean difference was - 0.174 (95% CI - 0.326, - 0.022; p = 0.030), indicating a statistically significant improvement in ACQ while the pooled odds ratio (OR) for adverse effects was 0.93 (95% CI 0.71, 1.23; p = 0.583) showing no statistically significant difference between benralizumab and control in the risk of adverse effects.

Conclusion: The meta-analysis indicated that benralizumab provides significant improvement in lung function (FEV_1) and asthma control (ACQ) compared to placebo in severe eosinophilic asthma. Clinically, the average FEV_1 improvement of approximately 0.11 L represents a small but valuable gain for patients with significant baseline obstruction, though it falls below the threshold for a minimal clinically important difference (MCID) in ACQ scores. However, substantial heterogeneity was observed across studies, demonstrating that these pooled estimates represent average effects and that individual patient responses may vary considerably.

Systematic review registration: PROSPERO CRD42024548225.

Keywords: Anti-interleukin-5; Benralizumab; Eosinophilic asthma; FEV_1; Monoclonal antibody.

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Conflict of interest statement

Declarations. Ethics approval and consent to participate: Not applicable. Consent for publication: Not applicable. Competing interests: The authors declare that they have no competing interests.

Supplementary info

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South Med J

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. 2026 Jun 2;119(6):318-322.

doi: 10.14423/SMJ.0000000000001979.

Impact of Temperature Variation on Patients with Acute Severe Asthma

Sumedha Nallamothu [1], Alhareth Al-Sagban [1], Scott Wright [1], Che Harris [1]

Affiliations Expand

- PMID: 42229554

- DOI: 10.14423/SMJ.0000000000001979

Abstract

Objective: Acute severe asthma (ASA) is associated with a heightened risk of death. The influence of ambient temperature on in-hospital mortality and healthcare utilization for patients with ASA is poorly characterized.

Methods: Using the National Inpatient Sample, we compared adults hospitalized with ASA in the northeast with southern regions of the United States. We used multivariable regression to determine outcomes (mortality, length of stay, hospital charges, and discharge site after hospitalization). We coupled ambient temperature data for regional comparisons using the National Centers for Environmental Information.

Results: From 2016 to 2019, 5485 patients were admitted with ASA; 2050 (37.4%) were in the Northeast, and 3435 (62.6%) were in the South. Comparison groups had similar mean ages, gender distribution, and comorbidity burden (all *P* values >0.05). No significant differences with respect to adjusted odds ratio (aOR) of mortality (aOR 0.65, 95% confidence interval [CI] 0.2-2.1, *P*=0.48) or adjusted mean difference (aMD) in length of stay (aMD 0.82 days, 95% CI -0.0 to 1.6, *P*=0.05) were observed. Patients in the Northeast had higher hospital charges (aMD $20,986, 95% CI 6743-35,228, *P*=0.04) and lower odds of being discharged to home (aOR 0.65, 95% CI 0.44-0.97, *P*=0.03), however. Throughout all months across the 4-year study period, average monthly temperatures were lower in the Northeast compared with the South.

Conclusions: Patients with ASA in the cooler Northeast incurred greater hospital charges and were less likely to be discharged home after hospitalizations than in the South. Future interventions to improve outcome differences may consider ambient temperature factors.

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Ann Intern Med

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. 2026 Jun 2.

doi: 10.7326/ANNALS-26-01482-JC. Online ahead of print.

In uncontrolled asthma, adding glycopyrronium to budesonide-formoterol reduced annualized severe exacerbations

Christopher Worsnop [1], Christine McDonald [1]; ACP Journal Club Editorial Team at McMaster University

Affiliations Expand

- PMID: 42224697

- DOI: 10.7326/ANNALS-26-01482-JC

Abstract

GIM/FP/GP: [Formula: see text] Allerg & Immunol: [Formula: see text] Pulmonology: [Formula: see text].

Conflict of interest statement

Disclosures: Disclosure forms are available with the article online.

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Thorax

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. 2026 Jun 8:thorax-2024-222204.

doi: 10.1136/thorax-2024-222204. Online ahead of print.

Association between overuse of short-acting β2-agonists and the risk of major adverse cardiovascular events among patients with asthma

Chih-Cheng Lai [# 1 2], Chao-Hsien Chen [# 3 4 5], Ya-Hui Wang [6], Cheng-Yi Wang [# 7], Hao-Chien Wang [# 8 9]

Affiliations Expand

- PMID: 41986159

- DOI: 10.1136/thorax-2024-222204

Abstract

Background: Short-acting β2-agonist (SABA) overuse is associated with increased asthma exacerbations and mortality, yet its impact on cardiovascular disease remains unclear. We investigate the association between SABA overuse and the risk of major adverse cardiovascular events (MACE) in patients with asthma.

Methods: Between 2011 and 2019, patients with asthma were identified from the Taiwan asthma pay-for-performance database. SABA overuse was defined as using ≥3 canisters annually, compared with acceptable use (0-2 canisters/year). Inverse probability of treatment weighting (IPTW) was applied to balance baseline covariates. The primary outcome was 1-year MACE. Secondary outcomes included MACE component (non-fatal myocardial infarction, haemorrhagic stroke, ischaemic stroke) and mortality.

Results: Among 231 970 patients, 28 500 had SABA overuse and 203 470 had acceptable use. In the IPTW-weighted cohort, 1-year MACE incidence was higher in the overuse group (2.82 vs 0.99 per 100 person-years; adjusted HR (aHR) 1.25, 95% CI 1.12 to 1.39). SABA overuse significantly increased the risk of non-fatal MI (aHR: 1.28, 95% CI 1.09 to 1.50), ischaemic stroke (aHR: 1.26, 95% CI 1.08 to 1.46) and mortality (aHR: 1.40, 95% CI 1.24 to 1.58). Haemorrhagic stroke risk was not significantly increased. A non-linear dose-response was observed, with MACE risk peaking at 6-8 canisters annually.

