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Asthma & COPD Treatment Guideline Updates

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ABSTRACT

This article provides a summary of the newly updated asthma and COPD treatment guidelines. The Global Initiative for Asthma (GINA) treatment guidelines were updated in 2022. The Global Initiative for Chronic Obstructive Lung Disease (GOLD) treatment guidelines were updated in 2023. Both the GINA and GOLD treatment guidelines are published by Science Committees composed of physicians from various countries; the Science Committees meet twice yearly to review published literature and update the guideline recommendations if necessary. The purpose of this article is to highlight some of the important updates to the GINA and GOLD treatment guidelines.

OVERVIEW

Table 1: Comparison of Asthma and Chronic Obstructive Pulmonary Disease (COPD)

	Asthma	Chronic Obstructive Pulmonary Disease (COPD)
Definition	Chronic airway inflammation that causes respiratory symptoms that vary over time and in intensity, with variable airflow limitation ³	Chronic respiratory symptoms due to airway and/or alveolar abnormalities, which cause persistent, progressive airflow obstruction ¹
Clinical Presentation	<ul style="list-style-type: none"> • Wheezing • Outbreaks of dyspnea • Chest tightness and/or cough 	<ul style="list-style-type: none"> • Chronic dyspnea • Wheezing • Activity limitation • Cough with or without sputum production
Pathophysiology	IgE mediated response that causes mast cells to degranulate and release histamine, prostaglandins, and leukotrienes, which cause smooth muscle contraction and airway tightening ⁴	Oxidative stress due to environmental and genetic factors cause an inflammatory response which leads to tissue destruction and structural changes that cause airflow limitation and impaired gas exchange in the airways, lung parenchyma, and pulmonary vasculature ²
Asthma vs COPD	<ul style="list-style-type: none"> • Spirometry shows reversibility • Symptoms have triggers and vary in intensity and over time • No sputum production 	<ul style="list-style-type: none"> • Spirometry shows absence of reversibility • Sputum production

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ASTHMA TREATMENT UPDATE – GINA GUIDELINES

Asthma is a respiratory disorder characterized by chronic airway inflammation. Patients with asthma typically present with wheezing, shortness of breath, chest tightness, and cough. Asthma affects about 1-18% of people in developed countries and more commonly affects children and older adults. The Global Initiative for Asthma (GINA) Scientific Committee reviews available asthma literature twice-yearly to provide the most up to date prevention and treatment recommendations. The guidelines were recently updated in 2022. The information below summarizes relevant updates to the 2022 GINA Global Strategy for Asthma Management and Prevention guidelines.³

Diagnosis

The diagnosis of asthma can be made based on patient presentation and both confirmation of variable expiratory airflow limitation and excessive variability in lung function. Patients with asthma typically present with symptoms including wheezing, shortness of breath, chest tightness, and cough. Forced expiratory volume in 1 second (FEV1) is the preferred test to determine lung function.

Treatment Goals

The long-term goals of asthma management are achieving symptom control and minimizing risk of asthma-related death, exacerbations, persistent airflow limitation, and side effects.

Difficult-To-Treat and Severe Asthma in Adults

Patients who present with persistent symptoms and/or exacerbations despite medium or high dose ICS-LABA or daily oral corticosteroids are considered to have “difficult-to-treat asthma”. For primary care practitioners, management of difficult-to-treat asthma includes confirming asthma diagnosis, evaluating for contributory factors, and optimizing asthma management. Respiratory specialist referral is recommended for patients with severe uncontrolled asthma despite optimized treatment. Treatment options for severe uncontrolled asthma include anti-IGE, anti-IL5/IL5R, anti-IL4R, or anti-TSLP medications.

Treatment Algorithms- Adults and Adolescents (<12 years old)

Table 2: Recommended treatment for patients likely to be adherent to daily controller therapy.

For patients likely to be adherent to daily controller therapy:				
Symptoms < 4-5 days per week		Symptoms most days or awakening with asthma ≥ 1 day per week	Daily symptoms or awakening with asthma ≥ 1 day per week, and low lung function	Severely uncontrolled asthma
Step 1	Step 2	Step 3	Step 4	Step 5
Maintenance				
PRN low dose ICS-formoterol combination		Low dose maintenance ICS-formoterol combination	Medium dose maintenance ICS-formoterol combination	Add on LAMA Consider high dose maintenance ICS-formoterol combination
Reliever:				
As needed ICS-formoterol				

ICS: inhaled corticosteroid
LAMA: long-acting muscarinic antagonist

Table 3: Recommended treatment for patients unlikely to be adherent to daily controller therapy.

