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

1

BMC Emerg Med

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. 2026 Apr 10.

doi: 10.1186/s12873-026-01571-2. Online ahead of print.

Prehospital treatment modalities for acute exacerbation of chronic obstructive pulmonary disease: a scoping review

Johanne Thorngaard Kristensen [1], Asger Bülow [1], Arne Sylvester Rønde Jensen [1], Martin Faurholdt Gude [2 3]

Affiliations Expand

- **PMID: 41963821**

- **DOI: 10.1186/s12873-026-01571-2**

No abstract available

Keywords: Chronic obstructive pulmonary disease; Dexamethasone; Emergency medical services; Lung; Nebulizers and vaporizers; Oxygen inhalation therapy; Point-of-care systems; Positive-pressure respiration; Respiratory insufficiency; Ultrasonography.

Conflict of interest statement

Declarations. Ethical approval and consent to participate: Not applicable. Ethical approval was not required for this scoping review, as it was based solely on previously published literature. Consent for publication: Not applicable. Use of AI technology: Artificial intelligence tools (ChatGPT, OpenAI) were used to assist with language editing and grammar checking. All content was reviewed and approved by the authors. No AI tools were used for data analysis or interpretation. Competing interests: The authors declare no competing interests.

- **56 references**

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Meta-Analysis

BMJ Open Respir Res

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doi: 10.1136/bmjresp-2025-003611.

What is the evidence for virtual wards or hospital-at-home care pathways for exacerbations of chronic obstructive pulmonary disease? A systematic review and meta-analysis

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Affiliations Expand

- **PMID: 41963074**

- **DOI: 10.1136/bmjresp-2025-003611**

Abstract

Objectives: Given increasing interest in admission avoidance, we evaluated the evidence to support virtual wards (VW) and hospital at home (HaH) models of care during exacerbations of chronic obstructive pulmonary disease (ECOPD).

Design: A systematic review and meta-analysis. A comprehensive search of MEDLINE (1946 to March 2024), Embase (1974 to March 2024) and CENTRAL (searched 22 March 2024) was conducted. Risk of bias and a random effects meta-analysis were performed.

Population: Adults with an ECOPD presenting to the hospital or who require hospital-led care.

Interventions: VW: defined as assessments and interventions delivered remotely or HaH (defined as assessments and interventions delivered by healthcare professionals in patient's homes) care pathways, compared with hospital admission.

Primary and secondary objectives: Safety (mortality rate of all causes, in-patient, 7 days and 30 days) and readmission rate in 7 and 30 days. Length of stay in hospital and changes in pulmonary function tests.

Results: One study assessed VWs (reported in two publications) and 10 assessed HaH. There were no changes in survival or short-term readmission rates attributable to the interventions and no evidence that VW or HaH care pathways reduced the total time a patient spent under hospital-led care, whether at home or in the hospital.

Conclusions: More evidence is needed to support the widespread roll-out of HaH and especially VW pathways for ECOPD. PROSPERO REGISTRATION NUMBER: https://www.crd.york.ac.uk/PROSPERO/view/CRD42024517565.

Keywords: COPD Exacerbations.

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Conflict of interest statement

Competing interests: None declared.

Supplementary info

Publication types, MeSH termsExpand

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3

Semin Respir Crit Care Med

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. 2026 Apr 10.

doi: 10.1055/a-2835-0340. Online ahead of print.

Bidirectional Clinical Interactions among Exacerbations and Comorbidities in COPD: A Narrative Review

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- PMID: 41962550

- DOI: 10.1055/a-2835-0340

Abstract

Acute deteriorations of respiratory symptoms in people with chronic obstructive pulmonary disease (COPD), known as exacerbations, worsen COPD severity (e.g., speed up lung function decline), and increase hospital admissions, healthcare costs, and mortality risk. The prevention, diagnosis, and treatment of exacerbations remain challenging due to the heterogeneous nature of these events. This complexity is further compounded by the high prevalence of multiple comorbidities and incompletely understood underlying mechanisms. Exacerbations of COPD and comorbidities are linked through bidirectional relationships, characterized by mutual adverse impacts, overlapping clinical manifestations, and increased susceptibility to the other condition. The identification and management of comorbidities are pivotal for effective disease management. Although current clinical frameworks, that is, models that integrate clinical features and biomarker-based identification of exacerbations to guide risk stratification and management, represent promising approaches to improve patient outcomes, multimorbidity is insufficiently incorporated. This narrative review provides an overview of the complex clinical associations of comorbidities in COPD, with a particular focus on exacerbations. It highlights differences in comorbidity prevalence among exacerbators, explores clinical interrelationships, and underscores the importance of multimorbidity-oriented management.

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Conflict of interest statement

F.M.E.F. reports a relationship with Sanofi and MAS that includes consulting or advisory services with AstraZeneca that include speaking and lecture fees and travel reimbursement, and with Chiesi, GSK, Sanofi, and Pfizer that include speaking and lecture fees. S.O.S. reports a relationship with Lung Foundation Netherlands, Roche, and Dutch Research Council (NWO) that includes funding grants, with AstraZeneca and Chiesi that includes board membership, speaking and

lecture fees, and travel reimbursement, and with P4O2 consortium and eVoiceNet that includes board membership.

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NPJ Prim Care Respir Med

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. 2026 Apr 9.

doi: 10.1038/s41533-026-00502-9. Online ahead of print.

Projecting the 20-year healthcare resource burden of asthma and COPD multimorbidity: insights from Singapore for integrated chronic respiratory care in South-East Asia

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Affiliations Expand

- PMID: 41957045

- DOI: 10.1038/s41533-026-00502-9

Free article

Abstract

Background: Asthma and chronic obstructive pulmonary disease (COPD) incur significant comorbidity and healthcare burden. However, their future economic burden remain unclear.

Objective: To project 20-year (2024-2043) asthma and COPD multimorbidity costs in Singapore, illustrating broader Southeast Asian trends.

Methods: Patients with asthma (all ages) or COPD (≥40 years) were identified from Singapore's health administrative data (2002-2019). Age- and sex-specific, disease-specific per-episode costs and annual healthcare utilisation rates (hospitalisation, emergency department, and outpatient) were estimated using generalised linear

models and projected using change-point analysis. Population-level costs were projected using a probabilistic simulation model incorporating population forecasts. Costs were reported in 2023 Singaporean dollars (SGD$1 = US$0.76 = £0.60 = €0.69).

Results: Asthma cases are projected to triple from 64,338 in 2019 to 192,409 by 2043 (95% confidence interval [CI]: 165,493-225,141), incurring $7.8 billion (95% CI: 4.4-17.1) from 2024-2043. Apart from asthma (16.4%), costs are driven by metabolic (20.0%), circulatory (14.3%), and other respiratory (9.2%) diseases, with children bearing the highest burden (girls: 39.9%; boys: 22.6%). COPD cases would grow from 8,988 in 2019 to 11,038 (95% CI: 8395-13,326) in 2043, incurring $2.4 billion (95% CI: 1.6-4.5) from 2024-2043. Apart from COPD (20.3%), metabolic (17.4%), circulatory (17.0%), and other respiratory diseases (9.8%) are the largest cost components, with elderly and adult males bearing the highest burdens (47.8% and 40.1%). In both cohorts, 20-year projected costs are dominated by outpatient (55%) and hospitalisation costs (30-40%).

Conclusion: The 20-year multimorbidity costs of asthma and COPD are significant, especially in cardiometabolic comorbidities, underscoring the need for holistic, value-based care.

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Conflict of interest statement

Competing interests: The authors declare no competing interests. Declarations: This study made use of data generated by the Ministry of Health and/or anonymised data retrieved from government administrative and health records. This study was supported by the Trusted Research and Real-World-Data Utilisation and Sharing Tech platform ("TRUST Platform") jointly developed by the Ministry of Health and Smart Nation and Digital Government Office and Synapxe. The views expressed are those of the author(s) are not necessarily those of the Government, TRUST Platform developed by the Ministry of Health and Smart Nation and Digital Government Office and Synapxe, investigators or institutional partners. We thank all participants and research staff who made the study possible.

- **70 references**

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Eur Respir J

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. 2026 Apr 9:2501348.

doi: 10.1183/13993003.01348-2025. Online ahead of print.

Postural relief of dyspnoea is associated with improved neuromechanical coupling in patients with advanced COPD

Amany F Elbehairy [1 2], Azmy Faisal [3], Hannah McIsaac [4], Matthew D James [4], Nicolle J Domnik [4], J Alberto Neder [4], Denis E O'Donnell [4]

Affiliations Expand

- PMID: 41956700

- DOI: 10.1183/13993003.01348-2025

Abstract

Background: Patients with advanced chronic obstructive pulmonary disease (COPD) often report that adopting a specific body posture improves their dyspnoea. Exploring the underlying mechanisms could enhance our understanding of the origin of this symptom and approaches towards its alleviation.

Methods: Pulmonary function tests and detailed sensory-mechanical measurements, including gastroesophageal catheter-based crural diaphragm electromyography (surrogate for inspiratory neural drive) and respiratory manometry, were performed in 16 patients (9M; age: 66±7 years) with advanced COPD (FEV_1=36±16% predicted; residual volume/total lung capacity: 55±11%) while adopting their most favourable (MF) and least favourable (LF) postures.

Results: The MF postures included sitting upright (56%), sitting with arms on knees in a forward-leaning position (25%), standing (13%), and lying with three pillows (6%). About two-thirds of patients choose the supine posture as the LF posture. There were no significant differences in minute ventilation and inspiratory capacity between MF and LF postures (p>0.05). Compared to LF, MF postures were associated with a) increased dynamic lung compliance, b) lower transdiaphragmatic pressures, and c) reduced total work of breathing, leading to d) decreased inspiratory neural drive to the diaphragm and e) improved neuromechanical and neuroventilatory coupling (all p<0.05). The decrease in the "*difficulty breathing in*" dyspnoea qualifier when assuming the MF posture correlated with corresponding improvements in neuromechanical (r=0.62, p=0.01) and neuroventilatory uncoupling (r=0.57, p=0.02).

Conclusion: Healthcare professionals should evaluate the benefits of positional therapy for reducing dyspnoea in patients with COPD. Incorporating postural interventions into rehabilitation or using them at night may help lessen symptoms and improve quality of life.

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Clin Med (Lond)

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. 2026 Apr 7:100574.

doi: 10.1016/j.clinme.2026.100574. Online ahead of print.

A multi-centre quality improvement project to assess the impact of a standardised NIV care bundle on mortality outcomes in patients with acute type two respiratory failure

C J Michie [1], K R Ward [2], P W Creber [3], S Beresford [4], M C Juniper [5], R H Mason [6]

Affiliations Expand

- PMID: 41956252

- DOI: 10.1016/j.clinme.2026.100574

Free article

Abstract

The evidence for NIV is clear; however, real-world outcomes fall short of those demonstrated by clinical trials. We developed a five-step care bundle in line with BTS quality standards to standardise management and guide clinicians through the first few hours of NIV care. This was combined with staff training initiatives. The project aimed to reduce acute NIV mortality to 10%. Although this target was not met, the project delivered a 7% reduction in mortality from 28% to 21% equating to 143 fewer deaths in 2023 compared to 2022. The project also delivered increased staff confidence. Through this project we have demonstrated that early, effective NIV, in appropriate patients, delivered in a standardised way by confident and competent staff, improves outcomes.

Keywords: Acute; BTS; COPD; Mortality; NCEPOD; NIV; Neuromuscular disease; Obesity hypoventilation; QI; Respiratory; care bundle.

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Conflict of interest statement

Conflicts of Interest No conflicts of interest Declaration of Competing Interest The authors have declared no conflict of interest

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Respir Med

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doi: 10.1016/j.rmed.2026.108818. Online ahead of print.

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.

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Conflict of interest statement

Declaration of Competing Interest The authors declare no conflicts of interest.

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Respir Res

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. 2026 Apr 9.

doi: 10.1186/s12931-026-03603-8. Online ahead of print.

COPD in China: the analysis of mortality and burden of disease trends from 2008 to 2021

Changlin Tang[#1,2], Shengxin Fan[#1,3], Yuezhou Zhang[1,3], Zhengyu Li[1,3], Hong Chen[1,3], Ke Liao[4,5]

Affiliations Expand

- **PMID: 41952222**

- **DOI: 10.1186/s12931-026-03603-8**

Free article

Abstract

Background: To determine basic death situation and assess trends in disease burden, we analyzed the death information of Chronic Obstructive Pulmonary Disease (COPD) among Chinese residents from 2008 to 2021.

Methods: Data were collected from the Cause-of-Death Surveillance dataset in China. The Crude Mortality Rate (CMR), Age-Standardized Mortality Rate (ASMR), Potential Years of Life Lost (PYLL), and Potential Years of Life Lost Rate (PYLLR) of COPD among Chinese residents from 2008 to 2021 were calculated by Excel 2016. The trends of ASMR and PYLLR were assessed by the average annual percentage change (AAPC), and the difference in mortality was tested by Chi-square tests(χ^2 tests). The age, period, and cohort effects on COPD mortality were analyzed by the Age-Period-Cohort (APC) model.

Results: The ASMR of COPD in Chinese residents decreased from 78.84/100,000 in 2008 to 27.81/100,000 in 2021 at an average annual rate of 8.41%, and the PYLLR of COPD in Chinese residents decreased from 1.28‰ in 2008 to 0.53‰ in 2021 at an average annual rate of 6.06%. From 2008 to 2021, the COPD ASMR and PYLLR among Chinese males were higher than females, urban areas were lower than rural areas, western China was higher than central China, and central China was higher than that in eastern China. The decline rate of COPD ASMR and PYLLR was significantly higher in females than males, rural areas than urban areas, and eastern/central regions than western regions.

Conclusions: The mortality and disease burdens of COPD in China decreased yearly and were higher in the elderly, males, rural areas, and western China. The disease burden of COPD decreased more rapidly in women, rural areas, eastern and central China.

Keywords: ASMR; COPD; Disease burden; Trends.

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Conflict of interest statement

Declarations. Ethics approval and consent to participate: Not applicable, this study uses publicly available anonymous data. Consent for publication: Not applicable. Competing interests: The authors declare no competing interests.

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Review

Eur Respir Rev

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. 2026 Apr 8;35(180):250304.

doi: 10.1183/16000617.0304-2025. Print 2026 Apr.

