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

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BMJ Open

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Can digital self-screening improve identification of chronic dyspnoea in Australian general practice? A proof-of-concept protocol for the BREATHE SMART trial

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Collaborators, Affiliations Expand

- **PMID: 42215269**

- **DOI: 10.1136/bmjopen-2025-110702**

Abstract

Introduction: Chronic dyspnoea is a prevalent and clinically significant symptom, often indicative of underlying cardiorespiratory disease. It is frequently under-reported by patients and under-recognised in primary care, with these challenges exacerbated in rural and remote communities where disease burden is greater and patients experience barriers to timely diagnosis and management. The BREATHE SMART trial aims to implement and evaluate an innovative, fully digital self-

screening system for chronic dyspnoea, integrated into general practice workflows and information technology infrastructure. This approach seeks to enhance early detection and management of chronic cardiorespiratory conditions across diverse practice settings.

Methods and analysis: This multisite proof-of-concept study will test a software platform delivering a preconsultation self-screening questionnaire across 40 general practices in urban, rural and remote Australia. The system identifies eligible patients (≥18 years, consenting to SMS communication with their practice), issues an automated SMS that administers a validated dyspnoea screening questionnaire, and summarises responses for integration into the electronic medical record. Process evaluation will assess acceptability and utility using deidentified audit data, software metrics and qualitative feedback from patients, staff and general practitioners (GPs) via surveys, interviews and focus groups. Approximately 12 000 patients will be screened over 12 months. Primary outcomes will include the proportion completing self-screening and prevalence of chronic dyspnoea and secondary outcomes will include the rate of newly diagnosed chronic dyspnoea-related conditions (ie, asthma, chronic obstructive pulmonary disease and heart failure) in the preceding 12 months and during the intervention period.

Ethics and dissemination: Ethics approval was granted by the University of New South Wales Human Research Ethics Committee (HREC) (iRECS6645) and the University of Notre Dame Australia HREC (2024-155). Participating practices and each GP will provide written, informed consent. All patients being screened will provide electronic informed consent. Results of the study will be disseminated through various forums, including peer-reviewed publications and presentation at national and international conferences. Following the study, participating practices will be provided with a summary of the findings of the study, together with a full copy of any publications and a plain language statement for participants, which will be made available in the practices.

Trial registration number: ACTRN12624001451594.

Keywords: Digital Technology; Primary Care; RESPIRATORY MEDICINE (see Thoracic Medicine).

Conflict of interest statement

Competing interests: None declared.

Supplementary info

Publication types, MeSH termsExpand

Full text links

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Eur J Appl Physiol

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. 2026 May 29.

doi: 10.1007/s00421-026-06278-7. Online ahead of print.

Small airway dysfunction across alpha-1 antitrypsin deficiency genotypes with preserved spirometry

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Affiliations Expand

- PMID: 42213128

- DOI: 10.1007/s00421-026-06278-7

Abstract

Purpose: Alpha-1 antitrypsin deficiency (AATD) is a genetic disorder that generally predisposes to pulmonary emphysema with or without chronic obstructive pulmonary disease (COPD). Despite the lack of spirometric obstruction, early Small Airways Dysfunction (SAD) may occur in AATD patients preceding lung damage.

Methods: We conducted a retrospective, single-center study on 60 AATD patients without airflow obstruction (FEV_1/FVC ≥ 0.70). SAD was defined as: reduced spirometric flows (≥2 of FEF25-75, FEF50, FEF75 <65% predicted) and/or IOS R5-R20 value greater than 0.07 kPa•s•L^{-1}. Correlation and agreement between spirometry and IOS were assessed, as well as associations with Modified Medical Research Council (mMRC) dyspnea scores.

Results: SAD was detected in 23% of patients by spirometry, 10% by IOS, and 13% by both methods. A slight agreement was found between spirometric and IOS criteria (κ = 0.22). Only IOS-defined SAD was significantly associated with dyspnea (mMRC ≥2; p = 0.05), and R5-R20 values correlated with mMRC scores (r = 0.38, p = 0.003). No association was observed between spirometry-defined SAD and symptoms.

Conclusions: These findings support IOS as a partially complementary tool for the early detection of peripheral airway impairment in AATD. Moreover, IOS but not spirometry criteria were related to breathlessness perception in AATD patients without airflow obstruction, with IOS proving to be a clinically more sensitive measure.

Keywords: Alpha-1 antitrypsin deficiency; Impulse oscillometry system; Small airways dysfunction; Spirometry.

Conflict of interest statement

Declarations. Conflict of interest: The authors declare no conflicts of interest.

- **24 references**

Full text links

Cite

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Chest

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. 2026 May 27:S0012-3692(26)00704-X.

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Characterization of CT-Derived Pulmonary Vascular Abnormalities Associated with Pulmonary Hypertension in Chronic Lung Disease

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Affiliations Expand

- **PMID: 42208731**

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Abstract

Background: Pulmonary vascular remodeling is implicated in the pathophysiology of pulmonary hypertension (PH) in chronic lung diseases. Computed tomography (CT) metrics of pulmonary vessels may provide insight into the impact of vessel morphology on PH severity in chronic lung diseases (CLD).

Research question: Are CT-assessed pulmonary vascular abnormalities associated with the presence and severity of PH in chronic obstructive pulmonary disease (COPD) and fibrosing interstitial lung disease (ILD), and how are they related to parenchymal damage?

Methods: We evaluated 117 patients with CLD (63 with COPD and 54 with ILD), and 38 subjects with idiopathic pulmonary arterial hypertension as a comparator group. Patients with COPD and ILD were stratified according to the presence and severity of PH using right heart catheterization. Pulmonary vessel volumes, stratified in arteries and veins, and the extent of emphysema and fibrosis were assessed by volumetric, non-contrast chest CT scans.

Results: Patients with COPD exhibited greater vascular and lung volumes than those with ILD, although they showed lower small-vessel volume when adjusted for lung volume. In both diseases, severe PH was associated with a reduced volume of small arteries normalized to total arterial volume (BV5art/TAV), more pronounced in COPD, who also showed larger central vessel volumes. In COPD, the extent of emphysema did not correlate with either hemodynamic impairment or small-vessel volume. In contrast, in ILD, the extent of fibrosis was unrelated to hemodynamic impairment but was inversely corelated with the volume of small arteries and veins.

Interpretation: COPD and fibrosing ILD exhibit marked differences in pulmonary vessel morphology and their relationship with parenchymal remodeling, suggesting distinct mechanisms underlying PH development. In lung disease, the BV5art/TAV ratio appears to be a sensitive marker of hemodynamically confirmed severe PH, particularly in COPD, reflecting intravascular volume redistribution due to peripheral vessel remodeling.

Keywords: Chronic obstructive pulmonary disease; emphysema; interstitial lung disease; lung fibrosis; pulmonary circulation; pulmonary hypertension; vascular density; vessel remodeling.

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PLOS Digit Health

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Short-term prediction of COPD exacerbations based on wearable vital sign monitoring

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- PMID: 42207714

- DOI: 10.1371/journal.pdig.0001405

Abstract

Early detection of acute exacerbations of chronic obstructive pulmonary disease (AECOPD) remains a critical challenge in COPD management. This study introduces the Bora Vital Sign Standard Score (BVS3), a novel unsupervised statistical score that predicts AECOPD using vital signs collected at home through remote patient monitoring, and retrospectively evaluates its predictive performance in identifying AECOPD ahead of clinician-defined episodes. The eMEUSE-SANTÉ clinical trial (NCT04963192) involved 220 COPD patients who were remotely monitored for six months using a CE-certified (Class IIa) connected wristband measuring oxygen saturation (SpO_2), breathing rate (BR) and heart rate (HR). A total of 42 physician validated exacerbations of COPD with no missing remote monitoring data were documented in 39 patients at a general hospital. Continuous 24-hour monitoring of vital signs using a connected wristband was well accepted over the long term, with a median adherence of 86% indicating strong patient compliance. The BVS3 risk score achieved excellent predictive performance, with an AUC of 0.88 (95% CI 0.83 - 0.92) for moderate and severe AECOPD combined. The BVS3 score anticipated exacerbations an average of 4.4 ± 3.1 days before clinical confirmation, with an overall accuracy of 84.8% and sensitivity of 74% with 85% specificity. Individual Z-scores for heart rate (z-HR), breathing rate (z-BR) and oxygen saturation (z-SpO2) showed specific predictive capabilities for moderate and severe events, yielding AUCs of 0.83, 0.82 and 0.71 respectively, but with inferior performances compared with the combination of the 3 vital signs Z-scores. These results demonstrate that integrating passive remote monitoring with unsupervised statistical modeling provides a scalable, high-compliance approach to AECOPD detection. The interpretable BVS3 risk score achieves good accuracy and anticipation for AECOPD prediction with minimal patient burden. By enabling earlier intervention, this end-to-end digital solution could significantly improve patient outcomes through proactive disease management.

Conflict of interest statement

YG and MP are co-founders and employees of Biosency. FT and SL are employees of Biosency and are named inventors on patents WO2024153532A1 and

EP4403096A1 issued to Biosency. SB is an employee of Biosency. JP, NR, and GC serve as members of Biosency's scientific advisory board. All other authors have declared that no competing interests exist.

Full text links

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ERJ Open Res

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Prognostic value of gait speed for exacerbations and mortality in COPD

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Affiliations Expand

- PMID: 42206019
- PMCID: PMC13202360
- DOI: 10.1183/23120541.01155-2025

Abstract

Background: Gait speed, a key component of exercise capacity, has been underutilised in COPD, despite its prognostic potential. We aimed to evaluate the association between gait speed and clinical outcomes in COPD using 3-year longitudinal data from the Korean COPD Subgroup Study cohort.

Methods: Poor gait speed (<1.0 $m \cdot s^{-1}$) was defined by usual pace during the 6-min walk test per Asian Working Group for Sarcopenia 2019 criteria. Lung function, symptoms, acute exacerbations (AEs) and mortality were compared between gait speed groups. Analyses included propensity score-matching, quartile classification, subgroup analyses and longitudinal trajectory modelling using random coefficient models.

Results: Among 2063 participants, poor gait speed (n=831, 40.3%) was associated with older age, higher symptom burden and more previous AEs despite similar lung function. This group showed higher AE risk and frequency than the normal-speed group: adjusted odds ratios 1.37-1.45 for moderate and 1.64-1.65 for severe AEs; adjusted incidence rate ratios 1.24-1.36 for moderate and 1.63-1.86 for severe AEs. The 3-year mortality was significantly higher in the poor-gait-speed group (adjusted hazard ratio 2.30, 95% CI 1.42-3.73). Longitudinally, the poor-gait-speed group demonstrated persistently worse COPD Assessment Test (CAT) and St George's Respiratory Questionnaire for COPD scores at baseline, with modest CAT worsening over time (+0.44 point/year, p=0.01), while lung function decline was similar.

Conclusions: Gait speed provides a simple, integrative marker that independently predicts exacerbation risk, mortality and symptom progression in COPD.

Conflict of interest statement

Conflict of interest: All authors report no conflicts of interest.

- **40 references**
- **4 figures**

Full text links

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ERJ Open Res

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. 2026 May 26;12(3):01102-2025.

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Diaphragm ultrasound and surface electromyography as predictors of clinical deterioration in acute exacerbations of COPD: a prospective observational study

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- **PMID: 42206018**

- PMCID: PMC13202368

- DOI: 10.1183/23120541.01102-2025

Abstract

Introduction: Acute exacerbations of COPD without respiratory acidosis lack reliable and practical physiological markers to monitor treatment response or predict clinical deterioration.

Methods: In this prospective observational study, 51 hospitalised acute exacerbations of COPD (AECOPD) patients without respiratory acidosis underwent diaphragm ultrasound and surface electromyography within 48 h of admission and at discharge. Associations between study parameters and dyspnoea (Borg scores and modified Medical Research Council scales) were assessed, and their predictive value for clinical outcomes (progression to noninvasive ventilation or in-hospital death, and 30-day readmission).

Results: An increase in diaphragm excursion during maximal inspiration associated weakly, yet significantly, with improvements in Borg scores (r_s=-0.365, p=0.011). A higher diaphragmatic excursion tidal breathing/maximal inspiration ratio at admission was associated with in-hospital deterioration (OR per 0.1-unit increase 1.59, 95% CI 1.05 to 2.41; p=0.029) and exploratory analysis suggested discriminative value of the excursion-to-surface electromyography (sEMG) ratio (0.941, 95% CI 0.855 to 1.000; p=0.013), although interpretation is limited by few events. Higher Borg scores (OR 2.19, 95% CI 1.22 to 3.94; p=0.009) and lower thickening fraction (area under the receiver operating characteristic curve 0.807, 95% CI 0.687 to 0.927; p=0.004) at discharge were independently associated with 30-day readmission.

Conclusion: Bedside ultrasound and sEMG provide potential physiological markers associated with clinical deterioration in non-acidotic AECOPD patients. These exploratory findings suggest a role in identifying at-risk patients and guiding personalised care. Validation in larger cohorts with more events is needed. Furthermore, we found that short-term readmission risk may be predicted by a simple bedside question: "How breathless do you feel right now?"

Conflict of interest statement

Conflict of interest: M.L. Duiverman and E. Oppersma received a research grant unrelated to this research from NWO (Nederlandse Organisatie voor Wetenschappelijk Onderzoek) with co-funding from Löwenstein BV, Vivisol Nederland BV and Sencure BV. The other authors have nothing to disclose.

- 35 references

- 4 figures

Full text links

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ERJ Open Res

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A randomised controlled trial of EP395, a novel anti-inflammatory macrolide, in stable COPD patients

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Affiliations Expand

- PMID: 42206016
- PMCID: PMC13202357
- DOI: 10.1183/23120541.00782-2025

Abstract

Background: Macrolide antibiotics have immunomodulatory activity and when taken chronically reduce exacerbations of COPD. However, chronic use can cause bacterial resistance. EP395 (glasmacinal), a novel macrolide, is being developed as a treatment to reduce exacerbations of COPD without inducing antimicrobial resistance.

Methods: In this double-blind, placebo-controlled, phase 2a trial (NCT05572333), patients (≥45 years old, diagnosed with COPD for ≥2 years and stable on at least one maintenance inhaled therapy) were randomised (2:1) to EP395 or placebo daily for 12 weeks. The primary objective was safety, with key secondary objectives assessing pharmacodynamic effects of EP395.

Results: A total of 61 patients were randomised (42 EP395, 19 placebo). A 12-week course of EP395 was well tolerated: no serious adverse events were considered related to EP395, and adverse events occurred in similar proportions in both groups (64.3% EP395, 63.2% placebo). Four patients were withdrawn due to adverse events

(three EP395, one placebo). Sputum neutrophil elastase and myeloperoxidase, mediators of neutrophil activation, were reduced with EP395 (treatment difference (log scale): neutrophil elastase -0.415 ng·mL^{-1}, 95% CI -0.787 to -0.043 ng·mL^{-1}, p=0.030; myeloperoxidase -0.282 ng·mL^{-1}, 95% CI -0.640 to 0.076 ng·mL^{-1}, p=0.119). Relative changes in neutrophil elastase and myeloperoxidase from baseline with EP395 were 66% and 75%, respectively, of those observed with placebo. Exploratory 16S rRNA sequencing of sputum showed EP395 had no detectable effect on the lung microbiome, including the proportion of pathogenic Proteobacteria species.

Conclusion: In patients with stable COPD, EP395 for 12 weeks was well tolerated, demonstrated selective anti-inflammatory activity and had no detectable effect on the lung microbiome.

Conflict of interest statement

Conflicts of interest: H. Watz, S. Korn, O. Kornmann, D. Singh and T. Wilkinson were investigators in this trial. H. Watz has received honoraria for lectures, advisory board meetings and consulting from AstraZeneca, Boehringer Ingelheim, Chiesi, EpiEndo, GlaxoSmithKline, Sanofi, Roche and Verona Pharma; his institution is reimbursed for the conduct of clinical trials by AstraZeneca, Boehringer Ingelheim, Bayer, BMS, Chiesi, EpiEndo, GlaxoSmithKline, Sanofi, Roche and Verona Pharma. S. Korn has received honoraria for lectures, advisory board meetings and consulting from AstraZeneca, Chiesi, GlaxoSmithKline, Sanofi and Roche. O. Kornmann has received honoraria for lectures, advisory board meetings and consulting from AstraZeneca, GlaxoSmithKline, Novartis and Sanofi. D. Singh has received personal fees from Adovate, Aerogen, Almirall, Apogee, Arrowhead, AstraZeneca, Bial, Boehringer Ingelheim, Chiesi, Cipla, CONNECT Biopharm, Covis, CSL Behring, DevPro Biopharma LCC, Elpen, Empirico, EpiEndo, Genentech, Generate Biomedicines, GlaxoSmithKline, Glenmark, Kamada, Kinaset Therapeutics, Kymera, Menarini, MicroA, OM Pharma, Orion, Pieris Pharmaceuticals, Pulmatrix, Revolo, Roivant Sciences, Sanofi, Synairgen, Tetherex, Teva, Theravance Biopharma, Upstream and Verona Pharma. T. Wilkinson has received research funding and/or consultancy fees from AstraZeneca, Biomerrieux, Bergenbio, Enanta, EpiEndo, GlaxoSmithKline, Janssen, my mhealth, Roche, Sanofi and Synairgen. K. Hanrott and V. Norris are employees of EpiEndo Pharmaceuticals and are included in the company's Employee Stock Option Plan. K.J. Staples received a grant from EpiEndo during the conduct of the trial, and from AstraZeneca outside of the conduct of the trial. J. Ackland reports no conflicts of interest.

- 26 references
- 2 figures

BMC Nephrol

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. 2026 May 27.

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Impact of CKD and COPD co-existence on mortality, vascular dementia, and Alzheimer's dementia; a comparative cohort study

Lino Merlino [1 2 3], Francesco Rainone [4 5], James Tollitt [4 5], Rajkumar Chinnadurai [5], Francesca Rusconi [6], Gema Hernandez [6], Graziana G Battini [7], Paolo M Colombo [8], Stuart Stewart [5 9], Ross A Dunne [10 11], Philip A Kalra [5]

Affiliations Expand

- PMID: 42204658

- DOI: 10.1186/s12882-026-05076-9

Free article

Abstract

Background: Chronic kidney disease (CKD) and chronic obstructive pulmonary disease (COPD) are common conditions associated with increased risks of mortality and cognitive impairment. However, the association between COPD and dementia outcomes in patients with CKD remains incompletely understood.

Methods: We conducted a retrospective observational cohort study using the TriNetX Global Collaborative Network, including patients aged 18-80 years with CKD stages 3-5, excluding those with prior dialysis, transplantation, dementia, or mild cognitive impairment before cohort entry. Two cohorts were identified: CKD with COPD, defined using classical ICD-10 COPD codes (J41-J44), and CKD without COPD. A secondary sensitivity analysis used a broader respiratory disease definition including asthma, bronchiectasis, and other chronic respiratory conditions. Cohorts were propensity score matched (1:1) for demographic characteristics, comorbidities, smoking exposure, and laboratory parameters. Outcomes included all-cause mortality, non-Alzheimer's dementia, and Alzheimer's disease, assessed over a maximum follow-up of 5 years using Kaplan-Meier and Cox proportional hazards analyses.

Results: Two cohorts were identified: CKD with COPD (n = 270 566) and CKD without COPD (n = 821 399). After propensity score matching, 234 317 patients remained in each cohort. CKD with COPD was associated with a higher observed risk of mortality compared with CKD alone (18.5% vs. 14.5%; HR 1.17; 95% CI 1.16-1.19; p < 0.001). The composite outcome of non-Alzheimer's dementia was also more frequent in the CKD with COPD cohort (4.6% vs. 3.9%; HR 1.07; 95% CI 1.04-1.10; p < 0.001). No significant association was observed for vascular dementia

alone or mild cognitive impairment alone. Alzheimer's disease incidence was low in both cohorts, and lower observed hazards were identified in the COPD cohort (HR 0.85; 95% CI 0.80-0.91; p = 0.002), although these findings should be interpreted cautiously given the relatively short follow-up and higher competing mortality in the COPD cohort.

Conclusions: Among patients with CKD, coexisting COPD was associated with higher observed risks of mortality and non-Alzheimer's dementia during follow-up. Further longitudinal studies with longer follow-up and competing-risk methodology are warranted.

Keywords: Chronic kidney disease; Chronic obstructive pulmonary disease; Dementia; Mortality; TriNetX.

Conflict of interest statement

Declarations. Ethics approval and consent to participate: This analysis is a non-interventional, retrospective study utilising data obtained from TriNetX, LLC ("TriNetX") and conducted in accordance with ethical guidelines aligned with the Declaration of Helsinki, the International Conference on Harmonization, and Good Clinical Practice. TriNetX is a global federated health research network providing access to EMRs from HCOs worldwide. Research studies utilising TriNetX do not require ethical approval as part of a federated network. Participating HCOs' identities to each dataset are kept confidential, adhering to ethical norms and regulatory frameworks that prevent data re-identification. The TriNetX platform uses only aggregated counts and statistical summaries of deidentified information. No Protected Health Information or personal data is accessible to platform users. All data collection, processing, and transmission comply with applicable Data Protection laws for the contributing HCOs, including the EU Data Protection Law Regulation 2016/679, the General Data Protection Regulation regarding the protection of individuals in relation to personal data processing, and the Health Insurance Portability and Accountability Act (HIPAA), the US federal law protecting the privacy and security of healthcare data. Individual personal data does not leave the HCO. TriNetX is ISO/IEC 27001: 2022 certified and maintains a robust IT security program to protect personal and healthcare data. This retrospective study is exempt from informed consent. The data reviewed constitutes a secondary analysis of existing data and does not involve intervention or interaction with human subjects, and it is deidentified per the deidentification standard defined in Section § 164. 514 (a) of the HIPAA Privacy Rule. The process of deidentifying the data is validated through a formal determination by a qualified expert as outlined in Section § 164. 514 (b) (1) of the HIPAA Privacy Rule, with this determination refreshed in December 2020. Consequently, the study was deemed exempt from Institutional Review Board (IRB) oversight and did not necessitate patient consent. Consent for publication: Not applicable. Competing interests: The authors declare no competing interests.

Cite

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Ann Am Thorac Soc

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Inhaler Technique in Chronic Obstructive Pulmonary Disease: Patient Impairments and Bronchodilation

Donald A Mahler [1 2], Sergio Martinez [3], Thomas M Siler [4], Surya P Bhatt [5], Alexander G Duarte [6], Jill A Ohar [7], Lingyue Gong [8], Radhika Shah [9], Jessica L Curran [10], Frank Sciurba [11]

Affiliations Expand

- PMID: 42203682

- DOI: 10.1093/annalsats/aaoag140

Abstract

Rationale: Despite worldwide use of handheld delivery systems in the treatment of chronic obstructive pulmonary disease (COPD), evidence is limited about how patient factors affect inhaler technique with each device type.

Objectives: To assess whether impairments in cognitive function, manual dexterity, and inhalational ability are independently associated with inhaler technique; and to examine whether inhaler technique affects bronchodilation.

Methods: In this multi-centre, prospective, cohort study, stable out-patients with COPD were enrolled based on use of handheld maintenance bronchodilator inhaler(s). At visit 1, demographic information and inhaled COPD medications/delivery systems were recorded. Subjects returned 2 to 21 days later and were instructed to bring in, but not use their inhaler(s) on the day of Visit 2. Spirometry and peak inspiratory flow against a medium-low resistance (PIFr) were measured. Subjects used their handheld maintenance bronchodilator inhaler(s) "as you do at home" and were observed/critiqued on a standardized checklist. Mini-Mental State Examination (MMSE) and the Functional Dexterity Test (FDT) were measured, and spirometry was repeated 30 minutes after patient inhalation.

Results: Of 503 patients, age was 70 ± 6 years, 55% were male, post-bronchodilator forced expiratory volume in one second (FEV1) was 46 ± 15% predicted. 71% had acceptable inhaler technique (4 or 5 items satisfactory). Cognitive impairment (MMSE score < 24; 10.3% prevalence), non-functional manual dexterity (FDT > 50

seconds; 34.8% prevalence), and suboptimal peak inspiratory flow (<60 L/min; 20.5% prevalence) were independently associated with unacceptable inhaler technique (≥2 items unsatisfactory). Compared with baseline, FEV1 increased by 105 ± 7 ml and 69 ± 13 ml in patients with acceptable and unacceptable inhaler technique, respectively. Of the five technique items, only satisfactory performance of "Hold your breath" showed statistical increases in lung function compared with not satisfactory performance.

Conclusions: In stable out-patients with COPD, cognitive impairment, non-functional manual dexterity, and suboptimal PIFr were each associated with unacceptable inhaler technique. Those with acceptable inhaler technique achieved greater increases in lung function at 30 minutes after inhalation of their maintenance handheld bronchodilator inhaler(s). "Hold your breath" was the only technique item associated with bronchodilation and was related to patient cognitive function.

Keywords: chronic obstructive pulmonary disease; cognitive function; inhaler technique; manual dexterity; peak inspiratory flow.

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Drug Ther Bull

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Dupilumab in chronic obstructive pulmonary disease

No authors listed

- PMID: 42203490

- DOI: 10.1136/dtb.2026.000013

No abstract available

Keywords: Pulmonary Disease, Chronic Obstructive; Secondary Care.

Conflict of interest statement

Competing interests: None declared.

Full text links

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Review

Eur Respir Rev

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doi: 10.1183/16000617.0231-2025. Print 2026 Apr.

Implementation of long-term noninvasive positive airway pressure therapy in patients with COPD: a systematic review and meta-analysis of acceptance and adherence

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Affiliations Expand

- **PMID: 42203234**
- **PMCID: PMC13213465**
- **DOI: 10.1183/16000617.0231-2025**

Abstract

Background: Long-term noninvasive positive airway pressure (PAP) therapy is an effective, albeit complex, intervention for obstructive sleep apnoea (OSA) and/or chronic hypercapnic respiratory failure (CHRF) in patients with chronic obstructive pulmonary disease (COPD). PAP uptake and use is often reported in studies

designed for other purposes. Systematic review methods were used to summarise acceptance of and adherence with PAP therapy.

Methods: A systematic search for studies that reported the proportion of patients that either declined or accepted PAP therapy and/or objective use of newly prescribed PAP therapy in patients with COPD was conducted according to a predefined protocol (PROSPERO CRD42021259262). Meta-analysis and meta-regression techniques were used to establish summary effect estimates and explore heterogeneity.

Results: On average, PAP therapy was declined or discontinued by 14% (95% CI 10-19) of participants, often within 6 weeks of initiation among studies reporting repeated measures. The pooled median adherence was 6.3 $h \cdot day^{-1}$ (95% CI 5.9-6.6). While meta-regression found higher acceptance (p=0.03) and shorter use per day (p<0.01) for the indication of OSA *versus* CHRF, this explained only some heterogeneity in the summary effect estimates. Summary of study-level variables associated with acceptance or adherence highlighted limitations in the available literature.

Conclusions: An anticipated six out of seven patients with COPD newly prescribed PAP therapy will be successful using therapy; however, heterogeneity was substantial among studies, and only partly explained by indication for use. Prospective studies to explore barriers to use and detailed reporting of acceptance and adherence in studies on PAP therapy in patients with COPD are needed.

Conflict of interest statement

Conflict of interest: The authors have no conflicts of interest to declare.

