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COMPREHENSIVE APPROACH FOR THE MANAGEMENT OF STABLE COPD: A MINI REVIEW OF THERAPY UPDATES FOR HEALTHCARE PROFESSIONALS BASED ON GOLD GUIDELINES

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ABSTRACT

Chronic Obstructive Pulmonary Disease (COPD) has been an extreme and sometimes deadly illness, with new methods of therapy developing throughout the years. Medical doctor save emphasized the need for patient education about ongoing developments in COPD therapies. Present review aims to develop a brief update for healthcare professional who are working passionately to save lives of COPD patients. Databases utilised for the sake of briefing the update review were Global Initiative for Chronic Obstructive Diseases (GOLD) guideline, PubMed, Google scholar, EMBASE, Science Direct etc. The search term employed were GOLD guideline on therapeutic management of COPD, Clinical terminologies of COPD, COPD, therapeutic management for COPD, Guideline based approach for COPD, COPD complications, Follow up treatment of COPD patients. COPD has always been prevalent to be a deadly disease and the therapy keeps changing. Healthcare professionals urge for timely updates associated with the COPD therapy. COPD therapy updates keep healthcare professionals rationalized. Health care workers are in urge of therapeutic updates of critical diseases. The therapeutic updates in any form can be helpful to make the therapist aware about what has been evicted and what has been added or replaced in the therapeutic management of some critical diseases.

KEYWORDS: COPD, Global approach, GOLD guideline, Therapy update, Healthcare professionals.

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) can worsen if left untreated. Patients suffers may suffer with a lot of complications while living with COPD. The COPD is dyspnea, the production of mucus in the sputum, sputum creation, and exacerbation due to airways (bronchitis, bronchitis) and/or alveolar (emphysema) abnormalities, which lead to a permanent airflow obstruction that keeps worsening with time.[1] COPD is the second principal cause of death in Sweden with 2100 deaths perceived from this disease every year and currently, COPD stands as third most reason for global mortality claiming about 3.23 million lives during only one calendar year (2019). In LMICs, where almost 90% of deaths occur due to COPD in people younger than 70. Additionally, COPD ranks seventh on a list of leading causes in disability-adjusted life years (DALYs). Tobacco smoking and other respiratory risk factors Tobacco smoking is the main cause of COPD; it accounts for more than 70% of all cases in high income countries but only about 30-40 % in LMICs, where exposure to household air pollution (burning coal or biomass) remains a primary risk factor.[2] The Global Initiative for Chronic Obstructive Lung Disease (GOLD) reported 2023 global incidence of COPD is approximately one in eight persons. COPD remains third principal cause of mortalities globally with three million mortalities each year.[3]

Bronchodilator inhalers - for COPD, bronchodilators are used to help breathe better and relax the airways. Short term bronchodilators are fast acting and last for four- six hours, so they can be beneficial during exacerbations. Long-acting bronchodilators do not work as quickly, but are long acting and used for maintenance therapy; they are taken once or twice daily with an inhaled steroid. Other treatments include oral steroid medications; Antibiotics to treat flares, Long-term and severe COPD may require oxygen therapy. Oxygen therapy, use of CPAP (continuous positive airway pressure) devices in waking and sleeping hours. Pulmonary rehabilitation to train breathing Paced Activity Cough Training Postural Drainage Exercise programs. Severe cases of surgery to prophylaxis symptoms. Inhaled corticosteroids to reduce inflammation in the lungs, which can be taken regularly for prevention or (as needed) during acute exacerbation as inhalers. Use of a spacer device may be necessary to ensure effective medication delivery, and the proper inhaler technique is important. But very few low- and middle-income countries can offer the public free access to an inhaler: only half of

these countries provided salbutamol in all centre/clinic facilities open to patients for primary health care also in 2021.[1]