Conclusion: SABA overuse (≥3 canisters/year) is associated with increased risks of MACE and mortality in patients with asthma. These findings emphasise the importance of monitoring SABA use and assessing cardiovascular risk in asthma management.

Keywords: Asthma.

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Conflict of interest statement

Competing interests: None declared.

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Am J Epidemiol

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Leukotriene-modifying agent chemoprophylaxis for severe influenza illness: a multi-approach study

Brittney M Snyder [1], Corinne A Riddell [2], Tebeb Gebretsadik [3], Tan Ding [3], Rees L Lee [4], William D Dupont [3], Justin R Ortiz [5], Veronika Pav [6 7], Thomas J Braciale [8], Pingsheng Wu [3 9], Tina V Hartert [9 10]

Affiliations Expand

- PMID: 41921057
- PMCID: PMC13231862
- DOI: 10.1093/aje/kwag072

Abstract

Animal and in vitro studies suggest that leukotriene-modifying agents (LMAs) may decrease susceptibility to influenza illness. We estimated the effect of LMAs on severe human influenza illness in a retrospective cohort using three analytic approaches: (1) a marginal structural model, (2) a proportional hazards model, and (3) a case-time-control design. Study populations included individuals with asthma and/or allergic rhinitis for whom LMAs are approved and who were enrolled in Tennessee Medicaid (TennCare) or Department of Defense Military Health System (DoD MHS) from 1995 to 2019. Exposed periods were defined by LMA prescription start dates plus days' supply. Severe influenza illness was defined using previously validated International Classification of Diseases criteria. Montelukast accounted for 99% of LMA prescription fills. Adjusted incidence rate ratios from the marginal structural model and adjusted hazard ratios from the proportional hazards model were 1.26 (95% confidence interval [CI], 0.99-1.59) and 1.14 (95% CI, 0.92-1.41) for TennCare and 1.01 (95% CI, 0.84-1.21) and 0.97 (95% CI, 0.82-1.16) for DoD MHS, respectively. Adjusted odds ratios from the case-time-control were 1.11 (95% CI,

0.74-1.65) for TennCare and 1.91 (95% CI, 1.29-2.84) for DoD MHS. Findings in different populations and designs do not support the use of LMAs for chemoprophylaxis of severe influenza illness. Conclusions regarding LMAs other than montelukast were not possible.

Keywords: case–time–control; chemoprophylaxis; leukotriene-modifying agents; marginal structural model; pandemic preparedness; proportional hazards; severe influenza illness.

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Conflict of interest statement

J.R.O. reports that his institution has received research grants from Pfizer and National Institutes of Health for vaccine research. He has received honoraria from Moderna, Pfizer, and Seqirus to serve on scientific advisory boards, outside the submitted work. T.V.H. reports compensated service as co-chair of the American Thoracic Society Vaccine and Immunization working group, vaccine Data and Safety Monitoring Boards for Pfizer, and consultancy for Sanofi. All other authors (B.M.S., C.A.R., T.G., T.D., R.L.L., W.D.D., V.P., T.J.B., P.W.) report no conflicts of interest.

- 47 references
- 4 figures

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

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. 2026 Jun 2.

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Pharmacovigilance Analysis of Azelastine-Related Adverse Events: Insights from the FDA FAERS Database (2006-2024)

Feihong Liang [1], Lulu Chen [2], Caixi Hu [3], Renbin Lu [2], Caihui He [4], Guodong Yu [1]

Affiliations Expand

- PMID: 42253253

- DOI: 10.2174/0115748863416393260406204526

Abstract

Background: Azelastine is widely used in the treatment of allergic rhinitis, and it is necessary to gain insight into the true extent of adverse events (AEs) associated with it.

Methods: This pharmacovigilance study was based on an analysis of reports from the FDA Adverse Event Reporting System (FAERS) for the period January 1, 2006, to December 31, 2024. AEs of drugs were compared using the Proportional Reporting Ratio (PRR), Reporting Odds Ratio (ROR), Bayesian Confidence Propagation Neural Network (BCPN), and Multi-item Gamma Poisson Shrinkage (MGPS).

Results: The number of AE occurrences in Respiratory, thoracic, and mediastinal disorders and Product issues was high. There is a significant difference in the proportion of occurrence between men and women. All AEs listed in the drug insert were validated through this analysis. In addition to the improvement of the drug process, the focus should still be on the adverse reactions such as Dysgeusia, Nasal discomfort, and Somnolence.

Conclusion: This study systematically depicts the safety profile of azelastine by analysing large-scale adverse reaction data and provides empirical evidence for the improvement of clinical dosing guidelines and risk communication strategies. Pharmacovigilance departments should maintain vigilance for rare but serious adverse reactions to azelastine to optimize its risk-benefit profile.

Keywords: Allergic rhinitis; FAERS.; adverse events; azelastine; pharmacovigilance; real world.

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J Glob Health

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Association between asthma, allergic rhinitis, atopic dermatitis, and dental caries: evidence from systematic review with meta-analysis and Mendelian randomisation investigation

Qi Yu [#1], Lei Lan [#2], Yachun Li [3], Ying He [3], Jiaqian Hu [3], Kaiwen Fang [3], Yinhui Ji [3], Zhuo Chen [1], Ya-Dong Gao [3], Yang Zheng [3]

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- PMID: 42246314
- PMCID: PMC13237811
- DOI: 10.7189/jogh.16.04223

Abstract

Background: Allergic diseases and dental caries share overlapping epidemiological trends and risk factors, compromising the patients' quality of life and increasing health care costs. We aimed to explore the associations and potential causal relationships between allergic diseases (asthma, allergic rhinitis, and atopic dermatitis) and the presence/severity of dental caries.