- 119 references
- 6 figures

Supplementary info

Publication types, MeSH termsExpand

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Cite

12

Review

Respir Med

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. 2026 May 26:259:108917.

doi: 10.1016/j.rmed.2026.108917. Online ahead of print.

Mucus plugs in COPD and cardiovascular mortality: An emerging risk pathway and the therapeutic potential of mucolytic strategies

Mario Cazzola [1], Luigino Calzetta [2], Vincenzo Parente [3], Paola Rogliani [4], Maria Gabriella Matera [3]

Affiliations Expand

- PMID: 42203184

- DOI: 10.1016/j.rmed.2026.108917

Abstract

Airway mucus plugging is an underrecognized feature of COPD that is increasingly associated with adverse outcomes, including higher mortality rates. Computed tomography studies demonstrate that mucus plugs are prevalent, variable, and frequently persistent or dynamic over time. The presence of mucus plugs is independently linked to a worse prognosis, even after adjusting for cardiovascular and respiratory risk factors. Patients with mild COPD appear to be at particularly high risk, suggesting that mucus plugging may represent an early and potentially modifiable disease trait. Mucus plugging contributes to COPD progression through several mechanisms, including airflow obstruction, ventilation/perfusion mismatch, hypoxemia, airway inflammation, and increased susceptibility to infectious exacerbations. These exacerbations are strongly associated with acute cardiovascular events caused by systemic inflammation, endothelial dysfunction, and vascular stress. Additionally, chronic hypoxia and inflammatory signaling related to mucus dysfunction may independently increase cardiovascular risk. Within the "treatable traits" framework, mucus dysfunction is an important therapeutic target. Mucolytic and mucoactive therapies aim to improve mucus properties and clearance, which could reduce exacerbations and their systemic consequences. Some meta-analytic evidence suggests that, among thiol-based mucolytics, erdosteine is the most effective at reducing exacerbation frequency and duration. It also demonstrates antioxidant and anti-inflammatory effects that may influence systemic disease pathways. However, its comparative advantages over other agents remain uncertain. This narrative review summarizes the current evidence regarding the epidemiology, pathophysiology, and clinical implications of mucus plugging in COPD, with a focus on the proposed mucus plug-exacerbation-cardiovascular event axis and the potential role of mucus-directed therapies.

Conflict of interest statement

Declaration of competing interest Mario Cazzola, Luigino Calzetta, and Paola Rogliani were consultants for Edmond Pharma, which manufactures erdosteine. Mario Cazzola is a consultant for PIAM Farmaceutici, which markets erdosteine. Cazzola is the deputy editor, Calzetta is an associate editor, and Rogliani is an editorial board member of Respiratory Medicine. Neither Cazzola, Calzetta, nor Rogliani are involved in selecting peer reviewers for the manuscript or making any subsequent editorial decisions.

Supplementary info

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Respir Med

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. 2026 May 26:259:108895.

doi: 10.1016/j.rmed.2026.108895. Online ahead of print.

Impact of concurrent COPD and cardiovascular disease on mortality

Hyun Woo Lee [1], Sang Hyuk Kim [2], Chin Kook Rhee [3], Deog Kyeom Kim [1], Joon Young Choi [4]

Affiliations Expand

- **PMID: 42203183**

- **DOI: 10.1016/j.rmed.2026.108895**

Abstract

Background: Chronic obstructive pulmonary disease (COPD) and cardiovascular disease (CVD) frequently coexist and share common risk factors. However, the mortality burden associated with their co-occurrence has not been fully characterized at the population level, particularly with respect to cause-specific and absolute risks.

Methods: We conducted a population-based cohort study using data from UK Biobank. Participants were classified into four groups according to baseline COPD

and CVD status. The primary outcome was all-cause mortality, and secondary outcomes included respiratory, cardiovascular, and lung cancer mortality. Multivariable Cox proportional-hazards models and competing-risk analyses were used to estimate adjusted hazard ratios (HRs). Absolute risks, risk differences, and numbers needed to harm (NNH) were calculated to quantify excess mortality burden.

Results: Among 293,948 participants followed for a median of 12.9 years, 3.9% had coexisting COPD and CVD at baseline. Compared to participants without either condition, those with both had a markedly increased risk of all-cause mortality (adjusted HR, 2.207 [95% confidence interval, 2.113-2.305]). Risks of respiratory-specific and cardiovascular-specific mortality were also substantially elevated. Although the COPD/CVD interaction was less than multiplicative on the HR scale, the absolute mortality burden was greatest among participants with both conditions. At 10 years, the excess absolute risk of all-cause mortality associated with coexisting COPD and CVD was 13.9 percentage points, corresponding to an NNH of 7.2.

Conclusion: Coexisting COPD and CVD defines a distinct high-risk phenotype with a significantly increased absolute burden of all-cause and cause-specific mortality, underscoring the need for integrated cardiopulmonary risk management.

Conflict of interest statement

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

Cite

14

Respir Med

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Acute COPD Exacerbation and long-term cardiopulmonary outcomes: Real-world EXACOS-CP evidence study in Israel

Samah Hayek [1], Uri Gottlieb [2], Nir Treves [3], Roni Yahalom [3], Kirsty Rhodes [4], Idit Livnat [3], Adva Yarden [3], Josh Silverbeck [2], Claudia Cabrera [5], Donna R Zwas [6], Neville Berkman [7]

Affiliations Expand

- PMID: 42203182

- DOI: 10.1016/j.rmed.2026.108913

Abstract

Background: Chronic obstructive pulmonary disease (COPD) is a common and debilitating respiratory disease. Acute exacerbations of COPD (AECOPD), characterized by a sudden worsening of symptoms, are associated with cardiovascular (CV) morbidity and mortality. However, their impact on cardiopulmonary outcomes (CP) has not been evaluated in Israel.

Study objective: To determine the association between AECOPD and risk of CP outcomes in newly diagnosed COPD patients and to estimate incidence rates across time intervals and exacerbation severity.

Study design and methods: This retrospective cohort study analyzed data from Clalit Health Services database. Patients aged ≥40 years who were newly diagnosed with COPD between 2010 and 2019 were included. Those who experienced a first moderate or severe AECOPD were compared to those without prior exacerbations. Matching (1:1) on COPD duration, and inverse probability weighting (IPW) further balanced baseline characteristics between groups. Cox proportional hazards models estimated hazard ratios (HRs) with 95% Confidence Interval (CI).

Results: The matched cohort comprised 51,480 patients. In the IPW-analysis, AECOPD was associated with an increased risk of composite CP event (HR 1.19; 95% CI: 1.16-1.23), CV events (HR 1.12; 95% CI: 1.08-1.16), respiratory outcomes (HR 1.35; 95% CI: 1.30-1.39), severe AECOPD (HR 1.51; 95% CI: 1.44-1.58), mechanical ventilation (HR 1.58; 95% CI: 1.43-1.75), and acute respiratory failure (HR 1.82; 95% CI: 1.65-2.01).

Conclusions: Moderate or severe AECOPD significantly increases the risk of CP complications, especially respiratory events. These findings underscore the need for proactive, multidisciplinary management and close follow-up after an exacerbation.

Keywords: Cardiopulmonary; Chronic obstructive pulmonary disease; Exacerbations; Heart disease; Pulmonary disease.

Conflict of interest statement

Declaration of competing interest N.T., R.Y, K.R., I.L, C.C, A.Y, are employees of AstraZeneca and may own AstraZeneca stock and/or options. N.B. received consultation fees from Astra Zeneca for the design and data interpretation part in

the project. S.H., U.G., J.S. are employees of Clalit Health Services. Clalit Research Institute received funding from AstraZeneca to support the execution of this study.

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15

Pulmonology

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From trials to clinical practice: Effect of Dupilumab on disease stability in severe COPD. A pilot study

Gabriella Guarnieri [1], Michela Pozza [1], Leonardo Bertagna De Marchi [2], Andrea Vianello [1]

Affiliations Expand

- **PMID: 42187235**
- **DOI: 10.1080/25310429.2026.2679849**

Free article

No abstract available

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16

Eur J Intern Med

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doi: 10.1016/j.ejim.2026.106965. Online ahead of print.

Heart failure and COPD - guideline adherence, diagnostic characterisation and treatment quality

Delphine Vauterin [1], Nathaniel M Hawkins [2], Leonardo M Fabbri [3], Lies Lahousse [4]

Affiliations Expand

- PMID: 42185148

- DOI: 10.1016/j.ejim.2026.106965

No abstract available

Conflict of interest statement

Declaration of competing interest Outside this manuscript, LL has been consulted as expert for AstraZeneca, GlaxoSmithKline and Sanofi, has received support for travel by AstraZeneca and Menarini, and has given lectures sponsored by Chiesi, Johnson and Johnson services INC, IPSA vzw and Domus Medica vzw (non-profit organizations facilitating lifelong learning for health care providers), all paid to her institution and outside the scope of this manuscript. LMF declares consulting fees from Chiesi, GlaxoSmithKline, AstraZeneca, Menarini Foundation, Novartis, Pfizer and Verona Pharma, payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events from Chiesi, GlaxoSmithKline, Glenmark, Lusofarmaco and Sanofi and participation in a Data Safety Monitoring Board or Advisory Board for Chiesi, Novartis and ICON. LMF declares to have received support for attending meetings and/or travel from Menarini Foundation and European Respiratory Society. NMH declares clinical trial funding, consulting fees and payment or honoraria for lectures, presentations, speakers bureaus, manuscript writing or educational events from AstraZeneca. All are outside the scope of the current manuscript. All other authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Supplementary info

Publication typesExpand

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17

Review

Jpn J Radiol

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. 2026 May 25.

doi: 10.1007/s11604-026-02017-2. Online ahead of print.

Chest CT imaging toward personalized management of chronic obstructive pulmonary disease, asthma, and bronchiectasis: pulmonologist perspectives

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Affiliations Expand

- PMID: 42183930

- DOI: 10.1007/s11604-026-02017-2

Abstract

Chronic airway diseases, including chronic obstructive pulmonary disease (COPD), asthma, and bronchiectasis, impose substantial morbidity and mortality worldwide. Precise phenotyping of their complex pathophysiological manifestations is essential for effective management. Chest computed tomography (CT) allows qualitative and quantitative assessments of emphysema, airway structure, mucus plugs, vascular abnormalities, bronchiectasis, and comorbid interstitial lung abnormality, making it central to charactering these conditions. From perspectives of pulmonologists who use chest CT with guidance from radiologists, this review describes the advances in CT image analysis and their implications for patients with chronic airway disease. On inspiratory CT, low-attenuation regions reflect emphysema and are associated with clinical outcomes in smokers. Airway lumen, wall size, branch count, and fractal dimension correlate with disease severity and lung function impairment in COPD and asthma. Airway mucus plugs reflect inflammatory patterns and are associated with reduced lung function and exacerbations; however, mucus plugs are increasingly recognized as a treatable trait in the era of biologics treatment. Pulmonary vascular abnormalities are quantified using pulmonary artery-to-aorta diameter ratio and small vessel volume proportions. Along with chronic symptoms, bronchiectasis is diagnosed radiologically by an increased broncho-arterial ratio, absent bronchial tapering, and peripheral airway visibility. Although limited spatial resolution precludes direct evaluation of small airway disease, air-trapping on expiratory CT or registered Inspiratory-expiratory CT allows indirect estimation of small airway disease. Despite these advances, many research findings remain unapplied to routine clinical image

analysis. Radiation exposure is an inherent limitation. Nonetheless, chest CT provides greater diagnostic information than chest radiography and is more accessible than magnetic resonance imaging and nuclear imaging. Further studies are needed to maximize the potential of chest CT for early detection, risk stratification, and treatment monitoring in airway disease management.

Keywords: Asthma; Bronchiectasis; COPD; Computed tomography; Imaging; Mucus plug.

Conflict of interest statement

Declarations. Competing interests: The authors declare no conflict of interest related to this review. Ethics approval: Not applicable. Informed consent: Not applicable.

- **227 references**

Supplementary info

Publication typesExpand

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18

Review

Radiographics

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. 2026 Jun;46(6):e250167.

doi: 10.1148/rg.250167.

Imaging Findings of Smoking-related Pulmonary Parenchymal Disease

Gonzalo Dulcich [1], Marcos Mestas Nuñez [2], Tami J Bang [3], Flavio Zuccarino [2], Rocio Perez-Johnston [4], Carlyne Cool [5], Daniel Vargas [4]

Affiliations Expand

- **PMID: 42166347**

- DOI: 10.1148/rg.250167

Abstract

Cigarette smoking is a major cause of parenchymal lung disease, with a wide range of imaging findings that radiologists must be able to recognize. These include chronic obstructive pulmonary disease (COPD) and a group of diffuse interstitial lung diseases (ILDs) collectively referred to as smoking-related ILDs (SR-ILDs), which encompass inflammatory and fibrotic processes induced by smoking. Although many of these conditions exhibit characteristic imaging features, significant overlap is common, and multiple entities may coexist in the same patient and add difficulty to the diagnostic process. The distinction between SR-ILDs and other ILDs is critical, as they differ in behavior, prognosis, and management. CT of the chest plays a pivotal role in allowing radiologists to identify characteristic features, distinguish overlapping patterns, and guide multidisciplinary evaluation. The authors provide a comprehensive review of smoking-related parenchymal lung diseases, focusing on clinical, histopathologic, and especially radiologic features. The authors also review emerging inhalation injuries associated with e-cigarette and marijuana use, which further expand the spectrum of imaging findings. Radiologist awareness of these imaging manifestations is essential for improving diagnostic accuracy and guiding appropriate management. ©RSNA, 2026 Supplemental material is available for this article.

19

Respir Med

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doi: 10.1016/j.rmed.2026.108863. Epub 2026 Apr 28.

The association of dyspnea and fatigue severity with physical activity and physical capacity in patients with COPD

Thais Moçatto Tofoli [1], Britt Dorssers [2], Anouk W Vaes [3], Banchia Palmen [2], Daisy J A Janssen [4], Laís Santin [5], Fabio Pitta [5], Alex J Van't Hul [6], Martijn A Spruit [2]

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- **PMID: 42061476**

- **DOI: 10.1016/j.rmed.2026.108863**

Free article

Abstract

Background: It is well-established that dyspnea and fatigue are barriers to physical activity (PA) and have a negative effect on physical capacity (PC) in individuals with chronic obstructive pulmonary disease (COPD). However, it remains unclear how those symptoms interact on physical function and whether one holds dominance over the other.

Aim: To compare physical activity and physical capacity of individuals with COPD with different severities of fatigue and dyspnea symptoms, and to identify the dominant limiting symptom of physical function.

Methods: In this cross-sectional study, individuals with COPD visiting an outpatient clinic were assessed for dyspnea (mMRC dyspnea) and fatigue (CIS-Fatigue). Key outcomes were PC (6-min walk distance, 6MWD) and daily PA (steps/day). Individuals were stratified into four groups based on severe dyspnea (yes/no, mMRC dyspnea ≥2) and/or severe fatigue (yes/no, CIS-Fatigue ≥36 points).

Results: 549 individuals with COPD (55% men, 64 ± 9 years, FEV_1 58 ± 18) were analyzed and classified as: Low dyspnea/low fatigue (LD/LF n = 186, 34%), low dyspnea/severe fatigue (LD/SF, n = 123, 22%), severe dyspnea/low fatigue (SD/LF, n = 71, 13%), severe dyspnea/severe fatigue (SD/SF, n = 169, 31%). The groups SD/LF and SD/SF had significantly worse 6MWD (413 ± 94 and 376 ± 107 m, respectively) and lower levels of daily PA (4183 [2382-6087] and 3470 [2114-5056] steps/day, respectively) when compared to the LD/LF and LD/SF groups (479 ± 75 and 475 ± 93 m; 6466 [4587-8094] and 5830 [4041-7889] steps/day, respectively) (p<.005).

Conclusion: Individuals with COPD who experience severe dyspnea consistently exhibit worse levels of daily PA and PC compared with those who report low dyspnea, regardless of the presence or not of severe fatigue.

Keywords: COPD; Dyspnea; Fatigue; Physical activity.

Conflict of interest statement

Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Fabio Pitta reports financial support was provided by National Council for Scientific and Technological Development. Daisy J.A. Janssen has received research grants within the past 36 months from the Netherlands Organisation for Health Research and Development, the European Union's Horizon Europe research and innovation programme, and Proteion, all outside the submitted work and all paid to the institution. All other authors have reported that there are no conflicts of

interest with any companies or organizations discussed in this article. Martijn A. Spruit reports consulting fees from Boehringer Ingelheim, GSK, O2matic Asp., and AMES B.V., which were all paid to Care2Know B.V. MAS is founder/owner of Care2Know B.V. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary info

MeSH termsExpand

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20

Review

Am J Physiol Lung Cell Mol Physiol

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. 2026 Jun 1;330(6):L625-L633.

doi: 10.1152/ajplung.00312.2025. Epub 2026 Apr 15.

Investigating human lung resilience, its evolutionary history and its relation to COPD

Isabelle Dupin [1] [2], Maël Lemoine [3]

Affiliations Expand

- **PMID: 41984160**
- **PMCID: PMC7619105 (available on 2026-06-01)**
- **DOI: 10.1152/ajplung.00312.2025**

Abstract

A subset of long-term smokers remain free of chronic obstructive pulmonary disease or lung cancer, a phenomenon termed "lung resilience." Understanding this

resilience could reveal protective mechanisms that preserve respiratory health, yet conceptual and methodological precision is required. Importantly, resilience is not merely the inverse of vulnerability, but a process that can be investigated in its own. In this review, we clarify this concept of resilience and its distinction from tolerance and resistance, and situate human lung resilience within a cross-organ and cross-species framework. We also critically assess the hypothesis that evolutionary processes may have influenced human resilience to smoke exposure. Finally, we advocate for rigorous clinical phenotyping and mechanistic approaches to dissect the interplay between genetics, physiology, and evolution. A refined conceptual framework will establish resilience as a productive paradigm in respiratory medicine, with potential to advance our understanding of disease susceptibility and to inform novel therapeutic strategies.

Keywords: COPD; evolution; resistance; smoke; tolerance.

Conflict of interest statement

Disclosures

I. Dupin has two patents (EP number 3050574 and EP number 20173595). None of the other authors has any conflicts of interest, financial or otherwise, to disclose.

- 59 references

Supplementary info

Publication types, MeSH terms, Grants and fundingExpand

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21

Randomized Controlled Trial

Respir Med

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. 2026 Jun:257:108818.

doi: 10.1016/j.rmed.2026.108818. Epub 2026 Apr 16.

Active for life intervention produces a sustained increase in physical activity in people with chronic obstructive pulmonary disease

Janet L Larson [1], Katelyn E Webster-Dekker [2], Ronald Dechert [2], She'Lon Tucker [2], Seoyoon Woo [3], Weijiao Zhou [4], Neha P Gothe [5], Jung Yoen Son [2], Bidisha Ghosh [2], Robert J Ploutz-Snyder [6]

Affiliations Expand

- PMID: 41956174

- DOI: 10.1016/j.rmed.2026.108818

Abstract

Purpose: Many older adults with chronic obstructive pulmonary disease (COPD) are inactive and moderate-to-vigorous physical activity (MVPA) can be too strenuous for long-term maintenance. We examined effects of an intervention to increase light physical activity (LPA). Primary outcomes were physical activity (PA) and sedentary behavior (SB).

Methods: Active for Life with COPD (Active-Life) is a self-efficacy-based intervention designed to increase LPA. Chair Exercises with Health Education (Chair-HE) served as an active control. PA and SB were measured with ActivPAL and ActiGraph accelerometers.

Results: We randomized 159 people with COPD to 10 weeks of Active-Life or Chair-HE. 128 people completed the intervention; 105 completed 1-year follow-up. The sample was 45% female, mean (SD) age was 69.6 (8.2), FEV_1 % predicted 55.7 (14.7), and FEV_1/FVC 60.8 (12.3). Increases in mean (±95% CI) total PA (upright time) at end-of-intervention, 3, and 6 months relative to baseline, were 23.7 (5.0, 42.3), 21.2 (2.5, 39.9), and 29.1 (10.6, 47.7) minutes/day higher in the Active-Life compared to Chair-HE group. Step count increases at end-of-intervention, 3, 6, and 12 months were 1243 (878, 1608), 788 (421, 1155), 603 (239, 967), and 418 (43, 793) steps/day higher in Active-Life. MVPA increased at end-of-intervention, 3, 6, and 12 months: 9.7 (6.5, 12.9), 6.8 (3.8, 9.8), 4.7 (1.6, 7.7), and 2.8 (0.2, 5.5) minutes/day higher in Active-Life. No consistent changes were seen in LPA and SB.

Conclusion: Active-Life produced significant, sustained increases in PA for 12 months. Further work is needed to reduce SB and establish longer-term PA effects.

Keywords: Accelerometry; COPD; Older adult; Physical activity; Pulmonary rehabilitation; Self-efficacy.

Conflict of interest statement

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

Supplementary info

Publication types, MeSH termsExpand

Full text links

Cite

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Chronic Obstr Pulm Dis

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. 2026 May 27;13(3):184-194.

doi: 10.15326/jcopdf.2025.0687.

Implementation of 2023 Canadian Thoracic Society Guidelines for Single-Inhaler Triple Therapy Could Reduce Exacerbation and Mortality Rates in COPD: PROMETHEUS Canada

Mohit Bhutani [1], Alan Kaplan [2], Sheena Kayaniyil [3], Kyla Jamieson [3], Ross Ormsby [3], John Bell [4], Prachi Bhatt [5], Jennifer Carioto [5], Bruce Pyenson [5]

Affiliations Expand

- PMID: 41911567

- DOI: 10.15326/jcopdf.2025.0687

Free article

Abstract

Background: Chronic obstructive pulmonary disease (COPD) is the fifth leading cause of death in Canada. The Efficacy and Safety of Triple Therapy in Obstructive Lung Disease (NCT02465567) and Informing the Pathway of COPD Treatment (NCT02164513) randomized controlled trials demonstrated reduced exacerbations and all-cause mortality for patients with COPD on single-inhaler triple therapy (SITT). The 2023 Canadian Thoracic Society (CTS) COPD pharmacotherapy guidelines recommend triple therapy, and preferably SITT use, in patients with moderate to severe symptom burden and high future risk of exacerbations. The clinical impact of broader SITT use in Canada has not yet been studied.

Aim: We aimed to estimate the benefit of appropriate SITT use according to CTS COPD guidelines on mortality, exacerbations, and their corresponding costs in Canada.

Methods: We used a stochastic model using literature-derived characteristics (e.g., incidence, changes in COPD severity, treatment, mortality, and exacerbations) that simulated the Canadian COPD population. Patients were assigned percentage of

forced expiratory volume in 1 second predicted levels, and their annual characteristics were modeled for 2025–2034 under 2 scenarios: “status quo” (current practice) and “increased SITT” (following CTS guidelines).

Results: Based on our simulated results for the flagged population, “Increased SITT” use over 10 years compared to current treatment reduced moderate and severe exacerbation rates by 23% and 12%, respectively, for a reduction of 159,000 severe and 2.81 million moderate exacerbations and reduced the all-cause mortality rate by 22%. In the flagged population alone, this reduction in exacerbations would equate to a savings of CA$3.9 billion over 10 years.

Conclusion: Appropriate use of SITT, informed by the 2023 CTS COPD guidelines, could lower mortality, exacerbation frequency, and their corresponding costs in patients with COPD.

Keywords: COPD; population model; single-inhaler triple therapy.

Supplementary info

Grants and fundingExpand

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Cite

23

Review

Drugs

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. 2026 Jun;86(6):943-948.

doi: 10.1007/s40265-026-02306-0. Epub 2026 Mar 26.

Depemokimab: First Approval

Arnold Lee [1]

Affiliations Expand

- PMID: 41882474

- DOI: 10.1007/s40265-026-02306-0

Abstract

Depemokimab (depemokimab-ulaa; EXDENSUR) is an anti-IL-5 antibody being developed by GSK for the treatment of asthma, chronic rhinosinusitis with nasal polyps (CRSwNP), chronic obstructive pulmonary disease, eosinophilic granulomatosis with polyangiitis and hypereosinophilic syndrome. Add-on treatment with depemokimab reduced asthma-related exacerbations in patients with severe asthma with an eosinophilic phenotype, in addition to reducing the severity of nasal polyps and nasal obstruction in patients with CRSwNP. This article summarizes the milestones in the development of depemokimab leading to this first approval in the UK as an add-on maintenance treatment of asthma in adult and adolescent patients aged ≥ 12 years with type 2 inflammation characterised by an eosinophilic phenotype who are inadequately controlled on maximum moderate-dose or high-dose inhaled corticosteroids plus another asthma controller; and as add-on therapy with intranasal corticosteroids for the treatment of adults with severe CRSwNP for whom therapy with systemic corticosteroids and/or surgery do not provide adequate control.

Conflict of interest statement

Declarations. Authorship and conflict of interest: During the peer review process the manufacturer of the agent under review was offered an opportunity to comment on the article. Changes resulting from any comments received were made by the authors on the basis of scientific completeness and accuracy. Arnold Lee is a contracted employee of Adis International Ltd/Springer Nature, and declares no relevant conflicts of interest. All authors contributed to this article and are responsible for its content. Ethics approval, consent to participate, consent to publish, availability of data and material, code availability: Not applicable.

- 20 references

Supplementary info

Publication types, MeSH terms, SubstancesExpand

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24

Clin Microbiol Infect

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. 2026 Jun;32(6):1006-1014.

doi: 10.1016/j.cmi.2026.03.011. Epub 2026 Mar 14.

Burden of respiratory syncytial virus and influenza in adults - a Danish nationwide cohort study

Maria João Fonseca [1], Stanislava Bratković [2], Mikkel Pedersen [3], Mathilde Kany [3], Triantafyllos Pliakas [4], Rachel Reeves [5], Alen Marijam [6], Elisa Turriani [7], Nikoline Vestergaard Dich [2], Yunus Çolak [8], Marie Helleberg [9]

Affiliations Expand

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- DOI: 10.1016/j.cmi.2026.03.011

Free article

Abstract

Objectives: Like influenza, respiratory syncytial virus (RSV) is a common cause of severe acute respiratory infection (ARI) in adults. With RSV vaccines recently approved, data on the burden of disease are required. Our objective was to investigate the short- and long-term clinical and economic burden of ARI in Danish adults over the past decade, with a primary focus on RSV, contextualising with influenza.

Methods: A nationwide cohort study in Denmark, including adults ≥18-year-old recorded with an ARI from 1 July 2011 to 30 June 2022 (i.e. exposed), matched 1:3 with individuals without ARI (unexposed). We assessed adverse clinical outcomes, direct and indirect healthcare resource utilization, and direct and indirect costs over 365 days after ARI.

Results: We identified 762 443 ARIs, of which 5289 were attributed to RSV and 48 047 to influenza. Common comorbidities in patients with RSV were chronic obstructive pulmonary disease (23.9%, 1264/5289), diabetes (13.5%, 712/5289), and asthma (12.2%, 647/5289), whereas 32.1% (1700/5289) were immunocompromised. RSV was associated with an increased risk of adverse clinical outcomes compared with matched unexposed individuals during the 365-day follow-up, including death (relative risk 2.7; 95% CI: 2.4-3.0), chronic obstructive pulmonary disease exacerbations (3.1; 2.8-3.4), asthma exacerbations (4.6; 3.6-5.9), and sepsis (4.0; 3.1-5.2). RSV was associated with increased risks of respiratory support (5.5; 4.3-7.0) and antibiotic treatment (2.0; 1.9-2.1). Direct and indirect costs were higher among patients with RSV than their unexposed peers, with a mean difference in direct costs of €12 096. Patients with influenza had fewer comorbidities than patients with RSV, but they also presented worse clinical and economic outcomes than their unexposed peers, with a mean difference in direct costs of €7992.