When a case of COPD flare-ups can be treated at home, it is suggested to take an oral corticosteroid up to 14 days long and an antibiotic that the place is sensitive to (conditional recommendation, very low to moderate quality of evidence). For those who have been hospitalized, the oral corticosteroids are preferred over the intravenous route if the gastrointestinal function of the patient is at the optimal level (conditional recommendation, low quality of evidence). Non-invasive mechanical ventilation is the most effective way to treat acute or acute-on-chronic hypercapnic respiratory failure (strong recommendation, low quality of evidence). The use of the long-term abode (home) method is necessary for emergency or hospital patients (conditional recommendation, moderate quality of evidence). Even if the patients want to do pulmonary rehabilitation during their time in the hospital, do not let them do it, but this should start within three weeks of hospital discharge (conditional recommendation, very low quality of evidence).[4]

COPD has long been an extreme and sometimes deadly illness, with new methods of therapy developing through the years. Medical doctor save emphasized the need for patient education about ongoing developments in COPD therapies. Present review aims to develop a pocket update for healthcare professional working to save lives of COPD patients.

METHODS

Database utilised for the sake of briefing the update review were Global Initiative for GOLD guideline, Pubmed, Google scholar, EMBASE, Science Direct etc. The search term employed were GOLD guideline on therapeutic management of COPD, Clinical terminologies of COPD, COPD, therapeutic management for COPD, Guideline based approach for COPD, COPD complications, Follow up treatment of COPD patients. Search period: 2024-2025.

COPD complications

There are more diseases one might suffer along with COPD; some of the risks are as follows:

- Things like the flu or pneumonia were lung infections
- Lung cancer
- Heart diseases
- Atrophy of the muscles and reduced bone density
- Depression and anxiety[2]

COPD patients may be observed to have various physical changes.

Typically, in severe attacks they endure severe respiratory distress and muscle deterioration. For instance, they may present with prolonged expiration, wheezing, and pursed-lip breathing as their respiratory symptoms. On the chest may very well be a significant anterior-posterior diameter, frequently named barrel chest. Problems concerning cutis can involve areas with central cyanosis from the lower oxygenation of the arterial system. On the feet they can have signs such as numeral clubbing and lower extremity edema, especially in cases of right heart failure.[5-7]

Table 1: Terminologies.[1]

Terminologies	Definitions
Dyspnea	A feeling of needing to breathe more deeply, a heavy chest, a need for air, or gasping.
Chronic cough	The cough may be sporadic at first, but it may then become constant, frequently occurring all day, and either productive or ineffective.
Sputum production	The traditional definition of chronic bronchitis is the regular production of sputum for two consecutive years for three months or longer.
Wheezing and chest tightness	Auscultation may reveal wheezes whether they are expiratory or inspiratory. When the chest is tight frequently, it can be a muscular nature, poorly localized, and may cause isometric contraction of the intercostal muscles.
Fatigue	A sensation of being "generally tired" or "drained of energy"
Exacerbations	A condition that becomes severe in a period of time acting less than 14 days and having symptoms like dyspnoea, coughing of mucus and/or tachycardia. It is mainly associated with increased inflammation both locally and systemically due to infection, pollution, or other such factors in the airways.

Table 2: New ABE Classifications.A[1] (2023)

Group A patients	Group B patients	Group E patients
Exacerbation history: 0 or 1 moderate exacerbations (not leading to hospitalization)		Exacerbation history: ≥2 modest or ≥1 require hospitalization

Group A	Group B	Group E
low symptoms + low risk (0–1 moderate exacerbation).	more symptomatic but low exacerbation risk.	patients with ≥2 moderate or ≥1 severe exacerbation.