Bronchopulmonary dysplasia and extremely preterm birth: time for a broader perspective on long-term outcomes

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Affiliations Expand

- PMID: 41951244

- PMCID: PMC13058737

- DOI: 10.1183/16000617.0304-2025

Abstract

Bronchopulmonary dysplasia is a hallmark respiratory complication of prematurity and remains a major health determinant of individuals born very preterm. Its impact, however, extends far beyond the neonatal period and far beyond the lungs. Children, adolescents and adults born very preterm often follow diverse developmental trajectories that diverge from typical postnatal growth. These trajectories often display early airflow limitation, as well as features of increased cardiovascular vulnerability and altered multisystemic profiles. Although common respiratory labels such as asthma are often applied to these patients, evidence highlights distinct pathobiological mechanisms rooted in arrested alveolar and vascular growth, with a possible contribution from persistent airway inflammation and oxidative stress. Extrapulmonary involvement, including cardiovascular, neurodevelopmental, neurosensory, renal and metabolic domains, further shapes long-term outcomes and should be systematically integrated into long-term monitoring. Yet, despite improving survival and growing recognition of this multisystemic burden, current evidence remains insufficient to design a dedicated, holistic, multidisciplinary follow-up programme tailored to the diverse subgroups of preterm-born individuals. Increasing awareness among healthcare professionals of the long-term implications of prematurity is essential to ensure that these patients

receive appropriate and coordinated attention. Emerging lines of research, spanning new preventive and therapeutic options, advanced imaging, mechanistic studies, and long-term cohort designs, hold promise in elucidating the biological determinants of disease. Integrating these insights into clinical pathways, together with sustained implementation of family-centred care models, will be crucial to optimise organ function trajectories, delay deterioration and ultimately improve the quality of life of the growing population of survivors of prematurity.

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Conflict of interest statement

Conflict of interest: All authors have nothing to disclose.

- 195 references
- 2 figures

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Review

Eur Respir Rev

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. 2026 Apr 8;35(180):250254.

doi: 10.1183/16000617.0254-2025. Print 2026 Apr.

Association between inhaled corticosteroids and risk of cardiovascular mortality in patients with COPD: a systematic review and meta-analysis

Ming-Jin Yang [1 2 3], Yan Zhang [4 2], Hai-Yun Dai [5 2], Wei He [5 2], Xue-Mei Ying [5 2], Xing-Xing Jin [5], Shu-Liang Guo [5 3], Don D Sin [6 7 3]

Affiliations Expand

- PMID: 41951243

- PMCID: PMC13058733

- DOI: 10.1183/16000617.0254-2025

Abstract

Background: COPD frequently coexists with cardiovascular diseases. Cardiovascular death is also a major contributor to mortality in COPD patients. Inhaled corticosteroids (ICS), as the most commonly prescribed inhaled anti-inflammatory medications, have been widely used for management of COPD patients who experience frequent exacerbations. However, whether ICS have a cardiovascular protective effect remains unclear. The purpose of this work was to comprehensively ascertain the risks of cardiovascular deaths related to ICS in COPD patients.

Methods: PubMed, the Cochrane Library and Embase were searched to screen qualifying articles from September to November 2022. An updated search was conducted in October 2025. We identified trials of any ICS for treatment of COPD and reported on cardiovascular deaths. Meta-analyses were conducted to calculate risk ratios with 95% confidence intervals. The primary end-point was cardiovascular mortality.

Findings: 35 randomised controlled trials enrolling 74 004 subjects were analysed. Inhaled formulations containing ICS significantly reduced the risk of cardiovascular deaths compared with inhaled formulations without ICS (risk ratio 0.84, 95% CI 0.74-0.95). ICS/long-acting muscarinic antagonist (LAMA)/long-acting β_2-agonist (LABA) significantly reduced the risk of cardiovascular deaths compared with dual LAMA/LABA therapy (risk ratio 0.56, 95% CI 0.37-0.86). ICS monotherapy also significantly reduced the risk of cardiovascular deaths compared with placebo (risk ratio 0.81, 95% CI 0.66-0.99). However, ICS/LABA did not significantly reduce the risk of cardiovascular deaths compared to LABA monotherapy (risk ratio 0.98, 95% CI 0.80-1.20).

Conclusions: Inhaled formulations containing ICS are associated with a reduced risk of cardiovascular deaths in patients with COPD.

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Conflict of interest statement

Conflict of interest: D.D. Sin reports payment or honoraria for lectures, presentations, manuscript writing or educational events from GSK, AstraZeneca and Boehringer Ingelheim. The other authors declare no conflicts of interest.

- 55 references
- 2 figures

Supplementary info

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Ann Am Thorac Soc

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. 2026 Apr 6:aaoag084.

doi: 10.1093/annalsats/aaoag084. Online ahead of print.

Cardiovascular and mortality risks following COVID-19-related vs. non-COVID-19 COPD exacerbations

Brian K Kirui [1], Huiqi Li [1], Oskar Wallström [2 3], Lowie E G W Vanfleteren [2 3 4], Ailiana Santosa [1], Carl Bonander [1 5], Caroline Stridsman [6], Mats Börjesson [7 8], Fredrik Nyberg [1]

Affiliations Expand

- PMID: 41950377

- DOI: 10.1093/annalsats/aaoag084

Abstract

Rationale: COPD exacerbations, often triggered by viral infections like COVID-19, are associated with increased cardiovascular risk. We hypothesized that COVID-19-related exacerbations carry higher short-term cardiovascular and mortality risks than non-COVID-19-related exacerbations.

Objectives: To compare 28-day risk of stroke, pulmonary embolism (PE), acute myocardial infarction (AMI), major adverse cardiovascular events (MACE) and all-cause mortality following COVID-19-related vs. non-COVID-19-related COPD exacerbations and assess variation across the pandemic.

Methods: Using Swedish national registers, we identified COPD with moderate (treated with oral corticosteroids with/without antibiotics) or severe (hospitalized) exacerbations from March 2020 to June 2023. Exacerbations with infection, hospitalization or intensive care admission for COVID-19 were defined as COVID-19-related. A target trial was emulated and adjusted hazard ratios (aHRs) with 95% confidence intervals (CI) estimated for each outcome, stratified by exacerbation severity and COVID-19 variants.

Measurements and main results: Among 266,273 exacerbations (87.2% moderate, 12.8% severe), 5,425 (2%) were COVID-19-related. COVID-19-related vs. non-COVID-19-related moderate exacerbations were associated with risk of PE (aHR 2.26, 95%CI 1.49-3.42), overall cardiovascular (1.94, 1.47-2.56), MACE (1.88, 1.28-2.76), and mortality (4.58, 4.06-5.17), but not significantly with AMI and stroke. Severe COVID-19-related exacerbations were only associated with higher mortality (1.46, 1.28-1.66). Cardiovascular risks were highest during pre-Alpha and Delta for moderate exacerbations. Mortality remained elevated for both moderate and severe exacerbations, particularly during the same periods.

Conclusions: COVID-19-related exacerbations increased MACE, short-term cardiovascular and mortality risks, mainly for moderate exacerbations, with attenuation during Alpha and Omicron, highlighting the need for proactive cardiovascular care during respiratory outbreaks.

Keywords: COPD; COVID-19; exacerbations; register data; target trial.

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Nat Commun

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. 2026 Apr 7.

doi: 10.1038/s41467-026-71652-0. Online ahead of print.

Daily steps offset risks of sedentary behavior in the All of Us research program

Neil S Zheng [1], Shi Huang [2], Jeffrey Annis [3 4 5], Hiral Master [3 4 6], Kelsie M Full [7], Evan L Brittain [8 9 10]

Affiliations Expand

- **PMID: 41946734**

- **DOI: 10.1038/s41467-026-71652-0**

Free article

Abstract

Sedentary behavior is associated with increased mortality and chronic diseases, yet it remains unclear whether higher daily step counts can mitigate these risks. In this study, we analyzed longitudinal sedentary and step data from Fitbit devices in the All of Us Research Program to examine incident diagnoses of chronic conditions. We show that greater sedentary time was associated with higher risk of obesity, diabetes mellitus, hypertension, coronary artery disease, heart failure, chronic kidney disease, metabolic dysfunction-associated steatotic liver disease, chronic obstructive pulmonary disease, major depressive disorder, sleep apnea, and atrial fibrillation. Increasing daily steps offset the excess risk of high sedentary time (14 vs. 8 hours/day) for several conditions, with the additional steps required ranging from 1700 to 5500 per day. However, no step count fully offset sedentary risks for coronary artery disease or heart failure. These findings support personalized, behavior-based recommendations that consider both sedentary behavior and daily steps.

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Conflict of interest statement

Competing interests: E.L.B has received research funds unrelated to this work from United Therapeutics and Anumana and unrestricted funds for research from Google. The All of Us Research Program was not involved in the design and conduct of the study; collection, management, and analysis of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication. To ensure privacy of participants, data used for this study was accessed and available to approved researchers only following registration, completion of ethics training, and attestation of a data use agreement through the All of Us Research Workbench platform, which can be accessed via https://workbench.researchallofus.org/login. The remaining authors declare no competing interests.

- **46 references**

Supplementary info

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13

Curr Opin Support Palliat Care

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. 2026 Apr 3.

doi: 10.1097/SPC.0000000000000801. Online ahead of print.

Clinical Decision Support System for Breathlessness

Anthony Sunjaya [1 2], Christine R Jenkins [1 2 3]

Affiliations Expand

- PMID: 41943924

- DOI: 10.1097/SPC.0000000000000801

Abstract

Purpose of review: This review summarizes high-level evidence on clinical decision support systems, both more classical rules-based and emerging artificial intelligence-based examples. It discusses their potential and concerns, how to evaluate them and describes future directions based on published evidence, clinical experience and broader experience working with others in this space.

Recent findings: There is significant potential for CDSS to benefit elicitation and assessment of breathlessness, assist clinical decision making, improve interpretation of common diagnostic tests for breathlessness and personalize management and patient education. Even so, current evidence from trials and real-world studies in this space remains limited with multiple studies ongoing. However, evidence from studies of model development indicates that CDSS have clinically acceptable performance levels for differentiating breathlessness causative conditions such as COPD, heart failure, lower respiratory tract infection or combinations of these. The extent to which this evidence translates to real world clinical benefits remains unknown.

Summary: In the era of CDSS leveraging significant volumes of data, there is the potential to augment the less precise nature of clinician prediction with that of AI prediction. This, combined with clinical judgment can support better care for patients and populations. CDSS are likely to be particularly valuable in settings with workforce constraints though we must also remember that there are limitations to CDSS use and applicability. It remains important to support and undertake high quality studies testing these tools in clinical practice.

Keywords: artificial intelligence; breathlessness; clinical decision support system.

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- 47 references

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14

Review

Respir Med

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. 2026 Apr 4:108812.

doi: 10.1016/j.rmed.2026.108812. Online ahead of print.

Exploring AI and ML in managing overlap between cardiovascular disease and asthma or COPD: a scoping review

Luigino Calzetta [1], Mario Cazzola [2], Elena Pistocchini [2], Shima Gholamalishahi [2], Rossella Laitano [2], Paola Rogliani [2]

Affiliations Expand

- **PMID: 41941973**

- **DOI: 10.1016/j.rmed.2026.108812**

Abstract

Cardiovascular disease (CVD) is a major comorbidity in asthma and chronic obstructive pulmonary disease (COPD), yet the contribution of artificial intelligence (AI) and machine learning (ML) to CVD risk assessment and management in these conditions remains insufficiently characterized. This scoping review identified the main original full-text studies applying AI/ML to the overlap between CVD and asthma or COPD for prediction, phenotyping or clinical decision support. Among the eleven identified studies, only one specifically addressed asthma, developing ML-based CVD risk prediction models from electronic health records that achieved good short-term discrimination but lacked external validation. The remaining studies focused on COPD and CVD, employing supervised learning, deep-learning survival analysis, natural language processing, unsupervised clustering and AI-enabled clinical decision support. Across these investigations, COPD and related comorbidities consistently emerged as strong predictors of CVD events, mortality and adverse clinical trajectories. Unsupervised clustering revealed COPD-dominant heart failure phenotypes with particularly poor outcomes, while AI-derived risk models frequently provided superior discrimination and calibration compared with traditional statistical approaches. However, most studies were retrospective, largely reliant on structured data, limited in generalizability and rarely implemented in routine care. Overall, current evidence indicates substantial potential for AI/ML to enhance CVD risk stratification, phenotyping and management in COPD, whereas

applications in asthma are strikingly scarce. These findings underscore a critical need for large-scale, prospectively evaluated and clinically integrated AI/ML strategies to improve detection, risk stratification and personalized management of CVD in patients with asthma or COPD.

Keywords: Artificial Intelligence; Asthma; COPD; CVD; Comorbidity; Machine Learning.

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Conflict of interest statement

Declaration of Competing Interest LC has no conflict of interest to declare. MC has no conflict of interest to declare. EP has no conflict of interest to declare. SG has no conflict of interest to declare. RL has no conflict of interest to declare. PR has no conflict of interest to declare.

Supplementary info

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PLoS One

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. 2026 Apr 6;21(4):e0346410.

doi: 10.1371/journal.pone.0346410. eCollection 2026.

Expression of Concern: Mortality trends and disparities for coexisting chronic obstructive pulmonary disease and cardiovascular disease: A retrospective analysis of deaths in the United States from 1999-2020

PLOS One Editors

- PMID: 41941414
- PMCID: PMC13052899

- DOI: 10.1371/journal.pone.0346410

No abstract available

Expression of concern for

- Mortality trends and disparities for coexisting chronic obstructive pulmonary disease and cardiovascular disease: A retrospective analysis of deaths in the United States from 1999-2020.

Goyal A, Saeed H, Sultan W, Singh A, Abdullah, Arshad MK, Amin Z, Changez MIK, Mahalwar G, Khan R, AlJaroudi W.PLoS One. 2025 Feb 4;20(2):e0317592. doi: 10.1371/journal.pone.0317592. eCollection 2025.PMID: 39903793 Free PMC article.

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J Allergy Clin Immunol Pract

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. 2026 Apr 3:S2213-2198(26)00263-1.

doi: 10.1016/j.jaip.2026.03.029. Online ahead of print.

Attitudes and practices regarding dosing interval extension of biologics in severe asthma: a nationwide survey and real-world data from the Dutch RAPSODI registry

Camiel J M Marijnissen [1], Jacob K Sont [2], Fleur L Meulmeester [3], Michel W J M Wouters [4], Gert-Jan Braunstahl [5], Arnoud F Aldenkamp [6], Simone Hashimoto [7], Johannes A Kroes [8], M Elske van den Akker-van Marle [9], Ewout W Steyerberg [10], Leti van Bodegom-Vos [11], Maarten J van Bezouw [12], Bart Hilvering [13], Els J M Weersink [14], Simone van der Sar-van der Brugge [15], Karin B Fieten [16], Annelies Beukert [17], Jeroen M A M Retera [18], Karen T M Oud [19], Renske van der Meer [20], Kornelis W Patberg [21], Thomas Macken [22], Veerle L de Visser [23], Lennart H Conemans [24], Edwin van Velzen [25], Ilonka H van Veen [26], Astrid van Huisstede [27], Elisabeth A P M Romme [28], Marijke Amelink [29], Charlotte A van Ruitenbeek [30], Anneke Ten Brinke [31], Jasper H Kappen [32]

Affiliations Expand

- PMID: 41936913

- DOI: 10.1016/j.jaip.2026.03.029

Free article

Abstract

Background: Biologics in severe asthma are an effective but costly treatment. A personalised dosing strategy could reduce treatment burden and improve cost-effectiveness.