Conclusions: The severe long-term clinical and economic burden of RSV in adults, which is comparable with influenza, provides evidence for adult vaccination strategies.

Keywords: Acute respiratory infections; Disease burden; Influenza; RSV; Vaccination.

Supplementary info

MeSH termsExpand

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Cite

25

J Diabetes Metab Disord

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Mortality patterns in patients with chronic obstructive pulmonary disease and diabetes mellitus in the United States: a retrospective analysis from 1999 to 2019

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Affiliations Expand

- **PMID: 41695558**

- **PMCID: PMC12905016 (available on 2027-02-13)**

- **DOI: 10.1007/s40200-026-01891-x**

Abstract

Aims: The global prevalence of DM and COPD is increasing. This study offers a longitudinal analysis of mortality patterns due to these two diseases along with

regional and demographic insights that highlight disparities in mortality rates in the US from 1999 to 2019.

Methods: CDC WONDER database was used to determine crude mortality rates (CMR) and age-adjusted mortality rates (AAMRs) per 1,000,000 individuals, 25 years and above. Join point Regression was used to examine annual percent change (APC), average APC (AAPC) and parallelism.

Results: From 1999 to 2019, there were 613,779 deaths with an AAPC of 1.59%. Males (175.88) had higher AAMR than females (108.48). American Indians had highest AAMR (159.12) while non-Hispanic Asians experienced lowest (54.08). AAMRs varied by region (Midwest: 154.69, South: 143.88, West: 127.36, Northeast: 109.26). States with highest AAMR were West Virginia and Oklahoma; those with the lowest were Utah and Hawaii. Non-metropolitan areas showed higher mortality (184.02) than metropolitan areas (125.78). Crude mortality rate was highest for the 85 + age group.

Conclusions: The US saw an upward trend in mortality where both COPD and DM were documented on death certificates. These trends were more pronounced among males, American Indians, and the Midwestern region.

Supplementary information: The online version contains supplementary material available at 10.1007/s40200-026-01891-x.

Keywords: Age-adjusted mortality rates; CDC WONDER; Chronic obstructive pulmonary disease; Diabetes mellitus; Joinpoint regression.

Conflict of interest statement

Competing interestsThe authors declare no competing interests.

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

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BMJ Open

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. 2026 May 24;16(5):e117387.

doi: 10.1136/bmjopen-2026-117387.

Illness perception and self-management behaviours in adults with multimorbidity: a systematic review protocol

Ana Lúcia Junger [1 2], Else Saliés Fonseca [3], Ana Luiza Lima Sousa [3 4], Sandro Rogério Rodrigues Batista [5 6]

Affiliations Expand

- PMID: 42192630
- PMCID: PMC13202164
- DOI: 10.1136/bmjopen-2026-117387

Abstract

Introduction: Multimorbidity, characterised by the coexistence of two or more chronic conditions, represents a growing challenge for health systems, adversely affecting quality of life, self-care, treatment adherence and service utilisation. Within the context of self-regulation in health, the Common-Sense Model of Self-Regulation of Health and Illness (CSM) proposes that illness perceptions-such as beliefs about causes, control, consequences, timeline and illness identity-influence health behaviours. Despite consolidated evidence in single-disease contexts, little is known about how these perceptions operate when multiple conditions coexist, particularly due to the need to integrate potentially conflicting representations. To date, no systematic reviews have synthesised these relationships specifically in populations with multimorbidity. This protocol describes the methods for a systematic review aimed at examining how illness perceptions are associated with treatment adherence, self-care and indicators of chronic condition management in adults with multimorbidity.

Methods and analysis: This systematic review will be reported in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines. Observational studies involving adults (≥18 years) with multimorbidity, which assess illness perceptions using validated instruments and report outcomes related to treatment adherence, self-care or self-management behaviours, will be included. The search will be conducted in the PubMed, Scopus, Web of Science, Embase, CINAHL, PsycINFO and LILACS databases, using combinations of descriptors related to illness perception, multimorbidity and health behaviours. Two independent reviewers will conduct study selection, data extraction and methodological quality assessment. The risk of bias will be assessed using the Newcastle-Ottawa Scale, and the overall quality of the evidence will be evaluated using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. Where appropriate, meta-analysis will be conducted using measures of association (eg, ORs, relative risk or HRs); otherwise, a structured narrative synthesis will be performed. Subgroup analyses will be conducted when data are available.

Ethics and dissemination: As it uses exclusively secondary and published data, this review does not require approval by a research ethics committee. The results will be submitted for publication in a peer-reviewed journal and disseminated at relevant scientific conferences.

Prospero number: CRD420251266292.

Keywords: Chronic Disease; Medication Adherence; Multimorbidity; Patient Reported Outcome Measures; Patient-Centered Care; Self Care.

- **47 references**

Supplementary info

MeSH termsExpand

Full text links

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Cite

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PLoS One

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. 2026 May 26;21(5):e0348191.

doi: 10.1371/journal.pone.0348191. eCollection 2026.

Comorbidity severity adjusted model for predicting mortality in hospitalized patients with COPD

Ji Hyeon Seo [1], Ji Hye Lim [2]

Affiliations Expand

- **PMID: 42189854**
- **PMCID: PMC13210387**
- **DOI: 10.1371/journal.pone.0348191**

Abstract

Background: Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality worldwide, ranking eighth in disability-adjusted life years (DALYs). Patients with COPD frequently exhibit multimorbidity-including cardiovascular disease, cerebrovascular disease, diabetes, and lung cancer. Accordingly, the Charlson Comorbidity Index (CCI) is widely used as a standard tool for comorbidity adjustment; however, as a general-purpose index, it may not fully capture disease-specific patterns of multimorbidity, underscoring the urgency for tailored approaches. Therefore, we aimed to construct a comorbidity severity adjustment model to improve the prediction of in-hospital mortality among COPD patients using large-scale registry data from the Korea Disease Control and Prevention Agency.

Method: This retrospective study used the Korea National Hospital Discharge In-Depth Injury Survey (KNHDIS) from 2011 to 2023, including 13,385 hospitalized COPD patients (ICD-10 code J44). All analyses accounted for the complex sample design with stratification, clustering, and sampling weights. The baseline model used multivariable logistic regression with conventional covariates, whereas the extended model incorporated comorbidity clusters derived from Apriori association rule mining to capture interconnected disease patterns. Odds ratios (OR) and 95% confidence intervals (CI) were calculated to assess determinants of in-hospital mortality.

Result: In the baseline model, advanced age, emergency admission, larger hospital size, and higher CCI scores were significantly associated with increased mortality. In the extended model with Apriori-derived clusters, additional high-risk profiles were identified: (i) septicemia with pneumonia, (ii) respiratory failure with sequelae of tuberculosis, and (iii) pulmonary heart disease with sequelae of tuberculosis. The predictive performance improved with the inclusion of comorbidity clusters (AUC 0.753 vs. 0.732), indicating that the cluster-augmented model provided superior discrimination compared with the baseline model.

Conclusion: These findings indicate that integrating data-driven comorbidity patterns into traditional risk models enhances mortality risk stratification for COPD inpatients and may support both clinical decision-making and the development of evidence-based health policies.

Conflict of interest statement

The authors have declared that no competing interests exist.

- **50 references**
- **5 figures**

Supplementary info

MeSH termsExpand

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. 2026 Apr 2:8:100473.

doi: 10.1016/j.pecinn.2026.100473. eCollection 2026 Jun.

Pretest-posttest trial of a lung cancer screening decision aid for individuals with multimorbidity from a primary care population

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Affiliations Expand

- PMID: 42016588
- PMCID: PMC13092692
- DOI: 10.1016/j.pecinn.2026.100473

Abstract

Objective: This study pilot tested a novel Decision Aid (DA) that clarifies the impact of multimorbidity on Lung Cancer Screening (LCS) risks and benefits. Outcomes of interest include LCS knowledge, disposition to complete LCS, decisional conflict and confidence.

Methods: Evaluation scales were administered before and after DA exposure to 50 patients with smoking history; 70% of them having moderate or severe multimorbidity.

Results: LCS Knowledge Measure scores improved (median 3 vs. 5 on scale 0-12, $p < 0.0001$). Scores of Decisional Conflict subscale related to feeling uninformed improved (median 3.5 vs. 3 on scale 0-15, $p = 0.03$). Overall Decisional Conflict (median 16 vs. 16 on scale 0-80), Stage of Decision Making (median 4 vs. 4 on scale 1-4), and share of participants disposed to complete LCS (86% vs. 84%) were similar.

Conclusion: Exposure to a DA tailored to individuals with multimorbidity was associated with improved knowledge of LCS. Further investigation is needed to evaluate the DA efficacy in patients with higher baseline decisional conflict and lower baseline confidence.

Innovation: A novel DA presenting information on the impact of comorbidities on LCS risks and benefits was found to hold potential for better supporting the decision-making of patients with multimorbidity.

Keywords: Decision aid; Lung cancer screening; Primary care.

Conflict of interest statement

Dr. Koster reports personal fees from DeciBio, outside the submitted work. Dr. Schnur reports grants from National Cancer Institute, during the conduct of the study. Dr. Schonberg reports grants from NIH/NIA K24AG071906, during the conduct of the study, and other support from UpToDate, outside the submitted work. Dr. Wisnivesky reports personal fees from Sanofi, BionTech, AMA, PPD, and Banook, as well as grants from Sanofi, Regeneron, and Axella, outside the submitted work. Dr. Kale reports additional grant support from the NIH/NIMHD R01MD014890. The remaining authors have no conflicts of interest to declare.

- **30 references**
- **1 figure**

Supplementary info

Grants and fundingExpand

Full text links

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Review

Ageing Res Rev

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. 2026 Jun:118:103117.

doi: 10.1016/j.arr.2026.103117. Epub 2026 Apr 1.

Vascular aging: A central driver of multimorbidity

Manyv Zheng [1], Wenya Su [2], Luyao Tian [3], Wenyuan Gao [4]

Affiliations Expand

- PMID: 41933553

- DOI: 10.1016/j.arr.2026.103117

Abstract

The aging of the vasculature is a primary determinant of cardiovascular disease risk and a key contributor to organismal decline. While our understanding of its molecular underpinnings has grown exponentially, the translation of these discoveries into effective clinical interventions remains a major hurdle. This review provides a critical appraisal of the current state of vascular aging pharmacology. We first dissect the core pathogenic mechanisms, including epigenetic drift, chronic low-grade inflammation, and cellular senescence, highlighting clinically relevant targets such as the IL-1β pathway and senescent cell populations. We then systematically evaluate current and emerging therapeutic strategies, ranging from repurposed metabolic drugs (e.g., SGLT2 inhibitors) and mitochondrial antioxidants (e.g., MitoQ) to pioneering senolytic and gene therapies. A central focus is placed on the translational bottlenecks that impede progress: the discordance between animal models and human biology, the challenge of targeted drug delivery to the vascular wall, and the lack of validated surrogate endpoints for clinical trials. We conclude by outlining a strategic roadmap for the future, emphasizing the need for precision medicine approaches, innovative clinical trial designs, and the integration of liquid biopsy biomarkers to accelerate the development of therapies that genuinely promote vascular health and resilience.

Keywords: Arterial Stiffness; Endothelial Dysfunction; Senescence; Senolytic; Vascular Aging.

Conflict of interest statement

Declaration of Competing Interest The authors declare no competing financial interests or personal relationships that could have influenced the work reported in this paper.

Supplementary info

Publication types, MeSH termsExpand

Full text links

5

Review

Psychiatry Res

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. 2026 Jun:360:117107.

doi: 10.1016/j.psychres.2026.117107. Epub 2026 Mar 20.

Multimorbidity and risk of cognitive impairment: A systematic review and meta-analysis of cohort studies

Jiali Bai [1], Fei Li [2], Yingying Chen [1], Ye Luo [1], Wei Xu [1], Haoying Liu [1], Wenxi Duan [1], Xin Zhang [1], Angi Shi [1], Li Chen [3], Huiru Yin [4]

Affiliations Expand

- PMID: 41895026

- DOI: 10.1016/j.psychres.2026.117107

Abstract

Background: The long-term relationship between multimorbidity and cognitive impairment remains unclear, and a quantitative synthesis comparing cognitive impairment risks across different multimorbidity patterns is still lacking. This review aimed to systematically synthesize longitudinal evidence on the association between multimorbidity and cognitive impairment, as well as the risk of cognitive impairment across different multimorbidity patterns.

Methods: Six databases were systematically searched from inception to 9 July 2025. Longtitudinal studies examining multimorbidity or multimorbidity patterns in relation to cognitive impairment risk were eligible. Meta-analyses generated pooled HRs and 95% CIs for cognitive impairment across disease counts and multimorbidity patterns. The review followed the PRISMA 2020 guidelines for abstracts.

Results: Eighteen cohort studies were included in the review. Multimorbidity was associated with a 49% higher risk of cognitive impairment (95% CI 1.22-1.82). The risk increased steadily with the number of chronic conditions, with HRs ranging from 1.38 (95% CI 1.26-1.51) to 3.57 (95% CI 2.84-4.47) for individuals with two to six or more diseases. Among multimorbidity patterns, the mental health pattern showed the highest risk (HR 2.07, 95% CI 1.86-2.32), followed by the cardiometabolic pattern (HR 2.05, 95% CI 1.92-2.19). Within cardiometabolic disease combinations, coexisting diabetes, stroke, and heart disease conferred the greatest risk.

Conclusions: Multimorbidity is linked to a substantially increased risk of cognitive impairment, underscoring the need for life-course prevention strategies that emphasize early management of chronic conditions, particularly in midlife. Future research should identify optimal management approaches for different multimorbidity patterns and tailor strategies to individual needs.

Keywords: Cognitive dysfunction; Cohort studies; Meta-analysis; Multimorbidity; Systematic review.

Conflict of interest statement

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

Supplementary info

Publication types, MeSH termsExpand

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

1

Sci Rep

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. 2026 May 30.

doi: 10.1038/s41598-026-54625-7. Online ahead of print.

Dupilumab attenuate IL-4 and IL-13 synergistic effect on airway remodeling in asthma via blocking IL-4Rα/STAT6 axis

Lina Sahnoon [1 2 3], Rola Abujabal [1 2], Tasneem M Alanta [1], Bushra Mdkhana [1], Ronald Olivenstein [4], Ellen Puré [5], Bassam Mahboub [6], Yves Laumonnier [3 7], Rifat Hamoudi [1 2 8 9], Khuloud Bajbouj [10], Qutayba Hamid [11 12 13]

Affiliations Expand

- **PMID: 42218198**

- **DOI: 10.1038/s41598-026-54625-7**

Abstract

Airway fibrosis in severe asthma is a hallmark of disease pathology, yet the mechanisms driving fibroblast activation remain incompletely understood. While interleukin-4 (IL-4) and interleukin-13 (IL-13) are central to type 2 inflammation, their combined role in directly promoting human lung fibroblast-mediated fibrosis is not well defined. This study demonstrates that IL-4 and IL-13 act synergistically on asthmatic fibroblasts to potentiate a pro-fibrotic program via the shared interleukin-4 receptor alpha (IL-4Rα)/Signal Transducer and Activator of Transcription 6 (STAT6) axis. We found that diseased human lung fibroblasts (DHLFs) from asthmatic patients exhibited elevated expression of the type II receptor (IL-4Rα/IL-13Rα1) compared to normal human lung fibroblasts (NHLFs), priming them for activation. Consequently, combined IL-4/IL-13 stimulation synergistically enhanced STAT6 phosphorylation and robustly upregulated key extracellular matrix (ECM) components (collagen I/III, fibronectin) and regulators (matrix metalloproteinase-9 (MMP-9), tissue inhibitor of metalloproteinase-1/2 (TIMP-1/2). Furthermore, IL-4 specifically emerged as the dominant driver of fibroblast proliferation. Critically, the IL-4Rα-blocking antibody dupilumab effectively abrogated this pro-fibrotic response. These findings provide a direct mechanistic basis for targeting the IL-4Rα pathway to mitigate airway remodeling and potentially alter the progressive course of fibrosis in patients with severe, type 2-high asthma.

Keywords: Airway remodeling; Asthma; Dupilumab; Fibrosis; Interleukin-13 (IL-13); Interleukin-4 (IL-4).

Conflict of interest statement

Declarations. Competing interests: Bassam Mahboub has received research support from Sanofi pertaining to the present study.

Supplementary info

Grants and fundingExpand

Full text links

Cite

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BMC Med Inform Decis Mak

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. 2026 May 29.

doi: 10.1186/s12911-026-03599-7. Online ahead of print.

Artificial intelligence-based models in predicting acute exacerbations and diagnosing pediatric asthma: a systematic review and meta-analysis

Qingxia Shi [1 2 3 4], Lu Zhu [1 2 3 4], Wenwen Wang [1 2 3 4], Xuemei Li [5 6 7 8]

Affiliations Expand

- PMID: 42216027

- DOI: 10.1186/s12911-026-03599-7

Abstract

Purpose: This systematic review and meta-analysis evaluated the performance of artificial intelligence (AI)-based models in diagnosing pediatric asthma and predicting acute asthma exacerbations.

Methods: A comprehensive literature search was conducted across PubMed, Embase, and Web of Science. The initial search was conducted up to December 6, 2024, and a supplementary search was conducted in April 2025 to identify newly published or newly indexed studies. Diagnostic performance metrics, including sensitivity, specificity, area under the curve (AUC), and 2 × 2 diagnostic data, were extracted or reconstructed. A bivariate random-effects model was used for meta-analysis, and study quality was assessed using a modified QUADAS-2 tool with PROBAST-informed signaling questions.

Results: A total of 18 studies were included: 13 studies evaluated AI-based models for pediatric asthma diagnosis and five studies evaluated AI-based models for predicting acute asthma exacerbations. For asthma diagnosis, internal validation showed a sensitivity of 0.87, specificity of 0.93, and AUC of 0.96, while external validation showed a sensitivity of 0.81 and specificity of 0.94. For acute exacerbation prediction, internal validation showed a sensitivity of 0.59, specificity of 0.79, and AUC of 0.68. These estimates should be interpreted cautiously because heterogeneity was very high and external validation evidence was limited.

Conclusion: AI-based models showed promising but preliminary diagnostic performance for pediatric asthma, whereas their performance for predicting acute exacerbations remained limited. The findings should be interpreted cautiously because of substantial heterogeneity, potential publication bias, and limited external validation. Future studies should use standardized definitions and independent external validation before these models are implemented in clinical practice.

Clinical trial number: Not applicable.

Keywords: Artificial intelligence; Asthma; Asthma exacerbations; Children; Meta-analysis.

Conflict of interest statement

Declarations. Ethics approval and consent to participate: This is a systematic review and meta-analysis, ethics approval and consent to participate are not applicable. Consent for publication: Not applicable. The manuscript does not include the participant's identification image or other personal or clinical details. Generative AI and AI-assisted technologies in the writing process: During the preparation of this work, the authors used Sider in order to improve readability and language quality. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication. Competing interests: The authors declare no competing interests.

Supplementary info

Publication types, Grants and fundingExpand

Full text links

Cite

3

Allergy

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. 2026 May 29.

doi: 10.1111/all.70391. Online ahead of print.

Effect of Dupilumab on Airway Inflammation in Patients With Persistent Asthma

Michael E Wechsler [1], Sally E Wenzel [2], Steve D Groshong [1], Mario Castro [3], Ian D Pavord [4], Klaus F Rabe [5 6 7], Elizabeth Laws [8], Alexandre Jagerschmidt [9], Kaitlyn Gayvert [10], Sivan Harel [10], Jennifer D Hamilton [10], Nikhil Amin [10], Lu Zhang [11], Heming Xing [11], Anissa Elfakir [12], Bema Coulibaly [13], Souâd Naimi [13], Sara Hamon [10], Paul J Rowe [8], Frank Nestle [11], Danen M Cunoosamy [11], Emanuele de Rinaldis [11], Leda P Mannent [9]

Affiliations Expand

- **PMID: 42215290**

- **DOI: 10.1111/all.70391**

Abstract

Background: Biologics targeting type 2 cytokines can inhibit airway inflammation and improve lung function in moderate-to-severe asthma; however, their impact on airway mucosal inflammatory cells is unclear. This study assessed the effects of dupilumab on airway mucosal and systemic inflammation, and related gene expression in patients with persistent asthma.

Methods: In the phase 2a EXPEDITION study (NCT02573233), patients aged 18-65 years were randomised to add-on dupilumab 300 mg (n = 20) or placebo (n = 22) every 2 weeks for 12 weeks. Pre- and post-treatment bronchial biopsies, bronchial brushings, bronchoalveolar lavage (BAL) fluid and blood samples were collected. Clinical and patient-reported outcomes, gene expression, type 2 biomarkers and safety outcomes were assessed.

Results: Dupilumab versus placebo improved lung function and asthma control. No significant changes in eosinophils, mast cells or type 2 helper cells were observed in bronchial biopsies. Downregulation of M2 macrophage- and eosinophil-associated gene sets was observed in BAL and brushing samples after dupilumab. Dupilumab decreased multiple circulating type 2 biomarkers in peripheral blood ($p_{unadj} < 0.001$, $p_{adj} < 0.01$), goblet cell numbers ($p_{unadj} = 0.0336$; $p_{adj} = 0.2554$) and mucus area ($p_{unadj} = 0.0426$; $p_{adj} = 0.2554$) in bronchial biopsies versus placebo. The safety profile was consistent with the known safety profile of dupilumab.

Conclusion: Dupilumab improved lung function and asthma control while reducing circulating type 2 biomarkers. No measurable impact was observed on type 2-associated inflammatory cell numbers in airway bronchial biopsies; however, dupilumab modulated the expression of inflammation-associated gene sets. These findings provide cellular and molecular data that may explain dupilumab-driven mechanisms of improved lung function in patients with type 2 asthma.

Keywords: asthma; bronchoscopy; dupilumab; endobronchial biopsies; gene expression.

- **30 references**

Supplementary info

Grants and fundingExpand

Full text links

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4

BMJ Open

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. 2026 May 29;16(5):e110702.

doi: 10.1136/bmjopen-2025-110702.

Can digital self-screening improve identification of chronic dyspnoea in Australian general practice? A proof-of-concept protocol for the BREATHE SMART trial

Kyumin Jang [1], Katrina Giskes [2], Allison Martin [3], Anthony Paulo Sunjaya [3 4], Phyu Khin [1], Christine Jenkins [3 4], Charlotte Mary Hespe [1]; BREATHE SMART Steering Committee

Collaborators, Affiliations Expand

- PMID: 42215269

- DOI: 10.1136/bmjopen-2025-110702

Abstract

Introduction: Chronic dyspnoea is a prevalent and clinically significant symptom, often indicative of underlying cardiorespiratory disease. It is frequently under-reported by patients and under-recognised in primary care, with these challenges exacerbated in rural and remote communities where disease burden is greater and patients experience barriers to timely diagnosis and management. The BREATHE SMART trial aims to implement and evaluate an innovative, fully digital self-screening system for chronic dyspnoea, integrated into general practice workflows and information technology infrastructure. This approach seeks to enhance early detection and management of chronic cardiorespiratory conditions across diverse practice settings.

Methods and analysis: This multisite proof-of-concept study will test a software platform delivering a preconsultation self-screening questionnaire across 40 general practices in urban, rural and remote Australia. The system identifies eligible patients (≥18 years, consenting to SMS communication with their practice), issues an automated SMS that administers a validated dyspnoea screening questionnaire, and summarises responses for integration into the electronic medical record. Process evaluation will assess acceptability and utility using deidentified audit data, software metrics and qualitative feedback from patients, staff and general practitioners (GPs) via surveys, interviews and focus groups. Approximately 12 000 patients will be screened over 12 months. Primary outcomes will include the proportion completing self-screening and prevalence of chronic dyspnoea and secondary outcomes will include the rate of newly diagnosed chronic dyspnoea-related conditions (ie, asthma, chronic obstructive pulmonary disease and heart failure) in the preceding 12 months and during the intervention period.

Ethics and dissemination: Ethics approval was granted by the University of New South Wales Human Research Ethics Committee (HREC) (iRECS6645) and the University of Notre Dame Australia HREC (2024-155). Participating practices and each GP will provide written, informed consent. All patients being screened will

provide electronic informed consent. Results of the study will be disseminated through various forums, including peer-reviewed publications and presentation at national and international conferences. Following the study, participating practices will be provided with a summary of the findings of the study, together with a full copy of any publications and a plain language statement for participants, which will be made available in the practices.

Trial registration number: ACTRN12624001451594.

Keywords: Digital Technology; Primary Care; RESPIRATORY MEDICINE (see Thoracic Medicine).

Conflict of interest statement

Competing interests: None declared.

Supplementary info

Publication types, MeSH termsExpand

Full text links

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Cite

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Respir Res

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. 2026 May 28;27(1):213.

doi: 10.1186/s12931-026-03512-w.

Asthma exacerbation risk after short-term air pollution exposure varies by age, sex, severity, and eosinophil count: East London cohort study

Hajar Hajmohammadi [1], Paul E Pfeffer [2 3], Ian S Mudway [4 5], Christopher J Griffiths [6]

Affiliations Expand

- PMID: 42210238
- PMCID: PMC13220545

- DOI: 10.1186/s12931-026-03512-w

Abstract

Background: Air pollution is associated with asthma mortality and hospital admissions, yet few studies have focused on exacerbations managed in the community or which subgroups of asthma patients are most vulnerable. Identifying these groups is crucial for targeted public health interventions and clinical guidance.

Methods: We developed Poisson generalised regression models examining associations between short-term exposure to air pollutants (NO_2, $PM_{2.5}$ and PM_{10}, and O_3) and courses of oral corticosteroids (OCS) prescribed in primary care for exacerbations in a cohort of asthma-registered adults (18-80 years) in East London, between March 2019-February 2023. We analysed three time frames: pre-, during, and post-COVID-19 pandemic, and performed stratified analyses by gender, age, asthma management step, and blood eosinophil levels.

Results: For every interquartile range (IQR) increase in the preceding week's average exposure, the risk of OCS prescription increased by 5% for NO_2, 2% for PM_{10}, and 2% for $PM_{2.5}$. Risk for OCS prescriptions were 2% lower during the COVID-19 period and 28% higher post-COVID-19 compared to pre-COVID-19. Stratified analyses showed that male and older adults had higher risks for NO_2 associated exacerbations with same-day exposure but lower risks for one-week exposure, compared to females and younger adults. Risks were also slightly higher in patients on step 4/5 asthma medications and in those with eosinophilia, with similar patterns observed for PM_{10} and $PM_{2.5}$.

Conclusion: Short-term exposure to NO_2, PM_{10}, and $PM_{2.5}$ increases the risk of mild asthma exacerbations, however risk and lag were affected by age, gender, and patient subgroups, emphasizing the need for tailored public health strategies.

Keywords: Air pollution; Asthma exacerbation; Medical records.

Conflict of interest statement

Declarations. Ethics approval and consent to participate: This study involved secondary analysis of routinely collected, de-identified primary care electronic health record data obtained from general practices in East London. The research team did not have access to identifiable patient information at any stage, and all data analysed were anonymised and reported in aggregate form. The study received retrospective sponsorship approval from Queen Mary University of London (EDGE ID: 204982). The study did not undergo Health Research Authority (HRA) or NHS Research Ethics Committee (REC) review. Consent for publication: Not applicable. Competing interests: The authors declare no competing interests.