Feature	GOLD 2023 (New system)	GOLD 2024 (Refined system)
System used	Shift from **ABCD → ABE** model	ABE model **retained**, with refinements
Group A	Low symptoms, 0–1 moderate exacerbation not leading to hospitalization	Same definition (low symptoms, low risk)

Group B	More symptomatic (higher CAT/mMRC), but ≤1 moderate exacerbation	Same definition; clearer emphasis on symptom control
Group E	≥2 moderate exacerbations or ≥1 hospitalization (any symptom level)	Same definition; reinforced focus on **frequent exacerbation**
Group D	Removed (merged into Group E)	Still **not used**
Key addition	Highlighted blood eosinophils for guiding ICS therapy	Reinforced eosinophil cut-offs (≥300 cells/μL for ICS benefit)

Table 3: New Pharmacological Management.[1]

Group A patients	Group B patients	Group E patients
Recommended Initial Pharmacological Management		
Bronchodilator Treatment: Short- or a long-acting bronchodilator. Long-acting bronchodilator is the preferred choice except in patients with very occasional breathlessness. Suggested to continue if the benefit is documented.	Initiation: Long-acting B2-agonist+ Long-acting anti-muscarinic (LABA+LAMA) combination.	LABA+LAMA is the preferred choice.
	If a LABA+LAMA combination is not considered appropriate, it is not encouraged to use one class of LABA over another (LABA or LAMA) for initial therapy	Use of LABA+ICS in COPD is not fortified. If there is an indication for an Inhaled corticosteroid (ICS), then LABA+LAMA+ICS is recommended as the preferred choice
	These patients are likely to develop comorbid conditions adding symptomatology and impact on their prognosis	Consider LABA+LAMA+ICS in group E if eos ≥ 300 cells/μL
		COPD with concomitant asthma: Use of an ICS is mandatory.

Table 4: Changes in Pharmacological Management – New & Old.[1]

Old Recommendations (Evidence Based)	New Recommendations (ABE classification based)
Recommended Bronchodilators in Stable COPD/ Exacerbations	
Evidence-A (Randomized controlled trials, a rich body of high-quality evidence without any significant limitation or bias,) recommended: Regular basis/as desirable use of Inhaled bronchodilator. Short acting B2 agonist (SABA) or Short acting muscarinic antagonists (SAMA) or a combination of both or LABAs and LAMAs to improve forced expiratory symptoms (FEV1) and symptoms	Initial therapy LABA+LAMA is the preferred (groups B & E). For group A either SABA or either LAMA or LABA is the preferred choice
Evidence-B (Randomized controlled trials with important limitations, limited body of evidence, Evidence) recommended LAMA, LABA+LAMA. Tiotropium and Theophylline.	Tiotropium and Theophylline not recommended
Evidence-C (Non- randomized trials, observational studies) recommended Short-acting inhaled beta 2-agonists, with or without short-acting anticholinergics as a initial bronchodilator	Group A-SABA or LABA should be continued if the benefit documented Group E- LABA+LAMA+ICS has been shown to be superior to

	LABA+ICS. Consider LABA+LAMA+ICS in group E if erythrocyte (eos) ≥ 300 cells/µL.
No recommendations regarding initial therapy for COPD with Asthma	In the case of Group E patients, treating COPD-associated asthma similar to asthma alone and the application of ICS will be a mandatory treatment.

Follow-up Treatment[1]

For patients who are still experiencing breathlessness or exercise restrictions after using a single bronchodilator, the two long-acting bronchodilators should be considered as the alternative treatment. If no improvement is seen after the second long-acting bronchodilator is added, then Phase The lung improvement may be considered by changing inhaler or the treatment. For people with constantly occurring acute episodes while on monotherapy with a single bronchodilator, it is better to switch to a LABA and a LAMA combined medication. In patients with dyspnoea who have exacerbations while receiving therapy with a single long-acting bronchodilator and have a blood eosinophil count of ≥ 300 cells/µL, the use of the LABA, LAMA, and ICS combination is a potentially effective treatment option. Persistent exacerbations with LABA and LAMA therapy can be predicted by a blood eosinophil count of < 100 cells/µL: Think in that scenario about escalation to the combination of LABA, LAMA, or ICS. Also, check the low eosinophil count below 100 cells/µL. Patients with blood eosinophil levels less than 100 µL or those on LABA, LAMA, and ICS therapy and experiencing exacerbations have the following options: roflumilast for individuals with chronic bronchitis and a projected FEV1 lower than 50% (usually Group A/B). Prescribe someone who is not a smoker azithromycin or a macrolide, in particular. In the event of pneumonia or serious adverse effects, consider quitting ICS. However, if the blood eosinophil count exceeds 300 cells/µL, tapering down can lead to exacerbations. In order to minimize side effects, it is necessary to regulate the ICS dose with caution.