For patients unlikely to be adherent to daily controller therapy:				
Symptoms < 2 days per month	Symptoms ≥ 2 days per month but < 4-5 days per week	Symptoms most days or awakening with asthma ≥ 1 day per week	Daily symptoms or awakening with asthma > 1 day per week, and low lung function	Severely uncontrolled asthma
Step 1	Step 2	Step 3	Step 4	Step 5
Maintenance:				
Take ICS whenever SABA taken	Low dose maintenance ICS	Low dose maintenance ICS-LABA combination	Medium/high dose maintenance ICS-LABA combination	Add on LAMA Consider high dose maintenance ICS-formoterol combination
Reliever:				
As needed SABA				

ICS: inhaled corticosteroid
LABA: long-acting beta agonist
LAMA: long-acting muscarinic antagonist
SABA: short-acting beta agonist

COPD TREATMENT UPDATE – GOLD GUIDELINE

Chronic Obstructive Pulmonary Disease (COPD) is one of the top three leading causes of mortality worldwide and accounted for 3 million deaths in 2012.⁵ As data and clinical practice related to COPD continues to evolve, the Global Initiative for Chronic Obstructive Lung Disease (GOLD) has also maintained its relevance through annual updates and revisions to their guidelines. According to the 2023 GOLD guidelines, COPD is defined as: “a heterogeneous lung condition characterized by chronic respiratory symptoms (dyspnea, cough, sputum production) due to abnormalities of the airways (bronchitis, bronchiolitis) and/or alveoli (emphysema) that cause persistent, often progressive, airflow obstruction”.¹ Similar to previous versions, the 2023 GOLD guidelines continues to define a spirometric criterion for airflow obstruction consistent with COPD as a post-bronchodilator ratio of FEV1/FVC <0.7. Once a diagnosis of COPD has been confirmed by spirometry, the guidelines also note four fundamental criterion to guide COPD assessment and therapy:

1) Severity of Airflow Limitation

Table 4: GOLD grades and severity of airflow obstruction in COPD (based on post-bronchodilator FEV1)

In COPD patients (FEV1/FVC < 0.7):		
GOLD 1	Mild	FEV1 ≥ 80% predicted
GOLD 2	Moderate	50% ≤ FEV1 < 80% predicted
GOLD 3	Severe	30% ≤ FEV1 < 50% predicted
GOLD 4	Very Severe	FEV1 < 30% predicted

•GOLD Grades and Severity of Airflow Obstruction in COPD (based on post-bronchodilator FEV1):

2) Nature and Magnitude of Current Symptoms

•Modified Medical Research Council (MRC) Dyspnea Scale: the first questionnaire developed to measure breathlessness. Patients are self-evaluated on a grade scale ranging from 0 to 4. Here, mMRC Grade 0 represents highly healthy and functional patients who only get breathless with strenuous exercise. Conversely, mMRC Grade 4 represents a patient who experiences severe breathlessness that affects the patients ability to perform activities of daily living (e.g., leaving the house, get dressing/undressed, etc.)

•The COPD Assessment Test (CAT) Assessment:

8-item questionnaire that assesses health status in patients with COPD. Each item contains a score of 0 to 5, where a score of 5 represents severe impairment. A cumulative score ranging from 0 to 40 is then calculated, where a higher score indicates greater impact of COPD on a patient’s overall health and well-being.

3) Previous History of Moderate and Severe Exacerbations

•COPD exacerbations are defined as: “episodes of acute respiratory symptom worsening often associated with increased local and systemic inflammation”. Of note, the guidelines recognize the best predictor of having frequent exacerbations (defined as two or more exacerbations per year) is the previous history of exacerbations.

4) Presence and Type of Other Diseases (multimorbidity)

•Patients should be evaluated for other concomitant chronic diseases and managed accordingly independent of the degree of airflow obstruction. Multimorbidity influences overall mortality and hospitalizations and should be assessed routinely and treated appropriately if present. The 2023 GOLD guideline contains a brief guide delineating the management of some common comorbidities occurring in people with COPD with stable disease and includes chronic disease states such as heart failure, ischemic heart disease, hypertension, obstructive sleep apnea, diabetes, gastroesophageal reflux, osteoporosis and so much more.