- 41 references
- 5 figures

Supplementary info

MeSH terms, Substances, Grants and fundingExpand

Full text links

Proceed to details

Cite

6

Review

Ann Allergy Asthma Immunol

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. 2026 May 27:S1081-1206(26)00231-0.

doi: 10.1016/j.anai.2026.05.027. Online ahead of print.

After the escalator: narrative review of biomarker-guided asthma care

Morgane Gronnier [1], Sanjay Ramakrishnan [2], Richard W Beasley [3], Ian D Pavord [4], Simon Couillard [5]

Affiliations Expand

- PMID: 42208733

- DOI: 10.1016/j.anai.2026.05.027

Abstract

Asthma, the most common chronic respiratory disease, is characterized by variable symptoms, airflow limitation, and airway inflammation. Current management relies largely on a symptom-focused stepwise escalation approach which often leads to suboptimal outcomes. This review examines how type-2 (T2) inflammatory biomarkers - blood eosinophils and fractional exhaled nitric oxide (FeNO) - can complement symptom-based assessment to optimize care pathways. We synthesize evidence for biomarker-guided management across five critical decision points: diagnostic triage, inhaled corticosteroid (ICS) initiation and dose escalation, acute attack phenotyping, and biologic selection. Across trials and observational cohorts, biomarker-high patients derived substantially greater benefit with ICS-based therapy, while biomarker-low patients had a worse benefit-harm profile. Each section is balanced by a review of data in disfavor of biomarker-based management. Indeed, tests for type-2 inflammation may be criticized in terms of accessibility or

variability and require threshold validation. Nevertheless, the cumulated evidence suggests that future trials and studies of biomarker integration into diagnostic and treatment pathways may help streamline management for the most at-risk patients, from diagnosis to treatment intensification. The analogy of 'fast and slow lanes' for diagnostic and treatment algorithms is developed. The utility of alternative treatable traits including chronic airway infection, persistent airflow limitation, and breathing pattern disorders is also explored. The quality and counterpoints of the reviewed evidence emphasize that biomarkers should complement rather than replace comprehensive clinical assessment to optimize care for all phenotypes. Trials and studies of interventions tailored according to blood eosinophils, FeNO, and other key treatable traits are urgently needed across diagnostic and treatment algorithms for asthma.

Keywords: FeNO; airways; asthma; biologics; biomarkers; diagnosis; eosinophils; exacerbations; management; prognosis; therapy; type-2 inflammation.

Supplementary info

Publication typesExpand

Full text links

Proceed to details

Cite

7

Review

Int Immunopharmacol

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. 2026 May 28:184:116920.

doi: 10.1016/j.intimp.2026.116920. Online ahead of print.

Th17/Treg imbalance: a key driver of neutrophilic inflammation in severe asthma

Baihui Yao [1], Chao Song [2], Shimei Li [3], Zhiling Ran [4], Chao Wang [5], Mishan Wu [6], Qing Yuan [7]

Affiliations Expand

- PMID: 42208332

- DOI: 10.1016/j.intimp.2026.116920

Abstract

Severe asthma, characterized by neutrophilic airway inflammation, poses a significant clinical obstacle, primarily due to its frequent association with glucocorticoid resistance. This review provides a systematic analysis of how the imbalance between T helper 17 (Th17) cells and regulatory T (Treg) cells contributes to this glucocorticoid-resistant phenotype. We emphasize three interconnected mechanisms that transcend traditional cytokine networks: immunometabolic reprogramming, which promotes glycolytic adaptation in Th17 cells while simultaneously impairing oxidative metabolism in Tregs; microbiome dysregulation, acting via the "gut-lung axis", which disrupts local and systemic immune tolerance; and Treg plasticity, wherein inflammatory signals transform suppressive Tregs into pro-inflammatory Th17-like cells, thereby exacerbating immune imbalance. Consequently, these processes establish a self-perpetuating inflammatory environment that sustains neutrophilic infiltration and impairs glucocorticoid sensitivity. On this basis, we evaluate emerging therapeutic strategies targeting the Th17/Treg axis, including Interleukin-17/Interleukin-23 (IL-17/IL-23) blockade, Janus kinase inhibitors, and Treg-enhancing approaches. We conclude that biomarker-guided patient stratification, rather than a "one-size-fits-all" strategy, will be essential to translate these mechanistic insights into effective precision immunotherapy for severe neutrophilic asthma.

Keywords: Glucocorticoid resistance; Immunotherapy; Neutrophilic inflammation; Severe asthma; Th17 cells; Treg cells.

Conflict of interest statement

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

Supplementary info

Publication typesExpand

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ASTHMA PHENOTYPES AND COMORBID DISEASES

Tuba Erdogan, Fusun Yildiz, Funda Seher Ozalp Ates, Ismet Bulut, Secil Kepil Ozdemir, Fatma Merve Tepetam, Selen Karaoglanoglu, Zeynep Yegin Katran, Seyma Ozden, Semra Demir, Elif Yilmazel Ucar

- PMID: 42207732

- DOI: 10.1159/000552377

Abstract

Background: Asthma is a heterogeneous chronic airway disease frequently accompanied by comorbidities that influence symptom burden, treatment requirements, and disease control. Understanding the distribution of comorbidities across asthma phenotypes is essential for improving individualized management strategies.

Methods: This cross-sectional study analyzed data from 2,053 adults enrolled in the nationwide Turkish Asthma Action and Research (TAAR) registry. Demographic characteristics, asthma phenotypes, comorbidities, treatment steps, and control status were extracted. Comorbidities were categorized as upper airway, lower airway, non-respiratory, and psychophysiological disorders. Comparative analyses were performed across phenotypes (eosinophilic, allergic, NERD, obese asthma), treatment steps, and control groups using appropriate statistical tests.

Results: Allergic rhinitis (64.2%), chronic rhinosinusitis (32.1%), gastroesophageal reflux (GER) (26.4%), and nasal polyposis (19.9%) were the most frequent comorbidities. Upper airway diseases were significantly more common in eosinophilic asthma, NERD, and allergic asthma. Obesity-related comorbidities-including diabetes mellitus, hypertension, cardiovascular disease, and obstructive sleep apnea -were markedly higher in the obese asthma phenotype and among women. GER was particularly prevalent in NERD, obese asthma, and uncontrolled asthma. Patients in GINA step 5 had the highest comorbidity burden. Poorly controlled asthma was associated with higher frequencies of chronic rhinosinusitis, diabetes mellitus, GER, recurrent URTIs, and osteoporosis. The proportion of uncontrolled asthma increased significantly with rising numbers of comorbidities.

Conclusion: Comorbidities are highly prevalent among adults with asthma and vary substantially across phenotypes, sex, treatment step, and control status. Upper airway disease, GER, obesity-related conditions, and metabolic disorders exert a major impact on asthma severity and control. Systematic identification and targeted management of comorbidities should be prioritized to optimize asthma outcomes and reduce disease burden.

S. Karger AG, Basel.

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Review

3 Biotech

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. 2026 Jun;16(6):232.

doi: 10.1007/s13205-026-04887-9. Epub 2026 May 25.

Tissue-resident immune cells in asthma: drivers of inflammation, memory, and airway remodeling

Payal Singh [1]

Affiliations Expand

- PMID: 42205905

- PMCID: PMC13201817 (available on 2027-06-01)

- DOI: 10.1007/s13205-026-04887-9

Abstract

The complex inflammatory condition associated with airflow obstruction and variable airway hyperresponsiveness (AHR) is a characteristics condition of asthma. Exposure of the lungs to different environmental triggers, such as allergens, pollen, and environmental toxicants, exaggerates the immune reaction, narrowing the airways and resulting in episodes of reversible bronchoconstriction. The interaction of resident immune cells, structural cells, and altered extracellular matrix proteins creates persistent inflammatory condition in lung, resulting in airways inflammation, hyperresponsiveness, and remodelling. The imbalance between pro-inflammatory and anti-inflammatory response from granulocytes, monocytes, and lymphocytes, along with an imbalanced ratio of matrix

metalloproteinases (MMPs) and their inhibitors (TIMPs), this results in continual airway inflammation and airway remodeling. The emerging protective role of a specific group of tissue-resident eosinophils (rEos), long-lived tissue-resident memory $CD4^+$ T cells (TRM) and B cells (BRM), resident macrophages, endothelial cell (ECs), and innate lymphoid cells (ILC2) in amelioration of asthma is disclosing the novel approach for attenuation of asthma pathogenesis. This new understanding emphasizes the elasticity, tenacity, and communication of myeloid and lymphoid cells in the lung microenvironment, opening the door to new therapeutic possibilities, particularly for severe and chronic asthma. This review combines recent findings that refine our understanding of how immune cells contribute to asthma development and progression. It highlights the important roles of innate immune cells and tissue-resident memory lymphocytes, their interactions with resident cells, and also identifies new treatment approaches that could attenuate asthma progression.

Keywords: Airway inflammation and remodeling; Asthma pathogenesis; Immune memory cells and hyperresponsiveness; Innate lymphoid cells (ILC2); Tissue-resident immune cells.

Conflict of interest statement

Conflict of interestAuthor declared the absence of any financial or personal conflicts to this work.

- 166 references

Supplementary info

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10

BMC Nephrol

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. 2026 May 27.

doi: 10.1186/s12882-026-05076-9. Online ahead of print.

Impact of CKD and COPD co-existence on mortality, vascular dementia, and Alzheimer's dementia; a comparative cohort study

Lino Merlino [1 2 3], Francesco Rainone [4 5], James Tollitt [4 5], Rajkumar Chinnadurai [5], Francesca Rusconi [6], Gema Hernandez [6], Graziana G Battini [7], Paolo M Colombo [8], Stuart Stewart [5 9], Ross A Dunne [10 11], Philip A Kalra [5]

Affiliations Expand

- PMID: 42204658

- DOI: 10.1186/s12882-026-05076-9

Free article

Abstract

Background: Chronic kidney disease (CKD) and chronic obstructive pulmonary disease (COPD) are common conditions associated with increased risks of mortality and cognitive impairment. However, the association between COPD and dementia outcomes in patients with CKD remains incompletely understood.

Methods: We conducted a retrospective observational cohort study using the TriNetX Global Collaborative Network, including patients aged 18-80 years with CKD stages 3-5, excluding those with prior dialysis, transplantation, dementia, or mild cognitive impairment before cohort entry. Two cohorts were identified: CKD with COPD, defined using classical ICD-10 COPD codes (J41-J44), and CKD without COPD. A secondary sensitivity analysis used a broader respiratory disease definition including asthma, bronchiectasis, and other chronic respiratory conditions. Cohorts were propensity score matched (1:1) for demographic characteristics, comorbidities, smoking exposure, and laboratory parameters. Outcomes included all-cause mortality, non-Alzheimer's dementia, and Alzheimer's disease, assessed over a maximum follow-up of 5 years using Kaplan-Meier and Cox proportional hazards analyses.

Results: Two cohorts were identified: CKD with COPD (n = 270 566) and CKD without COPD (n = 821 399). After propensity score matching, 234 317 patients remained in each cohort. CKD with COPD was associated with a higher observed risk of mortality compared with CKD alone (18.5% vs. 14.5%; HR 1.17; 95% CI 1.16-1.19; p < 0.001). The composite outcome of non-Alzheimer's dementia was also more frequent in the CKD with COPD cohort (4.6% vs. 3.9%; HR 1.07; 95% CI 1.04-1.10; p < 0.001). No significant association was observed for vascular dementia alone or mild cognitive impairment alone. Alzheimer's disease incidence was low in both cohorts, and lower observed hazards were identified in the COPD cohort (HR 0.85; 95% CI 0.80-0.91; p = 0.002), although these findings should be interpreted cautiously given the relatively short follow-up and higher competing mortality in the COPD cohort.

Conclusions: Among patients with CKD, coexisting COPD was associated with higher observed risks of mortality and non-Alzheimer's dementia during follow-up.

Further longitudinal studies with longer follow-up and competing-risk methodology are warranted.

Keywords: Chronic kidney disease; Chronic obstructive pulmonary disease; Dementia; Mortality; TriNetX.

Conflict of interest statement

Declarations. Ethics approval and consent to participate: This analysis is a non-interventional, retrospective study utilising data obtained from TriNetX, LLC ("TriNetX") and conducted in accordance with ethical guidelines aligned with the Declaration of Helsinki, the International Conference on Harmonization, and Good Clinical Practice. TriNetX is a global federated health research network providing access to EMRs from HCOs worldwide. Research studies utilising TriNetX do not require ethical approval as part of a federated network. Participating HCOs' identities to each dataset are kept confidential, adhering to ethical norms and regulatory frameworks that prevent data re-identification. The TriNetX platform uses only aggregated counts and statistical summaries of deidentified information. No Protected Health Information or personal data is accessible to platform users. All data collection, processing, and transmission comply with applicable Data Protection laws for the contributing HCOs, including the EU Data Protection Law Regulation 2016/679, the General Data Protection Regulation regarding the protection of individuals in relation to personal data processing, and the Health Insurance Portability and Accountability Act (HIPAA), the US federal law protecting the privacy and security of healthcare data. Individual personal data does not leave the HCO. TriNetX is ISO/IEC 27001: 2022 certified and maintains a robust IT security program to protect personal and healthcare data. This retrospective study is exempt from informed consent. The data reviewed constitutes a secondary analysis of existing data and does not involve intervention or interaction with human subjects, and it is deidentified per the deidentification standard defined in Section § 164. 514 (a) of the HIPAA Privacy Rule. The process of deidentifying the data is validated through a formal determination by a qualified expert as outlined in Section § 164. 514 (b) (1) of the HIPAA Privacy Rule, with this determination refreshed in December 2020. Consequently, the study was deemed exempt from Institutional Review Board (IRB) oversight and did not necessitate patient consent. Consent for publication: Not applicable. Competing interests: The authors declare no competing interests.

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Editorial

Thorax

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. 2026 May 27:thorax-2025-224629.

doi: 10.1136/thorax-2025-224629. Online ahead of print.

Time for course correction? Rethinking oral steroids duration in acute asthma

Madeline G Carr [1], Sanjay Ramakrishnan [2 3 4]

Affiliations Expand

- **PMID: 42203509**

- **DOI: 10.1136/thorax-2025-224629**

No abstract available

Keywords: Asthma; Asthma Guidelines.

Conflict of interest statement

Competing interests: MGC has no conflicts to declare. SR declares has received salary support from the National Institute for Health and Social Care Research (NIHR) UK and the Charlie's Foundation for Research, unrelated to this work. SR also declares speaker fees from GSK, Sanofi, Chiesi, Boehringer Ingelheim and AstraZeneca and conference travel support from GSK, Sanofi and AstraZeneca unrelated to this work. SR also declares GSK and Sanofi advisory board membership, unrelated to this work. SR is the deputy convenor of the COPD special interest group for the Thoracic Society Australia & New Zealand (TSANZ).

Supplementary info

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. 2026 May 27;35(180):250040.

doi: 10.1183/16000617.0040-2025. Print 2026 Apr.

Current understanding and future directions in severe asthma through artificial intelligence-integrated multi-omic approaches

Sundhas Rafeeq Valappil [1], Mohammed Uddin [1 2 3 4], Saba Al Heialy [5 4]

Affiliations Expand

- PMID: 42203233
- PMCID: PMC13213459
- DOI: 10.1183/16000617.0040-2025

Abstract

Severe asthma remains a challenging, heterogeneous condition, despite significant advances in therapeutic strategies. A subset of patients continues to experience poor control, frequent exacerbations and a high burden of disease. The advent of multi-omic technologies, including genomics, transcriptomics, proteomics and metabolomics, has opened new avenues for understanding the molecular underpinnings of asthma. When combined with artificial intelligence (AI), these approaches hold the potential to transform and augment the management of severe asthma by identifying key biomarkers, refining disease endotypes and enabling personalised treatment strategies. This review explores the role of AI-integrated multi-omic approaches in asthma research, highlighting how AI-driven models can analyse vast datasets to uncover patterns often missed by traditional methods. These insights can improve diagnostic precision, predict therapeutic responses and guide the development of novel, targeted therapies. Key areas of focus include genetic loci associated with asthma severity, single-cell RNA sequencing to uncover cellular heterogeneity, and proteomic profiles that differentiate asthma phenotypes. Through this review, we aim to provide readers with a clear understanding of the current landscape in severe asthma research, highlighting the breakthroughs achieved through AI-integrated multi-omic approaches. Additionally, we aspire to guide the future direction of the field by addressing the challenges that remain in translating these discoveries into clinical practice. By fostering a deeper understanding of the potential of these technologies, we hope to inspire further innovations that will pave the way for precision medicine to transform severe asthma management, ultimately leading to more personalised and effective treatment options for patients.

Conflict of interest statement

Conflict of interest: All authors have nothing to disclose.

- 97 references
- 3 figures

Supplementary info

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13

Review

Eur Respir Rev

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. 2026 May 27;35(180):250256.

doi: 10.1183/16000617.0256-2025. Print 2026 Apr.

The evolution of scientific knowledge in childhood asthma over time

Giuliana Ferrante [1 2], Laura Tenero [3], Marco Zaffanello [1], Michele Piazza [4], Giorgio Piacentini [1]

Affiliations Expand

- **PMID: 42203231**
- **PMCID: PMC13213461**
- **DOI: 10.1183/16000617.0256-2025**

Abstract

Paediatric asthma management has undergone a significant transformation from rudimentary assessments in the early 20th century to sophisticated diagnostic and therapeutic approaches today. Early clinical observations lacked paediatric

specificity, but mid-20th-century studies introduced functional assessments, spirometry and recognition of asthma as a chronic inflammatory condition. The introduction of inhaled corticosteroids transformed long-term management, offering targeted control with reduced systemic risks. Advances in noninvasive diagnostics, such as fractional exhaled nitric oxide, induced sputum analysis, exhaled breath condensate and electronic nose technology, have improved inflammation monitoring, phenotype classification and therapeutic responsiveness. The integration of omics technologies, *i.e.* genomics, proteomics and metabolomics, has enabled deeper insights into disease mechanisms and facilitated early, individualised interventions. Concurrently, artificial intelligence (AI) and machine learning are emerging as tools for predicting exacerbations, identifying clinical subtypes and enhancing decision-making through large-scale data integration. Despite these advancements, challenges remain around standardisation, data quality and ensuring equitable access. This narrative review synthesises decades of progress in paediatric asthma care, emphasising the transition from empirical treatment to personalised, biomarker-driven strategies. It highlights current gaps, particularly in algorithm transparency, paediatric-specific validation and holistic care integration. As asthma management enters an era of digital health and AI-assisted precision medicine, future success will depend on interdisciplinary collaboration, real-world validation and policies that close care disparities.

Conflict of interest statement

Conflict of interest: The authors have no conflicts of interest relevant to this article to disclose.

- 93 references

Supplementary info

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14

Expert Opin Biol Ther

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. 2026 May 27.

doi: 10.1080/14712598.2026.2681752. Online ahead of print.

Real-world effectiveness of tezepelumab on clinical remission and small airway dysfunction in severe asthma: a 52-week prospective study

Francesco Menzella [1], Rory Chan [2], Marcello Cottini [3], Michele Mondoni [4], Elena Parazzini [4], Laura Ventura [5], Michela Bortoli [6], Gianenrico Senna [7], Carlo Lombardi [8], Lorenzo Corsi [1], Andrea Ballarin [1], Andrea Rastelli [6], Cristina Albrici [4], Giulia Carone [4], Tatiana Scandiuzzi Piovesan [1], Claudio Sorino [9], Maria Rita Marchi [6]

Affiliations Expand

- PMID: 42201800

- DOI: 10.1080/14712598.2026.2681752

Abstract

Background: Clinical remission is an emerging goal in severe asthma (SA) management. While tezepelumab demonstrates broad efficacy, its real-world impact on remission - specifically in the context of small airway dysfunction (SAD) - remains incompletely defined.

Methods: This prospective, multicentre study enrolled 39 adults with SA treated with tezepelumab for 12 months. Clinical remission was defined by SANI criteria: complete oral corticosteroid (OCS) withdrawal, zero severe exacerbations, Asthma Control Test score ≥ 20, and stable/improved FEV_1. SAD remission required normalization of oscillometric parameters.

Results: At baseline, 44% of patients exhibited SAD. Tezepelumab eliminated severe exacerbations and achieved complete OCS withdrawal in 100% of evaluable patients. At 12 months, 77.4% of the overall evaluable cohort and 80.0% of those with baseline SAD achieved clinical remission. However, SAD remission was not observed; these patients maintained persistent oscillometric abnormalities despite reaching all clinical goals.

Conclusion: Tezepelumab enables high rates of clinical remission regardless of baseline small airway status. In the SAD phenotype, symptomatic and inflammatory recovery dissociates from physiological SAD remission. Persistent mechanical abnormalities highlight the necessity of oscillometry to identify hidden residual disease in patients who otherwise appear to be in remission.

Keywords: Severe asthma; clinical remission; oscillometry; real-world effectiveness; small airway dysfunction; tezepelumab.

J Allergy Clin Immunol

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. 2026 May 27:S0091-6749(26)00293-9.

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Differential responses of group 2 innate lymphoid cells and T_H2 cells to benralizumab in severe asthma

Misato Irie [1], Hiroki Kabata [2], Takashi Kamatani [3], Mai Yamagishi [4], Reina Nakamura [1], Katsunori Masaki [1], Rino Homma [5], Maho Suzukawa [6], Hitoshi Sasano [7], Norihiro Harada [7], Yasunari Miyazaki [8], Hideki Katsura [9], Etsuko Tagaya [9], Junko Terada [10], Masayuki Hojo [10], Naoya Sugimoto [11], Hiroyuki Nagase [11], Yuta Kono [12], Hisato Hiranuma [13], Yasuhiro Gon [13], Jun Miyata [1], Sotaro Uemura [5], Yoshitaka Shirasaki [14], Koichi Fukunaga [1]

Affiliations Expand

- PMID: 42201298

- DOI: 10.1016/j.jaci.2026.03.028

Abstract

Background: Severe asthma is a heterogeneous disease with variable treatment responses to biologic therapy. Conventional biomarkers, including blood eosinophil counts and fractional exhaled nitric oxide, only partially capture response heterogeneity.

Objective: We evaluated the cytokine secretion profiles of group 2 innate lymphoid cells (ILC2s) and T_H2 cells and examined their associations with clinical outcomes after benralizumab therapy.

Methods: We analyzed 70 patients with severe type 2-high asthma enrolled onto the multicenter Tokyo Asthma Study. Cytokine secretion by ILC2s and T_H2 cells was evaluated by live cell imaging of secretion activity, which enables real-time visualization of cytokine secretion from individual lymphocytes. The frequencies of IL-4-, IL-5-, and IL-13-producing cells were quantified at baseline and after 24 weeks of benralizumab treatment. Clinical responses were primarily assessed by the Asthma Control Questionnaire 5, and patients were classified as experiencing response or not.

Study registration: Japan Registry of Clinical Trials (jRCTs031190237).

Results: In type 2-high asthma, ILC2s and T_H2 cells exhibited distinct cytokine secretion profiles with no significant correlation between the two cell populations. Benralizumab selectively suppressed IL-5- and IL-13-producing ILC2s but had little effect on T_H2 cells. Patients with higher baseline frequencies of IL-4-producing T_H2

cells showed limited clinical improvement after benralizumab therapy. In multivariable logistic regression analysis, baseline IL-4-producing T_H2 cell frequency was associated with Asthma Control Questionnaire-defined nonresponse after adjustment for blood eosinophil counts and fractional exhaled nitric oxide.

Conclusions: Single-cell functional lymphocyte profiling identifies distinct innate and adaptive type 2 responses to benralizumab and provides complementary information associated with response heterogeneity in severe asthma.

Keywords: Benralizumab; ILC2; T(H)2 cells; cytokines; type 2–high asthma.

Conflict of interest statement

Disclosure statement Supported by Keio University Academic Development Funds (to H.K.), Keio Gijuku Fukuzawa Memorial Fund for the Advancement of Education and Research (H.K.), MSD Life Science Foundation, Public Interest Incorporated Foundation (H.K.), grants from JSPS Grants-in-Aid for Scientific Research-C (KAKENHI; 22K08240 to H.K.), AMED (JP20hm0102082 to Y.S., JP23ek0410110 to H.K.), Japan Society for the Promotion of Science Doctoral Course2 Research Fellowships (K.S. and M.K.), and KAKENHI-B (23K24342 to K.F. and 25K02662 to H.K.), and partially supported by the Japan Science and Technology Agency–Moonshot R&D under grant JPMJMS2217 (Y.S. and T.K.). AstraZeneca provided clinical research funding for the research group, including Keio University. The funders did not play any role in study design, data collection, or analysis; the writing of the report; or in the decision to submit the report for publication.
Disclosure of potential conflict of interest: H. Kabata, K. Masaki, N. Harada, Y. Miyazaki, E. Tagaya, M. Hojo, H. Nagase, J. Miyata, and K. Fukunaga have received honoraria for lectures from AstraZeneca. M. Suzukawa has received honoraria and grants from and participated on advisory boards for AstraZeneca. The rest of the authors declare that they have no relevant conflicts of interest.

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Clin Exp Allergy

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. 2026 May 27.

doi: 10.1111/cea.70348. Online ahead of print.

A Real-World Controlled Multicentre Study Evaluating the Association Between Benralizumab Therapy and Major Outcomes in Severe Asthma

Dennis Thomas [1 2], Vanessa M McDonald [1 2 3], Gijo Thomas [1], Joy Lee [4], Li Ping Chung [5], Matthew Peters [6 7], Shakti D Shukla [8], Yuto Hamada [1 2 9], Erin S Harvey [1 2 3], Michael Fricker [1 2], Hayley See [10 11], Rejoy Sabin Thomas [1 2], Claude S Farah [6 7 12], Andrew Gillman [13], Constance H Katelaris [14 15], Gregory P Katsoulotos [16 17 18 19], David Langton [20 21], Peter G Middleton [22 23 24], Paul Reynolds [25], Janet Rimmer [26 27], Francis Thien [28], Stephen Vincent [29], John W Upham [30], Peter G Gibson [1 2 3]

Affiliations Expand

- PMID: 42200301

- DOI: 10.1111/cea.70348

Abstract

Background: Real-world data on benralizumab in patients with severe eosinophilic asthma-while controlling for confounding factors-is currently lacking.

Aim: This real-world controlled multicentre study evaluated asthma outcomes in patients who received benralizumab compared with a severe asthma cohort who did not receive biologic therapy.

Methods: Two years of data from patients with severe eosinophilic asthma in the Australian Benralizumab Registry (ABenRa) and the Australasian Severe Asthma Registry (ASAR) were included in the analysis. Asthma control questionnaire-5 (ACQ-5) scores, asthma-related quality of life (AQLQ) scores, maintenance oral corticosteroid (OCS) dose, annualised exacerbation rate and clinical remission (ACQ-5 ≤ 1, with no asthma attacks or OCS use for 12 months, assessed at the 24-month follow-up) rates were compared between the groups after adjusting for baseline imbalances.