Objective: To explore physician attitudes and real-world practices regarding dosing interval extensions for biologics in severe asthma.

Methods: We assessed attitudes to dosing interval extension among Dutch pulmonologists prescribing biologics through a 28-item nationwide e-survey and investigated clinical practices using data from the Dutch severe asthma registry RAPSODI.

Results: Of 50 pulmonologists, 39 (78%) reported extending dosing intervals, primarily due to good clinical response (95%) and treatment costs (77%). Most required ≥1 year of stable asthma (82%), which respondents defined as ACQ-6 <1.5, stable lung function, absence of exacerbations and no maintenance oral corticosteroids. Reported success rates exceeded 50% for 62% of respondents, with failures mainly due to exacerbations or worsening symptoms. Interval extension was more frequent among physicians treating more than 25 severe asthma patients ($p < 0.01$). Major barriers included lack of evidence (63%) and experience (52%), yet 91% expressed a wish to extend intervals more often. In RAPSODI (n=1603), 159 interval extensions were recorded in 138 patients across 14 hospitals. Median increase in interval relative to the standard interval was 50% (range 12.5-300%) with multiple sequential extensions in 14% of patients. In 2024, the annual incidence of extensions was 5.2%, and the prevalence was 11.4%.

Conclusions: A vast majority of Dutch pulmonologists already apply dosing interval extension of biologics in severe asthma, however on a limited scale. Although the frequency is increasing, clinicians are reluctant to apply extension broadly due to limited experience and evidence, highlighting the need for evidence-based guidelines.

Keywords: Severe asthma; biologics; dosing interval extension; individualized dosing; real-world practice.

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NPJ Biofilms Microbiomes

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. 2026 Apr 4.

doi: 10.1038/s41522-026-00967-z. Online ahead of print.

Bacteria of the lung microbiome and health biomarkers in chronic airway disease: a systematic review and meta-analysis

Lucia Grassi [#1], Febe Heye [#1], Kristiaan Proesmans [2], Emmanuel Abatih [3], Axelle Van Daele [1], Lies Lahousse [2,4], Aurélie Crabbé [5]

Affiliations Expand

- PMID: 41935031

- DOI: 10.1038/s41522-026-00967-z

Free article

Abstract

The lung microbiome is increasingly recognized as a key contributor to the development and progression of chronic airway diseases. While these conditions are typically associated with reduced microbial diversity and pathogen overgrowth, emerging evidence suggests that non-pathogenic bacteria may influence clinical outcomes. However, inconsistent findings across studies have made it difficult to determine their exact role in disease pathophysiology. To identify potentially beneficial members of the lung microbiome, we conducted a systematic review and meta-analysis of clinical studies investigating the association between non-pathogenic bacterial genera or species and clinico-pathological features in individuals with asthma, bronchiectasis, chronic obstructive pulmonary disease and cystic fibrosis. For the meta-analysis, data from different diseases were combined. Our analysis revealed that several bacteria in the lung microbiome were significantly associated with improved lung function and/or reduced airway inflammation across diseases. Although causal relationships cannot be established due to the absence of interventional studies, our findings highlight promising candidates for functional characterization and therapeutic exploration. Considerable heterogeneity in study design and reporting underscores the need for standardized methods and validation in relevant experimental models to advance our understanding of the lung microbiome in chronic airway diseases and inform the development of effective microbiome-based interventions.

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Conflict of interest statement

Competing interests: AC declares a pending patent application related to this work titled “Bacterial compositions with anti-inflammatory activity,” published as US 2023/0293599 A1 and EP 4188399 A2; both applications claim priority from PCT/EP2021/071330. The listed co-inventors are Aurélie Crabbé, Tom Coenye, and Charlotte Rigauts, and the applicant is Ghent University. The application covers aspects of the manuscript relating to anti-inflammatory bacteria and their therapeutic potential.

- 89 references

Supplementary info

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18

BMJ Open Respir Res

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. 2026 Apr 3;13(1):e003571.

doi: 10.1136/bmjresp-2025-003571.

Associations between respiratory diseases and lung cancer risk: a secondary analysis of the large-scale prospective UK biobank cohort

Qiu Zhong [1 2], Yi Feng [3 2], Xiangyuan Zheng [3 2], Ying Deng [3 2], Juan He [3 2], Jianfu Li [3 2], Xinyi Wu [4], Zixun Wang [4], Runchen Wang [3 2], Ruixiang Sun [4], Xuanzhuang Lu [3 2], Jianxing He [3 2], Bo Cheng [5], Wenhua Liang [1 2]

Affiliations Expand

- **PMID: 41932814**
- **PMCID: PMC13052546**
- **DOI: 10.1136/bmjresp-2025-003571**

Abstract

Introduction: Respiratory diseases are significant risk factors for lung cancer; however, the association between acute respiratory infections and lung cancer incidence requires further exploration.

Methods: We performed a secondary analysis of the prospective UK Biobank cohort, including participants aged 37-73 years recruited from 22 assessment centres across the UK between 2006 and 2010. Cox proportional hazards models estimated HRs for incident lung cancer according to respiratory disease status, which was defined based on linked hospital inpatient records. Mediation analysis explored potential biomarkers, and Mendelian randomisation assessed causal relationships.

Results: During a mean follow-up of 10.44 years (4 790 738 person-years), 2189 participants developed lung cancer. Among 107 007 individuals with respiratory diseases, 1322 cases occurred (incidence rate 27.6 per 10 000 person-years), compared with 867 cases among 351 876 participants without respiratory diseases (7.9 per 10 000 person-years). Overall, respiratory diseases were associated with increased lung cancer risk (HR 2.97, 95% CI 2.75 to 3.21). Acute respiratory infections, including acute nasopharyngitis (HR 3.41; 95% CI 1.83 to 6.34), influenza (HR 3.90; 95% CI 2.53 to 6.01), viral pneumonia (HR 9.86; 95% CI 6.55 to 14.85) and bacterial pneumonia (HR 6.28; 95% CI 4.40 to 8.96), showed strong associations with lung cancer incidence. In subtype analyses, squamous cell carcinoma exhibited the highest risk elevation (HR 3.65; 95% CI 3.06 to 4.36). Mediation analysis indicated that neutrophil counts partially mediated these associations (proportion mediated up to 8%).

Conclusion: Acute respiratory infections were associated with higher lung cancer incidence, providing hypothesis-generating evidence that may inform future risk stratification research.

Keywords: Bacterial Infection; Lung Cancer; Pulmonary Disease, Chronic Obstructive.

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Conflict of interest statement

Competing interests: None declared.

- **78 references**
- **4 figures**

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19

JCI Insight

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. 2026 Feb 19;11(7):e199951.

doi: 10.1172/jci.insight.199951. eCollection 2026 Apr 8.

Multi-trait polygenic scores for COPD and COPD exacerbations implicate druggable proteins

Chengyue Zhang [1], Iain R Konigsberg [2], Yixuan He [3], Jingzhou Zhang [4], Tinashe Chikowore [1 5], William B Feldman [5 6], Xiaowei Hu [7], Yi Ding [8], Bogdan Pasaniuc [9], Diana Chang [10], Qingwen Chen [1 5], Jessica A Lasky-Su [1 5], Julian Hecker [1 5], Martin D Tobin [11], Jing Chen [11], Sean Kalra [1 5], Katherine A Pratte [12], Hae Kyung Im [13], Emily S Wan [5 14], Ani Manichaikul [15], Edwin K Silverman [1 5], Russell P Bowler [16], Leslie A Lange [2], Victor E Ortega [17], Alicia R Martin [5 18], Michael H Cho [1 5], Matthew R Moll [1 14]

Affiliations Expand

- PMID: 41712304

- DOI: 10.1172/jci.insight.199951

Free article

Abstract

BACKGROUNDWe constructed multi-trait polygenic risk scores (PRSs) predicting chronic obstructive pulmonary disease (COPD) and exacerbations, validated their performance in diverse cohorts, and identified PRS-related proteins for potential therapeutic targeting.METHODSPRSmix+, a multi-trait PRS framework, is used to train a composite PRS (PRSmulti) in COPDGene non-Hispanic White participants (n = 6,647). Associations of PRSmulti with COPD status (GOLD 2-4 vs. GOLD 0 or ICD) and exacerbation frequency were tested in COPDGene African American (n = 2,466), ECLIPSE (n = 1,858), Mass General Brigham Biobank (n = 15,152), and All of Us (n = 118,566). Protein prediction models were applied to GWAS summary statistics from traits contributing to PRSmulti and were validated with proteomic data in COPDGene (n = 5,173) and UK Biobank (n = 5,012).RESULTSPRSmix+ selected 7 traits for PRSmulti. In multivariable models, PRSmulti was associated with COPD status (meta-analysis random effects [RE] OR 1.58 [95% CI: 1.28-1.94]) and exacerbation frequency (meta-analysis RE β 0.21 [95% CI: 0.11-0.31]), with higher effect sizes observed in smoking-enriched cohorts. PRSmulti outperformed traditional single-trait PRS in all tested cohorts. Using protein prediction models, we identified 73 proteins associated with the PRSs that were also validated with

measured protein levels in COPDGene and UK Biobank. Of these proteins, 25 were linked to approved or investigational drugs. Notable targets include RAGE/sRAGE, IL1RL1, and SCARF2, all implicated in COPD pathogenesis and exacerbations.CONCLUSIONSMulti-trait PRS improves prediction of COPD and exacerbation risk. Integration with proteomic data identifies druggable protein targets, offering a promising avenue for precision medicine in COPD management.TRIAL REGISTRATIONCOPDGene: ClinicalTrials.gov NCT00608764; ECLIPSE: ClinicalTrials.gov NCT00292552.

Keywords: COPD; Genetic risk factors; Genetics; Proteomics; Pulmonology.

Update of

- **Multi-Trait Polygenic Scores for COPD and COPD Exacerbations Implicate Druggable Proteins.**

Zhang C, Konigsberg IR, He Y, Zhang J, Chikowore T, Feldman WB, Hu X, Ding Y, Pasaniuc B, Chang D, Chen Q, Lasky-Su JA, Hecker J, Tobin MD, Chen J, Kalra S, Pratte KA, Im HK, Wan ES, Manichaikul A, Silverman EK, Bowler RP, Lange LA, Ortega VE, Martin AR, Cho MH, Moll MR.medRxiv [Preprint]. 2025 Aug 26:2025.08.22.25334001. doi: 10.1101/2025.08.22.25334001.Update in: JCI Insight. 2026 Feb 19;11(7):e199951. doi: 10.1172/jci.insight.199951.PMID: 40909810 Free PMC article. Preprint.

Supplementary info

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

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HIV Med

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. 2026 Apr 11.

doi: 10.1111/hiv.70234. Online ahead of print.

A multidisciplinary, AI-supported quality improvement intervention to manage polypharmacy in aging people with HIV

Jovana Milic [1], Antonia Pugliese [2], Michela Belli [1], Gian Luca Lonardi [3], Caterina Ruffilli [4], Tommaso Albano [5], Marco Visicaro [5], Martina Ricciardetto [5], Pierluigi De Cosmo [6], Chiara Mussi [7], Francesca Gandolfi [2], Cristina Mussini [1 3], Costantino Grana [8], Giovanni Guaraldi [1 3]

Affiliations Expand

- PMID: 41964348

- DOI: 10.1111/hiv.70234

Abstract

Objectives: Aging people with HIV are increasingly affected by multimorbidity and polypharmacy, which heighten the risk of drug-drug interactions (DDIs) and potentially inappropriate medications (PIMs). This study evaluated a multidisciplinary, AI-supported quality improvement intervention designed to optimize polypharmacy management in older people with HIV.

Methods: People with HIV aged ≥50 years attending the Modena HIV Metabolic Clinic (MHMC) were invited to submit photos of their medications via WhatsApp. Images were processed by AI for optical character recognition and automatically reconciled with the electronic patient chart (EPC). AI recognition accuracy was 94% when validated against manual review. Pharmacists reviewed AI-generated reports from the NavFarma® decision support system, generated alerts for PIM, defined according to Beers and the STOPP/START criteria, DDIs, anticholinergic burden (ACB), and risks of QTc prolongation and nephrotoxicity. Primary outcome was agreement between patient-reported and EPC-recorded medications. Secondary outcomes included pill burden, total prescribed drugs and actionable alerts.

Results: Of 181 participants (median age 63 years; 72% male), 111 (61.3%) showed complete agreement between EPC and patient lists, while 70 (38.7%) had discrepancies. Pharmacist evaluation identified major DDIs in 70.4% of cases, ACB in 26.5%, QTc-prolonging drugs in 81.6% and nephrotoxic agents in 95.9%. Participants with ≥10 total prescribed drugs had higher frailty, pill burden and PIM.

Conclusions: AI-assisted medication reconciliation combined with pharmacist review improved the identification of PIM and medication-related risks, supporting safer prescribing in people with HIV. This model aligns with international calls to improve prescribing safety and offers a scalable framework for integrating digital tools into multidisciplinary HIV care.

Keywords: aging; inappropriate prescription; older people with HIV; polypharmacy; quality improvement.

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- 33 references

Supplementary info

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Semin Respir Crit Care Med

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. 2026 Apr 10.

doi: 10.1055/a-2835-0340. Online ahead of print.

Bidirectional Clinical Interactions among Exacerbations and Comorbidities in COPD: A Narrative Review

Daphne E M Peerlings [1 2], Sarah Houben-Wilke [1], Sami O Simons [2 3], Anne E Ioannides [4], Jennifer K Quint [4], Frits M E Franssen [1 2 3]

Affiliations Expand

- PMID: 41962550

- DOI: 10.1055/a-2835-0340

Abstract

Acute deteriorations of respiratory symptoms in people with chronic obstructive pulmonary disease (COPD), known as exacerbations, worsen COPD severity (e.g., speed up lung function decline), and increase hospital admissions, healthcare costs, and mortality risk. The prevention, diagnosis, and treatment of exacerbations remain challenging due to the heterogeneous nature of these events. This complexity is further compounded by the high prevalence of multiple comorbidities and incompletely understood underlying mechanisms. Exacerbations of COPD and comorbidities are linked through bidirectional relationships, characterized by mutual adverse impacts, overlapping clinical manifestations, and increased susceptibility to the other condition. The identification and management of comorbidities are pivotal for effective disease management. Although current clinical frameworks, that is, models that integrate clinical features and biomarker-based identification of exacerbations to guide risk stratification and management, represent promising approaches to improve patient outcomes, multimorbidity is insufficiently incorporated. This narrative review provides an overview of the complex clinical associations of comorbidities in COPD, with a particular focus on exacerbations. It highlights differences in comorbidity prevalence among exacerbators, explores clinical interrelationships, and underscores the importance of multimorbidity-oriented management.