Methods: We conducted a systematic review and meta-analysis by searching PubMed, Embase, and the Cochrane Library studies published up to 16 June 2025 reporting dental caries outcomes in relation to asthma, allergic rhinitis, or atopic dermatitis. We calculated pooled odds ratios (ORs) and standardised mean differences (SMDs) using random-effects models and utilised meta-regression to investigate heterogeneity. Then, we performed a two-sample Mendelian randomisation (MR) analysis based on genome-wide association study data to assess causal relationships, employing inverse-variance weighted (IVW) and other MR methods.

Results: We included 60 studies encompassing 343 975 participants across 22 countries/regions. Asthma (OR = 1.44; 95% CI = 1.17, 1.76) and atopic dermatitis (OR = 1.09; 95% CI = 1.01, 1.17) were associated with an increased risk of dental caries, while allergic rhinitis was not (OR = 1.01; 95% CI = 0.86, 1.18). Asthma and atopic dermatitis patients had higher decayed, missing, and filled teeth for permanent dentition (DMFT) scores, with SMDs of 0.92 (95% CI = 0.32, 1.52) and 0.06 (95% CI = -0.02, 0.14). We also found higher decayed, missing, and filled surfaces for permanent dentition (DMFS) and decayed, extracted, and filled surfaces for primary dentition (defs/dfs) scores in allergic patients, while dmft/dft and the plaque index scores did not show statistically significant associations, with SMDs of 0.17 (95% CI = -0.60, 0.93) and 1.78 (95% CI = -1.47, 5.03), respectively. The MR analysis confirmed a potential causal link for asthma (IVW OR = 1.09; 95% CI = 1.02, 1.17) and a non-significant trend for atopic dermatitis (OR = 1.05; 95% CI = 0.99, 1.11).

Conclusions: Our analysis showed that asthma and atopic dermatitis could be associated with an increased risk and severity of dental caries, while allergic rhinitis is not. Clinical practitioners could consider adopting an integrated prevention strategy that addresses the comorbidity between oral health and allergic diseases.

Registration: PROSPERO: CRD420251103903.

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Conflict of interest statement

Disclosure of interest: The authors completed the ICMJE Disclosure of Interest Form (available upon request from the corresponding author) and disclose no relevant interests

- 91 references
- 3 figures

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Review

Nat Rev Dis Primers

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. 2026 Jun 4;12(1):36.

doi: 10.1038/s41572-026-00703-z.

Atopic dermatitis

Stephan Weidinger [1], Valeria Aoiki [2], Sandipan Dhar [3], Ncoza C Dlova [4], Kenji Kabashima [5], Lin Ma [6 7 8], Carsten Flohr [9], Alan D Irvine [10]

Affiliations Expand

- PMID: 42243136

- DOI: 10.1038/s41572-026-00703-z

Abstract

Atopic dermatitis (AD) is the most common inflammatory skin disease and carries the highest disability-adjusted life-years burden, ranking 15th among all non-fatal diseases globally. It is characterized by intensely itchy skin and is associated with

multiple comorbidities, such as food allergy, asthma, allergic rhinitis and eosinophilic oesophagitis, which are mainly driven by type 2 immune responses. Other comorbidities include mental health disorders, disordered bone health, and cutaneous and extracutaneous infections. AD is also associated with other immune-mediated inflammatory diseases, including alopecia areata, vitiligo and inflammatory bowel disease. AD most often starts in the first 2 years of life but can occur at any life stage and onset at >60 years of age is increasingly common. The twenty-first century has brought greater insights into disease pathology, with an understanding of the complex interplay between the skin barrier, cutaneous and systemic immune pathways, cutaneous microbiome and neural networks. This improved mechanistic understanding has enabled rational drug design and a shift from non-specific broad immunomodulation to targeted biologic therapies and small molecules for severe disease and from topical corticosteroids to next-generation therapies for mild and moderate disease. Yet, considerable global inequity remains in access to these novel therapeutics.

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Conflict of interest statement

Competing interests: S.W. has received consulting fees, honoraria, grant support and/or lecture fees from AbbVie, Almirall, Apogee, Astria, Boehringer, Eli Lilly, Galderma, GSK, LEO Pharma, Pfizer, Regeneron Pharmaceuticals, Sanofi and UCB. V.A. has acted as an advisor for Galderma and Sanofi; and an investigator for AMGEN and Abbvie. N.C.D. received an honorarium or conducted clinal trials, and/or was a member of the advisory board, for Beiersdorf, L'oréal, Galderma, Piere Fabre, Sanofi and Aventis. S.D. was a member of the advisory board of Galderma, Sanofi and Cipla Immunology, with honoraria. K.K. has received consulting fees, honoraria, grant support and/or lecture fees from AbbVie, Amgen, Eli Lilly, Kyowa Kirin, Japan Tobacco, LEO Pharma, Maruho, Mitsubishi Tanabe, Ono Pharmaceutical, Pfizer, Procter & Gamble, Sanofi, Regeneron Pharmaceuticals, Taiho and Torii Pharmaceutical. L.M. has received research support and fees for consulting or as a speaker on atopic dermatitis from Regeneron Pharmaceuticals, Sanofi, Pfizer, Galderma, Leo Pharma, Janssen, Abbvie, Batanee and thederma, and declares no patents, ownership or financial gain from any atopic dermatitis drug. C.F. has received consulting fees, honoraria, grant support, and/or lecture fees from AbbVie, Almirall, Amgen, Apogee, Bioderma, LEO Pharma, Medac, Pfizer, Sanofi and Regeneron Pharmaceuticals. A.D.I. has acted as a consultant for AbbVie, Arena Pharmaceuticals, Dermavant, Eli Lilly, LEO Pharma, Menlo Therapeutics, Novartis, Pfizer, Regeneron Pharmaceuticals, Sanofi, Sitryx and UCB; has received speaker fees from AbbVie, Eli Lilly, LEO Pharma, Novartis, Pfizer, Regeneron Pharmaceuticals and Sanofi; has acted as an investigator for AbbVie, Novartis and Sanofi-Regeneron Pharmaceuticals and Sanofi; and is a patent holder with Regeneron Pharmaceuticals.