Results: A total of 211 participants from ABenRa (64.5% female; mean age 57.4 ± 14.5 years) and 250 from ASAR (63.1% female; mean age 53.7 ± 14.8 years) were included. ACQ and AQLQ improved significantly in both groups. Participants in the ABenRa showed greater improvements in ACQ at 12- (β = -0.5, p = 0.002) and 24-months (β = -0.5, p = 0.003), as well as in AQLQ at 12- (β = 0.6, p < 0.001) and 24-months (β = 0.4, p = 0.019), compared with the ASAR group, with no difference in maintenance OCS dose or annualised exacerbation rates between groups. At 12- and 24-months, approximately 60% of participants in the ABenRa achieved controlled or partially controlled asthma as per the GINA guidelines. Notably, clinical benefit was evident within 14 days of initiating treatment. A higher proportion of participants in the ABenRa achieved clinical remission (30.9% vs. 20.4%; OR 2.1 (95% CI 1.1, 4.1), p = 0.037).

Conclusion: Benralizumab was associated with significant improvement in asthma outcomes in patients with severe eosinophilic asthma. This benefit persisted when compared with patients who had severe eosinophilic asthma but did not receive any biologic therapy.

- 53 references

Supplementary info

Grants and fundingExpand

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17

Int Forum Allergy Rhinol

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. 2026 May 27.

doi: 10.1002/alr.70189. Online ahead of print.

Lower Airway Conditions Contribute to the Prediction of Polyp Recurrence in Chronic Rhinosinusitis With Nasal Polyps and Comorbid Asthma

Jiaxing Guo [1], Jing Yuan [2 3], Yu Hong [2 3], Zhou Yu [2 3], Xiaomo Wang [2 3], Chengshuo Wang [2 3], Aihui Yan [1], Luo Zhang [2 3 4], Ming Wang [2 3]

Affiliations Expand

- PMID: 42199170

- DOI: 10.1002/alr.70189

Abstract

Duration of asthma, ratio of peak expiratory flow to predicted value, and ratio of maximal expiratory flow at 25% of the vital capacity to predicted value are independent risk factors for polyp recurrence in patients with CRSwNP+AS. A lower+upper model created with the ethmoid sinus score and the three lower airway factors shows good predictive value for polyp recurrence in patients with CRSwNP+AS.

Keywords: chronic rhinosinusitis with nasal polyps; comorbid asthma; lower airway variables; polyp recurrence; prediction.

- 10 references

Supplementary info

Grants and fundingExpand

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Cite

18

J Allergy Clin Immunol Pract

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. 2026 May 25:S2213-2198(26)00424-1.

doi: 10.1016/j.jaip.2026.05.020. Online ahead of print.

Heterogeneity of Obese Asthma: A Hierarchical Cluster Analysis from the Australasian Severe Asthma Network

Yun Yun Yang [1], Ke Deng [2], Chang Yong Wang [2], Ji Wang [2], Si Yang Gao [2], Ling Qin [3], Brian G Oliver [4], Zhi Hong Chen [5], Peng Gao [6], Alan Chen-Yu Hsu [7], Min Xie [8], Gang Liu [9], Feng Ming Luo [2], Wei Min Li [10], Gang Wang [11], Lisa G Wood [12]

Affiliations Expand

- PMID: 42191069

- DOI: 10.1016/j.jaip.2026.05.020

Abstract

Background: Clinical heterogeneity exists within obese asthma (OA) traditionally defined by body mass index (BMI)-based measurements of obesity, which can either underestimate or overestimate adiposity.

Objective: To explore potential OA subtypes and verify future outcomes of the identified clusters.

Methods: We applied the new definition of obesity introduced by the European Association for the Study of Obesity to identify participants with OA from the Australasian Severe Asthma Network, and followed them in a 12-month prospective

cohort study. We explored potential OA clusters using a hierarchical cluster analysis and assessed clinical outcomes including asthma exacerbations (AE) and clinical remissions (CR) in the identified clusters. Additionally, a decision tree analysis was performed to validate cluster assignments in another separate dataset.

Results: Cluster analysis of 244 subjects with OA identified three clusters. Cluster 1 was "younger mild OA with high skeletal muscle mass", cluster 2 was "male smokers-predominant uncontrolled OA with multimorbidity and eosinophilic inflammation", and cluster 3 was "older female nonsmokers-predominant OA with high visceral fat area and neutrophilic inflammation". Clusters 2 and 3 had higher risk of moderate-to-severe AE (OR=5.60, 95%CI: 2.42-12.94; and OR=3.86, 95%CI: 1.74-8.58), and were less likely to achieve 2-component CR (OR=0.18, 95%CI: 0.08-0.41; and OR=0.26, 95%CI: 0.12-0.57). Decision tree analysis validated the clustering results in another dataset with an accuracy of 88.93%.

Conclusion: We identified three OA clusters with distinct clinical characteristics and differential future outcomes including AE and CR. These findings may provide clinical implications for the targeted management of OA.

Keywords: asthma; body composition; cluster analysis; inflammation; obesity.

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Review

Mol Biol Rep

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. 2026 May 26;53(1):828.

doi: 10.1007/s11033-026-12005-4.

Epithelial alarmins TSLP, IL-33, and IL-25 in asthma pathogenesis: mechanistic roles and therapeutic implications

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Affiliations Expand

- **PMID: 42189350**

- **DOI: [10.1007/s11033-026-12005-4](https://doi.org/10.1007/s11033-026-12005-4)**

Abstract

Background: Asthma is a heterogeneous chronic inflammatory airway disease affecting over 300 million people worldwide. The airway epithelium serves as the primary interface with environmental stimuli and responds by releasing epithelial-derived alarmins, thymic stromal lymphopoietin (TSLP), interleukin-33 (IL-33), and interleukin-25 (IL-25), which act as upstream regulators of both innate and adaptive immune responses. Current therapies targeting downstream inflammatory mediators demonstrate limited efficacy in severe and refractory asthma, necessitating novel approaches targeting upstream pathways.

Objective: This narrative review examines the mechanistic roles of epithelial alarmins TSLP, IL-33, and IL-25 in asthma pathogenesis, covering their regulation, receptor signalling, downstream immune activation, and contributions to airway remodelling. Current and emerging biologic therapies targeting these alarmins are summarised, with key clinical trials tabulated.

Methods: A comprehensive narrative literature review was conducted. Electronic databases searched included PubMed/MEDLINE, Scopus, Web of Science, and ClinicalTrials.gov, covering publications from January 2015 to March 2025, with seminal earlier studies included where relevant. Search terms used included: "TSLP asthma," "IL-33 asthma," "IL-25 asthma," "epithelial alarmins," "thymic stromal lymphopoietin," "tezepelumab," "itepekimab," "astegolimab," "airway inflammation," "ILC2," "airway remodelling," and "biologic therapy severe asthma." Priority was given to original research articles, randomised controlled trials, and systematic reviews; review articles were included to provide mechanistic context. Studies were selected based on relevance to alarmin biology, immunological pathways, and clinical evidence in asthma.

Results: TSLP: Functions as a central amplifier of type-2 and mixed inflammatory responses through transcriptional regulation following epithelial stimulation. Activates dendritic cells, group 2 innate lymphoid cells (ILC2s), and granulocytes via the TSLPR/IL-7Rα complex, driving both eosinophilic and non-eosinophilic inflammation. Tezepelumab, an anti-TSLP monoclonal antibody, has achieved regulatory approval (FDA/EMA) for severe asthma with demonstrated exacerbation reduction across multiple endotypes (40-60% reduction in clinical trials). IL-33: Constitutively stored in epithelial cell nuclei, acts as an immediate danger signal upon cellular injury, triggering rapid innate immune activation through the ST2/IL-1RAcP receptor complex. Mediates acute exacerbations, airway hyperresponsiveness, and steroid-refractory inflammation. Anti-IL-33 agents including itepekimab, astegolimab, and tozorakimab are in Phase 2-3 clinical development with promising early efficacy data. IL-25: Predominantly produced by epithelial tuft cells, sustains chronic type-2 immunity, mucus hypersecretion, and corticosteroid-insensitive disease phenotypes through IL-17RA/IL-17RB receptor engagement. IL-25-targeted approaches demonstrate preclinical efficacy and are advancing toward clinical evaluation.

Conclusion: Epithelial alarmins represent critical upstream drivers of asthma pathogenesis, orchestrating diverse inflammatory pathways that determine disease endotypes and severity. Therapeutic targeting of TSLP, IL-33, and IL-25 offers a paradigm shift from downstream cytokine inhibition to source-directed intervention, with potential to reduce exacerbations, prevent airway remodelling, and improve disease control across different asthma phenotypes. The success of anti-TSLP therapy and ongoing clinical development of IL-33 and IL-25 inhibitors validate epithelial alarmins as essential molecular targets for precision medicine approaches in severe and refractory asthma.

Keywords: Airway remodelling; Asthma; Biologic therapy; Epithelial alarmins; Interleukin-25 (IL-25); Interleukin-33 (IL-33); Thymic stromal lymphopoietin (TSLP); Type-2 inflammation.

Conflict of interest statement

Declarations. Competing interests: The authors declare no competing interests. Consent for publication: Not applicable. Ethics approval and consent to participate: Permission from the Institutional Ethical Committee does not apply to this review article.

- **117 references**

Supplementary info

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20

Review

Jpn J Radiol

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Chest CT imaging toward personalized management of chronic obstructive pulmonary disease, asthma, and bronchiectasis: pulmonologist perspectives

Naoya Tanabe [1], Toyohiro Hirai [2]

Affiliations Expand

- PMID: 42183930

- DOI: 10.1007/s11604-026-02017-2

Abstract

Chronic airway diseases, including chronic obstructive pulmonary disease (COPD), asthma, and bronchiectasis, impose substantial morbidity and mortality worldwide. Precise phenotyping of their complex pathophysiological manifestations is essential for effective management. Chest computed tomography (CT) allows qualitative and quantitative assessments of emphysema, airway structure, mucus plugs, vascular abnormalities, bronchiectasis, and comorbid interstitial lung abnormality, making it central to charactering these conditions. From perspectives of pulmonologists who use chest CT with guidance from radiologists, this review describes the advances in CT image analysis and their implications for patients with chronic airway disease. On inspiratory CT, low-attenuation regions reflect emphysema and are associated with clinical outcomes in smokers. Airway lumen, wall size, branch count, and fractal dimension correlate with disease severity and lung function impairment in COPD and asthma. Airway mucus plugs reflect inflammatory patterns and are associated with reduced lung function and exacerbations; however, mucus plugs are increasingly recognized as a treatable trait in the era of biologics treatment. Pulmonary vascular abnormalities are quantified using pulmonary artery-to-aorta diameter ratio and small vessel volume proportions. Along with chronic symptoms, bronchiectasis is diagnosed radiologically by an increased broncho-arterial ratio, absent bronchial tapering, and peripheral airway visibility. Although limited spatial resolution precludes direct evaluation of small airway disease, air-trapping on expiratory CT or registered Inspiratory-expiratory CT allows indirect estimation of small airway disease. Despite these advances, many research findings remain unapplied to routine clinical image analysis. Radiation exposure is an inherent limitation. Nonetheless, chest CT provides greater diagnostic information than chest radiography and is more accessible than magnetic resonance imaging and nuclear imaging. Further studies are needed to maximize the potential of chest CT for early detection, risk stratification, and treatment monitoring in airway disease management.

Keywords: Asthma; Bronchiectasis; COPD; Computed tomography; Imaging; Mucus plug.

Conflict of interest statement

Declarations. Competing interests: The authors declare no conflict of interest related to this review. Ethics approval: Not applicable. Informed consent: Not applicable.

- 227 references

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21

Review

Clin Exp Allergy

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. 2026 May 24.

doi: 10.1111/cea.70349. Online ahead of print.

Impact of Biologics on Oscillometry Defined Small Airway Dysfunction in Uncontrolled Asthma

Robert Greig [1], Philipp Suter [1], Rory Chan [1], Brian Lipworth [1]

Affiliations Expand

- **PMID: 42178280**

- **DOI: 10.1111/cea.70349**

Abstract

Small airways dysfunction (SAD) is a recognised treatable trait within severe asthma, associated with worse symptom control and increased exacerbations. It can be measured using forced oscillometry technique (FOT). FOT is an effective and effort-independent method of measuring peripheral lung resistance and compliance. Type 2 inflammation can affect the small airways via eosinophilic inflammation, mucus plugging and smooth muscle inflammation. These are all potential targets of monoclonal antibody therapy. Clinical trials have shown that mepolizumab, dupilumab and tezepelumab all effect both significant and clinically meaningful improvements in oscillometry-defined SAD; however, benralizumab does not. Furthermore, in indirect matched head-to-head comparisons, dupilumab exerts

greater improvements compared to either benralizumab or tezepelumab. Future research should consider oscillometry-defined SAD being incorporated as a key clinical outcome in phase 2 studies as new monoclonal antibodies are developed, such as bispecifics, especially both dual upstream (IL33/TSLP) or downstream blockade (IL4/5/13).

Keywords: asthma; benralizumab; biologics; dupilulmab; mepolizumab; monoclonal antibodies; oscillometry; small airways dysfunction; tezepelumab.

- 49 references

Supplementary info

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Laryngoscope Investig Otolaryngol

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. 2026 May 14:11:e70443.

doi: 10.1002/lio2.70443. eCollection 2026 Jun.

Obesity and New-Onset Asthma Risk in Chronic Rhinosinusitis: A Population-Based Cohort Study

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Affiliations Expand

- PMID: 42146118
- PMCID: PMC13175922
- DOI: 10.1002/lio2.70443

Abstract

Objective: Obesity and chronic rhinosinusitis (CRS) are independently associated with asthma, yet their combined impact on asthma risk remains less understood. This study evaluates the association between elevated body mass index (BMI) and new-onset asthma and asthma exacerbations in patients with CRS.

Methods: A retrospective cohort study was conducted using the TriNetX U.S. Collaborative Network. Adults ≥ 18 years with unspecified CRS and recorded BMI from 2009 to 2019 were identified. Patients with prior functional endoscopic sinus surgery were excluded. Cohorts were stratified by BMI (healthy, overweight, obese) and matched 1:1 by demographics and comorbidities. Primary outcomes were adjusted relative risks (aRR) of new-onset asthma and asthma exacerbations within 1, 2, and 5 years after BMI classification. A secondary analysis was performed in patients without CRS using the same BMI stratification and matching approach.

Results: Overweight CRS patients had a higher risk of new-onset asthma (aRR = 1.13, 95% CI 1.10-1.17) and exacerbations (aRR = 1.24, 95% CI 1.18-1.30) at 1 year compared to healthy-weight controls, with similar trends at 2 and 5 years. Obese CRS patients showed greater risks of new-onset asthma (aRR = 1.44, 95% CI 1.40-1.48) and exacerbations (aRR = 1.71, 95% CI 1.63-1.79) at 1 year, persisting at 2 and 5 years. In secondary analyses, elevated BMI was associated with increased relative asthma risk in patients without CRS, though absolute rates remained higher among CRS patients.

Conclusions: Elevated BMI is associated with increased risk of asthma onset and exacerbations in CRS patients, with a graded relationship across BMI categories. Secondary analyses in patients without CRS suggest this association likely reflects the broader relationship between excess adiposity and asthma rather than a uniquely CRS-specific effect; however, higher absolute asthma rates among CRS patients support the clinical relevance of BMI assessment in this population.

Level of evidence: 4.

Keywords: asthma; body mass index; chronic rhinosinusitis; epidemiology; obesity.

Conflict of interest statement

The authors declare no conflicts of interest.

- 63 references
- 1 figure

J Allergy Clin Immunol Pract

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Recognizing and Addressing Treatable Traits in Patients With Chronic Rhinosinusitis With Nasal Polyposis: Can We Do Better?

Philippe Gevaert [1], Lars-Olaf Cardell [2], Marjolein Cornet [3], Katie M Phillips [4], Sanna Toppila-Salmi [5], Johan Steineger [6]

Affiliations Expand

- PMID: 42114621

- DOI: 10.1016/j.jaip.2026.04.032

Abstract

Despite a rising awareness of the treatable traits of chronic rhinosinusitis with nasal polyposis (CRSwNP), gaps in the recognition and management of these traits remain. The present article summarizes the findings of a scientific discussion involving an international panel of ENT (ear, nose, and throat) specialists, allergists, and pulmonologists, aiming to bridge different perspectives to promote collaborative care. The discussion highlights the complexity of CRSwNP and its multiple treatable traits, as well as the current challenges in assessing and treating these traits. The authors share clinical experience and best practices, underscoring the need for a standardized, evidence-based management approach centered around the individual patient's concerns and medical needs. They outline a management approach that extends beyond sinonasal disease, encompassing a wide spectrum of treatable traits, from common CRSwNP-associated comorbidities such as asthma and allergies, to systemic inflammation, environmental triggers, infections, pain, and behavioral and psychosocial factors. In addition, the article discusses methods to enhance both patient and physician understanding of treatable traits and their impact on disease severity and recurrence, ultimately aiming to improve clinical outcomes for those with CRSwNP.

Keywords: Chronic rhinosinusitis; Comorbidities; Personalized care; Recurrence; Treatable traits.

Cite

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Review

Curr Opin Allergy Clin Immunol

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. 2026 Jun 1;26(3):233-236.

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Allergen-specific immunotherapy at earlier stages of allergic respiratory diseases: a change is in the air!

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Affiliations Expand

- PMID: 42055088

- DOI: 10.1097/ACI.0000000000001159

Abstract

Purpose: This expert point of view discusses why allergen-specific immunotherapy (AIT) should be considered earlier in the management of allergic rhinitis and asthma, highlighting a shift from its traditional use as a last-line add-on therapy toward a more proactive, disease-modifying intervention in carefully selected patients.

Recent findings: Large real-world datasets, including the REACT program and the EfficAPSI study, show that adding AIT to standard care in patients with allergic rhinitis, with or without mild-to-moderate asthma, is associated with sustained reductions in pharmacologic treatment needs, fewer severe asthma exacerbations, and lower healthcare utilization over long-term follow-up. Pediatric and adolescent analyses suggest that starting AIT earlier in life enhances these benefits, supporting the concept of a "window of opportunity" during which immune modulation may prevent or delay asthma onset and limit new sensitizations, in line with the notion of the allergic march.

Summary: The accumulating real-world evidence that early AIT can alter the natural history of allergic airway disease provides a strong rationale to reposition AIT within clinical algorithms, moving it from a rescue option for pharmacologic failures to an earlier, integrated disease-modifying strategy. Earlier use of AIT, alongside

optimized pharmacotherapy, may improve long-term control, reduce progression to severe asthma, with important implications for patients and health-care systems.

Keywords: allergen immunotherapy; allergic rhinitis; asthma; disease modification; early intervention.

- 10 references

Supplementary info

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25

Observational Study

Respir Med

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. 2026 Jun:257:108854.

doi: 10.1016/j.rmed.2026.108854. Epub 2026 Apr 25.

Rapid & sustained benefit of benralizumab in severe eosinophilic asthma: the BE-REAL study

Lieven Dupont [1], Charles Pilette [2], Maud Deschampheleire [3], Katrien Eger [4], Jean-Benoît Martinot [5], Mathias Leys [6], Ulrike Himpe [7], Rudi Peché [8], Muriel Lins [9], Solange Delovinfosse [10], Hélène Simonis [3], An Herreman [11], Leen Janssen [11], Charlotte Quataert [11], Tom Feys [12], Renaud Louis [13]

Affiliations Expand

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Free article

Abstract

Background: Benralizumab is an anti-IL-5Rα antibody used as add-on maintenance therapy in patients with severe eosinophilic asthma (SEA).

Materials and methods: The prospective, observational BE-REAL study evaluated the outcomes in SEA patients treated with benralizumab in a Belgian real-world setting. The primary objective of the study was to assess within-patient improvement of a minimum clinically important difference (MCID) in Asthma Control Questionnaire-6 (ACQ-6) (i.e., ≥0.5 units) up to 6 months (or 24 weeks). Secondary objectives include the change in ACQ-6 at weeks 56 and 112, the change in the daily oral corticosteroid (OCS) use, changes in asthma status and disease severity, healthcare resource utilization, treatment satisfaction, exacerbation rate and safety. Clinical remission rate was determined by combining the effect on asthma control, OCS use and exacerbation rate.

Results: 78 patients were screened, 2 were screening failures and 76 received at least one dose of benralizumab. At week 24, 71% of patients achieves an ACQ-6 response. Reductions in ACQ-6 scores were seen within 1 week of therapy. Over 112 weeks, the mean ACQ-6 score was reduced by 1.60 points (>3-fold MCID), the Annualized Exacerbation Rate (AER) was reduced by 82%, and the mean daily dose of OCS was reduced by 90%. 44% of patients in BE-REAL fulfilled the definition of clinical remission at week 56. Benralizumab was well-tolerated and associated with an improved perception of disease severity and a reduced healthcare utilization.

Conclusion: BE-REAL provide a real-world confirmation of the clinical trial data obtained with benralizumab showing both favourable short and long-term outcomes.

Keywords: ACQ6; Asthma; Asthma control; Belgium; Benralizumab; Clinical remission; Real-world data; SEA.

Conflict of interest statement

Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Supplementary info

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doi: 10.1016/j.rmed.2026.108855. Epub 2026 Apr 24.

Dupilumab-induced eosinophilia in severe asthma: 2-year follow-up real-life evidence from biologic-naïve and previously treated patients

Cristina Bellver-Asperilla [1], Ana Romero Ortíz [1], Héctor Cabrerizo-Carreño [2], Sandra Orozco Echeverría [1], Xavier González Compta [3], Mireia Golet Fors [3], Alexandra Andújar Ruiz [1], Guillermo Suárez-Cuartín [4], Nuria Padullés-Zamora [5], Carmen Ardanuy Tisaire [6], Salud Santos Pérez [4], Mariana Muñoz-Esquerre [7]

Affiliations Expand

- **PMID: 42036049**

- **DOI: 10.1016/j.rmed.2026.108855**

Free article

Abstract

Data from real-life settings regarding dupilumab-associated eosinophilia remains limited, particularly concerning potential risk factors for developing hypereosinophilia after treatment initiation.

Methods: We conducted a prospective observational study including an initial cohort of 36 patients with severe asthma treated with dupilumab and followed for up to two years. Blood eosinophil count (BEC), asthma outcomes, and treatment response - including ACT score, lung function, exacerbations, oral corticosteroid use, and the EXACTO scale as a multidimensional response measure - were assessed at baseline and at weeks 24, 52, and 104. Eosinophilia was categorized as mild (>500 cells/μL), moderate (>1500 cells/μL), or severe (>5000 cells/μL), and hypereosinophilia as moderate-severe eosinophilia.

Results: Transient eosinophilia occurred in 47.2% of patients and transient hypereosinophilia in 19.4%, with most cases being asymptomatic. Two patients (5.6%) developed a clinical presentation suggestive of eosinophilic granulomatosis with polyangiitis (EGPA). Hypereosinophilia was more frequent among patients who had switched from prior anti-IL-5/IL-5R therapy. Among the cases that developed hypereosinophilia, 42.9% persisted at the 2-year follow-up, whereas mild eosinophilia persisted in 65% of patients. Nevertheless, dupilumab treatment resulted in significant improvements in asthma control and treatment response outcomes, irrespective of eosinophil levels or prior biologic exposure.

Conclusion: Eosinophilia is a common finding in patients receiving dupilumab, generally without significant safety implications. The use of dupilumab is safe and highly effective, even in patients previously treated with anti-IL-5/IL-5R biologics. However, rare cases of severe eosinophilic complications may occur, making long-term systematic monitoring advisable.

Keywords: Adverse events; Dupixent; EGPA; Eosinophils; Hypereosinophilia; Safety.

Conflict of interest statement

Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:Mariana Munoz-Esquerre reports financial support was provided by Carlos III Health Institute.Salud Santos Perez reports financial support was provided by SEPAR. Cristina Bellver Asperilla reports a relationship with AstraZeneca Pharmaceutical Spain that includes: speaking and lecture fees. Cristina Bellver Asperilla reports a relationship with GlaxoSmithKline that includes: travel reimbursement. Cristina Bellver Asperilla reports a relationship with Chiesi Pharmaceuticals Inc that includes: travel reimbursement. Mireia Golet Fors reports a relationship with GlaxoSmithKline that includes: speaking and lecture fees. Mireia Golet Fors reports a relationship with Sanofi that includes: speaking and lecture fees. Xavier Gonzalez Compta reports a relationship with GlaxoSmithKline that includes: speaking and lecture fees. Xavier Gonzalez Compta reports a relationship with Sanofi that includes: speaking and lecture fees. Xavier Gonzalez Compta reports a relationship with AstraZeneca Pharmaceutical Spain that includes: speaking and lecture fees. Xavier Gonzalez Compta reports a relationship with Menarini Laboratories that includes: speaking and lecture fees. Xavier Gonzalez Compta reports a relationship with Aldo-Unión Laboratory that includes: speaking and lecture fees. Cristina Bellver Asperilla reports a relationship with Sanofi that includes: speaking and lecture fees and travel reimbursement. Guillermo Suarez-Cuartin reports a relationship with Laboratorios Gebro Pharma SA that includes: speaking and lecture fees. Guillermo Suarez-Cuartin reports a relationship with PARI Pharma GmbH that includes: speaking and lecture fees and travel reimbursement. Guillermo Suarez-Cuartin reports a relationship with Menarini Laboratories that includes: speaking and lecture fees and travel reimbursement. Guillermo Suarez-Cuartin reports a relationship with Pfizer that includes: speaking and lecture fees. Guillermo Suarez-Cuartin reports a relationship with Bial Pharmaceutical Industry SA that includes: travel reimbursement. Guillermo Suarez-Cuartin reports a relationship with Chiesi Pharmaceuticals Inc that includes: travel reimbursement. Guillermo Suarez-Cuartin reports a relationship with CSL Behring that includes: travel reimbursement. Guillermo Suarez-Cuartin reports a relationship with GlaxoSmithKline that includes: consulting or advisory. Guillermo Suarez-Cuartin reports a relationship with Insmed Incorporated that includes: consulting or advisory. Mariana Munoz-Esquerre reports a relationship with GlaxoSmithKline that includes: funding grants, speaking and lecture fees, and travel reimbursement. Mariana Munoz-Esquerre reports a relationship with Sanofi that includes: funding grants, speaking and lecture fees, and travel reimbursement. Mariana Munoz-Esquerre reports a relationship with AstraZeneca Pharmaceutical Spain that includes: funding grants, speaking and lecture fees, and travel reimbursement.

Mariana Munoz-Esquerre reports a relationship with Chiesi Pharmaceuticals Inc that includes: speaking and lecture fees and travel reimbursement. Mariana Munoz-Esquerre reports a relationship with Menarini Laboratories that includes: speaking and lecture fees. Mariana Munoz-Esquerre reports a relationship with Aldo-Unión Laboratory that includes: speaking and lecture fees. Mariana Munoz-Esquerre reports a relationship with Faes Farma that includes: speaking and lecture fees. Salud Santos Perez reports a relationship with AstraZeneca Pharmaceutical Spain that includes: speaking and lecture fees. Salud Santos Perez reports a relationship with GlaxoSmithKline that includes: consulting or advisory and speaking and lecture fees. Salud Santos Perez reports a relationship with Chiesi Pharmaceuticals Inc that includes: speaking and lecture fees and travel reimbursement. Salud Santos Perez reports a relationship with Menarini Laboratories that includes: speaking and lecture fees. Salud Santos Perez reports a relationship with Bial Pharmaceutical Industry SA that includes: consulting or advisory and speaking and lecture fees. Salud Santos Perez reports a relationship with Sanofi that includes: speaking and lecture fees and travel reimbursement. Salud Santos Perez reports a relationship with MSD Pharmaceutical that includes: speaking and lecture fees. Salud Santos Perez reports a relationship with Ambu SL that includes: speaking and lecture fees. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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27

Observational Study

Respir Med

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Temporal trends in baseline severity and 12-month response to mepolizumab in severe asthma: The TYREX multicentre real-world study in Spain (2017-2024)

Javier Domínguez-Ortega [1], Carlos Almonacid [2], Francisco Javier Alvarez-Gutiérrez [3], Carolina Cisneros [4], Ignacio Dávila [5], David Bañas-Conejero [6], Esteban Antelo-Cea [6], Luis Pérez de Llano [7]; TYREX study group

Collaborators, Affiliations Expand

- PMID: 42025815

- DOI: 10.1016/j.rmed.2026.108849

Free article

Abstract

Background and objective: Although mepolizumab has demonstrated efficacy and effectiveness in the treatment of severe asthma, it is unknown whether the characteristics of patients starting this biologic have changed over the years and whether this impacts their response to mepolizumab.