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Conflict of interest statement

F.M.E.F. reports a relationship with Sanofi and MAS that includes consulting or advisory services with AstraZeneca that include speaking and lecture fees and travel reimbursement, and with Chiesi, GSK, Sanofi, and Pfizer that include speaking and lecture fees. S.O.S. reports a relationship with Lung Foundation Netherlands, Roche, and Dutch Research Council (NWO) that includes funding grants, with AstraZeneca and Chiesi that includes board membership, speaking and lecture fees, and travel reimbursement, and with $P4O_2$ consortium and eVoiceNet that includes board membership.

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Epidemiol Psychiatr Sci

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. 2026 Apr 7:35:e21.

doi: 10.1017/S2045796026100626.

The interplay of multimorbidity and depressive symptoms: mediation role of functional dependence

Rui She [1], Haiyue Luo [1], Shanquan Chen [2], Fangfei Xiong [3], Karen P Y Liu [1], Marco Y C Pang [1]

Affiliations Expand

- **PMID: 41943950**
- **DOI: 10.1017/S2045796026100626**

Abstract

Objective: Mental-physical multimorbidity is an emerging prevalent global health challenge. This study aims to examine reciprocal relationships between depressive symptoms and multimorbidity, with the mediation role of functional dependence in activities of daily living.

Methods: Data were derived from the China Health and Retirement Longitudinal Study, which included 11,572 Chinese residents aged 45 years and older, surveyed

in 2011, 2013, 2015 and 2018. Depressive symptoms were assessed using the Chinese version of the Center for Epidemiologic Studies Depression Scale (CESD-10) at baseline and each follow-up survey. Multimorbidity was operationalized as the condition count and the patterns identified via exploratory factor analysis. Four-wave cross-lagged panel models (CLPM) with bootstrapping were employed to estimate the path coefficients and the mediation effect of functional dependence.

Results: Multimorbidity (cardiometabolic and respiratory-degenerative) and depressive symptoms exhibited bi-directional associations. Multimorbidity had a stronger impact on later depression (β: 0.042-0.130) than depression on multimorbidity (β: 0.005-0.064). Associations were stronger for respiratory-degenerative (β: 0.027-0.104) than cardiometabolic diseases (β: 0.005-0.065). Functional dependence partially mediated these links, with higher mediation for cardiometabolic (9-21%) than respiratory-degenerative diseases (4-6%). Additionally, some sex- and age-specific differences were identified in these dynamic associations.

Conclusions: The study revealed bi-directional links between multimorbidity and depressive symptoms among Chinese adults. Functional dependence was a significant pathway in the cycle of multimorbidity and depressive symptoms, especially for cardiometabolic diseases. These insights suggest that interventions aimed at preventing functional dependence may be beneficial in mitigating the risk of coexisting mental and physical disorders.

Keywords: bi-directional association; depressive symptoms; functional dependence; mediation; multimorbidity.

Supplementary info

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Review

Expert Opin Drug Saf

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. 2026 Apr 4:1-12.

doi: 10.1080/14740338.2026.2653753. Online ahead of print.

Safe prescribing of antihypertensive drugs in the elderly and managing the risk of adverse events

Siddhant Passey [1], Maheen Erum [2], Nandan Patel [3], Shrey Chopra [4], Hritvik Jain [3], Jagriti Jha [5], Tyler Kingma [1], Obada Kholoki [1], Ashwin Pillai [1], Sai Vikram Alampoondi Venkataramanan [6], Wilbert Aronow [7]

Affiliations Expand

- PMID: 41915803

- DOI: 10.1080/14740338.2026.2653753

Abstract

Introduction: Older patients with hypertension have unique clinical challenges based on age-related physiological changes, multimorbidity, and vulnerability to drug side effects. The 2017 American College of Cardiology/American Heart Association guidelines propose initiating antihypertensive therapy at a systolic blood pressure threshold of 130 mm Hg for non-institutionalized ambulatory adults over the age of 65. They also recommended individualized treatment for adults with advanced frailty or high risk of adverse events.

Areas covered: This article reviews evolving paradigms and strategies in blood pressure therapy in elderly individuals, based on shifting the approach from stringent treatment targets toward individualized management. Step-care management is one such strategy that involves prudent introduction of low doses of antihypertensives with regular follow-up to avoid side effects. Deprescribing is increasingly being promoted as a key intervention in reducing polypharmacy and maximizing safety in at-risk groups of patients.

Expert opinion: There is an increased need to incorporate frailty and functional assessments into routine practice and clinical trials. Despite growing evidence, there are still implementation challenges such as insufficient robust long-term data for frail populations. Pragmatic trials, adoption of digital solutions, and implementation of individualized goals must be the targets of future research.

Keywords: Hypertension; adverse drug events; de-prescription; elderly; frailty; shared decision making.

Supplementary info

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

1

Respiration

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. 2026 Apr 10:1-18.

doi: 10.1159/000550911. Online ahead of print.

Sex comparison in clinical presentation, response, and remission in severe type-2 asthma patients treated with biologics: a real-world analysis from the "Southern Italy Network on Severe Asthma Therapy"

Giulia Scioscia, Carla Maria Irene Quarato, Alida Benfante, Maria Filomena Caiaffa, Raffaele Campisi, Giovanna Elisiana Carpagnano, Isabella Carrieri, Claudia Crimi, Mariella D Apos Amato, Danilo Di Bona, Chiara Lupia, Angelantonio Maglio, Vitaliano Nicola Quaranta, Corrado Pelaia, Girolamo Pelaia, Nicola Scichilone, Giuseppe Spadaro, Alessandra Tomasello, Alessandro Vatrella, Giuseppe Valenti, Nunzio Crimi, Maria Pia Foschino Barbaro

- PMID: 41961768

- DOI: 10.1159/000550911

Abstract

Background: Sex influences asthma phenotypes and treatment outcomes. However, real-world data on sex-related differences in response to biologics are limited.

Objective: To assess sex differences in baseline characteristics and treatment response in a cohort of severe asthma patients treated with biologics.

Methods: We retrospectively analyzed 370 patients (235 females, 135 males) treated with mepolizumab, benralizumab or dupilumab. Clinical remission was defined as no OCS use plus at least two of: no exacerbations, ACT ≥20, or FEV1 >80%. Logistic regression was used to identify sex-specific predictors of remission at 24 months.

Results: Females were more prevalent. Males had higher FeNO levels; females showed higher obesity and osteoporosis; males had more smoking history and nasal polyposis. Treatment outcomes and remission rates were similar across sexes. In females, remission was associated with eosinophils >300/μL, FeNO >50 ppb, and nasal polyposis; obesity, smoking, anxiety, and reflux were negative predictors. In males, OCS-dependency and FEV1 <80% were negative predictors.

Conclusion: Biologics were equally effective across sexes, but different predictors influenced outcomes. Sex-aware strategies may support personalized asthma care.

S. Karger AG, Basel.

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2

Review

J Investig Allergol Clin Immunol

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. 2026 Apr 10:0.

doi: 10.18176/jiaci.1171. Online ahead of print.

Artificial Intelligence in Asthma: From Diagnosis to Management

Carlos Almonacid [1], Ignacio Dávila [2], Vicente Plaza [3], Javier Dominguez-Ortega [4], José L Izquierdo [5], Santiago Quirce [4]

Affiliations Expand

- PMID: 41960858

- DOI: 10.18176/jiaci.1171

Abstract

Artificial intelligence (AI) offers new opportunities to improve asthma management across the care process. This review synthesizes evidence on AI applications in diagnosis, classification, monitoring, and treatment. We conducted a narrative review based on a PubMed search (1995-2025). Eligible studies included peer-reviewed reports on AI applied to diagnosis, monitoring, prediction, and treatment of asthma. Outcomes of interest included diagnostic accuracy, risk prediction, adherence, and clinical decision support. Of 943 records screened, 32 studies met the inclusion criteria. Diagnostic tools integrating clinical data and data from objective tests performed best: deep neural networks combining spirometry and bronchial challenge tests achieved up to 98% accuracy, and automated pulmonary function test interpretation outperformed specialists in consistency and accuracy. Acoustic analyses of cough and respiratory sounds demonstrated sensitivity and specificity above 90%, supporting remote monitoring. In prediction of exacerbations, the electronic health record combining peak expiratory flow and symptom data achieved areas under the curve of up to 0.85. Unsupervised clustering approaches provided clinically meaningful asthma phenotypes. Evidence on treatment optimization remains scarce. AI has the potential to enhance diagnostic accuracy, phenotyping, and monitoring in asthma. However, most studies remain proof-of-concept, with limited external validation and little evidence of clinical impact. Future research should prioritize pragmatic trials, responder stratification, and real-world implementation to confirm clinical and cost-effectiveness.

Keywords: Artificial intelligence; Asthma; Exacerbation prediction; Machine learning; Remote monitoring.

Supplementary info

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NPJ Prim Care Respir Med

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. 2026 Apr 9.

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Projecting the 20-year healthcare resource burden of asthma and COPD multimorbidity: insights from Singapore for integrated chronic respiratory care in South-East Asia

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Affiliations Expand

- **PMID: 41957045**

- **DOI: 10.1038/s41533-026-00502-9**

Free article

Abstract

Background: Asthma and chronic obstructive pulmonary disease (COPD) incur significant comorbidity and healthcare burden. However, their future economic burden remain unclear.

Objective: To project 20-year (2024-2043) asthma and COPD multimorbidity costs in Singapore, illustrating broader Southeast Asian trends.

Methods: Patients with asthma (all ages) or COPD (≥40 years) were identified from Singapore's health administrative data (2002-2019). Age- and sex-specific, disease-specific per-episode costs and annual healthcare utilisation rates (hospitalisation, emergency department, and outpatient) were estimated using generalised linear models and projected using change-point analysis. Population-level costs were projected using a probabilistic simulation model incorporating population forecasts. Costs were reported in 2023 Singaporean dollars (SGD$1 = US$0.76 = £0.60 = €0.69).

Results: Asthma cases are projected to triple from 64,338 in 2019 to 192,409 by 2043 (95% confidence interval [CI]: 165,493-225,141), incurring $7.8 billion (95% CI: 4.4-17.1) from 2024-2043. Apart from asthma (16.4%), costs are driven by metabolic (20.0%), circulatory (14.3%), and other respiratory (9.2%) diseases, with children bearing the highest burden (girls: 39.9%; boys: 22.6%). COPD cases would grow from 8,988 in 2019 to 11,038 (95% CI: 8395-13,326) in 2043, incurring $2.4 billion (95% CI: 1.6-4.5) from 2024-2043. Apart from COPD (20.3%), metabolic (17.4%), circulatory (17.0%), and other respiratory diseases (9.8%) are the largest cost components, with elderly and adult males bearing the highest burdens (47.8% and 40.1%). In both cohorts, 20-year projected costs are dominated by outpatient (55%) and hospitalisation costs (30-40%).

Conclusion: The 20-year multimorbidity costs of asthma and COPD are significant, especially in cardiometabolic comorbidities, underscoring the need for holistic, value-based care.

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Conflict of interest statement

Competing interests: The authors declare no competing interests. Declarations: This study made use of data generated by the Ministry of Health and/or anonymised data retrieved from government administrative and health records. This study was supported by the Trusted Research and Real-World-Data Utilisation and Sharing Tech platform ("TRUST Platform") jointly developed by the Ministry of Health and Smart Nation and Digital Government Office and Synapxe. The views expressed are those of the author(s) are not necessarily those of the Government, TRUST Platform developed by the Ministry of Health and Smart Nation and Digital Government Office and Synapxe, investigators or institutional partners. We thank all participants and research staff who made the study possible.

- **70 references**

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Clin Exp Allergy

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. 2026 Apr 9.

doi: 10.1111/cea.70302. Online ahead of print.

Association Between Asthma and Chronic Bone Diseases: A Cross-Sectional Analysis From the Longitudinal Ageing Study in India (LASI) Data

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Affiliations Expand

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J Allergy Clin Immunol

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Blood neutrophil genetics highlight the role of neutrophils in early childhood asthma and viral respiratory illnesses

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Abstract

Background: Neutrophils are key in eliminating bacterial and fungal pathogens, but are less effective against viruses. Excessive neutrophil activity may indicate dysregulated immunity preceding childhood asthma and viral respiratory illnesses.

Objective: To investigate if genetic predisposition to an excessive neutrophil activation is linked to childhood asthma and viral respiratory illnesses.

Methods: Polygenic Risk Scores (PRS)-calculated as the weighted sum of genetic variants associated with blood neutrophil counts-were derived for children in the COpenhagen Prospective Studies on Asthma in Childhood 2010 ($COPSAC_{2010}$) cohort and two registry-based cohorts hospitalized for asthma by age 6 years (iPSYCH and $COPSAC_{severe}$). Mendelian randomization (MR) was used to test whether genetically predicted neutrophil counts causally influence childhood asthma risk. In $COPSAC_{2010}$, blood cytokines were measured at 18 months upon ex vivo stimulation with viral-mimicking ligands (R848 and Poly(I:C)) and then combined into neutrophil PRS-associated immune signature scores representing genetically linked variation in innate immune responsiveness. Nasopharyngeal samples from children during acute illness were analysed for pathogenic viruses and bacteria.

Results: The neutrophil PRS was associated with an increased risk of hospitalization for asthma (Odds Ratio [OR] 1.09, 95% Confidence Interval [CI]: 1.05-1.13, p = 8.7e-6). MR suggested causality. In $COPSAC_{2010}$, neutrophil PRS was associated with an increased Type 17 immune response to viral stimulation, notably CXCL8, IL-6, and IL-18. The neutrophil PRS-associated cytokine signature scores were associated with increased risk of viral respiratory illnesses by age three and asthma by age six.

Conclusion: Genetic predisposition to elevated neutrophils may drive early-life antiviral immune dysregulation, increasing the risk of respiratory illness and childhood asthma. This supports neutrophil pathways as potential preventive or therapeutic targets.

Keywords: Asthma; Immunology; Infection; Neutrophil; Polygenic risk score.

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J Asthma Allergy

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doi: 10.2147/JAA.S578876. eCollection 2026.

Differential Metabolites Before and After Allergen Specific Immunotherapy in Children with Allergic Asthma

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Affiliations Expand

- PMID: 41953433
- PMCID: PMC13055859
- DOI: 10.2147/JAA.S578876

Abstract

Background: Asthma is the most common chronic respiratory disease in children. Although conventional treatments such as inhaled corticosteroids and long-acting β2-receptor agonists can effectively control symptoms, some children still face the problem of frequent attacks and drug side effects. As a potential etiological treatment, allergen-specific immunotherapy (AIT) aims to induce immune tolerance by gradually increasing exposure to specific allergens, thereby relieving asthma symptoms in the long term. This study aimed to investigate the differential metabolites in children with allergic asthma before and after subcutaneous allergen-specific immunotherapy (SCIT) using a non-targeted metabolomics approach, to gain deeper insight into the potential mechanisms of AIT and its systemic effects.