- 308 references

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Review

Hum Vaccin Immunother

. 2026 Dec;22(1):2658911.

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Depemokimab: A twice yearly anti-IL 5 biologic for chronic rhinosinusitis with nasal polyps (CRSwNP) - A narrative review

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Affiliations Expand

- PMID: 42234701
- PMCID: PMC13240964
- DOI: 10.1080/21645515.2026.2658911

Abstract

Depemokimab is a monoclonal antibody that targets interleukin-5 with enhanced binding affinity and an extended terminal elimination half-life of 6-8 weeks. The unique pharmacodynamic features of depemokimab enable sustained suppression of type 2 inflammation with twice-yearly subcutaneous dosing. This narrative review provides details of depemokimab's molecular profile, pharmacokinetics, and pharmacodynamics and results regarding the clinical efficacy and safety of depemokimab from recently published Phase 3 clinical trials for the treatment of chronic rhinosinusitis with nasal polyposis (CRSwNP). In 528 severe adult CRSwNP patients (ANCHOR-1/-2 trials), depemokimab achieved Δ total endoscopic nasal polyp score by -0.70 ($p < .001$) and Δ nasal obstruction verbal response scale by -0.24 ($p = .003$) at week 52, compared to placebo. Twice-yearly 100 mg depemokimab provides durable eosinophil suppression and with a safety profile comparable to placebo in Phase 3 trials for CRSwNP. Future work should refine biomarkers and

assess comparative cost-effectiveness and long-term adherence, safety, and effectiveness.

Keywords: CRSwNP; Depemokimab; IL-5; biologics; chronic rhinosinusitis with nasal polyposis; eosinophil; interleukin-5; mepolizumab; type 2 inflammation.

Conflict of interest statement

No potential conflict of interest was reported by the author(s).

- 94 references
- 1 figure

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Am J Epidemiol

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. 2026 Jun 3;195(6):1634-1646.

doi: 10.1093/aje/kwag072.

Leukotriene-modifying agent chemoprophylaxis for severe influenza illness: a multi-approach study

Brittney M Snyder [1], Corinne A Riddell [2], Tebeb Gebretsadik [3], Tan Ding [3], Rees L Lee [4], William D Dupont [3], Justin R Ortiz [5], Veronika Pav [6 7], Thomas J Braciale [8], Pingsheng Wu [3 9], Tina V Hartert [9 10]

Affiliations Expand

- PMID: 41921057
- PMCID: PMC13231862
- DOI: 10.1093/aje/kwag072

Abstract

Animal and in vitro studies suggest that leukotriene-modifying agents (LMAs) may decrease susceptibility to influenza illness. We estimated the effect of LMAs on severe human influenza illness in a retrospective cohort using three analytic approaches: (1) a marginal structural model, (2) a proportional hazards model, and (3) a case-time-control design. Study populations included individuals with asthma and/or allergic rhinitis for whom LMAs are approved and who were enrolled in Tennessee Medicaid (TennCare) or Department of Defense Military Health System (DoD MHS) from 1995 to 2019. Exposed periods were defined by LMA prescription start dates plus days' supply. Severe influenza illness was defined using previously validated International Classification of Diseases criteria. Montelukast accounted for 99% of LMA prescription fills. Adjusted incidence rate ratios from the marginal structural model and adjusted hazard ratios from the proportional hazards model were 1.26 (95% confidence interval [CI], 0.99-1.59) and 1.14 (95% CI, 0.92-1.41) for TennCare and 1.01 (95% CI, 0.84-1.21) and 0.97 (95% CI, 0.82-1.16) for DoD MHS, respectively. Adjusted odds ratios from the case-time-control were 1.11 (95% CI, 0.74-1.65) for TennCare and 1.91 (95% CI, 1.29-2.84) for DoD MHS. Findings in different populations and designs do not support the use of LMAs for chemoprophylaxis of severe influenza illness. Conclusions regarding LMAs other than montelukast were not possible.

Keywords: case–time–control; chemoprophylaxis; leukotriene-modifying agents; marginal structural model; pandemic preparedness; proportional hazards; severe influenza illness.

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Conflict of interest statement

J.R.O. reports that his institution has received research grants from Pfizer and National Institutes of Health for vaccine research. He has received honoraria from Moderna, Pfizer, and Seqirus to serve on scientific advisory boards, outside the submitted work. T.V.H. reports compensated service as co-chair of the American Thoracic Society Vaccine and Immunization working group, vaccine Data and Safety Monitoring Boards for Pfizer, and consultancy for Sanofi. All other authors (B.M.S., C.A.R., T.G., T.D., R.L.L., W.D.D., V.P., T.J.B., P.W.) report no conflicts of interest.

- **47 references**
- **4 figures**

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chronic cough

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doi: 10.1136/thorax-2025-224359. Online ahead of print.

Paediatric bronchiectasis phenotypes and their association with clinical outcomes: development and validation in two prospective clinical cohorts

Vikas Goyal [1 2 3 4], Don Vicendese [5 6 7], Keith Grimwood [4 8], Stephanie Yerkovich [9 8], Shyamali Dharmage [5], Anne B Chang [9 2 8]

Affiliations Expand

- **PMID: 42259636**

- **DOI: 10.1136/thorax-2025-224359**

Abstract

Background: In most chronic airway diseases, identifying phenotypes has advanced clinical practice and research. However, no such phenotypes exist for paediatric bronchiectasis. We therefore sought to develop robust paediatric bronchiectasis phenotypes and to investigate whether they were associated with relevant clinical outcomes.

Methods: Latent class analysis was independently applied to two study cohorts of children with bronchiectasis. Data from 158 children from one study (BEST, development cohort) were used to identify phenotypes and their associations with relevant clinical outcomes. A cohort of 198 children from a second study (BAMP) was used to validate these phenotypes and compare findings for consistency.