Methods: TYREX was a multicenter, retrospective, observational study conducted in 24 asthma units across Spain to compare baseline clinical and demographic characteristics, and 12-month response to mepolizumab in two cohorts defined by the date of biologic initiation (cohort 1: 2017-2019 vs cohort 2: 2022-2024).

Results: Among the 446 patients included in the TYREX study, 191 were classified in cohort 1 and 108 in cohort 2. Cohort 1 had higher baseline exacerbation rates (3.45 vs. 2.40/year; p = 0.0002) and higher blood eosinophils (806 vs. 607 cells/μL; p = 0.0175). Twelve months after mepolizumab initiation, annual exacerbation rate were reduced to 0.46 in cohort 1 and to 0.51 in cohort 2, ACT scores increased from 14.23 to 21.84 vs. from 15.43 to 21.06; daily oral corticosteroid dependent patients dropped from 33.51% to 9.04% vs. from 12.96% to 2.78%; and clinical remission was achieved in 37.5% vs. 38.5% of patients after 12 months with mepolizumab. In multivariable analysis for 4-domain clinical remission (n = 108), higher baseline ppFEV1 increased the odds of remission while maintenance OCS use decreased them (Figure. 3). In the 3-domain remission model (n = 198), CRSwNP and higher baseline blood eosinophil count increased the odds of remission, whereas maintenance OCS use decreased them (Figure. 3).

Conclusion: The decrease over time in severity and blood eosinophilia in asthma patients starting mepolizumab has not shown any impact on the clinical response to the drug.

Keywords: Biologic therapy; Clinical remission; Mepolizumab; Real-world study; Severe asthma; Spain.

Conflict of interest statement

Declaration of competing interest LPdLL reports grants, personal fees and non-financial support from AstraZeneca, personal fees and non-financial support from GSK, grants and personal fees from Chiesi, grants, personal fees and non-financial

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28

Observational Study

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. 2026 Jun:257:108850.

doi: 10.1016/j.rmed.2026.108850. Epub 2026 Apr 19.

Treatable traits of asthma in adults: a population-based study based on the National Health and Nutrition Examination Survey

Wen Wen Wu [1], Xue Ling Wang [2]

Affiliations Expand

- **PMID: 42013941**

- **DOI: 10.1016/j.rmed.2026.108850**

Abstract

Background: Data on treatable traits (TTs) in different populations are still limited.

Objective: To evaluate TT prevalence in asthma patients versus non-asthmatic controls using Nutrition Examination Survey (NHANES) data, and investigate TT associations with prior asthma attacks.

Methods: This is an observational study based on data of the NHANES from 2001 to 2018 and 2021 to 2023. We evaluated the prevalence of TTs in patients with asthma and compared it with a group of participants without asthma. Additionally, logistic

regressions were used to examine the cross-sectional associations between TTs and a self-reported history of asthma attack in the past 12 months.

Results: A total of 4949 adults with asthma were studied. We assessed 41 TTs in total, including 13 pulmonary traits, 19 extrapulmonary traits, and nine behavioral/risk-factor traits. Almost all of these traits were more common in patients with asthma than in those without asthma. Univariate logistic regression analysis identified nine traits were associated with a history of asthma attack in the past year. These associations remained significant for a core set of traits in the multivariable logistic regression analysis, including blood eosinophil-marked T2 inflammation, emphysema/chronic bronchitis/COPD, hay fever, angina, stroke, systemic inflammation, and insufficient sleep time.

Conclusions: Patients with asthma bear a significantly higher burden of TTs, and some traits are associated with increased odds of prior asthma attack, suggesting the added disease burden in this population. Large-scale prospective studies are required to confirm these associations.

Keywords: Asthma; Asthma attack; National health and nutrition examination survey (NHANES); Treatable traits.

Conflict of interest statement

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

Supplementary info

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Respir Med

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Outcomes of patients with COPD before and after initiation of treatment with budesonide/glycopyrrolate/formoterol fumarate: Results from the US ARCTOS study

Sanjay Sethi [1], Laurence Gozalo [2], Donna McMorrow [2], Norbert Feigler [3], Amanda Spy [3], Sunny Hirpara [4], Keith Szymanski [4], Christopher Evangelista [3], Joseph Tkacz [2], Hayley D Germack [5]

Affiliations Expand

- PMID: 42009263

- DOI: 10.1016/j.rmed.2026.108826

Free article

Abstract

Objective: To assess change in COPD exacerbations, healthcare resource utilization, and costs among patients diagnosed with COPD following initiation of budesonide/glycopyrrolate/formoterol fumarate (BGF), a single inhaler triple therapy for COPD.

Methods: This study was a retrospective analysis of the Inovalon MORE2 Registry and 100% Medicare Fee-for-Service claims databases between 1/1/2021-3/31/2024.

Inclusion criteria: 1) prescription claim for BGF and ≥1 refill within 60 days (earliest prescription = index date), 2) ≥12 months of health plan enrollment preceding and following the index date, 3) diagnosis of COPD, 4) age ≥40 years, 5) absence of cancer and select respiratory diseases, and 6) presence of ≥1 severe or ≥2 moderate COPD exacerbations during baseline. Subgroups were established based on treatment history, baseline blood eosinophil counts and asthma comorbidity. Outcomes included COPD exacerbations, healthcare resource utilization and costs, assessed for statistically significant differences between baseline and follow-up in the overall sample and subgroups.

Results: A total of 2204 patients were included. Following initiation of BGF, mean per patient per year (PPPY) total COPD exacerbations decreased by 28.7% (3.0 ± 1.7 to 2.1 ± 2.2; $p < 0.0001$), while mean severe COPD exacerbations decreased by 43.9% (0.3 ± 0.6 to 0.2 ± 0.5; $p < 0.0001$). PPPY COPD exacerbation-related medical costs decreased by 35.7% ($4664±$9355 to $2998±$8723; $p < 0.001$). Pre-defined subgroups showed similar changes in outcomes.

Conclusions: Results demonstrate that patients with COPD and a history of exacerbations had substantial reductions in exacerbations, healthcare resource utilization, and healthcare costs after initiating BGF across a variety of subgroups including patients treated with ICS/LABA during baseline and across a range of eosinophil counts.

Keywords: Budesonide/glycopyrrolate/formoterol fumarate; COPD; Exacerbations; Triple therapy.

Conflict of interest statement

Declaration of competing interest The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: SS is an external clinical consultant to AstraZeneca and has received honoraria for consulting and speaking from AstraZeneca, Boehringer Ingelheim, Chiesi, Nuvaira, Pulmonx, Glaxo Smith Kline, Sanofi-Regeneron. HDG, NF, AS, SH, KS, and CE are employees of AstraZeneca and may hold stock/stock options in this company. LG and DM are employees of Inovalon who received funding to conduct the study. JT was an employee of Inovalon at the time the study was conducted.

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Type 2 biomarkers outperform asthma-COPD overlap definitions in predicting clinical outcomes in COPD patients initiating triple therapy: A prospective cohort study

Hailun Huang [1], Huayuan Liang [2], Junrao Wang [3], Zhaoqian Gong [1], Yuling Hu [1], Guiling Xu [1], Xueying Zhao [1], Junwen Huang [1], Yaoxin Chen [1], Wenqu Zhao [1], Haijin Zhao [4]

Affiliations Expand

- **PMID: 41980658**

- **DOI: 10.1016/j.rmed.2026.108825**

Abstract

Background: It remains uncertain whether type 2 (T2) inflammation is associated with clinical outcomes during triple therapy in chronic obstructive pulmonary

disease (COPD) and whether asthma-COPD overlap (ACO) definitions add prognostic value beyond T2 biomarkers.

Methods: This prospective cohort enrolled 201 stable COPD patients scheduled to initiate triple therapy. Patients were classified into T2-high and T2-low groups based on blood eosinophils, FeNO, and sputum eosinophils. Outcomes at 1 year included CAT, SGRQ-C, FEV_1, achievement of minimal important differences (MIDs), and moderate-to-severe exacerbations. Multivariable models assessed associations, adjusting for baseline values and covariates. Four ACO definitions were tested for incremental predictive performance.

Results: Within this cohort, T2-high was independently associated with better 1-year outcomes: lower CAT (AMD -2.31, 95% CI -3.73 to -0.88) and SGRQ-C (AMD -7.54, -11.38 to -3.70), and higher FEV_1 (AMD +0.19 L, 0.08 to 0.29; all $P \leq 0.002$). T2-high increased odds of achieving MIDs for CAT (aOR 2.78, 1.22-6.34), SGRQ-C (aOR 3.92, 1.61-9.54), and FEV_1 (aOR 3.13, 1.55-6.30); the association with fewer exacerbations was borderline (aOR 0.44, 0.18-1.09). ACO criteria agreement was moderate ($\kappa = 0.416$), and adding ACO definitions yielded minimal predictive gain (Δ adjusted $R^2 \leq 0.024$; ΔAUC -0.001 to 0.021; DeLong $P \geq 0.25$). FeNO showed more consistent dose-response associations with clinical improvement than blood eosinophil counts.

Conclusion: Baseline T2-high status was associated with more favorable 1-year clinical outcomes during triple therapy, whereas adding ACO definitions to T2 stratification provided limited incremental prognostic value.

Keywords: ACO; COPD; Eosinophils; FeNO; Treatable traits; Triple therapy; Type 2 inflammation.

Conflict of interest statement

Declaration of competing interest The authors declare not to have any conflicts of interest that may be considered to influence directly or indirectly the content of the manuscript.

Supplementary info

MeSH terms, SubstancesExpand

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Cite

31

Review

Drugs

. 2026 Jun;86(6):813-840.

doi: 10.1007/s40265-026-02310-4. Epub 2026 Mar 28.

Current and Emerging Biologic Therapies for Severe Asthma

Mario Cazzola [1], Maria Gabriella Matera [2], Josuel Ora [3], Luigino Calzetta [4], Paola Rogliani [3]

Affiliations Expand

- PMID: 41904357
- PMCID: PMC13179240
- DOI: 10.1007/s40265-026-02310-4

Abstract

Severe asthma is a heterogeneous disorder characterized by persistent symptoms, frequent exacerbations, and corticosteroid dependence despite optimized therapy. Seven monoclonal antibodies are currently approved, targeting immunoglobulin E (IgE; omalizumab), interleukin (IL)-5 or IL-5 receptor α (mepolizumab, reslizumab, depemokimab, benralizumab), IL-4 receptor α (dupilumab), and the epithelial alarmin thymic stromal lymphopoietin (TSLP; tezepelumab). These therapies have demonstrated substantial reductions in exacerbation rates and oral corticosteroid use, along with improvements in lung function and patient-reported outcomes. Safety profiles are generally favorable across populations. Key predictors of response include blood eosinophil counts, fractional exhaled nitric oxide, and phenotype-specific biomarkers. Despite these advances, unmet needs remain. Current biologics only partially address type 2-low, neutrophilic, and mixed granulocytic phenotypes, as well as airway remodeling and persistent exacerbations in type 2-high patients. Emerging strategies aim to overcome these limitations by targeting upstream alarmins (TSLP and IL-33), dual or trispecific cytokine pathways, and IgE-producing B cells. Novel Fc-engineered and dual-receptor anti-IgE monoclonal antibodies enhance the magnitude and durability of IgE suppression. Multi-target constructs, including bispecific and trispecific agents, simultaneously block overlapping type 2 and non-type 2 pathways, which could improve outcomes in heterogeneous and refractory populations. Preclinical and early-phase clinical studies suggest that these approaches may provide disease-modifying effects and support biomarker-guided personalized therapy. This review summarizes the current landscape of approved biologics and the rationale for next-generation therapies in severe asthma. It highlights mechanistic insights, clinical efficacy, and future directions for precision-targeted treatment strategies.

Conflict of interest statement

Declarations. Conflicts of Interest: Mario Cazzola, Maria Gabriella Matera, Josuel Ora, Luigino Calzetta, and Paola Rogliani have no conflicts of interest that are directly relevant to the content of this article. Mario Cazzola and Luigino Calzetta are Editorial Board members of Drugs. Mario Cazzola and Luigino Calzetta were not involved in the selection of peer reviewers for the manuscript nor any of the subsequent editorial decisions. Ethics Approval: Not applicable. Consent to Participate: Not applicable. Consent for Publication: Not applicable. Availability of Data and Material: Not applicable. Code Availability: Not applicable. Authors' Contributions: All authors were involved in the initial conception of the manuscript. MC and MGM supervised the project. All authors searched and screened all relevant literature. MC and MGM conducted the data extraction and collection. All authors performed the data analysis and review. MC drafted the manuscript. MGM, JO, LC, and PR critically revised the content in their respective areas of expertise. All authors read and approved the final version of the manuscript.

- **225 references**
- **4 figures**

Supplementary info

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32

Review

Drugs

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. 2026 Jun;86(6):943-948.

doi: 10.1007/s40265-026-02306-0. Epub 2026 Mar 26.

Depemokimab: First Approval

Arnold Lee [1]

Affiliations Expand

- PMID: 41882474

- DOI: 10.1007/s40265-026-02306-0

Abstract

Depemokimab (depemokimab-ulaa; EXDENSUR) is an anti-IL-5 antibody being developed by GSK for the treatment of asthma, chronic rhinosinusitis with nasal polyps (CRSwNP), chronic obstructive pulmonary disease, eosinophilic granulomatosis with polyangiitis and hypereosinophilic syndrome. Add-on treatment with depemokimab reduced asthma-related exacerbations in patients with severe asthma with an eosinophilic phenotype, in addition to reducing the severity of nasal polyps and nasal obstruction in patients with CRSwNP. This article summarizes the milestones in the development of depemokimab leading to this first approval in the UK as an add-on maintenance treatment of asthma in adult and adolescent patients aged ≥ 12 years with type 2 inflammation characterised by an eosinophilic phenotype who are inadequately controlled on maximum moderate-dose or high-dose inhaled corticosteroids plus another asthma controller; and as add-on therapy with intranasal corticosteroids for the treatment of adults with severe CRSwNP for whom therapy with systemic corticosteroids and/or surgery do not provide adequate control.

Conflict of interest statement

Declarations. Authorship and conflict of interest: During the peer review process the manufacturer of the agent under review was offered an opportunity to comment on the article. Changes resulting from any comments received were made by the authors on the basis of scientific completeness and accuracy. Arnold Lee is a contracted employee of Adis International Ltd/Springer Nature, and declares no relevant conflicts of interest. All authors contributed to this article and are responsible for its content. Ethics approval, consent to participate, consent to publish, availability of data and material, code availability: Not applicable.

- 20 references

Supplementary info

Publication types, MeSH terms, SubstancesExpand

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Review

Curr Opin Support Palliat Care

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. 2026 Jun 1;20(2):71-79.

doi: 10.1097/SPC.0000000000000799. Epub 2026 Mar 25.

The prevalence of persisting breathlessness despite treatment in chronic conditions

Hayley Lewthwaite [1 2 3], Naomi Takemura [4]

Affiliations Expand

- **PMID: 41879122**

- **DOI: 10.1097/SPC.0000000000000799**

Abstract

Purpose of review: Breathlessness impairs all aspects of daily life and places substantial burden on healthcare systems. This review explores the prevalence of breathlessness that persists despite optimal treatment in chronic conditions. Defining its scale is essential to ensure recognition and provision of evidence-based, breathlessness-specific interventions alongside disease management. Despite advances in breathlessness management research over the past decade, persistent breathlessness remains unacceptably common, reflecting implementation gaps and limited access to effective therapies.

Recent findings: Recent systematic reviews report breathlessness in 35-87% of people with cancer, with episodic breathlessness affecting up to 80% of those with persistent symptoms. Across primary studies in COPD, asthma, pulmonary fibrosis, pulmonary vascular and neurological conditions, and cancer, prevalence ranges from 9% to 91%. Even among people receiving guideline-based disease treatment, 38-53% report clinically relevant breathlessness. The mMRC dyspnea scale may underestimate prevalence compared with exercise testing and multidimensional questionnaires.

Summary: Persistent breathlessness remains common across major chronic diseases, often despite optimal disease therapy. Clinicians across all sectors of healthcare should routinely ask people about their breathlessness, and evidence-based strategies should be offered as part of routine, integrated symptom management to help reduce the high burden of persistent breathlessness in clinical populations.

Keywords: cancer; chronic respiratory disease; dyspnea; symptom assessment.

- 67 references

Supplementary info

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34

Clin Microbiol Infect

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. 2026 Jun;32(6):1006-1014.

doi: 10.1016/j.cmi.2026.03.011. Epub 2026 Mar 14.

Burden of respiratory syncytial virus and influenza in adults - a Danish nationwide cohort study

Maria João Fonseca [1], Stanislava Bratković [2], Mikkel Pedersen [3], Mathilde Kany [3], Triantafyllos Pliakas [4], Rachel Reeves [5], Alen Marijam [6], Elisa Turriani [7], Nikoline Vestergaard Dich [2], Yunus Çolak [8], Marie Helleberg [9]

Affiliations Expand

- PMID: 41839420

- DOI: 10.1016/j.cmi.2026.03.011

Free article

Abstract

Objectives: Like influenza, respiratory syncytial virus (RSV) is a common cause of severe acute respiratory infection (ARI) in adults. With RSV vaccines recently approved, data on the burden of disease are required. Our objective was to investigate the short- and long-term clinical and economic burden of ARI in Danish adults over the past decade, with a primary focus on RSV, contextualising with influenza.

Methods: A nationwide cohort study in Denmark, including adults ≥18-year-old recorded with an ARI from 1 July 2011 to 30 June 2022 (i.e. exposed), matched 1:3 with individuals without ARI (unexposed). We assessed adverse clinical outcomes, direct and indirect healthcare resource utilization, and direct and indirect costs over 365 days after ARI.

Results: We identified 762 443 ARIs, of which 5289 were attributed to RSV and 48 047 to influenza. Common comorbidities in patients with RSV were chronic obstructive pulmonary disease (23.9%, 1264/5289), diabetes (13.5%, 712/5289), and asthma (12.2%, 647/5289), whereas 32.1% (1700/5289) were immunocompromised. RSV was associated with an increased risk of adverse clinical outcomes compared with matched unexposed individuals during the 365-day follow-up, including death (relative risk 2.7; 95% CI: 2.4-3.0), chronic obstructive pulmonary disease exacerbations (3.1; 2.8-3.4), asthma exacerbations (4.6; 3.6-5.9), and sepsis (4.0; 3.1-5.2). RSV was associated with increased risks of respiratory support (5.5; 4.3-7.0) and antibiotic treatment (2.0; 1.9-2.1). Direct and indirect costs were higher among patients with RSV than their unexposed peers, with a mean difference in direct costs of €12 096. Patients with influenza had fewer comorbidities than patients with RSV, but they also presented worse clinical and economic outcomes than their unexposed peers, with a mean difference in direct costs of €7992.

Conclusions: The severe long-term clinical and economic burden of RSV in adults, which is comparable with influenza, provides evidence for adult vaccination strategies.

Keywords: Acute respiratory infections; Disease burden; Influenza; RSV; Vaccination.

Supplementary info

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35

Review

J Appl Toxicol

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. 2026 Jun;46(6):1838-1855.

doi: 10.1002/jat.70165. Epub 2026 Mar 13.

Assessment of Efficacy and Safety Issues of Current Biological Agents in Management of Asthma

Ibtehal Nasser Salman [1], Nashwan Asaad [1], Mohamed M Khalifa [1 2]

Affiliations Expand

- PMID: 41825945

- DOI: 10.1002/jat.70165

Abstract

Around 5%-10% of people with asthma have severe or uncontrolled type of asthma, which is linked to higher hospitalization, higher death rates, higher health care costs, and lower quality of life. Recent years have seen the introduction of novel medications and the identification of multiple asthma phenotypes based on specific biomarkers. The management and treatment of severe asthma have been completely transformed by biologic therapy, which has demonstrated excellent therapeutic efficacy and substantial clinical advantages. In addition to enhancing the quality of life for individuals with severe asthma, biologic therapy significantly reduces exacerbations, hospital visits, and the requirement for continuous systemic steroids. Their therapeutic efficacy is demonstrated by randomized controlled trials (RCTs), extended research, metaanalyses, and real-world data. The development and registration of biologics, new systemic medications for severe asthma are the main topics of this study, which also describes possible future treatment strategies. PubMed, Scopus, and Google Scholar were used to examine the content of recent medical literature. The results of early, important RCTs and later research into biologics for severe types of asthma are summarized in this study. Their safety and effectiveness results, which were obtained in a range of contexts, improved their generalizability and offer useful insights into their use.

- 114 references

Supplementary info

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36

Review

Paediatr Respir Rev

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. 2026 Jun:58:24-31.

doi: 10.1016/j.prrv.2026.02.004. Epub 2026 Feb 20.

Year in review: "Best" papers in pediatric pulmonary and sleep medicine in 2025

M E Soto-Martinez [1], B K Rubin [2]

Affiliations Expand

- **PMID: 41813463**

- **DOI: 10.1016/j.prrv.2026.02.004**

Abstract

With an ever increasing number of excellent publications in the field of pediatic pulmonary and sleep medicine each year, it is a challenge to identify those with the greatest impact and interest for readers of this journal. The challenge was made both more exciting and more difficult when a group of leaders in the field recommend nearly 100 papers that they loved and asked us to consider. We have read each of these recommendations and agonized over which to include here. We hope that you enjoy reading this collection as much as we have enjoyed preparing it.

Keywords: Asthma; Bronchiectasis; Cystic fibrosis; Lung function; Pneumonia; Pollution; Respiratory syncytial virus; Sleep apnoea.

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. We thank all who suggested papers to be considered into the review. The scope and pace of advances in pediatric pulmonology and sleep medicine made synthesizing this literature into a single comprehensive review both an opportunity and a challenge. Although not all-important contributions could be included, we aimed to highlight studies most likely to influence clinical practice, guide future research, and ultimately improve respiratory health outcomes for children.

Supplementary info

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Cite

37

Clin Pediatr (Phila)

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. 2026 Jun;65(6):740-746.

doi: 10.1177/00099228251411609. Epub 2026 Jan 30.

Nocturnal Awakenings and Asthma Control in Urban School-Age Children

Mehtap Haktanir Abul [1 2 3], Sheryl J Kopel [2 4 5], Anna Cohenuram [5], Isabelle Oliva [5], Shira Dunsiger [6], Daniella Teape [1 2], Carissa Ruggiero [5], Cynthia A Esteban [1 2], Daphne Koinis-Mitchell [2 4 5]

Affiliations Expand

- **PMID: 41618094**

- **DOI: 10.1177/00099228251411609**

Abstract

This study evaluated the extent to which the sleep is disrupted by nighttime awakenings in urban children with and without asthma and examined racial/ethnic differences in sleep outcomes. Three hundred and seventy-nine urban children aged 7 to 9 years with (n = 250) and without (n = 129) asthma were included. Participants were 45% Latino, 34% black, and 21% non-Latino white (NLW). Nighttime awakenings were assessed via actigraphy. Asthma status was assessed by a clinically and via self-report. Children with asthma had significantly more awakenings than those without. Latino children with asthma had more and longer awakenings compared to Latino children without asthma; these effects were not observed among black or NLW participants. Poor asthma control was associated with more awakenings. Urban children face higher risks for poor sleep and asthma outcomes. Multicomponent interventions addressing asthma management and culturally tailored sleep hygiene strategies are necessary to improve asthma and sleep outcomes in this highly burdened population.

Keywords: asthma; health disparities; nocturnal asthma; sleep awakenings; urban children.

Conflict of interest statement

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

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38

Observational Study

J Asthma

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. 2026 Jun;63(6):723-734.

doi: 10.1080/02770903.2026.2623427. Epub 2026 Feb 6.

Clinical response to biologic therapies in patients with severe asthma: impact of obesity status

Ninon Brousse [1], Bruno Pereira [2], Benjamin Bonnet [3], Yves Boirie [4], Clairelyne Dupin [5], Camille Rolland-Debord [1]

Affiliations Expand

- PMID: 41606965

- DOI: 10.1080/02770903.2026.2623427

Abstract

Background: Biologic agents targeting airway inflammation improve symptoms and reduce corticosteroid use in severe asthma. Obesity is associated with more severe disease and greater corticosteroid dependence. However, data are limited on whether obesity modifies the clinical response to biologics.

Objective: To compare clinical outcomes of biologics in severe asthma patients with and without comorbid obesity.

Methods: We conducted a retrospective, single-center observational study of adults with severe asthma receiving biologics. Patients were classified by obesity status (BMI > 30 kg/m^2). Baseline characteristics and outcomes at 6 months were compared, including proportion of patients experiencing at least one exacerbation, changes in weight and lung function, and biologic switching/discontinuation.

Results: Eighty-one patients were included (mean age 58 ± 17 years; mean BMI 28.1 ± 7.7 kg/m^2), of whom 28 (34.5%) were obese. Obese patients had higher prevalence of obstructive sleep apnea (25% vs. 3.8%, $p < 0.001$) and more often received triple inhaled therapy (85.7% vs. 54.7%, $p = 0.005$). Baseline proportion of patients experiencing at least one exacerbation were similar between obese and non-obese patients (median 3 [IQR 1-3] vs. 2 (1-3), respectively; $p = 0.356$). At 6 months, the proportion of patients with at least one exacerbation was 28.6% in obese patients (8/28) and 20.8% in non-obese patients (11/53), with no significant difference between groups (OR 1.53, 95% CI 0.53-4.39; $p = 0.431$). Obese patients experienced modest but significant weight loss ($p = 0.045$). Biologic switching/discontinuation rates were similar.

Conclusions: Obesity did not significantly alter the clinical response to biologics in severe asthma, suggesting comparable efficacy across BMI categories.Further studies with deeper phenotyping are needed to optimize treatment strategies for this complex phenotype.

Keywords: Severe asthma; biotherapy; obesity; response.

39

J Asthma

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. 2026 Jun;63(6):692-700.

doi: 10.1080/02770903.2026.2619512. Epub 2026 Feb 2.

Assessment of asthma control in elderly patients using Forced Oscillation Technique, spirometry, and asthma control test in relation to GINA classification

Martyna Miodońska [1], Andrzej Bożek [1], Dominika Sadowska [1], Maksymilian Dobosz [1], Małgorzata Fuchs [2], Eliza Wasilewska [3]

Affiliations Expand

- PMID: 41556751

- DOI: 10.1080/02770903.2026.2619512

Abstract

Background: Asthma prevalence increases with age, yet assessment in elderly patients is often limited by difficulties in performing reliable spirometry. Alternative, noninvasive methods such as the Forced Oscillation Technique (FOT) and fractional exhaled nitric oxide (FeNO) measurement may improve evaluation of asthma control in this population.