Methods: A total of 30 children were enrolled, including 15 healthy controls and 15 children with asthma (prior to AIT and after one year of AIT). Serum samples were analyzed using LC-MS to identify differential metabolites and their associated metabolic pathways.

Results: AIT could reverse the lung function of patients with allergic asthma. There were six pathways that had difference among the control group, pre-AIT group and post-AIT group. These six pathways were the PPAR signaling pathway (impact = 0.6000), the GABAergic synapse (impact =0.5882), the alanine, aspartate and glutamate metabolism (impact =0.4290), the central carbon metabolism in cancer (impact =0.3019), the arginine biosynthesis (impact =0.2956) and the linoleic acid

metabolism (impact =0.2368). There were 24 metabolites that had difference among these three groups. During them, there were 5 metabolites (9,12,13-TriHOME; 9,10-Epoxyoctadecenoic acid; Isocitrate; L-Arginine; Succinic acid semialdehyde) of the pre-AIT patients reversed by AIT compared to the control group. The levels of the 5 metabolites were increased of the pre-AIT compared to the control group. After one year of usage of AIT, the levels of the 5 metabolites were decreased. Comparing of the pre-AIT group and post-AIT group revealed additional pathways: the intestinal immune network for IgA production (impact = 0.5) and aldosterone-regulated sodium reabsorption (impact = 0.4). Key metabolites included all-trans-retinoic acid, cortisol, and cortisone.

Conclusion: This study demonstrates for the first time the impact of one-year AIT on the metabolic profile of children with allergic asthma receiving long-term inhaled glucocorticoid therapy. Children with asthma mainly exhibited six pathways which including 24 metabolites disturbances compared to healthy peers, 5 of which were reversed following AIT. AIT may synergistically enhance the therapeutic effects of glucocorticoids while also introducing novel regulatory mechanisms. The persistence of these metabolic changes over a one-year period supports their validity as stable therapeutic outcomes rather than transient fluctuations.

Keywords: GABAergic synapse; allergen specific immunotherapy; allergic asthma; inhaled-glucocorticoid; metabolite.

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Conflict of interest statement

The authors have no conflicts of interest to declare in this work.

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Review

Eur Respir Rev

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doi: 10.1183/16000617.0304-2025. Print 2026 Apr.

Bronchopulmonary dysplasia and extremely preterm birth: time for a broader perspective on long-term outcomes

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Affiliations Expand

- PMID: 41951244

- PMCID: PMC13058737

- DOI: 10.1183/16000617.0304-2025

Abstract

Bronchopulmonary dysplasia is a hallmark respiratory complication of prematurity and remains a major health determinant of individuals born very preterm. Its impact, however, extends far beyond the neonatal period and far beyond the lungs. Children, adolescents and adults born very preterm often follow diverse developmental trajectories that diverge from typical postnatal growth. These trajectories often display early airflow limitation, as well as features of increased cardiovascular vulnerability and altered multisystemic profiles. Although common respiratory labels such as asthma are often applied to these patients, evidence highlights distinct pathobiological mechanisms rooted in arrested alveolar and vascular growth, with a possible contribution from persistent airway inflammation and oxidative stress. Extrapulmonary involvement, including cardiovascular, neurodevelopmental, neurosensory, renal and metabolic domains, further shapes long-term outcomes and should be systematically integrated into long-term monitoring. Yet, despite improving survival and growing recognition of this multisystemic burden, current evidence remains insufficient to design a dedicated, holistic, multidisciplinary follow-up programme tailored to the diverse subgroups of preterm-born individuals. Increasing awareness among healthcare professionals of the long-term implications of prematurity is essential to ensure that these patients receive appropriate and coordinated attention. Emerging lines of research, spanning new preventive and therapeutic options, advanced imaging, mechanistic studies, and long-term cohort designs, hold promise in elucidating the biological determinants of disease. Integrating these insights into clinical pathways, together with sustained implementation of family-centred care models, will be crucial to optimise organ function trajectories, delay deterioration and ultimately improve the quality of life of the growing population of survivors of prematurity.

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Conflict of interest statement

Conflict of interest: All authors have nothing to disclose.

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- 2 figures

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Review

Eur Respir Rev

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. 2026 Apr 8;35(180):250179.

doi: 10.1183/16000617.0179-2025. Print 2026 Apr.

Prevalence of respiratory viruses in stable and acute asthma: a systematic review and meta-analysis

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Affiliations Expand

- **PMID: 41951240**

- **PMCID: PMC13058738**

- **DOI: 10.1183/16000617.0179-2025**

Abstract

Background: Respiratory viruses, frequently detected in asthma, are associated with worse outcomes. This meta-analysis systematically quantifies the prevalence

of respiratory viruses in stable and acute asthma, across children and adults, and explores factors associated with increased viral burden through meta-regression.

Methods: This prospectively registered meta-analysis (PROSPERO-CRD42023375108) included studies employing molecular techniques to assess respiratory virus prevalence in asthma. Three databases were searched in August 2024. Risk of bias and certainty of evidence were assessed. We performed random-effects meta-analysis of proportions.

Results: We included 111 eligible studies. Moderate-certainty evidence indicated a pooled prevalence of any respiratory virus of 33.9% (95% confidence interval 24.8-43.7%) in children and 23.0% (12.9-35.0%) in adults with stable asthma. In acute asthma, prevalence increased to 58.8% (52.5-65.0%) in children and 49.9% (41.2-58.5%) in adults (moderate certainty). Rhinovirus was the most frequently identified virus, especially in acute asthma (45.0% in children *versus* 21.2% in adults). Respiratory syncytial virus and bocavirus were more common in younger children, while coronavirus and influenza were more frequently detected in adults; respiratory syncytial virus peaked in older adults too. A higher prevalence of influenza virus B and adenovirus in children, and of influenza virus A and parainfluenza 2 in adults with severe *versus* non-severe acute asthma suggests a potential association with more severe acute attacks.

Conclusion: Respiratory viruses are common in both stable and acute asthma. This suggests that the diagnostic value of a positive viral test during acute episodes may be limited and could benefit from complementary biomarkers to improve interpretation.

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Conflict of interest statement

Conflict of interest: S. Ananth, G.S. Alimani, C. Boccabella, E. Khaleva, J. Hansel and R. Wang have nothing to disclose. G. Roberts reports honoraria from ALK-Abello, AstraZeneca, ThermoFisher and Viatris, not related to this work and paid to his institution. C. Kosmidis has nothing to disclose. A. Bossios reports a grant from AstraZeneca; honoraria from Chiesi, GlaxoSmithKline and AstraZeneca; and participation on a Data Safety Advisory Board for AstraZeneca; all paid to his institution and not related to this work. J. Vestbo reports honoraria from AstraZeneca, GlaxoSmithKline, Chiesi and ALK-Abello, not related to this work. E. Papageorgiou has nothing to disclose. N.G. Papadopoulos reports grants from Numil Hellas SA, Vianex and Vibrant America; consulting fees from Abbott Nutrition, HAL Allergy Holding BV, Regeneron Pharmaceuticals Inc and Berlin-Chemie AG; and honoraria from Nestle Nutrition Institute, Numil Hellas SA, GlaxoSmithKline, Menarini International Operations Luxembourg SA, OM Pharma SA and DBV Technologies SA; all paid to his institution and not related to this work. A. Beloukas reports grants or sponsorships from Gilead and GSK/ViiV paid to the University of West Attica; payment or honoraria for lectures, presentations, speakers' bureaus, manuscript writing or educational events from Gilead and GSK/ViiV paid to the University of West Attica; support for attending meetings and/or travel from Gilead and GSK/ViiV; and receipt of equipment, materials, drugs, medical writing, gifts or other services from Cepheid for FOC reagents provided for a research project; all outside the submitted work. A.G. Mathioudakis reports honoraria from

GlaxoSmithKline, consulting fees from Sanofi, stock options from Healthy Networks and non-financial support by Verona Pharma, not related to this work.

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Respir Med

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Safety and tolerability of the low global warming potential propellant HFA-152a in patients with asthma receiving beclometasone dipropionate/formoterol fumarate/glycopyrronium: The TRECOS study

Dave Singh [1], Lorenzo Mancini [2], Giada Melis [2], Mauro Cortellini [2], Chiara Rostello [2], Kusum S Mathews [2]

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- PMID: 41951188

- DOI: 10.1016/j.rmed.2026.108814

Abstract

Background: Propellants currently used in pressurised metered-dose inhalers (e.g., HFA-134a) are being replaced by low global warming potential alternatives, including HFA-152a. This study aimed to assess the bronchoconstriction potential and the safety and tolerability of triple combination beclometasone dipropionate/formoterol fumarate/glycopyrronium (BDP/FF/G) HFA-152a pMDI compared to BDP/FF/G HFA-134a pMDI.

Methods: Adults with moderate-to-severe controlled asthma received BDP/FF/G HFA-134a pMDI for a two-week run-in, then were randomised 1:2 to either continue the HFA-134a pMDI formulation or switch to the HFA-152a pMDI formulation, both for 12 weeks. The primary objective was to compare the bronchoconstriction potential of BDP/FF/G HFA-152a vs HFA-134a in terms of the relative change from pre-dose in forced expiratory volume in 1 sec (FEV_1) at 10 min post-dose on Day 1. Safety and tolerability assessments included adverse event occurrence.

Results: Of 553 patients randomised to treatment, 539 (97.5%) completed the study (356/368 [96.7%] and 183/185 [98.9%] with the HFA-152a and HFA-134a formulations, respectively). There was no difference between the two groups for the primary endpoint, with an adjusted mean (95% confidence interval) HFA-152a vs HFA-134a difference of -1.143% (-2.769%, 0.483%). A total of 19.3% patients experienced adverse events with the HFA-152a formulation (71/368) compared to 27.6% with the HFA-134a formulation (51/185); most events with both formulations were mild or moderate in severity.

Conclusions: Overall, transitioning to the low global warming potential HFA-152a formulation had no impact on the safety and tolerability of BDP/FF/G, with the positive effect on lung function comparable to the original HFA-134a formulation.

Keywords: Formulation; asthma; bronchoconstriction; climate change; propellant; triple therapy.

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Conflict of interest statement

Declaration of Competing Interest In addition to the medical writing support disclosed above, the authors have the following conflicts of interest. Dave Singh 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, all outside the scope of the current manuscript. Lorenzo Mancini was engaged as a consultant by Chiesi. Giada Melis, Mauro Cortellini, Chiara Rostello and Kusum S Mathews are employees of Chiesi, the sponsor of the study.

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. 2026 Apr 6.

doi: 10.1111/all.70325. Online ahead of print.

Iron Physiology and Its Impact on Atopic Diseases: An EAACI Taskforce Report

Franziska Roth-Walter [1], Ioana Agache [2], Beatriz Cabanillas [3], Roberto Berni Canani [4 5 6], Pasquale Comberiati [7], Holger Garn [8], Cristina Gomez-Casado [9], Karin Hufnagl [10], Ekaterina Khaleva [11 12], Gregorio P Milani [13 14], Daniel Munblit [15 16], Nikolaos Douladiris [17], Liam O'Mahony [18 19 20], Frank Redegeld [21], Carmen Riggioni [22 23], Peter K Smith [24], Betty van Esch [21], Emilia Vassilopoulou [13 14 25 26], Carina Venter [27], Diego G Peroni [7]

Affiliations Expand

- PMID: 41943501

- DOI: 10.1111/all.70325

Abstract

Iron is essential for oxygen transport, energy metabolism, and immune regulation. Yet iron deficiency is the most common micronutrient disorder across all age groups, affecting nearly one quarter of the global population. Iron deficiency triggers nutritional immunity, a host defense mechanism that withholds and redistributes iron, contributing to increased morbidity and mortality. This review outlines normal iron physiology, distribution and absorption pathways and on the consequences of deficiency across body compartments, with particular attention to type 2-driven diseases. Beyond anemia, insufficient iron availability disrupts immune homeostasis by promoting type 2 inflammation, elevating IgE, and activating mast cells and eosinophils. Regulatory macrophages, the central hub of iron cycling, adopt an inflammatory, iron-sequestering state that reinforces malabsorption and redistribution. Epidemiology studies show higher iron-deficiency risk in allergic individuals; low maternal iron or early-life iron predisposes to eczema, wheeze, and asthma, while food-allergen elimination (notably cow's milk) further worsens anemia risk. Clinical evidence indicates that restoring iron status through diet, supplementation, or fortification lowers IgE levels, improves lung function, and alleviates symptoms of rhinitis, urticaria, and asthma. Iron may therefore represent a modifiable determinant of allergic disease development and severity. Integrating iron assessment and nutritional care into allergy management may reduce disease burden and slow the progression of allergic march.

Keywords: HIF1 alpha; HIF2 alpha; allergy; anemia of chronic inflammation; atopic diseases; atopy; hepcidin; inflammation; iron-deficiency; type 2.

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Review

Clin Exp Allergy

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doi: 10.1111/cea.70299. Online ahead of print.

Does ABPA Contribute to Bronchiectasis? A Structured Evaluation of Competing Hypotheses

Ritesh Agarwal [1], Inderpaul Singh Sehgal [1], Valliappan Muthu [1], Philip Bardin [2]

Affiliations Expand

- PMID: 41943086

- DOI: 10.1111/cea.70299

Abstract

Whether allergic bronchopulmonary aspergillosis (ABPA) causes bronchiectasis or merely represents Aspergillus fumigatus colonisation of damaged airways remains debated. Establishing causality is challenging because airway damage is predominantly driven by host immune responses rather than by direct fungal invasion. We systematically evaluate four competing hypotheses: (i) ABPA causes bronchiectasis, (ii) reverse causation, with bronchiectasis predisposing to ABPA, (iii) a shared underlying factor independently producing both conditions and (iv) a spurious association. We evaluate radiological, pathological, immunological, temporal and therapeutic evidence in relation to these hypotheses. The characteristic radiological phenotype (central bronchiectasis and high-attenuation mucus), eosinophil-dominant histopathology and disease-specific immunological profile (typically absent in other forms of bronchiectasis despite Aspergillus

colonisation) distinguish ABPA from incidental colonisation. Randomised controlled trials demonstrating that antifungal treatment or anti-inflammatory therapy (glucocorticoids and biological agents) improve clinical and immunological outcomes argue against a purely spurious association. Temporal observations indicate that ABPA precedes bronchiectasis in many cases. While uncertainty remains and host susceptibility is likely essential, the available evidence suggests that ABPA contributes to bronchiectasis through antigen-driven immune injury, supporting the use of appropriate antifungal and immunomodulatory therapy in selected patients.

Keywords: Bradford Hill criteria; IgE; IgG; allergic bronchopulmonary mycosis; allergy; asthma; causality; computed tomography.