Results: A three-class model was the best fit in the BEST cohort. Based on clinical characteristics, we labelled the phenotypes as 'Baseline-Well', 'Wheeze-Dyspnoea Predominant' and 'Daily Wet-Cough Predominant'. These phenotypes were validated in the BAMP cohort. In both development and validation cohorts, the 'Daily Wet-Cough Predominant' phenotype was associated with higher numbers of bronchiectatic lobes (OR 1.61, 95% CI 0.61 to 4.27; and 3.06, 95% CI 1.30 to 7.21 for BEST and BAMP cohorts, respectively) and more bronchiectasis-related hospitalisations ever at enrolment (incidence rate ratio (IRR) 4.33, 95% CI 1.94 to 9.66; and 2.96, 95% CI 1.07 to 8.20, respectively) and also within 2 years of enrolment (IRR 2.68, 95% CI 1.24 to 5.8; and 1.54, 95% CI 0.72 to 3.28, respectively) than the reference phenotype, although the strengths of evidential support differed.

Conclusions: We identified and validated three novel paediatric bronchiectasis phenotypes, and linked them to distinct clinical outcomes. These phenotypes might enable targeted interventions and improve participant selection for clinical trials.

Keywords: Bronchiectasis; Child.

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Conflict of interest statement

Competing interests: VG is supported by a Gold Coast Health Clinician Researcher Fellowship (2023-002), Queensland Advancing Research Fellowship (CRF3-2021-no number) and Royal Australasian College of Physicians' Early Career Fellowship (2022REF00054). ABC (L3 grant 2025379) and SCD (L3 grant 2041755) hold fellowships funded by the NHMRC. ABC and KG have received multiple grants to their institutions from the NHMRC and the Australian Medical Research Future Funds (MRFF) related to studies on Indigenous lung health, asthma, bronchiolitis, chronic cough and bronchiectasis in children and young people. ABC received funds to her institution for being an independent data management committee member for clinical trials of unlicensed vaccines (GlaxoSmithKline and Moderna) and a monoclonal antibody (AstraZeneca); an advisory member of study design for unlicensed products for bronchiectasis (Boehringer-Ingelheim and Zambon), an advisory diversity committee member (Boehringer-Ingelheim) and personal fees from being an author of two UpToDate chapters that are outside the submitted work. SD has received investigator-initiated grants and/or honoria to her institution from GlaxoSmithKline, AstraZeneca, Sanofi-Aventis, Limbic, NHMRC and MRFF, as well as funds to attend a conference from AstraZeneca.

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Nat Commun

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. 2026 Jun 5.

doi: 10.1038/s41467-026-73707-8. Online ahead of print.

Mycobacterium tuberculosis transmission from tuberculosis patients with and without recognized symptoms: a case-contact study in eastern China

Cheng Chen [#1], Xinsong Hu [#1,2], C Robert Horsburgh [3,4,5], Wenjuan Wu [1,2], Chi Chen [1,2], Yan Shao [1], Hui Jiang [6], Zhuping Xu [7], Jun Jiang [8], Qiao Liu [1], Wei Lu [1], Limei Zhu [9], Leonardo Martinez [3]

Affiliations Expand

- PMID: 42248852

- DOI: 10.1038/s41467-026-73707-8

Free article

Abstract

A large number of tuberculosis patients manifest with minimal or no symptoms, and the infectiousness of these individuals is not well characterized. Index cases were consecutively enrolled from the four health centers in Jiangsu Province. Symptoms among index cases were assessed covering the 3 months prior to diagnostic evaluation, in addition to those present at the time of diagnosis. Concurrently, one control community was selected for QuantiFERON screening. Mycobacterium tuberculosis infection was measured through QuantiFERON for all groups. 1,050 contacts of 473 tuberculosis patients, and 560 unexposed controls were included. Asymptomatic tuberculosis among index cases varied from 15% (no symptoms), to 24% (no cough), and 44% (no prolonged cough). The relative risk of QuantiFERON positivity was higher than controls compared to contacts of both asymptomatic (aRR; 2.06; 1.28-3.33) and symptomatic tuberculosis patients (aRR; 2.23; 1.66-3.01). When using alternative QuantiFERON cutoffs, the relative risk was consistently higher among both contact groups compared to controls. When comparing contacts of symptomatic and asymptomatic tuberculosis patients, similar rates of QuantiFERON and ESAT6-CFP10 skin test levels were seen, regardless of the cutoff. This study suggests that tuberculosis patients that are minimally symptomatic or without recognized symptoms may be infectious.

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Conflict of interest statement

Competing interests: The authors declare no competing interests.

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NPJ Prim Care Respir Med

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. 2026 Jun 3.

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How to quickly determine whether patients with chronic cough need corticosteroid treatment--construction of a predictive model for corticosteroid-responsive cough in chronic cough

Baiyi Yi [#1], Haodong Bai [#1], Shujie Li [#1], Tongyangzi Zhang [1], Yiqing Zhu [1], Wenxiu Luo [1], Xianghuai Xu [2], Li Yu [3]

Affiliations Expand

- PMID: 42236714

- DOI: 10.1038/s41533-026-00527-0

Free article

Abstract

Patients with chronic cough need to undergo a wide range of tests and rely on empirical medication to determine the underlying cause. Corticosteroid-responsive cough (CRC) accounts for the majority of the causes of chronic cough, and the diagnostic process is relatively complicated. To develop a predictive model for diagnosis of CRC, which is based on readily available clinical information. A retrospective dataset of 304 cases was used for training, and a prospective dataset of 131 cases was used for temporal single-center validation. Candidate predictors were screened via univariate analysis and refined using LASSO regression. A final multivariable model was constructed through stepwise logistic regression and presented as a clinical nomogram. The model's performance was rigorously evaluated in terms of discrimination (AUC-ROC), calibration (calibration curve), and clinical utility (decision curve analysis). The robustness of the model predictors was further supported by their consistency with the key variables identified by an optimal machine learning model. Of 20 candidate variables based on patient basic information and test results, 7 variables were selected as optimal predictors to establish a CRC prediction model for chronic cough, including reflux symptoms, history of allergic diseases, blood eosinophils, IgE, CRP, FEV_1/FVC, and $FeNO_{50}$. The model demonstrated good discrimination and calibration in both the training set (AUC = 0.900 [0.865,0.935], MAE = 0.017) and the validation set (AUC = 0.840 [0.771,0.909], MAE = 0.046). The results of decision curve analysis revealed that using our models to predict CRC in chronic cough would add more benefit than either the treat-all scheme or the treat-none scheme. The variable selection for the nomogram was further validated by the high degree of agreement with the feature importance rankings derived from the top-performing machine learning model (Random Forest). Our study has developed a nomogram model, along with a simplified version, based on easily accessible clinical information and pulmonary function tests. The model demonstrates strong predictive performance and good calibration, providing clinicians with a rapid aid for initiating targeted treatment.