Objective: To evaluate asthma control and treatment effectiveness in elderly patients using the Asthma Control Test (ACT), GINA classification, spirometry, FOT, and FeNO, and to compare their clinical usefulness.

Methods: A total of 105 patients aged ≥65 years with diagnosed bronchial asthma were enrolled. All participants completed the ACT and underwent spirometry (FEV_1, FVC, FEV_1/FVC), FOT (R5, R20, R5-R20, X5, AX), and FeNO measurement according to ATS/ERS recommendations. Treatment intensity was classified by GINA steps (1-5). Nonparametric tests and Spearman's rank correlation were used for statistical analysis.

Results: ACT scores correlated significantly with spirometric, oscillometric, and FeNO parameters. Lower ACT scores were associated with reduced FEV_1% predicted and increased airway resistance and reactance (R5, AX), as well as higher FeNO levels (all $p < 0.001$). Patients treated at higher GINA steps (4,5) exhibited poorer asthma control, higher FeNO, and less favorable FOT indices. Reductions in FeNO following treatment intensification were accompanied by improvements in FEV_1 and FOT parameters, particularly AX and R5-R20.

Conclusions: FOT provides a useful, noninvasive assessment of asthma control in elderly patients and complements spirometry. FeNO adds important information on airway inflammation and treatment response. Their combined use may enhance monitoring of asthma control when spirometry is limited.

Keywords: Bronchial asthma; Forced Oscillation Technique; asthma control; elderly; spirometry.

Cite

40

Review

Paediatr Respir Rev

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. 2026 Jun:58:45-61.

doi: 10.1016/j.prrv.2025.06.003. Epub 2025 Jun 18.

Choosing biologic therapy in children with severe asthma

Latika Gupta [1], Michele Arigliani [2], James Cook [3], Atul Gupta [4]

Affiliations Expand

- PMID: 40634222

- DOI: 10.1016/j.prrv.2025.06.003

Abstract

Omalizumab, a monoclonal antibody targeting IgE, was the first biologic therapy approved in 2003 for treating severe, allergen-driven, therapy-resistant asthma. Since then, many new biologics have been approved for use in children, targeting specific pathways, including anti-interleukin (IL)-5 (mepolizumab), IL-5 receptor (benralizumab), IL-4/IL-13 receptor (dupilumab), and thymic stromal lymphopoietin (TSLP) (tezepelumab). As the portfolio of biologics with diverse targets continues to expand, it has brought additional challenges to clinical practice. These include accurately identifying the endotype/phenotype of asthmatic inflammation and determining response criteria. Here, we summarise findings from phase 3 trials, discuss practical considerations for individual patients, and propose an algorithm for initiating biologics in children and adolescents with severe asthma.

Keywords: Asthma exacerbation; Benralizumab; Dupilumab; Eosinophilia; Mepolizumab; Omalizumab; Paediatric asthma; Tezepelumab.

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.

- Cited by 2 articles

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J Sch Nurs

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. 2026 Jun;42(3):242-259.

doi: 10.1177/10598405241311464. Epub 2025 Feb 5.

Effects of School Nurse-Led Asthma Interventions for Students: A Systematic Review

Jaehee Yoon [1], Hyun-Ju Seo [2], Jeonghyun Cho [3], Su Jung Lee [4], Ji Sung Lee [5], Yumi Choi [6], Suyeon Noh [7]

Affiliations Expand

- **PMID: 39905980**

- **DOI: 10.1177/10598405241311464**

Abstract

School nurse-led asthma interventions play a critical role in managing asthma among students. This study evaluates the effectiveness and key components of interventions for children with asthma. A systematic search of multiple databases was conducted up to September 2023. Two independent reviewers assessed the risk of bias using the Mixed Methods Appraisal Tool, and descriptive evidence synthesis with albatross plots was used to analyze the findings. Results revealed that school nurse-led asthma interventions positively influenced asthma symptoms, medication use, asthma-related quality of life, and self-management in schoolchildren. However, emergency visits, hospitalization, and absence outcomes remain inconclusive. Effective components identified across studies included chronic disease management, direct care, and collaborative communication. Further, well-designed randomized controlled trials with standardized outcome

measurements are needed to examine objective outcomes, including emergency visits, hospitalization, and school absences, and strengthen the evidence base for school nurse-led asthma interventions.

Keywords: asthma; intervention; school nurse; school-aged children.

Conflict of interest statement

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

Supplementary info

Publication types, MeSH termsExpand

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

1

Review

Eur J Pediatr

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. 2026 May 29;185(6):447.

doi: 10.1007/s00431-026-07031-0.

Effect of probiotics on allergic rhinitis in children; A systematic review and meta-analysis

Aida Bakhshi [1 2], Farid Poursadegh [3], Moeen Salari [4], Elham Shaarbaf Eidgahi [5], Safieh Shazdehahmadi [3], Mahmoud Mahmoudi [6 7], Arezoo Faridzadeh [8 9]

Affiliations Expand

- **PMID: 42209809**

- **DOI: 10.1007/s00431-026-07031-0**

Abstract

Background: Allergic rhinitis (AR) is a prevalent chronic inflammatory disorder in children, often undiagnosed and associated with reduced quality of life and risk of comorbidities such as asthma. Probiotics have been found to be potential modulators of immune responses in allergic conditions. This systematic review and

meta-analysis evaluated the efficacy of probiotics compared with placebo in the management of pediatric AR.

Methods: Searches were conducted in accordance with a pre-registered protocol using MEDLINE (PubMed), the Web of Science, Scopus, and Embase through April 8, 2025. Randomized controlled trials (RCTs) of children aged < 18 years that compared probiotics, prebiotics, or synbiotics with a placebo were considered for inclusion. Outcomes of interest included clinical and laboratory parameters. Random-effects models with Hedges' g were used; heterogeneity was assessed via I^2.

Results: Fourteen RCTs involving 1,739 children were included. Meta-analysis revealed a significant reduction in nasal symptom scores (SMD = -1.40; 95% CI: -2.26 to -0.54; I^2 = 91.3%) and eye symptom scores (SMD = -3.59; 95% CI: -5.84 to -1.33; I^2 = 94.3%). Quality of life (RQLQ) was also significantly improved (SMD = -2.98; 95% CI: -4.85 to -1.12; I^2 = 95.7%). Among laboratory markers, a small but significant increase in serum eosinophils was observed (SMD = 0.29; 95% CI: 0.06 to 0.52; I^2 = 0%).

Conclusion: Probiotics were associated with improvements in nasal and ocular symptoms and quality of life in children with AR; however, these findings should be interpreted with caution due to substantial heterogeneity across studies. Probiotics may have a potential role as an adjunctive therapy, but further high-quality, standardized trials are needed. PROSPERO registration code: CRD420250654461 on 24 February 2025. What is Known • Probiotics have been investigated as adjunctive therapy for pediatric allergic rhinitis because of their potential immunomodulatory effects. • Previous studies and meta-analyses have reported inconsistent findings regarding the clinical and immunological effects of probiotics in allergic rhinitis. What is New •This meta-analysis demonstrated significant improvements in nasal symptoms, ocular symptoms, and quality of life in children with allergic rhinitis receiving probiotics versus placebo. • Probiotic supplementation showed no consistent beneficial effects on immunological markers, while substantial heterogeneity remained across studies.

Keywords: Allergic rhinitis; Meta-analysis; Pediatric; Probiotics; Systematic review.

Conflict of interest statement

Declarations. Ethics Approval and Consent to Participate: This systematic review and meta-analysis was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. As it relied solely on data from previously published studies and did not include direct involvement of human participants, ethical approval and informed consent were not required. Competing interests: The authors declare no competing interests.

- **35 references**

Supplementary info

Publication types, MeSH termsExpand

Cite

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Clin Exp Pediatr

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. 2026 May 28.

doi: 10.3345/cep.2026.00444. Online ahead of print.

Update on pediatric allergic rhinitis: narrative review based on guideline updates

Jung Yeon Shim [1]

Affiliations Expand

- PMID: 42208600

- DOI: 10.3345/cep.2026.00444

Abstract

Pediatric allergic rhinitis, among the most common chronic allergic diseases in children and adolescents, represents a significant public health burden in Korea and other countries. Allergic rhinitis in childhood is closely associated with asthma and should be considered a unified airway disease requiring integrated management. Recent Allergic Rhinitis and its Impact on Asthma and Korean Academy of Asthma, Allergy and Clinical Immunology guidelines advocate an evidence-based control-oriented stepwise treatment strategy that incorporates a patient-centered approach that is supported by both randomized trial data and real-world evidence. Intranasal corticosteroids (INCS) remain the first-line treatment for moderate to severe pediatric allergic rhinitis, whereas INCS plus intranasal antihistamine (INAH) combination therapy is recommended when symptom control is inadequate with INCS alone. Oral antihistamines (OAH) and INAH are recommended for children with mild disease or when rapid symptom relief is required. However, the addition of OAH to INCS therapy does not confer clinically meaningful additional benefits compared with INCS monotherapy in most patients with allergic rhinitis; therefore, routine combination therapy is not recommended. Leukotriene receptor antagonists are not recommended as first-line therapy for allergic rhinitis and are mainly used as add-on therapy in patients with concomitant asthma. In patients with predictable seasonal allergic rhinitis, INCS may be initiated 1-2 weeks before the anticipated pollen season to optimize symptom control.

Pediatric management requires special consideration of age-specific clinical features, treatment adherence, safety, and caregiver education. The early diagnosis and guideline-based treatment of allergic rhinitis in children may improve their quality of life and reduce long-term respiratory morbidity.

Keywords: Allergic rhinitis; Child; Glucocorticoids; Guideline; Intranasal.

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Int Arch Allergy Immunol

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ASTHMA PHENOTYPES AND COMORBID DISEASES

Tuba Erdogan, Fusun Yildiz, Funda Seher Ozalp Ates, Ismet Bulut, Secil Kepil Ozdemir, Fatma Merve Tepetam, Selen Karaoglanoglu, Zeynep Yegin Katran, Seyma Ozden, Semra Demir, Elif Yilmazel Ucar

- PMID: 42207732

- DOI: 10.1159/000552377

Abstract

Background: Asthma is a heterogeneous chronic airway disease frequently accompanied by comorbidities that influence symptom burden, treatment requirements, and disease control. Understanding the distribution of comorbidities across asthma phenotypes is essential for improving individualized management strategies.

Methods: This cross-sectional study analyzed data from 2,053 adults enrolled in the nationwide Turkish Asthma Action and Research (TAAR) registry. Demographic characteristics, asthma phenotypes, comorbidities, treatment steps, and control status were extracted. Comorbidities were categorized as upper airway, lower airway, non-respiratory, and psychophysiological disorders. Comparative analyses were performed across phenotypes (eosinophilic, allergic, NERD, obese asthma), treatment steps, and control groups using appropriate statistical tests.

Results: Allergic rhinitis (64.2%), chronic rhinosinusitis (32.1%), gastroesophageal reflux (GER) (26.4%), and nasal polyposis (19.9%) were the most frequent comorbidities. Upper airway diseases were significantly more common in eosinophilic asthma, NERD, and allergic asthma. Obesity-related comorbidities-including diabetes mellitus, hypertension, cardiovascular disease, and obstructive sleep apnea -were markedly higher in the obese asthma phenotype and among women. GER was particularly prevalent in NERD, obese asthma, and uncontrolled asthma. Patients in GINA step 5 had the highest comorbidity burden. Poorly controlled asthma was associated with higher frequencies of chronic rhinosinusitis, diabetes mellitus, GER, recurrent URTIs, and osteoporosis. The proportion of uncontrolled asthma increased significantly with rising numbers of comorbidities.

Conclusion: Comorbidities are highly prevalent among adults with asthma and vary substantially across phenotypes, sex, treatment step, and control status. Upper airway disease, GER, obesity-related conditions, and metabolic disorders exert a major impact on asthma severity and control. Systematic identification and targeted management of comorbidities should be prioritized to optimize asthma outcomes and reduce disease burden.

S. Karger AG, Basel.

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Review

Curr Opin Allergy Clin Immunol

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. 2026 Jun 1;26(3):184-188.

doi: 10.1097/ACI.0000000000001153. Epub 2026 Apr 15.

The interplay of chronic rhinitis and sleep-disordered breathing

Retno S Wardani [1], Natasha Supartono, Febriani Endiyarti

Affiliations Expand

- **PMID: 41994929**

- DOI: 10.1097/ACI.0000000000001153

Abstract

Purpose of review: This review examines how chronic rhinitis contributes to sleep-disordered breathing (SDB), shifting the focus from a localized nasal issue to a systemic sleep and respiratory disorder. It highlights inflammatory mechanisms that affect sleep differently from mechanical nasal obstruction, which worsens airway collapsibility.

Recent findings: Evidence indicates that chronic rhinitis, regardless of allergy status, is associated with sleep fragmentation and lighter non-REM sleep, with some groups showing reduced REM sleep. Sleep improves, including partial REM restoration, after procedures such as functional endoscopic sinonasal surgery (including turbinoplasty and posterior nasal neurectomy) that reduce nasal resistance. NOSE scale scores, which reflect nasal obstruction severity, correlate with markers of respiratory instability, such as oxygen desaturation and epiglottic collapse, during sleep endoscopy. Excessive daytime sleepiness (ESS) reflects sleep fragmentation rather than specific respiratory events. Rhinitis-related sleep disruption involves oxidative stress and autonomic pathways beyond IgE-mediated inflammation, leading to hypoxia and systemic effects.

Summary: Nasal airflow and inflammation are key determinants of sleep quality and respiratory stability. Using symptom-based tools with physiological assessments could better identify early and atypical SDB types. Treatments that open nasal passages and reduce inflammation may improve sleep and reduce intermittent hypoxia.

Keywords: hypoxia; rapid eye movement sleep; rhinitis; sleep apnea; sleep-disordered breathing.

- 22 references

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Review

Curr Opin Allergy Clin Immunol

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. 2026 Jun 1;26(3):149-156.

doi: 10.1097/ACI.0000000000001146. Epub 2026 Apr 4.

Biologics for chronic rhinosinusitis with nasal polyps: from downstream cytokine blockade to upstream epithelial targets

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Affiliations Expand

- PMID: 41947372

- DOI: 10.1097/ACI.0000000000001146

Abstract

Purpose of review: Chronic rhinosinusitis with nasal polyps (CRSwNP) is a heterogenous inflammatory disease that often persist despite optimal medical and surgical treatment. Advances in the understanding of CRS immunopathophysiology have led to the development of biologic therapies targeting specific inflammatory pathways. This review summarizes the current knowledge on the downstream biologics and the latest update on the next generation upstream biologics therapies in CRSwNP, with focus on endotype-driven treatment selection.

Recent findings: Biologic therapies targeting downstream mediators of type 2 inflammation, including immunoglobulin E and interleukins interleukin (IL)-4, IL-5 and IL-13, have demonstrated substantial clinical benefit in selected patients. Nevertheless, CRSwNP commonly involves overlapping inflammatory endotypes, which may limit treatment response. Newer biologics targeting upstream epithelial-derived cytokines offer broader approach by modulating multiple inflammatory pathways simultaneously and may address current therapeutic gaps. The development of long-acting biologics also improves treatment convenience and adherence.

Summary: Biologic therapy has shifted CRSwNP management towards a more personalized, mechanism-based approach. Upstream-targeted treatments represent an important step forward, particularly for patients with refractory or mixed disease. Future research should focus on biomarker-guided therapy and long-term clinical outcomes.

Keywords: alarmins; biologic therapies; chronic rhinosinusitis; inflammation; nasal polyps.

- 45 references

Supplementary info

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Review

Drugs

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. 2026 Jun;86(6):943-948.

doi: 10.1007/s40265-026-02306-0. Epub 2026 Mar 26.

Depemokimab: First Approval

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Affiliations Expand

- PMID: 41882474

- DOI: 10.1007/s40265-026-02306-0

Abstract

Depemokimab (depemokimab-ulaa; EXDENSUR) is an anti-IL-5 antibody being developed by GSK for the treatment of asthma, chronic rhinosinusitis with nasal polyps (CRSwNP), chronic obstructive pulmonary disease, eosinophilic granulomatosis with polyangiitis and hypereosinophilic syndrome. Add-on treatment with depemokimab reduced asthma-related exacerbations in patients with severe asthma with an eosinophilic phenotype, in addition to reducing the severity of nasal polyps and nasal obstruction in patients with CRSwNP. This article summarizes the milestones in the development of depemokimab leading to this first approval in the UK as an add-on maintenance treatment of asthma in adult and adolescent patients aged ≥ 12 years with type 2 inflammation characterised by an eosinophilic phenotype who are inadequately controlled on maximum moderate-dose or high-dose inhaled corticosteroids plus another asthma controller; and as add-on therapy with intranasal corticosteroids for the treatment of adults with

severe CRSwNP for whom therapy with systemic corticosteroids and/or surgery do not provide adequate control.

Conflict of interest statement

Declarations. Authorship and conflict of interest: During the peer review process the manufacturer of the agent under review was offered an opportunity to comment on the article. Changes resulting from any comments received were made by the authors on the basis of scientific completeness and accuracy. Arnold Lee is a contracted employee of Adis International Ltd/Springer Nature, and declares no relevant conflicts of interest. All authors contributed to this article and are responsible for its content. Ethics approval, consent to participate, consent to publish, availability of data and material, code availability: Not applicable.

- 20 references

Supplementary info

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Randomized Controlled Trial

Laryngoscope

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. 2026 Jun;136(6):2752-2760.

doi: 10.1002/lary.70399. Epub 2026 Feb 3.

Effect of Mepolizumab on Middle Ear Disease and Hearing Outcomes in CRSwNP

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Affiliations Expand

- PMID: 41631410

- DOI: 10.1002/lary.70399

Abstract

Objective: Otitis media with effusion (OME) is frequently observed in patients with severe Chronic Rhinosinusitis with Nasal Polyps (CRSwNP)-yet it remains underrecognized. Both conditions are debilitating and may share type 2 inflammatory mechanisms. This study investigates the prevalence of OME (measured by tympanometry) in patients with CRSwNP and evaluates the effect of biologic treatment with mepolizumab, with or without combined FESS, on hearing outcomes as well as otologic symptoms.

Methods: Secondary analysis of a randomized controlled trial (RCT) (n = 58) comparing FESS and mepolizumab versus mepolizumab alone in patients suffering from severe CRSwNP. Tympanometry, audiometry, and patient-reported outcomes (SNOT-22 and COMOT-15) were assessed at baseline and after 6 months.

Results: At baseline, 22.8% (13/57) of patients had pathological tympanometry (OME), consistent with previous prevalence estimates. After 6 months, the proportion decreased to 14% (p = 0.07). No significant changes were observed in pure tone averages (PTA). In contrast, self-reported outcomes improved significantly, with reductions in both COMOT-15 and SNOT-22 scores (p < 0.05), independent of baseline tympanometry status.

Conclusion: Mepolizumab treatment was associated with a trend toward reduced middle ear symptoms and significant improvement in self-reported otologic symptoms, supporting the concept of global type 2 airway inflammation and the clinical relevance of assessing ear disease in CRSwNP.

Keywords: CRSwNP; OME; biologics; mepolizumab; middle ear disease; middle ear symptoms; monoclonal antibodies.

- 31 references

Supplementary info

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Meta-Analysis

Pediatr Res

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. 2026 Jun;99(5):1730-1741.

doi: 10.1038/s41390-025-04439-6. Epub 2025 Sep 27.

Gestational age and the risk of allergic diseases: a systematic review and meta-analysis

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Affiliations Expand

- **PMID: 41006890**

- **DOI: 10.1038/s41390-025-04439-6**

Abstract

Background: The perinatal period has been postulated to be a window of opportunities in preventing atopic disorders. Accumulating studies suggested that an association exists between gestational age (GA) and allergic diseases.

Methods: The meta-analysis of observational studies was conducted through a search of relevant literature until 31 December 2023 from PubMed, Embase, and Web of Science databases. Subgroup analyses and sensitivity analyses were performed to test the robustness and consistency of the observed associations.

Results: Thirty observational studies comprising 5,410,969 participants were included in the meta-analysis. The pooled estimates (odds ratio [OR]) of atopic dermatitis (AD) risk for early preterm, preterm and post-term birth were 0.75 (95% confidence interval [CI]: 0.68-0.82), 0.86 (95% CI: 0.81-0.93), 1.08 (95% CI: 1.03-1.14), respectively. Additionally, early preterm birth was suggestively associated with reduced risk of allergic rhinitis (AR) (OR: 0.84, 95% CI: 0.73-0.97).

Conclusion: Our study demonstrated that early preterm and preterm births were associated with a reduced risk of AD, while post-term birth was linked to an increased risk, with early preterm birth also suggestively associated with a reduced risk of AR.

Impact: This large-scale meta-analysis demonstrates that early preterm and preterm births are associated with a significantly reduced risk of atopic dermatitis (AD), while post-term birth is linked to an increased risk. Early preterm birth is also suggestively associated with a lower risk of allergic rhinitis (AR), highlighting the nuanced role of gestational age in the development of allergic diseases. These findings underscore the importance of the perinatal period as a critical window for allergy risk stratification and early prevention strategies in pediatric populations.

Conflict of interest statement

Competing interests: The authors declare no competing interests. Ethical approval and consent to participate: This study is based on secondary analyses of previously published individual participant data (IPD). All original studies included had been independently registered and received ethics approval in accordance with the regulations of their respective countries and institutions.

- Cited by 1 article
- 49 references

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chronic cough

1

Review

Otolaryngol Clin North Am

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. 2026 May 29:S0030-6665(26)00048-4.

doi: 10.1016/j.otc.2026.03.022. Online ahead of print.

Office-Based Procedures for Chronic Cough

Mollie C Perryman [1], C Blake Simpson [2]

Affiliations Expand

- PMID: 42215346

- DOI: 10.1016/j.otc.2026.03.022

Abstract

Refractory chronic cough is a common and challenging condition that results from laryngeal hypersensitivity. Office-based procedures can serve as adjuncts to behavioral or medical therapies or as alternatives for patients with incomplete response or intolerance to these treatments. This article reviews the rationale, techniques, and outcomes of three office-based interventions: superior laryngeal nerve block, laryngeal botulinum toxin injection, and vocal fold injection augmentation. These procedures are safe, cost-effective, and well-tolerated in the clinic setting.

Keywords: Botulinum toxin; Chronic cough; In-office procedures; Laryngeal hypersensitivity; Neurogenic cough; Superior laryngeal nerve block; Vocal fold injection.

Conflict of interest statement

Disclosure The authors having nothing to disclose.

Supplementary info

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Review

Otolaryngol Clin North Am

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. 2026 May 29:S0030-6665(26)00071-X.

doi: 10.1016/j.otc.2026.04.004. Online ahead of print.

Pharmacology of Cough

Emily Garvey [1], Joseph Spiegel [2]

Affiliations Expand

- PMID: 42215344

- DOI: 10.1016/j.otc.2026.04.004

Abstract

Treatment of refractory chronic cough remains a challenge for physicians due to limited therapeutic options. One leading hypothesis regarding the etiology of chronic cough is damage to the vagus nerve, which mediates the cough reflex, after an insult such as a viral infection. This results in hypersensitivity and therefore a reduced cough threshold. Neuromodulators such as gabapentin, pregabalin, and tramadol have been repurposed to treat this hypersensitivity similar to other neuropathic pain conditions. A new class of drugs, P2X3 antagonists, have emerged as another possibility for treating individuals with chronic cough; however, Food and Drug Administration approval is still pending.

Keywords: Chronic cough; Gefapixant; Neuromodulators; P2X3 receptor antagonists.

Conflict of interest statement

Disclosure None.

Supplementary info

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Review

Life Sci

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. 2026 May 28:124499.

doi: 10.1016/j.lfs.2026.124499. Online ahead of print.

Airway sensory neurobiology and TRP channels in chronic cough: mechanisms, cough hypersensitivity, and therapeutic translation

Xinyue Yang [1], Xianglong Duan [2]

Affiliations Expand

- PMID: 42214607

- DOI: 10.1016/j.lfs.2026.124499

Abstract

Aims: Chronic cough is increasingly viewed as a heterogeneous clinical syndrome associated with cough hypersensitivity, not simply a symptom defined by duration. This review examines key mechanisms in chronic cough, the reasons why mechanistic insights have translated poorly into therapy, and future directions involving patient stratification and biomarkers.

Materials and methods: We reviewed and summarized mechanistic, preclinical, and translational studies on TRPA1, TRPV1, TRPV4, and TRPM8 channels, focusing on peripheral and central mechanisms and on how these findings relate to clinical development.

Key findings: TRP channels are multimodal sensors in airway sensory nerves and epithelial cells. They respond to irritants, temperature changes, mechanical stress, osmotic stimuli, and inflammatory mediators. Their activation can drive cation influx, neuronal depolarization, neuropeptide release, and ATP-P2X3 signaling, thereby increasing cough reflex sensitivity and neurogenic inflammation. The translational evidence differs across TRP subtypes. TRPV1 has relatively strong support from mechanistic studies and human cough challenge work, whereas TRPA1 is biologically plausible but still has limited human evidence. Evidence for TRPV4 and TRPM8 is more sparse, with TRPV4 mainly linked to ATP-purinergic signaling and TRPM8 less clearly defined in chronic cough. To date, TRP-channel antagonists have produced limited and inconsistent reductions in spontaneous cough frequency.

Significance: These findings suggest that blocking peripheral TRP channels alone may not be enough to control cough hypersensitivity. Future studies should connect patient selection with biomarkers and clinically relevant endpoints.

Keywords: Airway Hyperresponsiveness; Chronic cough; Sensory neurons; Transient receptor potential (TRP) channels.

Conflict of interest statement

Declaration of competing interest We, the undersigned authors of the review article entitled “Airway sensory neurobiology and TRP channels in chronic cough: mechanisms, cough hypersensitivity, and therapeutic translation” submitted to Life Sciences, hereby declare that we have no financial, personal, or professional relationships with any individuals or organizations that could inappropriately influence or bias the content of this work.

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Review

Otolaryngol Clin North Am

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. 2026 May 27:S0030-6665(26)00070-8.

doi: 10.1016/j.otc.2026.04.003. Online ahead of print.

Pathophysiology of Cough

Peter S Giannaris [1], Seth E Kaplan [2]

Affiliations Expand

- PMID: 42203561

- DOI: 10.1016/j.otc.2026.04.003

Abstract

Cough pathophysiology ranges from a simple reflex to a complex neuroimmune disorder involving intricate neural circuitry, peripheral sensitization, and central plasticity. The cough reflex is governed by a complex orchestration of sensory nerves and central brain structures. Chronic cough often results from peripheral and central sensitization, leading to hypersensitivity influenced by various physiologic and environmental factors. This advanced understanding is vital for developing personalized, mechanism-directed therapies for this prevalent condition.

Keywords: Chronic cough; Cough hypersensitivity syndrome; Neuroimmune interactions; P2X3 receptors; Vagal afferents.

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Review

Otolaryngol Clin North Am

. 2026 May 27:S0030-6665(26)00073-3.

doi: 10.1016/j.otc.2026.04.006. Online ahead of print.