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Am J Rhinol Allergy

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Clinical Characteristics of Patients with Non-Type 2 Chronic Rhinosinusitis with Nasal Polyps

Pei-Wen Wu [1 2 3], Cheng-Hsun Chiu [2 3], Cheng-Chi Lee [2 4], Po-Hung Chang [1], Chi-Che Huang [1 2], Ta-Jen Lee [1 2 5], Yu-Hsi Fan [1], Chien-Chia Huang [1 2 3]

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- PMID: 41940864

- DOI: 10.1177/19458924261436871

Abstract

BackgroundEndotype identification based on clinical characteristics is crucial for the selection and prediction of the efficacy of various therapeutic modalities in patients with chronic rhinosinusitis with nasal polyps (CRSwNP).ObjectiveThis study aimed to evaluate the clinical characteristics of patients with non-type 2 (non-T2) CRSwNP.MethodsClinical and laboratory data, as well as nasal tissues, were collected from adult patients who underwent endoscopic sinus surgery (ESS) for primary diffuse CRSwNP. Non-T2 CRSwNP was defined as a tissue eosinophil count <10/high power field. The levels of interleukin (IL)-5 and IL-13 in nasal polyps were measured using real-time polymerase chain reaction.ResultsA total of 199 patients with bilateral CRSwNP were recruited. Sixty-five (32.7%) exhibited non-T2 CRSwNP. Regression analysis revealed that male sex, absence of asthma, low ethmoid/maxillary (E/M) ratio, high blood neutrophil, low lymphocyte, and low eosinophil percentages were significantly associated with non-T2 inflammation in patients with CRSwNP. Age and nasal polyp score were significant predictors of postoperative residual sinus inflammation-defined as a modified Lund-Kennedy endoscopy score of ≥5 at 3 months after surgery-in patients with non-T2 CRSwNP.ConclusionMale sex, absence of asthma, E/M ratio, and the percentages of neutrophils, lymphocytes, and eosinophils were significantly associated with non-T2 CRSwNP. Age and polyp score were predictors of postoperative residual sinus inflammation in patients with non-T2 CRSwNP. These findings may help clinicians better evaluate patients with non-T2 CRSwNP and provide optimal therapeutic strategies.

Keywords: chronic rhinosinusitis; endoscopic sinus surgery; modified Lund-Kennedy endoscopy score; nasal polyp; neutrophil; non-type 2.

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Am J Rhinol Allergy

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High Response Rates and Predictors in Patients with CRSwNP Treated With Mepolizumab and Dupilumab: Results From a Prospective, Multicenter Cohort Study

Mireia Golet [1 2], Paula Cruz Toro [2 3], Albert Llansana Ríos [4], Carlota González Lluch [3], Laura Pardo-Muñoz [3], Ignacio Clemente [3], Aina Brunet [1 2 5], Xavier Gonzalez-Compta [1 2 5]

Affiliations Expand

- PMID: 41940839

- DOI: 10.1177/19458924261431418

Abstract

BackgroundDupilumab and mepolizumab are effective add-on therapies for severe chronic rhinosinusitis with nasal polyps (CRSwNP). However, predictors of response and guidance on biologic selection remain limited. The aims were to identify baseline parameters associated with favorable response to dupilumab or mepolizumab at 6 and 12 months in severe CRSwNP and compare outcomes among treatments.MethodsWe conducted a multicenter, prospective, non-randomized, real-world cohort study across three tertiary hospitals in Spain. Patients with severe CRSwNP initiating dupilumab or mepolizumab were enrolled and followed at 6 and 12 months. Response was defined using EPOS/EUFOREA 2023 criteria, incorporating nasal polyp score (NPS), sinonasal outcome test (SNOT-22), total symptom score (TSS), olfaction (Sniffin' Sticks Smell Test), systemic corticosteroid need, and asthma control test. Patients were classified as excellent, good, poor, or non-responders based on criteria fulfilled.ResultsSixty-nine patients were included: 35 received dupilumab and 34 mepolizumab. Asthma was present in 86.8%, and 42.6% had aspirin-exacerbated respiratory disease. Both biologics improved SNOT-22, TSS and NPS at 6 and 12 months ($P < .05$), with comparable efficacy for most outcomes. Dupilumab showed superior improvement in olfaction (coefficient *B* [95% CI] mepolizumab vs dupilumab: -6.30 [-9.42; -3.19]). Overall, 84.2% of patients achieved a good/excellent response at 6 months and 89.6% at 12 months. Factors associated with better response included comorbid asthma and shorter time since last surgery.ConclusionsDupilumab and mepolizumab improved clinical outcomes in severe CRSwNP, with dupilumab offering greater benefit in olfaction. Asthma and surgical history may help predict response.

Keywords: CRSwNP; SNOT-22; Sniffin’ sticks; asthma; biologics; nasal polyps; olfaction; real-world; responders; rhinosinusitis.

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Ann Allergy Asthma Immunol

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Five-year inhaled, systemic and total corticosteroid exposure reduction during anti-Interleukin-5/Rα treatment for severe asthma

Kjell Erik Julius Håkansson [1], Susanne Hansen [2], Marianne Baastrup Soendergaard [2], Asger Sverrild [2], Anna von Bülow [3], Ole Hilberg [4], Alexander Silberbrandt [5], Sofie Lock-Johansson [6], Lycely Dongo [7], Roxana Vijdea [8], Linda Makowska Rasmussen [3], Johannes Martin Schmid [9], Charlotte Suppli Ulrik [10], Anne Sofie Bjerrum [9], Celeste Porsbjerg [2]

Affiliations Expand

- PMID: 41936962

- DOI: 10.1016/j.anai.2026.03.026

Free article

Abstract

Background: Anti-Interleukin 5/Rα (IL5/Rα) for severe asthma has demonstrated marked reductions in systemic corticosteroid use. However, little is known about the long-term total (inhaled and systemic) corticosteroid exposure.

Objective: Estimate total corticosteroid exposure reduction and prevalence of corticosteroid remission over five years of anti-IL5/Rα therapy for severe asthma.

Methods: All Danish adults initiating anti-IL5/Rα for severe asthma during 2016-2019 were followed for five years. Corticosteroid exposure was assessed annually using national registries, and changes were estimated using mixed models. Corticosteroid remission was defined as no systemic corticosteroid exposure and low-to-moderate daily inhaled corticosteroid doses.

Results: In total, 253 patients were included (median age 57, 51% female). At baseline, 33% were using daily maintenance oral corticosteroids. The year prior to biologic therapy, median total corticosteroid exposure was 3,604mg (3,404, 3,803) prednisolone equivalents. Year one, total corticosteroid exposure was reduced by 25.2% (13.4, 36.9) increasing to a reduction of ∼45% years three through five. Systemic corticosteroids accounted for the majority of reductions, with decreases of 32.8% (21.1-44.6) during the first year and ∼60% during later years. For inhaled corticosteroids, statistically significant reductions were observed during year four at -149.7mcg (-13.7, -285.7) budesonide-equivalents and -189.1mcg (-23.2, -355.1) during year five. During later treatment years, inhaled corticosteroids represented the main source of corticosteroid exposure. An annual average of 23% achieved corticosteroid remission, while only 2.4% achieved five-year sustained corticosteroid remission.

Conclusion: Over five years, anti-IL5/Rα treatment significantly reduced total corticosteroid exposure. Reductions were driven by marked reductions in systemic corticosteroid exposure, whereas modest reductions in inhaled corticosteroid exposure were observed.

Keywords: anti; escalation, downtitration, maintenance, background therapy; interleukin 5, weaning, de.

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Ann Allergy Asthma Immunol

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doi: 10.1016/j.anai.2026.03.024. Online ahead of print.

Mepolizumab Demonstrates Quantifiable Reduction in Corticosteroid-Related Adverse Effects in Severe Asthma

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Affiliations Expand

- **PMID: 41936961**

- **DOI: 10.1016/j.anai.2026.03.024**

Abstract

Background: Treatment which reduces systemic corticosteroid (SCS)-related adverse effects but maintains disease control is of broad public health importance.

Objective: To evaluate the effect of mepolizumab versus chronic-SCS use on SCS-related adverse effects in patients with severe asthma.

Methods: This retrospective, longitudinal cohort study (GSK ID: US 218950) used claims data from the Optum Clinformatics Data Mart database from November 2014 - December 2022. Eligible patients (aged ≥12 years with ≥2 asthma diagnostic claims),

had ≥2 mepolizumab claims (mepolizumab-treated cohort) or ≥6 months continuous SCS use (chronic-SCS-treated cohort). Inverse probability of treatment weighting was used to balance cohort characteristics.

Primary outcome: SCS-related adverse effects.

Secondary outcomes: exacerbation frequency, SCS/oral corticosteroid (OCS) use, healthcare resource utilization (HCRU), and costs (excluding cost of therapy).

Results: Overall, 1,219 (mepolizumab-treated) and 835 (chronic-SCS-treated) patients with severe asthma were included (median follow-up 12 months). Cohorts were well-balanced after weighting (mean age 63-65 years, 66% female). The mepolizumab-treated cohort had significant reductions in overall, acute, and chronic-SCS-related adverse effects (rate ratio [RR] [95% confidence interval] 0.80 [0.70-0.92], 0.63 [0.47-0.84], 0.80 [0.70-0.92], respectively) versus the chronic-SCS-treated cohort; SCS dose reduction of 4.7 mg/day corresponds to a 20% reduction in SCS-related adverse effects (p=0.002). Similar trends were observed in exacerbation rates, HCRU, and medical costs, although not all reached statistical significance.

Conclusion: Mepolizumab treatment reduced acute and chronic corticosteroid effects in patients with severe asthma versus chronic-SCS use, suggesting avoidance of corticosteroid use can lead to measurable regression of SCS-associated adverse effects and more favorable disease trajectory.

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J Allergy Clin Immunol Pract

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doi: 10.1016/j.jaip.2026.03.029. Online ahead of print.

Attitudes and practices regarding dosing interval extension of biologics in severe asthma: a nationwide survey and real-world data from the Dutch RAPSODI registry

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Hilvering [13], Els J M Weersink [14], Simone van der Sar-van der Brugge [15], Karin B Fieten [16], Annelies Beukert [17], Jeroen M A M Retera [18], Karen T M Oud [19], Renske van der Meer [20], Kornelis W Patberg [21], Thomas Macken [22], Veerle L de Visser [23], Lennart H Conemans [24], Edwin van Velzen [25], Ilonka H van Veen [26], Astrid van Huisstede [27], Elisabeth A P M Romme [28], Marijke Amelink [29], Charlotte A van Ruitenbeek [30], Anneke Ten Brinke [31], Jasper H Kappen [32]

Affiliations Expand

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Free article

Abstract

Background: Biologics in severe asthma are an effective but costly treatment. A personalised dosing strategy could reduce treatment burden and improve cost-effectiveness.

Objective: To explore physician attitudes and real-world practices regarding dosing interval extensions for biologics in severe asthma.

Methods: We assessed attitudes to dosing interval extension among Dutch pulmonologists prescribing biologics through a 28-item nationwide e-survey and investigated clinical practices using data from the Dutch severe asthma registry RAPSODI.

Results: Of 50 pulmonologists, 39 (78%) reported extending dosing intervals, primarily due to good clinical response (95%) and treatment costs (77%). Most required ≥1 year of stable asthma (82%), which respondents defined as ACQ-6 <1.5, stable lung function, absence of exacerbations and no maintenance oral corticosteroids. Reported success rates exceeded 50% for 62% of respondents, with failures mainly due to exacerbations or worsening symptoms. Interval extension was more frequent among physicians treating more than 25 severe asthma patients ($p < 0.01$). Major barriers included lack of evidence (63%) and experience (52%), yet 91% expressed a wish to extend intervals more often. In RAPSODI (n=1603), 159 interval extensions were recorded in 138 patients across 14 hospitals. Median increase in interval relative to the standard interval was 50% (range 12.5-300%) with multiple sequential extensions in 14% of patients. In 2024, the annual incidence of extensions was 5.2%, and the prevalence was 11.4%.

Conclusions: A vast majority of Dutch pulmonologists already apply dosing interval extension of biologics in severe asthma, however on a limited scale. Although the frequency is increasing, clinicians are reluctant to apply extension broadly due to limited experience and evidence, highlighting the need for evidence-based guidelines.

Keywords: Severe asthma; biologics; dosing interval extension; individualized dosing; real-world practice.

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Lancet

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doi: 10.1016/S0140-6736(26)00371-5.

Clinical phenotyping improves choices of biologics in asthma - Authors' reply

Elliot Israel [1], David J Jackson [2], Michael E Wechsler [3], Wendy C Moore [4]

Affiliations Expand

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- DOI: 10.1016/S0140-6736(26)00371-5

No abstract available

Conflict of interest statement

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Lancet

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Clinical phenotyping improves choices of biologics in asthma

Katrin Milger [1], Johann Christian Virchow [2], Marek Lommatzsch [2]

Affiliations Expand

- PMID: 41936362

- DOI: 10.1016/S0140-6736(26)00140-6

No abstract available

Conflict of interest statement

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Allergy

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. 2026 Apr 4.

doi: 10.1111/all.70333. Online ahead of print.

Patterns and Clinical Efficacy of Biologics Switching in Patients With Severe Asthma: A Systematic Review and Meta-Analysis

Yang Zheng [1], Ya-Chun Li [1], Sheng-Jie Li [1], Meng Xu [2], Jia-Qian Hu [1], Wen-Qu Tian [1], Shi-Wei Chen [1], Xue-Hui Li [1], Ying He [1], Gan Lu [1], Mübeccel Akdis [3], Ioana Agache [4], Cezmi Akdis [3], Ya-Dong Gao [1]

Affiliations Expand

- PMID: 41934326

- DOI: 10.1111/all.70333

Abstract

Background: This systematic review (SR) aims to delineate the patterns and rationales for biologic switching in patients with severe asthma and evaluate its efficacy across the clinical remission criteria.

Methods: The SR followed the PRISMA guidelines (PROSPERO CRD420251155819), with searches up to September 2025. Studies reporting on switching of biologics, including anti-IgE, anti-IL-4R/13R, anti-IL5/5R, and anti-TSLP, were included. Standardized mean difference (SMD) or mean difference (MD), and pooled relative risk (RR) were calculated for pre- and post- switch comparisons.

Results: The SR included 49 studies (2292 switched severe asthma patients). The most common switching patterns were mepolizumab-benralizumab (n = 637) and omalizumab-mepolizumab/benralizumab (n = 386 or 305, respectively). Additional switching patterns included transitions from other biologicals to dupilumab or tezepelumab. Suboptimal asthma control (n = 1005, 77.0%) was the predominant reason for switching. The switch led to a significant reduction in exacerbations (SMD -1.03, 95% CI: -1.26 to -0.80, I^2 = 89%), emergency department visits, hospitalizations, and maintenance oral corticosteroid dose and to improved asthma control ACT MD 5.18 (95% CI 4.32 to 6.04, I^2 = 80%), ACQ MD -1.05 (95% CI -1.26 to -0.83, I^2 = 45%) and lung function FEV1 MD 0.18 L (95% CI: 0.11 to 0.25, I^2 = 0%). T2-biomarkers (blood eosinophils, total serum IgE, FeNO) significantly decreased.