•Cigarette smokers have a higher prevalence of respiratory symptoms and lung function abnormalities, a greater annual rate of decline in FEV1, and a greater COPD mortality rate than non-smokers. COPD is often associated with long-term tobacco use; however, occupational and household air pollution (e.g., animal dung, crop residues, organic and inorganic dusts, chemical agents and fumes, etc.) are also important COPD risk factors that should be considered as well. Avoiding or eliminating insulting factors remains to be a key non-pharmacological intervention.

•Tobacco dependence is a chronic disease and relapse is common. Relapse reflects the chronic nature of dependence and addiction, and does not represent failure on the part of the patient or the clinician. Tobacco dependence and addiction is a multifaceted condition and healthcare professionals should support patients along their clinical course to achieve smoking cessation via non-pharmacologic (e.g., counseling, regular telephone encounters, referral to support groups, etc.) and pharmacologic measures (e.g., nicotine patch/gum/lozenges, varenicline, bupropion, etc.) when deemed necessary.

Treatment Algorithm

Table 5: Recommended initial treatment for patients with COPD

	Initial Treatment	
≥2 moderate exacerbations or ≥1 leading to hospitalization	Group E: LABA + LAMA Consider LABA + LAMA + ICS if blood eos ≥ 300	
0 or 1 moderate exacerbations (not leading to hospitalization)	Group A: Bronchodilator	Group B: LABA + LAMA
	mMRC 0-1 CAT <10	mMRC ≥ 2 CAT ≥ 10

Treatment Summary

Table 6: Single-drug inhaler options for the treatment of asthma or COPD

Single-Drug Inhalers				
Inhaled Corticosteroids (ICS)				
Beclomethasone (QVAR)	Budesonide (Pulmicort)	Ciclesonide (Alvesco)	Fluticasone (Flovent)	Mometasone (Asmanex)
Short-Acting Beta Agonists (SABA)				
Albuterol (ProAir, Ventolin)		Levalbuterol (Xopenex)		
Long-Acting Beta-Agonists (LABA)				
Formoterol (Foradil)	Salmeterol (Serevent)	Aformoterol (Brovana)	Aformoterol (Brovana)	
Short-Acting Muscarinic Antagonists (SAMA)				
Ipratropium (Atrovent)				
Long-Acting Muscarinic Antagonists (LAMA)				
Aclidinium (Tudorza)	Glycopyrrolate (Seebri)	Revifenacin (Yupelri)	Tiotropium (Spiriva)	Umeclidinium (Incruse)

Table 7: Combination Inhaler options for the treatment of asthma and COPD

Combination Inhalers			
Inhaled Corticosteroid (ICS) + Long-Acting Beta Agonist (LABA) Combination			
fluticasone/salmeterol (Advair)	budesonide/formoterol (Symbicort)	mometasone/formoterol (Dulera)	fluticasone/vilanterol (Breo Ellipta)
Long-Acting Muscarinic Antagonist (LAMA) + Long-Acting Beta Agonist (LABA) Combination			
glycopyrrolate/formoterol (Bevespi)	tiotropium/olodaterol (Stiolto)	umeclidinium/vilanterol (Anoro Ellipta)	
Inhaled Corticosteroid (ICS) + Long-Acting Muscarinic Antagonist (LAMA) + Long-Acting Beta Agonist (LABA) Combination			
fluticasone/umeclidinium/vilanterol (Trelegy Ellipta)			

Table 8: Treatment options for difficult-to-treat asthma

Medications for Difficult-to-Treat Asthma		
Anti-IgE		
Omalizumab (Xolair)		
Anti-IL5/IL5R		
Benralizumab (Fasenra)	Mepolizumab (Nucala)	Reslizumab (Cinqair)
Anti-IL4R		
Depilumab (Dupixent)		
Anti-TLSP		
Tezepelumab (Tezspire)		

REFERENCES

1. Global Initiative for Chronic Obstructive Lung Disease. Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease, 2023. Accessed March 1, 2023. www.goldcopd.org
2. Agarwal AK, Raja A, Brown BD. Chronic Obstructive Pulmonary Disease. In: StatPearls. NCBI Bookshelf version. StatPearls Publishing: 2022. Accessed February 20, 2023. <https://www.ncbi.nlm.nih.gov/books/NBK559281/>
3. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2022. Accessed March 1, 2023. <https://ginasthma.org>
4. Sinyor B, Concepcion Perez L. Pathophysiology of Asthma. In: StatPearls. NCBI Bookshelf version. StatPearls Publishing: 2022. Accessed February 20, 2023. <https://www.ncbi.nlm.nih.gov/books/NBK551579>
5. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS Med 2006;3(11):e442. <https://doi.org/10.1371/journal.pmed.0030442>