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Conflict of interest statement

Competing interests: The authors declare no competing interests. Consent to Participate: Informed consent was obtained from all individual participants included in the study.

Supplementary info

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

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NPJ Prim Care Respir Med

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. 2026 Jun 8.

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The European respiratory society guideline for adult bronchiectasis 2025: summary and implementation guide for primary care

Fiona Mosgrove [1 2], Janwillem Wh Kocks [3], Eliza Kompatsiari [3], Alan Timothy [4], Tanja Hedberg [4], Merete B Long [5], Stefano Aliberti [6 7], James D Chalmers [5 8]

Affiliations Expand

- **PMID: 42259823**

- **DOI: 10.1038/s41533-026-00528-z**

Abstract

Bronchiectasis is a common chronic respiratory disease with rising prevalence, hospitalisation rates, and mortality. It is estimated to affect approximately 1 in 200 adults, imposing a substantial symptom burden and significant healthcare costs, largely driven by exacerbations. Although diagnosis and long-term management are usually led by respiratory specialists, most patient care interactions occur in

primary care, including the management of multimorbidity and acute exacerbations. In December 2025, the European Respiratory Society (ERS) published updated global clinical practice guidelines for adult bronchiectasis. This article summarises the 2025 ERS recommendations with a specific focus on their implementation in primary care practice. Key priorities include improving early recognition and reducing diagnostic delay, undertaking standardised investigations to identify underlying causes and treatable traits, and recognising features associated with poor outcomes that warrant specialist referral. The guidance emphasises the importance of sputum microbiology, including testing for non-tuberculous mycobacteria, and targeted blood investigations such as immunoglobulins and allergic bronchopulmonary aspergillosis serology. Core management strategies relevant to primary care are reviewed, including airway clearance techniques, pulmonary rehabilitation, and evidence-based use of inhaled therapies. The article outlines best practice for the management of acute exacerbations, highlights differences from asthma and COPD care, and clarifies the limited role of inhaled corticosteroids in bronchiectasis. The identification and monitoring of patients who may benefit from long-term antibiotic therapy, including those with Pseudomonas aeruginosa infection, are also discussed. By translating specialist guideline recommendations into a primary care context, this summary aims to support timely diagnosis, optimise ongoing management, and improve outcomes for adults with bronchiectasis.

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Conflict of interest statement

Competing interests: J.D. Chalmers reports grants or contracts from AstraZeneca, Boehringer Ingelheim, Gilead Sciences, GlaxoSmithKline, Grifols, Novartis, Insmed, and other industry partners; and consulting or personal fees from AstraZeneca, Boehringer Ingelheim, Chiesi, GSK, Insmed, Novartis, Janssen, Zambon, Antabio, and others, outside the submitted work.S. Aliberti reports receiving research grants and institutional funding from AstraZeneca, Chiesi, GlaxoSmithKline, Insmed, Zambon, Novartis, Boehringer Ingelheim, Menarini, and Pfizer; and personal fees or advisory board honoraria from AstraZeneca, Chiesi, GSK, Insmed, Zambon, Novartis, Boehringer Ingelheim, Menarini, and Pfizer, outside the submitted work.. Kochs reports receiving research funding from Insmed, Zambon, Chiesi, Novartis, AstraZeneca, GlaxoSmithKline, Menarini, and Boehringer Ingelheim; and personal fees or advisory board honoraria from Insmed, Zambon, Chiesi, Novartis, AstraZeneca, GSK, Menarini, and Boehringer Ingelheim, outside the submitted work.FM has received personal fees or advisory board honoraria from AstraZeneca, Chiesi, GSK, Insmed, Trudell and Viatris.

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doi: 10.1136/thorax-2025-224359. Online ahead of print.

Paediatric bronchiectasis phenotypes and their association with clinical outcomes: development and validation in two prospective clinical cohorts

Vikas Goyal [1 2 3 4], Don Vicendese [5 6 7], Keith Grimwood [4 8], Stephanie Yerkovich [9 8], Shyamali Dharmage [5], Anne B Chang [9 2 8]

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Abstract

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Conclusions: We identified and validated three novel paediatric bronchiectasis phenotypes, and linked them to distinct clinical outcomes. These phenotypes might enable targeted interventions and improve participant selection for clinical trials.

Keywords: Bronchiectasis; Child.

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Conflict of interest statement

Competing interests: VG is supported by a Gold Coast Health Clinician Researcher Fellowship (2023-002), Queensland Advancing Research Fellowship (CRF3-2021-no number) and Royal Australasian College of Physicians' Early Career Fellowship (2022REF00054). ABC (L3 grant 2025379) and SCD (L3 grant 2041755) hold fellowships funded by the NHMRC. ABC and KG have received multiple grants to their institutions from the NHMRC and the Australian Medical Research Future Funds (MRFF) related to studies on Indigenous lung health, asthma, bronchiolitis, chronic cough and bronchiectasis in children and young people. ABC received funds to her institution for being an independent data management committee member for clinical trials of unlicensed vaccines (GlaxoSmithKline and Moderna) and a monoclonal antibody (AstraZeneca); an advisory member of study design for unlicensed products for bronchiectasis (Boehringer-Ingelheim and Zambon), an advisory diversity committee member (Boehringer-Ingelheim) and personal fees from being an author of two UpToDate chapters that are outside the submitted work. SD has received investigator-initiated grants and/or honoria to her institution from GlaxoSmithKline, AstraZeneca, Sanofi-Aventis, Limbic, NHMRC and MRFF, as well as funds to attend a conference from AstraZeneca.