Conclusion: Biologics switching represents a promising strategy supported by high-quality evidence of its clinical efficacy. Switching should consider clinical remission goals, co-morbidities, side effects, costs and reimbursement policies, and patient preferences.

Keywords: biologics switch; clinical remission; efficacy; severe asthma; systematic review and meta-analysis.

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Allergy

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. 2026 Apr 3.

doi: 10.1111/all.70318. Online ahead of print.

Adipokines in Obese Asthma: A Complex Relationship Influenced More by Sex, Weight, and Oral Steroid Treatment Than Disease Severity

Lars I Andersson [1 2], Maciej Kupczyk [3], Barbro Dahlén [1 2], Kenji Izuhara [4], Mina Gaga [5], Nikos M Siafakas [6], Alberto Papi [7], Bianca Beghe [8], Guy Joos [9 10], Klaus F Rabe [11], Elisabeth H Bel [12], Sebastian L Johnston [13], Pascal Chanez [14], Mark Gjomarkaj [15], Peter H Howarth [16 17], Ewa Niżankowska-Mogilnicka [18], Roelinde Middelveld [19], Sven-Erik Dahlén [1 2 20], Apostolos Bossios [2 21 22 23], Anna James [24]; BIOAIR (Longitudinal Assessment of Clinical Course and BIOmarkers in Severe Chronic AIRway Disease) and ChAMP consortia

Affiliations Expand

- **PMID: 41933278**

- **DOI: 10.1111/all.70318**

Abstract

Background: Obesity-related asthma (OBA) is a distinct asthma phenotype, with increased severity. Adipokine release from excessive adipose tissue is suggested to be a key feature of OBA pathophysiology. However, it is unclear how the clinical characteristics of severe asthma associate with adipokine mediators. We examined systemic adipokine levels and evaluated relationships with disease severity, weight, sex, and steroid treatment in asthma.

Methods: A multiplex immunoassay for nine adipokines with proposed involvement in obesity-related inflammation (adiponectin, adipsin, BAFF, chemerin, FGF-21, leptin, lipocalin-2/NGAL, osteonectin and resistin) was designed. Plasma adipokines were measured in 127 patients with mild-to-moderate asthma (MMA) or severe asthma (SA) from the European BIOAIR cohort at baseline and after a controlled 2-week oral corticosteroid (OCS) intervention.

Results: Leptin and chemerin were significantly increased in patients with SA vs. MMA. Leptin, adiponectin, adipsin, and NGAL were affected by sex, whereas leptin and adipsin were strongly affected by weight. OCS increased leptin and adiponectin, decreased adipsin and BAFF, and did not affect osteonectin, resistin, or chemerin. No adipokines showed positive associations with exhaled NO, blood or sputum eosinophils, although certain correlations with serum CRP, blood, and sputum neutrophils were observed.

Conclusions: Overall, we observe variable relationships between the nine adipokines, obesity and asthma severity. There were no relationships between adipokine levels and type-2 airway inflammation, yet associations with systemic neutrophilic inflammation were seen. Although one adipokine, chemerin, was independently associated with asthma severity, deciphering the role of adipokines in OBA is complex due to the influence of sex, BMI, and OCS.

Keywords: adipokines; asthma; biomarkers; obesity.

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- **58 references**

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Observational Study

Medicine (Baltimore)

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. 2026 Apr 3;105(14):e48237.

doi: 10.1097/MD.0000000000048237.

Could impulse oscillometry be an easy and practical test for differential diagnosis in healthy adults and patients with asthma and COPD?

Buket Caliskaner Ozturk [1], Ilgim Vardaloglu [1], Enes Furkan Aykac [1], Nihal Ensen [1], Gunay Can [2], Sermin Borekci [1], Bilun Gemicioglu [1]

Affiliations Expand

- **PMID: 41931355**

- **PMCID: PMC13052934**

- DOI: 10.1097/MD.0000000000048237

Abstract

Impulse oscillometry (IOS) is a type of oscillation technique that can detect pathological changes in small airways early. While spirometry is still normal in asthma and in patients who will have chronic obstructive pulmonary disease (COPD) in future, IOS can detect increased airway resistance with increased sensitivity in the early stages. The aim of this study is to evaluate IOS in healthy adults and patients with asthma and COPD. In this prospective and observational study; healthy adults without any airway disease and patients with asthma and COPD admitted to the pulmonology outpatient clinic were included. The IOS and spirometry tests were performed simultaneously in all 3 groups, and the test results and demographic data were recorded. Higher AX (kPa/L), Fres (1/s), lower X5 Hz (kPa/[L/s]), FEV1(L), FEV1/FVC%, MEF 25-75 (L), FEV3 (L), FEV3/FEV6%, FEV3/FVC6% values were found in COPD and asthma patients compared to healthy adults. The resistance difference between 5 and 20 Hz was unaffected in asthma patients whereas it was higher in COPD patients than in healthy adults. R5 Hz (kPa/[L/s]) was significantly higher in COPD patients than in healthy and asthma patients (P = .01). Our study results suggest that IOS shows significant variations among healthy adults, asthma patients, and those with COPD.

Keywords: COPD; asthma; oscillometry.

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Conflict of interest statement

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

- 25 references
- 2 figures

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22

Review

Expert Rev Respir Med

. 2026 Apr 7:1-12.

doi: 10.1080/17476348.2026.2656470. Online ahead of print.

Time for proper physiological assessment: the role of cardiopulmonary exercise testing in helping step-up therapy in difficult-to-treat and severe asthma

Ariel Fabian Floriani [1], Francesco Menzella [1]

Affiliations Expand

- PMID: 41931027

- DOI: 10.1080/17476348.2026.2656470

Abstract

Introduction: Persistent exertional dyspnea remains a major unmet need in patients with difficult-to-treat and severe asthma, even in the era of optimized inhaled therapy and biologics. Resting lung function and inflammatory biomarkers often fail to explain exercise intolerance, leading to empirical step-up therapy without clear physiological justification.

Areas covered: This review discusses the role of cardiopulmonary exercise testing (CPET) in the evaluation of exertional dyspnea in difficult-to-treat and severe asthma, within the treatable traits framework. The review focuses on the main CPET-derived physiological patterns, including ventilatory limitation, dynamic hyperinflation, ventilatory inefficiency, dysfunctional breathing, deconditioning, cardiovascular limitation, exercise-induced laryngeal obstruction, and normal exercise physiology. It also examines how CPET may influence step-up decisions, support trait-directed interventions, and inform pharmacoeconomic considerations. A pragmatic clinical framework for selective integration of CPET into severe asthma assessment is proposed.

Expert opinion: CPET may represent a valuable physiological adjunct in selected patients with difficult-to-treat or severe asthma and persistent exertional dyspnea insufficiently explained by resting assessments. Its integration into the assessment pathway may help contextualize symptoms, distinguish asthma-driven exercise limitation from non-inflammatory or non-asthmatic causes of dyspnea, and support more mechanism-based management. However, current evidence supports CPET primarily as a tool for physiological phenotyping and trait reclassification rather than as a prospectively validated guide to treatment escalation, biologic stewardship, or long-term outcome improvement.

Keywords: Severe asthma; cardiopulmonary exercise testing (CPET); dynamic hyperinflation (DH); dysfunctional breathing (DB); exercise-induced laryngeal obstruction (EILO); exertional dyspnea; precision medicine; treatable traits.

Supplementary info

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23

Review

J Asthma

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. 2026 Apr 9:1-5.

doi: 10.1080/02770903.2026.2654583. Online ahead of print.

The asthma-anxiety connection: friends or foes?

Antia Ferreiro-Posse [1], Elva Mendoza-Zambrano [2], Angelica Tiotiu [3 4], Francisco-Javier Gonzalez-Barcala [2 5 6 7]

Affiliations Expand

- PMID: 41924916

- DOI: 10.1080/02770903.2026.2654583

Abstract

Objective: To analyze the relationship between anxiety and asthma.

Methods: We carried an English scientific literature search using electronic search engines (PubMed). We included articles published in peer-review journals from 2020 to December 2024. In order to perform the search for the most suitable and representative articles, keywords were selected (-asthmall, and -anxietyll). The evidence level was assessed according to the criteria of the Oxford Center For Evidence-Based Medicine.

Results: Across multiple studies, the prevalence of anxiety among patients with asthma ranged from 13.7% to 54.3%, consistently higher than in the general population. Anxiety was associated with poorer asthma control (lower ACQ/ACT

scores), reduced quality of life (AQLQ) and, in some cases, impaired lung function and higher inflammatory markers (hs-CRP, NLR). Depression emerged as the strongest risk factor for anxiety (OR 26.00), while well-controlled asthma (ACT ≥ 20) and allergic asthma were associated with approximately 70% lower risk. Being female and asthma onset occurring between ages 40 and 59 were also linked to higher anxiety prevalence. Screening tools such as the mini-AQLQ, HADS, EQ-5D and PHQ-4 demonstrated potential utility in identifying anxiety in asthmatic populations. In specific subgroups, asthma-related anxiety was associated with increased symptom reporting and exacerbations, even without a deterioration in objective measurements for airway obstruction.

Conclusions: Anxiety is a common comorbidity among patients with asthma and it is associated with poorer disease control and a reduced quality of life.

Keywords: Asthma; anxiety; disease control; prevalence; quality of life.

Supplementary info

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

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. 2026 Apr 10.

doi: 10.1038/s41598-026-44756-2. Online ahead of print.

Refining the diagnosis of house dust mite-induced allergic rhinitis: optimizing SPT and sIgE cutoff values as predictors of clinically relevant allergy

Lobna A El-Korashi [1], Noha M Hammad [1 2], Tarek Gheith [1], Iman Mohamed Abdel Fattah Ouda [3], Nessma Hessin Mohamed Gandor [3], Samar A Abdelsalam [4], Ahmed Nagy Hadhoud [5], Doaa Alhussein Abo-Alella [6]

Affiliations Expand

- **PMID: 41963406**

- **DOI: 10.1038/s41598-026-44756-2**

No abstract available

Keywords: Der p and Der f; House dust mites; NPT; SIgE; SPT.

Conflict of interest statement

Declarations. Competing interests: The authors declare no competing interests. Ethics approval: This study was performed in line with the principles of the Declaration of Helsinki and it was approved by the institutional review boards of Zagazig University Hospitals (ZU-IRB#10848). Consent to Participate: An informed consent was obtained from all participants included in the study. Consent to publish: The authors affirm that human research participants provided informed consent for publication.

- **20 references**

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OTO Open

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. 2026 Apr 6;10(2):e70229.

doi: 10.1002/oto2.70229. eCollection 2026 Apr-Jun.

Age-Related Differences in Efficacy and Safety of Subcutaneous Immunotherapy in Allergic Rhinitis: A Real-World Study

Jiaxin Jia [1 2 3 4], Xuan Yuan [1 2 3 4], Liyuan Liu [5], Shaobing Xie [1 2 3 4], Lai Meng [1 2 3 4], Wei Zhong [1 2 3 4], Hua Zhang [1 2 3 4], Weihong Jiang [1 2 3 4], Can Liao [1 2 3 4], Zhihai Xie [1 2 3 4]

Affiliations Expand

- **PMID: 41948692**

- **PMCID: PMC13052108**

- **DOI: 10.1002/oto2.70229**

Abstract

Objective: To investigate age-related differences in efficacy and safety of subcutaneous immunotherapy (SCIT) among patients with allergic rhinitis (AR).

Study design: Retrospective cohort study.

Setting: Tertiary referral center.

Methods: AR patients who completed a 3-year course of dust mite SCIT with a 2-year post-SCIT follow-up were categorized into pediatric and adult groups. Baseline characteristics, SCIT efficacy, and adverse reactions were compared between groups. Multivariable logistic regression was used to identify independent predictors of SCIT efficacy and adverse reaction.

Results: 889 patients were included, comprising 544 children and 345 adults. Adults exhibited higher baseline symptom burden, higher rates of former or current smoking and alcohol consumption, longer AR duration, more frequent dose adjustments during SCIT, and greater prevalence of comorbid asthma and urticaria. In contrast, children had higher frequencies of family history of allergy, monosensitization, food allergy, and secondary immunotherapy. Multivariable logistic regression confirmed that older age, particularly adult status, was an independent risk factor for reduced SCIT efficacy at both 1 and 2 years post-SCIT discontinuation, after adjusting for clinical confounders. Adverse reactions, including both local and systemic events, occurred more frequently in children, though the majority were mild and occurred during the maintenance phase. Notably, older or adult age was independently associated with a lower risk of SCIT-related adverse reactions.

Conclusion: Pediatric patients demonstrated superior short- and long-term SCIT efficacy compared to adults, along with a higher incidence of adverse reactions. These results support age-specific strategies to maximize clinical benefits and minimize risks in SCIT for AR.

Keywords: adult; adverse reactions; allergic rhinitis; children; efficacy; subcutaneous immunotherapy.

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Conflict of interest statement

None.

- **36 references**
- **3 figures**

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3

Allergy

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. 2026 Apr 6.

doi: 10.1111/all.70325. Online ahead of print.

Iron Physiology and Its Impact on Atopic Diseases: An EAACI Taskforce Report

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Affiliations Expand

- PMID: 41943501

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Abstract

Iron is essential for oxygen transport, energy metabolism, and immune regulation. Yet iron deficiency is the most common micronutrient disorder across all age groups, affecting nearly one quarter of the global population. Iron deficiency triggers nutritional immunity, a host defense mechanism that withholds and redistributes iron, contributing to increased morbidity and mortality. This review outlines normal iron physiology, distribution and absorption pathways and on the consequences of deficiency across body compartments, with particular attention to type 2-driven diseases. Beyond anemia, insufficient iron availability disrupts immune homeostasis by promoting type 2 inflammation, elevating IgE, and activating mast cells and eosinophils. Regulatory macrophages, the central hub of iron cycling, adopt an inflammatory, iron-sequestering state that reinforces malabsorption and redistribution. Epidemiology studies show higher iron-deficiency risk in allergic individuals; low maternal iron or early-life iron predisposes to eczema, wheeze, and asthma, while food-allergen elimination (notably cow's milk) further worsens anemia risk. Clinical evidence indicates that restoring iron status through diet, supplementation, or fortification lowers IgE levels, improves lung function, and alleviates symptoms of rhinitis, urticaria, and asthma. Iron may therefore represent a modifiable determinant of allergic disease development and severity. Integrating iron assessment and nutritional care into allergy management may reduce disease burden and slow the progression of allergic march.

Keywords: HIF1 alpha; HIF2 alpha; allergy; anemia of chronic inflammation; atopic diseases; atopy; hepcidin; inflammation; iron-deficiency; type 2.

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- 573 references

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Review

Ann Allergy Asthma Immunol

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. 2026 Apr 4:S1081-1206(26)00152-3.

