Risk Assessment in Asthma

Biomarkers and clinical factors can identify high-risk patients who may warrant increased intervention

Asthma Phenotypes

Allergic[1–3]

Triggers include:
allergens, pathogens

Characterized by:
IgE, EOS, FeNO

Non-Allergic Eosinophilic[2,3,5,6]

Triggers include:
pathogens, pollutants and smoke

Characterized by:
EOS, FeNO

Non-T2[3,9,10]

Triggers include:
pathogens, pollutants and smoke

Characterized by:
low T2 biomarkers, AHR, ASM hypertrophy, metabolic dysfunction / obesity, non-responsiveness
to corticosteroids, neutrophils

Diagnostic Biomarkers for Asthma

IgE

- Nonspecific biomarker; used for the **identification of phenotypes** or atopy in asthma[1]
- Allergen-specific IgE may aid in the **identification of specific triggers** in asthma[1]
- Total serum IgE (30–700 IU/mL) is used for initiation and dose determination of anti-IgE therapy[4]

EOS

- Influenced by multiple factors, including age (≤18 years), sex, atopic status, and ICS or OCS use[1,7,8]
- Blood EOS ≥150 cells/µL suggests **T2 inflammation**[1]
- Blood EOS ≥300 cells/µL is a common threshold for biologic eligibility[1]

FeNO

- Influenced by multiple factors, including age, sex, allergen exposure, measuring device, and ICS or OCS use[1,11,12]
- FeNO levels considered to be "high":[1]
  - ICS naïve: >50 ppb
  - Medium-dose ICS: ≥25 ppb
  - High-dose ICS: ≥20 ppb
- FeNO >50 ppb may indicate **eosinophilic inflammation** and responsiveness to corticosteroids[11]

Comprehensive Assessment of Uncontrolled Asthma and Exacerbation Risk Is Essential for Improving Patient Outcomes[13]

Risk Factors for Poor Asthma Outcomes[1,13]

1. **Medication Usage:** high SABA use; inadequate ICS use (not prescribed, poor adherence, incorrect inhaler technique)
2. **Low Lung Function:** <60% predicted FEV_1; high BD responsiveness
3. **Elevated T2 Biomarkers:** EOS, FeNO
4. **Exacerbation/Hospitalization History:** intubation and/or ICU admittance, severe exacerbations

Other Factors[1]

- Exposure to Triggers
- Psychosocial Factors
- Symptoms
- Other Medical Conditions

AIRQ® is a validated **asthma control tool** that assesses both domains of asthma control and may predict future risk of exacerbations[1,14]

Domains of Asthma Control
Symptom impairment
Exacerbation risk

Higher AIRQ® score → Earlier and more frequent exacerbations

AHR, airway hyperresponsiveness; AIRQ, Asthma Impairment and Risk Questionnaire; ASM, airway smooth muscle; BD, bronchodilator; EOS, eosinophils; FeNO, fractional exhaled nitric oxide; FEV_1, forced expiratory volume in 1 second; ICS, inhaled corticosteroid(s); IgE, immunoglobulin E; IU, international unit; OCS, oral corticosteroid(s); ppb, parts per billion; SABA, short-acting β_2-agonist; T2, type 2.

1. Global Initiative for Asthma. Global strategy for asthma management and prevention. 2025. Available from: https://ginasthma.org/wp-content/uploads/2025/11/GINA-2025-Update-25_11_08-WMS.pdf (Accessed February 11, 2026); 2. Porsbjerg CM, et al. *Eur Respir J*. 2020;56:2000260; 3. Gauvreau GM, et al. *Expert Opin Ther Targets*. 2020;24:777–792; 4. XOLAIR: highlights of prescribing information. 2024. Available from: https://www.accessdata.fda.gov/drugsatfda_docs/label/2024/103976s5245lbl.pdf (Accessed February 11, 2026); 5. Busse WW. *Allergol Int*. 2019;68:158–166; 6. Tran TN, et al. *Ann Allergy Asthma Immunol*. 2016;116:37–42; 7. Hartl S, et al. *Eur Respir J*. 2020;55(5):1901874; 8. Amaral R, et al. *Clin Transl Allergy*. 2021;11:e12036; 9. Hudey SN, et al. *Curr Opin Immunol*. 2020;66:123–128; 10. Bourdin A, et al. *J Allergy Clin Immunol Pract*. 2024;12:809–823; 11. Dweik RA, et al. *Am J Respir Crit Care Med*. 2011;184:602–615; 12. Högman M, et al. *Eur Respir J*. 2024;63:2300370; 13. Meulmeester FL, et al. *Lancet Respir Med*. 2025;13:505–516; 14. Beuther DA, et al. *J Allergy Clin Immunol Pract*. 2022;10:3204–3212.e2.

