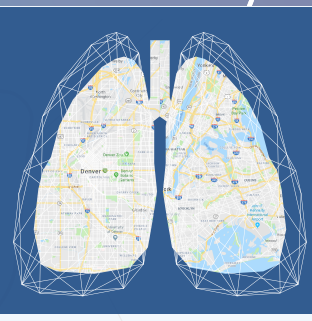
Navigating Asthma Control

– Severe Asthma Roadmap



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A DOES THE PATIENT HAVE ASTHMA?

- **Confirm** variable airflow limitation: review/repeat pulmonary function tests with bronchodilator
- **Consider** methacholine or exercise challenge tests if spirometry inconclusive and clinical response to treatment is absent or limited
- **Exclude** other conditions (eg, airway tumor, foreign body, COPD, bronchiectasis, vocal cord dysfunction, CF, aspiration)

Treat other pulmonary conditions if misdiagnosed

YES — NO

Evaluate Adhearance and Optimize Inhaler Technique

- Use shared-decision making approach to select treatment
- Choose best device for patient and individualize education
- Assess barriers to proper medication use
- Assess knowledge and attitudes about medication
- Educate patient about strategies to reduce side effects
- Check and correct inhaler techinuqe at each visit

B EVALUATE COMORBIDITIES AND COMPLICATING FACTORS

Diagnose and manage comorbidities

- Rhinosinusitis/nasal polyps
- Gastroesophageal reflux
- Obstructive sleep apnea
- Vocal cord dysfunction
- Allergic bronchopulmonary aspergillosis
- Eosinophilic granulomatosis with polyangiitis (previously known as Churg-Strauss syndrome)
- Obesity
- Psychological factors (personality, depression, anxiety)
- Drug side effects aspirin, NSAIDs, beta-blockers, ACE inhibitors
- Aspiration

Address environmental factors

- Allergen exposures (indoor, outdoor, pets)
- Occupational exposures
- Respiratory infections (eg, viruses)
- Second-hand cigarette smoke
- Traffic-related pollution
- Respiratory irritants

Asthma education and health maintenance

eating healthy
vaccination
smoking cessation
exercise

C IS ASTHMA UNCONTROLLED, DESPITE STEPPING UP TO A HIGH-DOSE ICS+LABA?

Asthma is uncoltrolled when any 1 of the 4 criteria below is present:

- ☐ **Poor aymptom coltrol**
  ACQ >1.5, ACT < 20, or per GINA/NAEPP guidelines
- ☐ **Systemic corticosteroids**
  ≥ 2 bursts for asthma exacerbations in the past year
- ☐ **Hospitalizations**
  ≥ 1 hospotalazation for asthma in the past year
- ☐ **Pulmonary function**
  FEV1 < 80% predicted when not taking short- or long-acting bronchodilators

NO — YES

Close follow-up. Reduce treatment intensity after at least 3–6 months of stable, good control, per GINA/NAEPP guidelines

Consider safety and potential effects of long-term oral corticosteroids (OCS)

1. Counsel patients about long term effects of OCS
2. Optimize chronic OCS dose (establish current dose is truly needed)
3. Use objective criteria to control taper (PEF, symptoms score, SABA use)
4. Counsel patients reguarding symptoms of adrenal insufficency and steroid withdrawal ("go slow when low")
5. Manage steroid related adverse effects

Rx caution

D CONSIDER ADDING A NON-BIOLOGIC THERAPY

- Tiotropium
- Leukotriene modifier
- Theophylline
- Macrolide antibiotic
- Oral corticosteroid (short course)

E IS ASTHMA STILL UNCONTROLLED, DESPITE TREATMENT WITH HIGH-DOSE ICS + LABA AND A NON-BIOLOGIC ADD-ON THERAPY?

YES — NO

Consider referring patient to an asthma specialist

Close follow-up. Reduce treatment intensity after at least 3–6 months of stable, good control, per GINA/NAEPP guidelines

F DETERMINE INFLAMMATORY PHENOTYPE/ ENDOTYPE FOR PERSONALIZED TREATMENT SELECTION

- Start with non-invasive testing (allergy testing, IgE level, blood eosinophil count and FENO level)
- If poor response to therapy continues, considerinduced sputum differential for eosinophil and neutrophil counts and/or bronchoscopy with endobronchial biopsy and BAL

Non-Type 2

Biomarkers

- Blood eosinophil < 150 µL
- FeNO < 20 ppb
- Sputum or BAL eosinophil < 2%

OR

- No T2 biomarkers and sputum or BAL neutrophils < 40-60% (pauciinflamatory)

Treatment

Weight loss
Bariatric surgery
Macrolide Antibiotics
Bronchial Thermoplasty
Possible anti TSLP
Secretion clearance
Pulmonary rehabilitation

Type 2

Biomarkers

- Blood eosinophil ≥ 300 µL
- FeNO ≥ 20 ppb
- Sputum or BAL eosinophil ≥ 2%

Can occpur along with neutrophilic inflimation

Patients with -

	Treatment
Allergic Eosinophilic Asthma	Anti-IgE - Omalizumab Anti-IL-5 - Mepolizumab, Reslizumab Anti-IL5Rα - Benralizumab Anti IL4/13 - Dupilumab
Allergic Noneosinophilic Aasthma	Anti-IgE - Omalizumab Anti IL4/13 - Dupilumab
Eosinophilic Asthma who: • Are nonallergic **OR** • Do not respond to anti-IgE treatment **OR** • Are out of dosing range for anti-IgE treatment	Anti-IL-5 - Mepolizumab, Reslizumab Anti-IL5Rα - Benralizumab Anti IL4/13 - Dupilumab

References

1. Global Initiative for Asthma (GINA) Global Strategy for Asthma Management and Prevention. 2016. www.ginasthma.org | **2.** US National Heart, Lung, and Blood Institute (NHLBI) National Asthma Education and Prevention Program Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. 2007. www.nhlbi.nih.gov/files/docs/guidelines/asthgdln.pdf | **3.** Chung KF, et al. International ERS/ATS guidelines on definition, evaluation and treatment of severe asthma. Eur Respir J. 2014;43(2):343-73. | **4.** Israel E, Reddel HK. Severe and difficult-to-treat asthma in adults. N Engl J Med. 2017;377(10):965-976. | **5.** Wechsler ME. Getting control of uncontrolled asthma. Am J Med. 2014;127(11):1049-59. | **6.** Bousquet J, et al. Care pathways for the selection of a biologic in severe asthma. Eur Respir J. 2017;50(6). | **7.** Chipps BE, et al. Asthma Yardstick: Practical recommendations for a sustained step-up in asthma therapy for poorly controlled asthma. Ann Allergy Asthma Immunol. 2017;118(2):133-142.

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