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When the Eyes and Nose Collide: The Shared Pathways of Rhinoconjunctivitis

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Affiliations Expand

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Abstract

Although allergic rhinoconjunctivitis (ARC) is highly prevalent and involves both nasal and ocular symptoms, the mechanisms proposed to connect these responses remain poorly integrated, limiting a comprehensive understanding of the disease. Multiple anatomical, neural, and immunological pathways have been proposed to explain the nasal-ocular interactions in ARC, yet these mechanisms remain dispersed across the literature without a recent unifying analysis. This review brings together current evidence to clarify the pathways that drive the rhinoconjunctivitis response. Specifically, anatomical connections including the nasolacrimal duct and shared venous drainage, allow for the physical movement of antigens and mediators between the sites. Furthermore, the shared trigeminal and autonomic neural pathways allow for a rapid reflex response between the eye and nose following allergen triggers. Immune mediators including histamine and

eosinophilic proteins can also diffuse both locally and systemically to promote cross-tissue inflammation. This appraisal takes a novel approach by exploring an aspect of ARC often mentioned but widely underappreciated in the literature, which is the bilateral responses following unilateral allergen challenges which reflect complex integrated neural and inflammatory responses. Moreover, these integrated mechanisms provide a rationale for cross-site therapeutic effects, including improved ocular symptoms with intranasal corticosteroid use. Although anatomical, neural, and immunological pathways have been described, the precise interactions underlying bilateral and cross-site responses are still largely underdefined, representing a major gap in the literature, particularly in terms of ocular allergy research. By clarifying these interconnected pathways researchers may inform more effective treatment strategies resulting in better patient outcomes.

Keywords: Allergic conjunctivitis; Allergic rhinitis; Allergic rhinoconjunctivitis; Conjunctival allergen challenge; Contralateral response; Cross-tissue communication; Immune crosstalk; Nasal allergen challenge; Naso-ocular reflex; Nasonasal responses; Trigeminal nerve.

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Conflict of interest statement

Declaration of competing Interest Sophie Spicer and Abigail Davis have no conflicts of interest to report. In the past 12 months, Dr. Anne K. Ellis has participated in advisory boards for ALK-Abello A/S, AstraZeneca, Bausch Health, Eli Lilly Canada, GSK, Novartis AG, Novartis Canada, Siemens, and Sanofi-Opella Healthcare. She has been a speaker for ALK Abello-A/S, AstraZeneca, Cellitron, Novartis Pharmaceuticals, Regeneron Pharmaceuticals Inc., and Sanofi-Aventis Canada. Her institutional research program has received research grants and support from ALK-Abello A/S, AstraZeneca, Bayer Consumer Health, Celldex Theraputics, Inimmune, Regeneron Pharmaceuticals Inc., Sanofi-Aventis Healthcare, and Sanofi-Opella Healthcare. She has served as an independent consultant to ALK Abello A/S, AstraZeneca, Biocryst Pharmaceuticals Inc., Orexo, and Regeneron Pharmaceuticals Inc.

Supplementary info

chronic cough

1

Review

Otolaryngol Clin North Am

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doi: 10.1016/j.otc.2026.03.003. Online ahead of print.

Neurogenic Cough

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Affiliations Expand

- PMID: 41963138

- DOI: 10.1016/j.otc.2026.03.003

Abstract

Neurogenic cough is a diagnosis of exclusion characterized by laryngeal hypersensitivity. More common etiologies of chronic cough should be systematically excluded prior to diagnosis. Although the pathophysiology of neurogenic cough is not fully understood, proposed etiologies typically involve injury to the vagus nerve. Treatment options include neuromodulating medications, behavioral cough suppression therapy, and procedures such as superior laryngeal nerve block. Newer targeted treatments, including P2X3 antagonists, may offer effective treatment alternatives moving forward.

Keywords: Cough reflex; Laryngeal hypersensitivity; Neurogenic cough; Neuromodulators; Superior laryngeal nerve block.

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Conflict of interest statement

Disclosures The authors have nothing to disclose.

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Comparative Study

Medicine (Baltimore)

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. 2026 Apr 10;105(15):e48331.

doi: 10.1097/MD.0000000000048331.

Nasal nitric oxide in post-acute COVID-19 cough: A comparison with chronic cough and the role of current allergic rhinitis

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Affiliations Expand

- PMID: 41961726

- DOI: 10.1097/MD.0000000000048331

Abstract

Post-acute COVID-19 cough (PACC) is a persistent or recurrent cough lasting >3 weeks after SARS-CoV-2 infection without other causes. This study examined nasal nitric oxide (nNO) in PACC patients to evaluate diagnostic and treatment potential. In this retrospective study, we enrolled 156 PACC patients after December 2022 and 161 chronic cough patients before December 2022. Compared to chronic cough patients, PACC patients had higher rates of current allergic rhinitis (60.9% vs 37.3%; P < .001), higher nNO levels (536 ± 192 ppb vs 483 ± 189 ppb; P = .014), and a greater proportion of elevated nNO (57.1% vs 42.9%; P = .012). Initial binary logistic regression indicated that both PACC (odds ratio [OR] = 1.771, 95% confidence interval [CI]: 1.135-2.764; P = .012) and current allergic rhinitis were associated with elevated nNO. However, multivariate logistic regression showed that only current allergic rhinitis remained an independent risk factor for elevated nNO (OR = 5.168, 95% CI: 3.121-8.558; P < .001), not PACC. Consistently, when comparing PACC patients without allergic rhinitis to chronic cough patients without it, no significant differences were found in nNO levels (436 ± 150 ppb vs 428 ± 179 ppb; P = .790) or elevated nNO rates (29.6% vs 29.3%; P = .971). The increased nNO observed in PACC patients compared to those with chronic cough is primarily driven by a higher concomitant prevalence of current allergic rhinitis in the PACC group, rather than by PACC itself.

Keywords: allergic rhinitis; chronic cough; nasal nitric oxide; post-acute COVID-19 cough.

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Conflict of interest statement

The authors have no conflicts of interest to disclose.

- 32 references

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Review

Lung

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. 2026 Apr 6;204(1):20.

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Underlying Mechanisms of Comorbidity between Chronic Cough and Depression: A Review

Beiyi Xiang [# 1], Mingtong Lin [# 2], Yang Rui [1], Chen Zhan [2], Yaowei He [3], Kefang Lai [4], Li Long [5], Zhe Chen [6]

Affiliations Expand

- PMID: 41936621

- DOI: 10.1007/s00408-026-00884-0

Abstract

There is a complex bidirectional association between chronic cough and depression, which constitutes a significant medical challenge. Epidemiological studies have shown that the incidence of depression in patients with chronic cough is as high as 33-53%, while the risk of new-onset chronic cough is significantly increased in patients with depression. Specifically, the risk of cough in individuals with severe depression is 3.32 times than those without depressive symptoms. Pathophysiological mechanisms underlying this bidirectional association include the following. From the perspective of neural pathways, the cough reflex and emotional regulation share neural pathways, including the vagus nerve, brainstem, limbic system, prefrontal cortex, and other brain regions. Both patients with chronic cough and depression exhibit abnormal functional connectivity and remodeling of the aforementioned neural pathways, as well as imbalanced levels of key

neurotransmitters such as serotonin, glutamate, and γ-aminobutyric acid. From the perspective of the immune-inflammatory dimension, chronic inflammatory mediators such as IL-6 and TNF-α form a vicious cycle between peripheral inflammation and central inflammation, further exacerbating the comorbidity process. Elucidating the pathophysiological mechanism of this bidirectional association is of great theoretical and practical significance for optimizing clinical diagnosis and treatment strategies for comorbid patients, as well as improving their prognosis.

Keywords: Chronic cough; Comorbidity; Depression; Mechanisms.

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Conflict of interest statement

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- 108 references

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

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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.

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Conflict of interest statement

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- 125 references

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Review

Clin Exp Allergy

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Does ABPA Contribute to Bronchiectasis? A Structured Evaluation of Competing Hypotheses

Ritesh Agarwal [1], Inderpaul Singh Sehgal [1], Valliappan Muthu [1], Philip Bardin [2]

Affiliations Expand

- PMID: 41943086

- DOI: 10.1111/cea.70299

Abstract

Whether allergic bronchopulmonary aspergillosis (ABPA) causes bronchiectasis or merely represents Aspergillus fumigatus colonisation of damaged airways remains debated. Establishing causality is challenging because airway damage is predominantly driven by host immune responses rather than by direct fungal invasion. We systematically evaluate four competing hypotheses: (i) ABPA causes bronchiectasis, (ii) reverse causation, with bronchiectasis predisposing to ABPA, (iii) a shared underlying factor independently producing both conditions and (iv) a spurious association. We evaluate radiological, pathological, immunological, temporal and therapeutic evidence in relation to these hypotheses. The characteristic radiological phenotype (central bronchiectasis and high-attenuation mucus), eosinophil-dominant histopathology and disease-specific immunological profile (typically absent in other forms of bronchiectasis despite Aspergillus colonisation) distinguish ABPA from incidental colonisation. Randomised controlled trials demonstrating that antifungal treatment or anti-inflammatory therapy (glucocorticoids and biological agents) improve clinical and immunological outcomes argue against a purely spurious association. Temporal observations indicate that ABPA precedes bronchiectasis in many cases. While uncertainty

remains and host susceptibility is likely essential, the available evidence suggests that ABPA contributes to bronchiectasis through antigen-driven immune injury, supporting the use of appropriate antifungal and immunomodulatory therapy in selected patients.

Keywords: Bradford Hill criteria; IgE; IgG; allergic bronchopulmonary mycosis; allergy; asthma; causality; computed tomography.

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NPJ Biofilms Microbiomes

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doi: 10.1038/s41522-026-00967-z. Online ahead of print.

Bacteria of the lung microbiome and health biomarkers in chronic airway disease: a systematic review and meta-analysis

Lucia Grassi [#1], Febe Heye [#1], Kristiaan Proesmans [2], Emmanuel Abatih [3], Axelle Van Daele [1], Lies Lahousse [2,4], Aurélie Crabbé [5]

Affiliations Expand

- PMID: 41935031

- DOI: 10.1038/s41522-026-00967-z

Free article

Abstract

The lung microbiome is increasingly recognized as a key contributor to the development and progression of chronic airway diseases. While these conditions

are typically associated with reduced microbial diversity and pathogen overgrowth, emerging evidence suggests that non-pathogenic bacteria may influence clinical outcomes. However, inconsistent findings across studies have made it difficult to determine their exact role in disease pathophysiology. To identify potentially beneficial members of the lung microbiome, we conducted a systematic review and meta-analysis of clinical studies investigating the association between non-pathogenic bacterial genera or species and clinico-pathological features in individuals with asthma, bronchiectasis, chronic obstructive pulmonary disease and cystic fibrosis. For the meta-analysis, data from different diseases were combined. Our analysis revealed that several bacteria in the lung microbiome were significantly associated with improved lung function and/or reduced airway inflammation across diseases. Although causal relationships cannot be established due to the absence of interventional studies, our findings highlight promising candidates for functional characterization and therapeutic exploration. Considerable heterogeneity in study design and reporting underscores the need for standardized methods and validation in relevant experimental models to advance our understanding of the lung microbiome in chronic airway diseases and inform the development of effective microbiome-based interventions.

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Conflict of interest statement

Competing interests: AC declares a pending patent application related to this work titled “Bacterial compositions with anti-inflammatory activity,” published as US 2023/0293599 A1 and EP 4188399 A2; both applications claim priority from PCT/EP2021/071330. The listed co-inventors are Aurélie Crabbé, Tom Coenye, and Charlotte Rigauts, and the applicant is Ghent University. The application covers aspects of the manuscript relating to anti-inflammatory bacteria and their therapeutic potential.

- 89 references

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Comparative Study

Microbiol Spectr

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. 2026 Apr 7;14(4):e0395025.

doi: 10.1128/spectrum.03950-25. Epub 2026 Feb 17.

Comparison of clinical and microbiological features between mucoid and non-mucoid *Pseudomonas aeruginosa* in non-cystic fibrosis bronchiectasis

Yanghua Xiao [1,2], Tingxiu Peng [1,2], Keyi Li [1,2], Rui Zhao [3], Zige Wang [3], Guangyi Zhang [1,2]

Affiliations Expand

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- PMCID: PMC13055210
- DOI: 10.1128/spectrum.03950-25

Abstract

Mucoid *Pseudomonas aeruginosa* is frequently isolated from patients with non-cystic fibrosis bronchiectasis (NCFB), yet the clinical and microbiological consequences of this phenotype remain unclear. In this retrospective study, we analyzed 66 patients with NCFB from whom *P. aeruginosa* was isolated between 2021 and 2024 to compare mucoid and non-mucoid isolates. Among the patients, 32 harbored mucoid and 34 non-mucoid isolates. Compared with patients with non-mucoid isolates, those with mucoid isolates had poorer lung function (FEV_1 % predicted: 52.3 ± 15.7 vs 63.8 ± 17.2; P = 0.006), more frequent exacerbations (2.4 ± 1.3 vs 1.5 ± 1.0 per year; P = 0.002), a faster annual FEV_1 decline (-2.9% ± 2.1% vs -1.6 % ± 1.8% predicted; P = 0.01), more severe radiological disease, and higher treatment burden. Antimicrobial susceptibility profiles and multidrug resistance rates were similar between the groups. However, mucoid isolates showed significantly greater adhesion to airway epithelial cells but lower cytotoxicity than non-mucoid isolates. Time-kill assays revealed a higher tolerance of mucoid isolates to ceftazidime, ciprofloxacin, and tobramycin, with comparable killing observed only for colistin. RT-qPCR analysis revealed that mucoid isolates exhibited significant upregulation of alginate biosynthesis genes, alongside downregulation of motility-associated genes and T2SS/T3SS virulence genes. These findings indicate that mucoid *P. aeruginosa* infection in NCFB is linked to more severe clinical outcomes and enhanced antibiotic tolerance. Targeted therapeutic strategies addressing the unique biology of mucoid *P. aeruginosa* may be warranted in NCFB management.IMPORTANCEMucoid *Pseudomonas aeruginosa* is frequently isolated from patients with non-cystic fibrosis bronchiectasis (NCFB) and is associated with persistent airway infection and difficult-to-treat infections, yet it has been studied far less in NCFB than in cystic fibrosis. The study provides new insights into the biological adaptations of mucoid strains, demonstrating their capacity to persist in the airway and evade standard antimicrobial therapies. Our

findings also suggest that conventional antimicrobial susceptibility testing may not fully reflect the clinical challenges posed by mucoid strains. These results highlight the need for improved diagnostic and therapeutic strategies tailored to the distinctive characteristics of mucoid *P. aeruginosa* in bronchiectasis.

Keywords: Pseudomonas aeruginosa; mucoid; resistance; tolerance; virulence.

Conflict of interest statement

The authors declare no conflict of interest.

- **44 references**
- **3 figures**

Supplementary info

Publication types, MeSH terms, Substances