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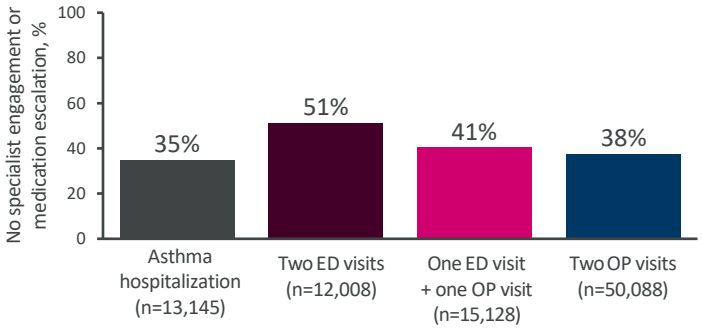
Lack of Access to Specialist Care Remains a Clear Unmet Need[1]

Asthma management guidelines from the National Heart, Lung, and Blood Institute and Global Initiative for Asthma recommend that patients with severe asthma are referred to an asthma specialist[2,3]

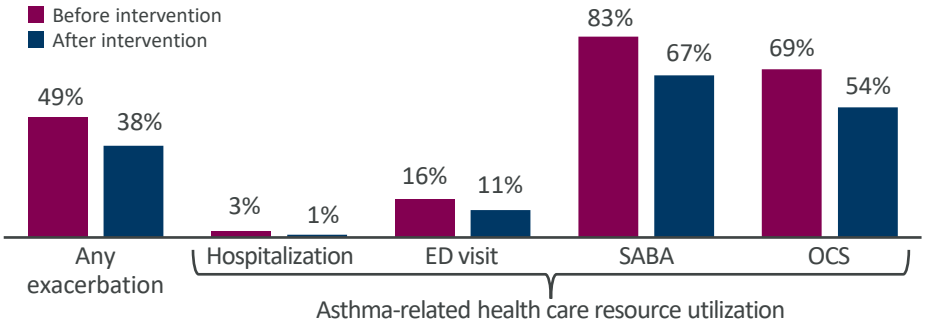
Many patients do not receive specialist review in the 12 months before or after evidence of severe asthma[1]*

Many patients do not receive specialist engagement or medication escalation following an event indicative of poor asthma control[4†]



Clinical Outcomes are Associated with Specialist Care

Asthma-related **clinical outcomes** 12 months **before and after specialist visit**[1]



Asthma **exacerbations decrease patients' HRQoL** and **increase healthcare resource utilization**[5]

Annualized rates of **exacerbations** and **ED/hospital visits** are **reduced after biologic initiation**[5]

A Call to Action: Together We Can Transform Severe Asthma Care

- **Ensure** that patients are discharged on guideline-directed medical therapies
- **Draw** labs before the administration of OCS to avoid biomarker suppression
- **Follow-up** after an exacerbation
  New HEDIS measure: Follow-Up After Acute Care Visits for Asthma (AAF-E)‡
- **Implement** evidence-based guideline recommendations, and use or create order sets for appropriate management
- **Obtain** patients' lung function at baseline and follow up as indicated

GINA Report 2025

Asthma Resource Center

MIPS

HEDIS

*Data from a retrospective cohort study analyzing administrative claims data from patients with severe asthma who were identified between 2015 and 2017 (N=54,322);[1] †Data from an administrative claims database identifying patients with severe, persistent asthma from 2015-2020 matched with a control group (N=180,736);[4] ‡Assesses the percentage of patients aged 5–64 years with an urgent care visit, acute inpatient discharge, observation stay discharge or ED visit that had a corresponding outpatient follow-up visit within 30 days.[6]

ED, emergency department; GINA, Global Initiative for Asthma; HEDIS, Healthcare Effectiveness Data and Information Set; HRQoL, health-related quality of life; MIPS, Merit-based Incentive Payment System; OP, outpatient, OCS, oral corticosteroid(s); SABA, short-acting β_2 agonist.

1. Most JF, et al. *J Allergy Clin Immunol Pract*. 2021;9:3662–3671.e2; 2. Global Initiative for Asthma. Global strategy for asthma management and prevention. 2025. Available from: https://ginasthma.org/2025-gina-strategy-report (Accessed February 11, 2026); 3. National Heart, Lung, and Blood Institute. Asthma management guidelines: focused updates. 2021. Available from: https://www.nhlbi.nih.gov/health-topics/asthma-management-guidelines-2020-updates (Accessed February 12, 2026); 4. Carr T, et al. Presented at the 2022 American College of Allergy, Asthma, and Immunology Annual Scientific Meeting; November 10-14, 2022;
5. Trevor J, et al. *Ann Allergy Asthma Immunol*. 2021;127:579–587.e1; 6. National Committee for Quality Assurance. Follow-up after acute and urgent care visits for asthma (AAF-E). Available from: https://www.ncqa.org/report-cards/health-plans/state-of-health-care-quality-report/follow-up-after-acute-and-urgent-care-visits-for-asthma-aaf-e/ (Accessed February 12, 2026).

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