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Ann Am Thorac Soc

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. 2026 Jun 8:aaoag152.

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Multi-Omics Analysis Defines Endotypes and Systemic Inflammation in Primary Ciliary Dyskinesia: A Comparison with Healthy Controls

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Abstract

Introduction: Primary ciliary dyskinesia (PCD) is a rare genetic disorder characterized by chronic airway inflammation and progressive lung injury. The inflammatory profile and systemic involvement remain poorly defined. We applied integrated multi omics (transcriptomics, proteomics, and metagenomics) to characterize inflammatory signatures and explore saliva as a noninvasive marker of systemic inflammation. These findings may support improved disease characterization and inform therapy and monitoring.

Methods: This cross sectional, multicenter study included participants with PCD and healthy controls from Houston, Texas; Puerto Rico; and Mexico. Demographic and clinical data were collected in the absence of acute infection. Oral swabs underwent a bulk inflammatory transcriptomic profiling of 590-genes using NanoString nCounter® and microbiome evaluation via metagenomic sequencing. High sensitivity NULISA™ proteomic profiling of 250-proteins was performed on both saliva and plasma, with results correlated across omic layers. Pathway and gene set analyses were conducted using nSolver Advanced Analysis.

Results: Seventy-six participants were enrolled: 51 with PCD and 25 healthy controls. PCD patients, especially those older than 10 years and those with microtubular defects, showed markedly elevated inflammatory gene and protein expression in saliva and plasma. Five inflammatory endotypes were identified: Neutrophilic protease dominant, Dipeptidyl Peptidase 1(DPP-1) profile (78%); neutrophilic recruiting, high-Th17 (71%); eosinophilic dominant, high-Th2 (51%); Th2/Th17-high (47%), and Th2/Th17-low (25%). PCD demonstrated increased neutrophil, and CD45-related gene expression and activation of ten inflammatory pathways, including NF-κB, oxidative stress, T-cell-receptor, TREG, Th17, TNF, Th1, Th2, TGF-B signaling, and TLR ($P < .01$). Saliva and plasma showed strong molecular concordance. Microbiome analysis revealed significant shifts in diversity and abundance linked to inflammatory pathways.

Discussion: These findings show that PCD is characterized by baseline inflammatory activity with marked endotypic heterogeneity, most frequently involving neutrophilic-immune pathways driven by DPP1-associated protease activity and Th17-mediated neutrophil recruitment, while a distinct subset of patients demonstrates a Th2-predominant inflammatory endotype. Salivary inflammatory profiling, which closely mirrors plasma, may offer a practical, non-invasive approach to capturing this patient-level heterogeneity and monitoring systemic immune activity and treatment response, especially with the new anti-inflammatory medications for bronchiectasis.

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Impact of smoking on the treatment cycle and health economics of acute exacerbations of chronic obstructive pulmonary disease

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Abstract

Introduction: Acute exacerbations of chronic obstructive pulmonary disease (COPD) increase disease progression and mortality. Smoking influences treatment and health economics. This study examines how smoking status affects medical costs, hospital stays, and outcomes in acute COPD exacerbations.

Methods: We included 658 patients with acute COPD exacerbations, excluding those with asthma, allergic diseases, bronchiectasis, or tuberculosis. Participants were divided into never smokers (n=218) and smokers (n=440). Smokers were further classified as early smokers (age ≤24 years, n=70) or late smokers (age >24 years, n=370), and as current (n=164) or former smokers (n=276). We used Mann-Whitney U tests, chi-squared tests, and univariate logistic regression ($p<0.05$).

Results: Median hospital stay was 11 days (IQR: 8-16) for smokers versus 10 days (IQR: 7-15) for never smokers (p=0.179). Median daily cost was 1280.63 versus 1182.01 RMB (1000 Chinese Renminbi about US$151.4, mean exchange rate 2018) (p=0.217). However, total treatment costs were higher for smokers (median=13477.81 [IQR: 9096.81-22651.91] vs 12296.95 RMB [7954.42-20392.61]; Hodges-Lehmann difference: 1068.87 RMB, p=0.045). Medicare (government health insurance program in China) payments were higher (12389.82 [7528.24-20366.10] vs 10216.77 RMB [4691.43-17742.65]; difference: 2349.09 RMB, p<0.001), while out-of-pocket payments were lower for smokers (1005.00 [100.00-2500.00] vs 1527.03 RMB [960.00-4686.97]; difference: -600 RMB, p<0.001). Early smokers had higher costs, longer stays (difference: 1.0 day, p=0.019), higher daily costs (difference: 173.2 RMB, p=0.001), and greater out-of-pocket payments (difference: 328.5 RMB, p=0.008) than late smokers. Current smokers had higher Medicare and total expenditures than former smokers (p=0.011 and p=0.010, respectively).

Conclusions: Smoking, especially early smoking, significantly increases the economic burden of acute COPD exacerbations without affecting hospital stay duration.

Keywords: chronic obstructive pulmonary disease acute exacerbation; health economics; smoking; treatment cycle.

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Conflict of interest statement

The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none was reported.

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Reproductive Lifespan and Adult-Onset Bronchiectasis in U.S. Postmenopausal Women: An Investigation of the Women's Health Initiative Cohort

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Abstract

Background: While bronchiectasis disproportionately affects post-menopausal women, the role of reproductive factors in its pathogenesis is not well characterized. We hypothesized that a shorter reproductive lifespan is associated with higher risk of bronchiectasis.