Rare Causes of Unexplained Chronic Cough in Adults

Nivedita Sabarinathan [1], Raluca Gray [2]

Affiliations Expand

- PMID: 42203560
- DOI: 10.1016/j.otc.2026.04.006

Abstract

Cough can result from a variety of etiologies, and rare pulmonary, otolaryngologic, cardiac, neurologic, medication-related, and functional conditions are often overlooked. Pulmonary etiologies, including structural airway abnormalities, endobronchial obstruction, expiratory central airway collapse, and occupational eosinophilic bronchitis, frequently require advanced imaging and bronchoscopy for diagnosis. Otolaryngologic conditions include elongated uvula, tonsillar hypertrophy, and external auditory canal pathology, which can trigger vagally mediated cough reflexes. Obstructive sleep apnea may result in chronic cough through inflammatory and reflux-mediated mechanisms. Cardiac causes include heart failure, airway compression, and arrhythmias. Neurologic, medication-induced, and functional causes should also be considered in refractory cases.

Keywords: Arnold's nerve reflex; CANVAS; Cardiac-induced cough; Cough; Endobronchial obstruction; Epiglottic impingement; Expiratory central airway collapse; Obstructive sleep apnea.

Conflict of interest statement

Disclosure No commercial disclosures or financial conflicts of interest. No funding sources for all authors.

Supplementary info

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Editorial

Otolaryngol Clin North Am

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. 2026 May 25:S0030-6665(26)00080-0.

doi: 10.1016/j.otc.2026.04.013. Online ahead of print.

Otolaryngologic Understanding of Acute and Chronic Cough

Sujana S Chandrasekhar [1]

Affiliations Expand

- **PMID: 42185188**

- **DOI: 10.1016/j.otc.2026.04.013**

No abstract available

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

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Pulmonology

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. 2026 Dec;32(1):2682603.

doi: 10.1080/25310429.2026.2682603. Epub 2026 May 29.

From CFTR genotype enrichment to functional and longitudinal endotyping in Bronchiectasis

Changping Tian [1], Ke Xue [2]

Affiliations Expand

. PMID: 42212955

. DOI: 10.1080/25310429.2026.2682603

No abstract available

Full text links

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BJGP Open

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. 2026 May 28:BJGPO.2026.0079.

doi: 10.3399/BJGPO.2026.0079. Online ahead of print.

Integrated healthcare services for non-COPD chronic respiratory diseases: a systematic review

Lucy Anne Boast [1], Kushal Varma [2], Georgia Swinnerton [3], Alice M Turner [4], Sarah Damery [5]

Affiliations Expand

- PMID: 42209125

- DOI: 10.3399/BJGPO.2026.0079

Abstract

Background: Respiratory service integration has typically focused on chronic obstructive pulmonary disease (COPD) but may be appropriate for other chronic respiratory diseases (CRDs).

Aim: To investigate integrated care in asthma, bronchiectasis and interstitial lung disease (ILD).

Design & setting: A systematic review of interventional or observational studies published in English since 2014 from high-income countries. Integration was defined as multi-disciplinary care across two or more settings.

Method: Medline, Embase, CINAHL, PsycINFO, Cochrane Library and Scopus were searched. Intervention characteristics, patient-reported and healthcare utilisation outcomes were described narratively. A random-effects model was used to report standardised mean difference for asthma control and mean difference for quality of life (QOL) outcomes (mAQLQ).

Results: Sixteen studies (seven countries) met the inclusion criteria from 14 246 titles/abstracts: asthma=11, ILD=5. Most asthma studies targeted poorly controlled patients. Five RCTs (1096 participants) showed potentially moderate improvements in post-intervention asthma control (standardised mean difference 0.45, 95% CI -0.20 to 1.10, follow-up 3-12months). Three RCTs (1025 participants) reported small improvements in QOL at 12 months (mean difference 0.39, 95% CI 0.13 to 0.66, MCID=0.5). A reduced healthcare utilisation trend was seen. Most ILD studies included advanced care planning, reporting improvements to symptoms, care coordination and healthcare use towards end of life. No integrated care studies for bronchiectasis were identified.

Conclusion: Integrated care for non-COPD CRDs may improve short-term QOL, symptom control and healthcare utilisation. Heterogeneity of study populations and outcomes limited meta-analysis. There remains a paucity of real-world evidence for integrated care outside COPD.

Keywords: Community care; Respiratory illness; Systematic reviews.

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ERJ Open Res

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. 2026 May 26;12(3):01121-2025.

doi: 10.1183/23120541.01121-2025. eCollection 2026 May.

[Association of German Bronchiectasis Registry participation with disease course]

Jessica Rademacher[1 2 3], Felix C Ringshausen[1 2 4 3], Sivagurunathan Sutharsan[5], Gernot Rohde[2 6 7], Annegret Zurawski[2], Sarah Sieber[8], Grit Barten-Neiner[7], Nina Adaskina[7], Isabell Pink[1], Pontus Mertsch[2 9]

Affiliations Expand

- PMID: 42206015

- PMCID: PMC13202358

- DOI: 10.1183/23120541.01121-2025

Abstract

Background: Bronchiectasis research has advanced significantly through international and national registries, such as the European Multicentre Bronchiectasis Audit and Research Collaboration (EMBARC) registry, revealing crucial insights into the disease's heterogeneous nature. These efforts underscore the importance of precise patient phenotyping and the identification of underlying causes to improve management and outcomes in bronchiectasis.

Methods: The prospective, non-interventional PROGNOSIS registry has collected data from over 1500 computed tomography-confirmed adult bronchiectasis patients across 38 German sites,

excluding those with cystic fibrosis or lung transplants. Aligned with the EMBARC registry, it ensures comprehensive clinical data collection. Statistical analyses of baseline and follow-up data aims to assess disease progression and patient outcomes.

Results: Key outcomes include a reduction in median (interquartile range (IQR)) exacerbations (2 (1-4) to 1 (1-3); p<0.001) and hospitalisations (1 (1-2) to 1 (1-1); p<0.001), demonstrating an improvement in managing the disease during patients' participation in the registry. Lung function (median (IQR) forced expiratory volume in 1 s % pred 73% (51-90%) to 73% (52-92%); p=0.6) remained stable over time, contradicting the expected decline in such chronic lung conditions. There was a significant decrease in active smokers (4.4% to 3.6%; p<0.001), and improvements were seen in sputum quantity and quality. There was an increase in the detection of pathogens, particularly *Pseudomonas aeruginosa* (32% to 36%; p<0.001). Notable shifts in the underlying causes of bronchiectasis were observed over the registry period, including a decrease in idiopathic cases (35% to 28%; p<0.001) and an increase in cases with a proven aetiology.

Conclusion: The PROGNOSIS registry highlights the critical role of comprehensive management in bronchiectasis, emphasising infection control and treatment adherence. It underscores the need for

personalised treatment by identifying the underlying aetiology and reinforces the ongoing importance of research in improving patient care and quality of life.

Conflict of interest statement

Conflict of interest: J. Rademacher reports grants from Insmed, InfectoPharm, BMBF and BMG; payment or honoraria for lectures, presentations, manuscript writing or educational events from AstraZeneca, Berlin-Chemie, Gilead, GSK, Insmed and Pfizer; support for attending meetings from AstraZeneca; and participation on a data safety monitoring or advisory board with AstraZeneca, GSK, Insmed, Gilead, MSD and Advanz. F.C. Ringshausen reports grants from Deutsches Zentrum für Lungenforschung (DZL), Deutschen Zentrum für Infektionsforschung, the Innovative Medicines Initiative (European Union/European Federation of Pharmaceutical Industries and Associations) and iABC Consortium (including Alaxia, Basilea, Novartis and Polyphor), Mukoviszidose Institute, Novartis and Insmed Germany; consultancy fees from Parion Sciences, Boehringer Ingelheim, Insmed and Chiesi; payment or honoraria for lectures, presentations, manuscript writing or educational events from I!DE Werbeagentur GmbH, Insmed, Grifols, Universitätsklinikum Frankfurt am Main, University

Hospital Hamburg, AstraZeneca and Sanofi; participation on a data safety monitoring or advisory board with Insmed, Boehringer Ingelheim, Parion Sciences and Chiesi; leadership roles with the ERN-LUNG Bronchiectasis Core Network, the German Bronchiectasis Registry PROGNOSIS, the European Bronchiectasis Registry EMBARC and the DZL; and fees for clinical trial participation from Arcturus, AstraZeneca, Boehringer Ingelheim, Insmed, Novartis, Parion, ReCode, Ruhr, University-Bochum, University of Dundee and Vertex. S. Suthersan reports grants from Vertex, Galapagos, Insmed, Proteostasis and Corbus; consultancy fees from Insmed, Vertex Pharmaceuticals and Boehringer Ingelheim; and payment or honoraria for lectures, presentations, manuscript writing or educational events from Insmed, Vertex Pharmaceuticals and Boehringer Ingelheim. G. Rohde reports consultancy fees from AstraZeneca, Atriva, Boehringer Ingelheim, GSK, Insmed, MSD, Sanofi, Novartis and Pfizer; payment or honoraria for lectures, presentations, manuscript writing or educational events from AstraZeneca, Berlin-Chemie, BMS, Boehringer Ingelheim, Chiesi, Essex Pharma, Grifols, GSK, Insmed, MSD, Roche, Sanofi, Solvay, Takeda,Novartis, Pfizer and Vertex; and a leadership role with CAPNETZ. A. Zurawski reports grants from Vertex Pharmaceuticals. S. Sieber reports support for the present study from Hannover Medical School. G. Barten-Neiner reports

support for the present study from Hannover Medical School. N. Adaskina reports support for the present study from Hannover Medical School. I. Pink reports grants from the DZL. P. Mertsch reports grants from the DZL; consultancy fees from ResMed, AstraZeneca and Pari; payment or honoraria for lectures, presentations, manuscript writing or educational events from Insmed, Vertex, AstraZeneca, PhysioAssist, Pari, Pharma, Forum Sanitas and Streamed Up; support for attending meetings from the German Kartagener Syndrome and Primary Ciliary Dyskinesia Patient Advocacy Group and CSL Behring; leadership roles with the German Bronchiectasis Registry PROGNOSIS, German Kartagener Syndrome and PCD Patient Advocacy Group, and German Respiratory Society; and financial (or nonfinancial) interests with Insmed, AstraZeneca, Boehringer Ingelheim and PhysioAssist.

. 2026 May 25;185(6):436.

doi: 10.1007/s00431-026-07101-3.

Treatable traits in paediatric bronchiectasis: current practice and a proposed checklist

Joséphine Annereau [1 2], Apolline Gonsard [1 3], Rola Abou Taam [1], Christophe Delacourt [1 3], Charlotte Roy [1], Anaïs Le [1 3], Isabelle Sermet-Gaudelus [1], Alice Hadchouel [1 3], David Drummond [4 5 6]

Affiliations Expand

- PMID: 42184004

- DOI: 10.1007/s00431-026-07101-3

Abstract

We recently published a treatable traits (TT) framework for children with non-cystic fibrosis bronchiectasis (NCFB). Whether these traits are routinely documented as assessed and identified in clinical practice is unknown. We conducted a retrospective study of children (< 18 years) with CT-confirmed NCFB followed at a tertiary referral centre (2010-2024). For each patient, we

determined which of 41 predefined TTs across four domains-aetiological (n = 6), pulmonary (n = 15), extrapulmonary (n = 9), and behavioural/environmental (n = 11)-were documented as assessed, and among those assessed, which were identified. Among 121 children (median age 10.1 years; median 2 exacerbations/year), only 20 out of 41 TTs (49%) were documented as assessed per patient, and a median of 6 were identified. Aetiological and pulmonary traits were more frequently documented as assessed than extrapulmonary and behavioural. Anxiety and depression in children or parents, as well as viral prevention measures, were never documented, and treatment adherence was rarely recorded. When traits were documented as assessed, several were frequently identified: neutrophilic inflammation was found in 93%, eosinophilic inflammation in 35%, and short-acting beta-agonist overuse in 47% of assessed patients.

Conclusion: Even in a tertiary referral centre, half of TTs lacked documented assessment in children with NCFB, particularly psychosocial and behavioural factors. Based on these findings, we propose a pragmatic TT checklist, used as a flexible clinical guide, to support structured, clinically relevant, and traceable assessment of children with NCFB in routine care.

What is known: • Paediatric non-cystic fibrosis bronchiectasis is a heterogeneous disease

requiring individualised management. • A "treatable traits" approach has been proposed to guide precision medicine beyond standard guidelines.

What is new: • In real-life paediatric practice, only half of treatable traits are documented as assessed, with psychosocial and behavioural factors particularly infrequently documented. • We propose a pragmatic checklist to support structured, clinically guided assessment and improve routine care.

Keywords: Bronchiectasis; Comorbidity; Medication adherence; Paediatrics; Precision medicine.

Conflict of interest statement

Declarations. Competing Interests: The authors have no conflict of interest to disclose.

- 31 references

Supplementary info

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Review

Jpn J Radiol

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. 2026 May 25.

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Chest CT imaging toward personalized management of chronic obstructive pulmonary disease, asthma, and bronchiectasis: pulmonologist perspectives

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Affiliations Expand

- PMID: 42183930

- DOI: 10.1007/s11604-026-02017-2

Abstract

Chronic airway diseases, including chronic obstructive pulmonary disease (COPD), asthma,

and bronchiectasis, impose substantial morbidity and mortality worldwide. Precise phenotyping of their complex pathophysiological manifestations is essential for effective management. Chest computed tomography (CT) allows qualitative and quantitative assessments of emphysema, airway structure, mucus plugs, vascular abnormalities, bronchiectasis, and comorbid interstitial lung abnormality, making it central to charactering these conditions. From perspectives of pulmonologists who use chest CT with guidance from radiologists, this review describes the advances in CT image analysis and their implications for patients with chronic airway disease. On inspiratory CT, low-attenuation regions reflect emphysema and are associated with clinical outcomes in smokers. Airway lumen, wall size, branch count, and fractal dimension correlate with disease severity and lung function impairment in COPD and asthma. Airway mucus plugs reflect inflammatory patterns and are associated with reduced lung function and exacerbations; however, mucus plugs are increasingly recognized as a treatable trait in the era of biologics treatment. Pulmonary vascular abnormalities are quantified using pulmonary artery-to-aorta diameter ratio and small vessel volume proportions. Along with chronic symptoms, bronchiectasis is diagnosed radiologically by an increased broncho-arterial ratio, absent bronchial tapering, and peripheral airway visibility. Although limited spatial resolution

precludes direct evaluation of small airway disease, air-trapping on expiratory CT or registered Inspiratory-expiratory CT allows indirect estimation of small airway disease. Despite these advances, many research findings remain unapplied to routine clinical image analysis. Radiation exposure is an inherent limitation. Nonetheless, chest CT provides greater diagnostic information than chest radiography and is more accessible than magnetic resonance imaging and nuclear imaging. Further studies are needed to maximize the potential of chest CT for early detection, risk stratification, and treatment monitoring in airway disease management.

Keywords: Asthma; Bronchiectasis; COPD; Computed tomography; Imaging; Mucus plug.

Conflict of interest statement

Declarations. Competing interests: The authors declare no conflict of interest related to this review. Ethics approval: Not applicable. Informed consent: Not applicable.

- 227 references

Supplementary info

Publication typesExpand

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Cite

6

Expert Rev Respir Med

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. 2026 May 25:1-10.

doi: 10.1080/17476348.2026.2678615. Online ahead of print.

Impulse oscillometry indices are associated with functional impairment and progressive pulmonary fibrosis across interstitial lung diseases

Eyal Kleinhendler[1], Tomer Hasson[1], Doron Cohn-Schwartz[1], Ariel Melloul[1], Sharon Enghelberg[1], Inbal Friedman Regev[1], Nimrod Urtreger[1], Aviv Kupershmidet[1], Amir Bar-Shai[1], Boaz Tiran[1], Ophir Freund[1 2], Avraham Unterman[1 2]

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- DOI: 10.1080/17476348.2026.2678615

Abstract

Background: Respiratory oscillometry provides effort-independent indices of airway heterogeneity (R5-20) and respiratory system stiffness (AX). Their clinical relevance in interstitial lung diseases (ILD) remains unclear and was the aim of our study.

Research design and methods: A cross-sectional study including patients with ILD who underwent oscillometry, pulmonary function tests (PFTs), and six-minute walking distance (6MWD) at a single visit. R5-20 and AX were analyzed as continuous variables and as thresholds derived from receiver operating characteristic (ROC) analysis for progressive pulmonary fibrosis (PPF). Associations with clinical outcomes were assessed using multivariable regression models.

Results: Ninety-four patients (median age 70y; 44% females) were included. Oscillometry parameters correlated with PFTs and 6MWD, and had a moderate discriminative ability for PPF (AUC 0.747-0.764). Abnormal oscillometry was identified in 46 patients (49%) and was not associated with any baseline characteristic or ILD subtype. However, it was linked to lower DLCO (48% vs. 54% predicted, $p = 0.02$) and reduced 6MWD (median [IQR] 413 [354-503] vs. 465 [425-533] meters, $p = 0.024$). R5-20 was higher in patients with air-trapping or mosaic attenuation in chest CT,

although not in those with honeycombing or traction bronchiectasis.

Conclusion: Oscillometric abnormalities are common in ILD and independently associated with disease severity.

Keywords: Respiratory oscillometry; connective tissue disease; idiopathic pulmonary fibrosis; prognosis; pulmonary function tests.

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Semin Arthritis Rheum

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doi: 10.1016/j.semarthrit.2026.152996. Epub 2026 May 8.

Hospitalization risk in patients with rheumatoid arthritis-associated interstitial lung disease or bronchiectasis: A matched cohort study

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Affiliations Expand

- PMID: 42127546

- DOI: 10.1016/j.semarthrit.2026.152996

Abstract

Objectives: To investigate hospitalization risk and identify factors associated with respiratory hospitalization in rheumatoid arthritis-associated lung disease (RA-LD).

Methods: We conducted a retrospective cohort study using the Mass General Brigham Biobank (Boston, Massachusetts), comparing RA-LD cases to matched RA comparators without lung disease (RA-no LD). RA-LD was verified by medical record review and chest imaging for clinically-apparent RA-associated interstitial lung disease (RA-ILD) and/or RA-associated bronchiectasis (RA-BR). A subset had genotyping performed for the MUC5B promoter variant. The co-primary outcomes were overall and respiratory hospitalizations. Incidence rate ratios (IRRs) with 95% confidence intervals (CI) were estimated using multivariable Poisson regression models, comparing RA-LD, RA-ILD, and

RA-BR cases vs. RA-no LD comparators, adjusting for covariates by a propensity score.

Results: We analyzed 221 RA-LD cases (151 RA-ILD and 70 RA-BR) and 980 RA-no LD comparators. RA-LD, including RA-ILD and RA-BR, had higher risks of overall hospitalization (adjusted IRR 1.73, 95%CI 1.57-1.91) and respiratory hospitalization (adjusted IRR 5.13, 95%CI 3.80-6.94). RA-ILD also had increased risk of intensive care unit (ICU) admissions (adjusted IRR 1.99, 95%CI 1.81-2.18). The MUC5B promoter variant and glucocorticoid use were each associated with higher respiratory hospitalization risk, whereas more frequent clinic visits and female sex were associated with lower risk.

Conclusion: RA-ILD and RA-BR were each associated with markedly higher risks of overall and respiratory hospitalization than RA-no LD comparators. Factors including the MUC5B promoter variant and glucocorticoid use may place patients at higher risk for acute care utilization. These findings support early risk stratification and proactive monitoring to guide personalized RA-LD management.

Keywords: Acute care utilization; Bronchiectasis; Hospitalization risk; Interstitial lung disease; Rheumatoid arthritis.

Conflict of interest statement

Declaration of competing interest All other authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary info

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8

Review

Drugs

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Targeting Inflammation in Bronchiectasis

Micheál Mac Aogáin [1 2], Amy Gilmour [3], James D Chalmers [3 4], Sanjay H Chotirmall [5 6]

Affiliations Expand

- PMID: 41954871

- DOI: 10.1007/s40265-026-02314-0

Abstract

Bronchiectasis is defined by chronic infection, dysregulated inflammation and impaired mucociliary clearance underpinning progressive structural lung injury. While airway infection remains a clinical hallmark, numerous studies demonstrate that excessive neutrophil-dominated inflammation is a key determinant of disease severity, exacerbation risk and quality of life. Recent developments have transformed our understanding of inflammatory drivers uncovering distinct inflammatory endotypes defined by dominant microbial species, pattern-recognition receptor activation, inflammasome signalling, Th17-associated cytokine networks and failures of mucosal immunity. The emerging roles of viral-bacterial interactions, fungi, pathobionts and the broader microbiome challenge the conventional infection-only paradigm and highlight gaps in current therapeutic strategies. Such developments underpin the rationale behind anti-inflammatory strategies in bronchiectasis, ranging from

suppression of neutrophil-driven injury through direct neutrophil elastase or upstream dipeptidyl peptidase-1 (DPP-1) inhibition, to immunomodulatory macrolides, toward therapies aimed at recalibrating epithelial and mucosal homeostasis. While several antibacterial and anti-infective trials have produced mixed results, this is likely to reflect unresolved heterogeneity in microbiome composition and host immune signalling. In contrast, emerging anti-inflammatory strategies show strong positive signals, reinforcing the need for better endotyping and biomarker-guided patient selection. Here we synthesize recent mechanistic and clinical insights to propose a more integrated framework for understanding and ultimately targeting airway inflammation in bronchiectasis.

Conflict of interest statement

Declarations. Conflict of Interest: J.D.C reports grants or contracts from AstraZeneca, Boehringer Ingelheim, Genentech, Gilead Sciences, GlaxoSmithKline, Grifols, Insmed, Novartis and Trudell Medical Group; consulting fees from Antabio, AstraZeneca, Boehringer Ingelheim, Chiesi Farmaceutici, GlaxoSmithKline, Grifols, Insmed, Janssen, Novartis, Pfizer, Trudell Medical Group and Zambon. S.H.C has served on advisory

boards for CSL Behring, Pneumagen Ltd., Zaccha Pte Ltd, Boehringer-Ingelheim, GSK, Chiesi Farmaceutici and Sanofi, on DSMBs for Inovio Pharmaceuticals and Imam Abdulrahman Bin Faisal University and has received personal fees from Astra-Zeneca, Boehringer-Ingelheim, CSL Behring and Chiesi Farmaceutici, all unrelated to this work. All other authors have no potential conflicts of interest to disclose. Ethics Approval: Not applicable. Consent to Participate: Not applicable. Consent for Publication: Not applicable. Data Availability: Not applicable. Code Availability: Not applicable. Author Contributions: M.M.A., A.G., J.D.C. and S.H.C. contributed to drafting and revising the manuscript and approved the final version.

- 125 references

Supplementary info

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9

Randomized Controlled Trial

Physiotherapy

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. 2026 Jun:131:101875.

doi: 10.1016/j.physio.2026.101875. Epub 2026 Jan 7.

Effect of an airway clearance technique on nebulized drug delivery in patients with CF: A randomized cross-over trial

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Affiliations Expand

- PMID: 41820130

- DOI: 10.1016/j.physio.2026.101875

Abstract

Objectives: The aim of this study was to verify the efficacy of airway clearance technique on drug delivery by nebulization.

Design: Cross-over study.

Participants: Stable patients with CF (PwCF) (n=8).

Interventions: Participants performed the airway clearance technique before or after the nebulization session. The Autogenic Drainage (AD) was the executed airway clearance techniques. The nebulization session was a delivery of 500 mg-amikacin with the AKITA®.

Main outcome measures: The primary endpoint was the 24 h-urinary excretion of amikacin.

Results: PwCF were between 18 and 48 years old (FEV1: 43 to 92 %), all colonized by Pseudomonas aeruginosa, and all with bronchiectasis. Irrespective of the order of the nebulization and the physiotherapy sessions, the total amount of urinary amikacin excretion was similar (Median Difference (95%CI): 0 (-7 to 4)% of the nominal dose). The elimination constant rate for nebulization before (Median: 0.153 (IQR: 0.071 to 0.205)) and after the airway clearance technique (0.149 (0.041 to 0.182); p = 0.26) were similar (Median difference (95%CI): 0.02 (-0.004 to 0.023)).

Conclusions: The lung delivery of nebulized medication in PwCF colonized with Pseudomonas aeruginosa was not improved by the order of the airway clearance and nebulization procedures. CONTRIBUTION OF THE PAPER.

Keywords: Airway clearance technique; Chest physiotherapy; Cystic fibrosis; Drug delivery; Nebulization.

Conflict of interest statement

Conflict of interest None declared.

Supplementary info

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Cite

10

Review

Paediatr Respir Rev

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. 2026 Jun:58:24-31.

doi: 10.1016/j.prrv.2026.02.004. Epub 2026 Feb 20.

Year in review: "Best" papers in pediatric pulmonary and sleep medicine in 2025

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- PMID: 41813463

- DOI: 10.1016/j.prrv.2026.02.004

Abstract

With an ever increasing number of excellent publications in the field of pediatic pulmonary and sleep medicine each year, it is a challenge to identify those with the greatest impact and interest for readers of this journal. The challenge was made both more exciting and more difficult when a group of leaders in the field recommend nearly 100 papers that they loved and asked us to consider. We have read each of these recommendations and agonized over which to include here. We hope that you enjoy reading this collection as much as we have enjoyed preparing it.

Keywords: Asthma; Bronchiectasis; Cystic fibrosis; Lung function; Pneumonia; Pollution; Respiratory syncytial virus; Sleep apnoea.

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. We thank all who suggested papers to be considered into the review. The scope and pace of advances in pediatric pulmonology and sleep medicine made synthesizing this literature into a single comprehensive review both an opportunity and a challenge. Although not all-important contributions could be included, we aimed to highlight studies most likely to influence clinical practice, guide future research, and ultimately improve respiratory health outcomes for children.

Supplementary info

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11

Review

Paediatr Respir Rev

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. 2026 Jun:58:69-82.

doi: 10.1016/j.prrv.2025.08.002. Epub 2025 Aug 28.

Immunologic evaluation by a pediatric pulmonologist

Kasama Manothummetha [1], Matthew Wyke [2], Gary Kleiner [3], Melissa Gans [4]

Affiliations Expand

- PMID: 40957775

- DOI: 10.1016/j.prrv.2025.08.002

Abstract

Respiratory symptoms are among the most common presentations of inborn errors of immunity (IEI) and acquired immunodeficiencies in children. Pediatric pulmonologists are often the first to evaluate these patients, yet immunologic evaluations remain underutilized due to diagnostic complexity and limited familiarity with immune testing. Not all patients will have access to a timely consultation with an immunologist. This review provides a practical framework to aid pediatric pulmonologists in identifying, evaluating, and managing immune dysfunction in children with respiratory disease. It outlines clinical indicators, such as recurrent infections, bronchiectasis, failure to thrive, and syndromic features, and describes the utility and limitations of key

immunologic tests. Stepwise diagnostic strategies are presented, from initial laboratory screening to functional assays and genetic testing. Common IEI with respiratory manifestations, including antibody deficiencies, combined immunodeficiencies, phagocytic disorders, and immune dysregulation syndromes, are reviewed. The article also addresses acquired immunodeficiencies, diagnostic mimics, and principles of pulmonary co-management, including prophylaxis and long-term follow-up. Early recognition and collaborative care can improve outcomes and prevent irreversible pulmonary damage in this vulnerable population.

Keywords: Immunologic evaluation; Inborn errors of immunity; Pediatric pulmonology; Secondary immunodeficiency.

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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