Methods: We studied postmenopausal women in the Women's Health Initiative (WHI) study. The exposures included ages at menarche and menopause, and time between the two (reproductive lifespan). The outcome was the first incidence of bronchiectasis after Medicare enrollment, as reflected in the Medicare Claims Data. Incidence rates were calculated and a series of Cox proportional hazards models controlling for demographics, BMI, smoking, oophorectomy, hormone therapy (HT), oral contraceptives, and comorbid conditions were created.

Results: Cumulative incidence of bronchiectasis in the cohort of 96,996 women was 2.7%. Shorter reproductive lifespan was associated with higher bronchiectasis risk (trend p=0.01). Women with the longest reproductive lifespan (≥40 years) were at 12% lower risk than those with the shortest reproductive lifespan (<30 years; aHR=0.88 [95% CI: 0.77, 0.99]). HT modified this relationship (interaction p=0.04): shorter reproductive lifespan was associated with bronchiectasis risk only in the absence of HT (trend p=0.01). Without HT, women with the reproductive lifespans ≥40 years were at 22% lower risk of bronchiectasis than those with the reproductive lifespans <30 years (aHR=0.78 [95% CI: 0.62, 0.94]). The use of HT was associated with a 19% greater risk of bronchiectasis (p<0.01).

Conclusion: Longer reproductive lifespan is associated with reduced risk of bronchiectasis in post-menopausal women - but only in those without history of HT use.

Keywords: age; bronchiectasis; epidemiology; sex.

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Bone Disease in Non-Cystic Fibrosis Bronchiectasis: Connections, Mechanisms, and Care Gaps

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- **PMID: 42242549**

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Abstract

Topic importance: Non-cystic fibrosis bronchiectasis (NCFB) is a heterogeneous chronic airway disease increasingly recognized worldwide and associated with a substantial burden of extra-pulmonary manifestations. Osteoporosis has emerged as a highly prevalent yet underappreciated comorbidity. Unlike cystic fibrosis, where bone health guidelines exist, no screening or management recommendations are available for NCFB despite overlapping risk factors, including chronic inflammation, malnutrition, hypoxia, medication exposure, and physical inactivity.

Review findings: Reported prevalence of osteoporosis and osteopenia in NCFB varies widely (12-70% and 15-40%, respectively), reflecting disease heterogeneity and differences in study methodology. Mechanisms include persistent systemic inflammation, hypoxemia, nutritional deficiencies, and exposure to inhaled or systemic corticosteroids, all of which disrupt bone remodeling. Emerging contributors, such as microbiome dysbiosis and reduced physical activity, may further drive skeletal fragility. Clinically, osteoporosis in NCFB is linked to greater symptom burden, increased comorbidity, poorer quality of life, higher healthcare costs, and elevated mortality. Despite these consequences, bone health is rarely discussed in bronchiectasis literature, and current comorbidity indices do not include osteoporosis as a prognostic factor.

Summary: This review synthesizes current evidence on the epidemiology, mechanisms, and clinical impact of osteoporosis in NCFB, highlighting significant knowledge gaps and opportunities for early intervention. There is an urgent need

for systematic screening, heightened awareness among pulmonologists and primary care clinicians, and interdisciplinary management approaches. Recognizing and addressing this overlooked comorbidity has the potential to improve outcomes and quality of life for patients with NCFB and to inform future disease-specific guidelines.

Keywords: Bronchiectasis; bone density; osteopenia; osteoporosis; quality of life.

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Post-infectious bronchiolitis obliterans in children: pathogenesis, treatment strategies, and future directions

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- PMID: 42234623

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Abstract

Purpose of review: To provide a comprehensive and updated overview of post-infectious bronchiolitis obliterans (PIBO) in children, focusing on pathogenesis, diagnostic approaches, and current management strategies, while highlighting emerging mechanistic insights and future therapeutic directions.

Recent findings: Recent studies emphasize neutrophilic inflammation, inflammasome activation (e.g., interleukin-18, caspase-1), and genetic susceptibility as key contributors to disease development and progression.

Summary: PIBO is a heterogeneous and often underrecognized chronic lung disease requiring a structured diagnostic approach based on clinical, functional, and radiologic criteria. Management remains largely empirical and supportive, with limited evidence for disease-modifying therapies. Improved understanding of disease mechanisms may enable the development of targeted, phenotype-directed interventions in the future.

Keywords: adenovirus; airway inflammation; bronchiectasis; post-infectious bronchiolitis obliterans; small airways disease.

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Associations between disease factors and clinical outcomes in common variable immunodeficiency: a systematic literature review

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Abstract

Common variable immunodeficiency (CVID) is associated with diverse clinical manifestations. This systematic review aimed to explore associations between disease factors and clinical outcomes in patients with CVID. Eligible studies included patients with CVID and reported associations between disease factors and clinical outcomes (e.g., autoimmune cytopenia, bronchiectasis, infections, lung damage, malignancy, and mortality). Quality assessment was conducted using the Newcastle-Ottawa Scale. Thirty-nine studies met inclusion criteria. The occurrence of lymphadenopathy or splenomegaly was associated with an increased risk of autoimmune cytopenia and lung damage specific to granulomatous-lymphocytic interstitial lung disease; splenomegaly was associated with increased risk of bronchiectasis. Higher levels of switched memory B (smB) cells and marginal zone B cells were associated with reduced risks of lung damage; higher levels of smB cells were associated with a reduced risk of autoimmune cytopenia. Elevated $CD21^{low}$ B cells were associated with increased risks of autoimmune cytopenia, lung damage, and infections. Higher total B cells were associated with lower risk of bronchiectasis and mortality. These findings suggest specific relationships are present between lymphoproliferation markers and B-cell subsets and clinical outcomes in CVID. Limitations including heterogeneity in study designs and low- to moderate-quality evidence underscore the need for additional research to validate these associations.

Keywords: B cells; common variable immunodeficiency (CVID); hepatomegaly; infections; lung damage; lymphoproliferation.

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