Table No. 5: Recommendations for ICS/LABA in COPD Management.[1]

Evidence A	Evidence C
Combination of ICS and LABA is more efficient in fighting against exacerbations and COPD with the category from moderate to very severe than ICS and LABA separately.	Independent of ICS use, there is evidence that a blood eosinophil count < 2% increases the risk of pneumonia
Regular use of ICS shows that it may be the risk factor for pneumonia, this risk especially increases in the patients with critically severe illness, said the studies.	
Treatment using LABA+LAMA+ ICS through inhalation	

can help in better lung function, relief of symptoms and feeling of well-being and in avoidance of exacerbations of disease than the case of using LABA+ICS, LABA+LAMA or LAMA monotherapy.	

Patients under treatment with LABA+ICS[1]

In case the therapy used for the treatment of COPD without asthma, which includes LABA+ICS, if the condition is well controlled with it, the therapy of LABA+ICS continues to be one of the options.

If the exacerbations of the patient are multiplied, one way to handle them is by changing the therapy to LABA+LAMA+ICS for more exacerbations; in the presence of the major symptoms, one can contemplate taking the therapy to LABA+LAMA.

Table 6: Evidence of a Lower Mortality Rate in COPD Patients Using and Without Pharmacotherapy.[1]

Therapy	Treatment effect on mortality	Patient features
Pharmacological therapy		
LABA+LAMA+ICS	Triple compared to dual LABD relative risk reduction: IMPACT HR 0.72 (95% Cl: 0.53, 0.99) ETHOS HR 0.51 {95% Cl: 0.33, 0.80)	Symptomatic people with a history of frequent and/or severe exacerbations
Non-Pharmacological Therapy		
Smoking (Sm) Cessation	8.83/1000 person-years (Sm cessation) vs 10.38/1000 person-years (UC) (p= 0.03)	Asymptomatic or mildly symptomatic
Pulmonary rehabilitation (PR)	After early PR: RR 0.58 (95% Cl 0.35, 0.98) and at the longest follow-up RR 0.55 (95% Cl 0.12, 2.57)	Hospitalized for exacerbations of COPD (during or ≤ 4 weeks post d/c)
Long-term oxygen therapy (LTOT)	Nocturnal oxygen therapy trial (NOTT), ≥ 19 hours of continuous oxygen vs ≤13 hours: 50% reduction Modified medical research council scale (MRC) ≥15 hours vs no oxygen: 50% reduction	Partial pressure of oxygen in the alveoli ($PaO_{2)}$ ≤55 or < 60 mmHg with cor pulmonale or secondary polycythaemia
Non-invasive positive pressure ventilation (NPPV)	12% in NPPV (high IPAP level) and 33% in control (Hazard ratio 0.24; 95% Cl 0.11, 0.49)	Stable COPD with marked hypercapnia
Lung volume reduction surgery (LVRS)	0.07 deaths/person-year (LVRS) vs 0.15 deaths/ person-year (UC) Relative risk for death 0.47 (p = 0.005)	Upper lobe emphysema and low exercise capacity

European Guidelines[1]

European respiratory society guideline Recommendations.[1]

Oral Mucolytic

The criteria for moderate or severe airflow restriction are FEV1/FVC <0.70 post-bronchodilator and FEV1 % pred of 30–79%. Trials utilized high-dose mucolytic treatment. For example, N-acetylcysteine 600 mg twice a day. These trials were the primary source of the favorable impact. Additionally, Mucolytic therapy found to reduce the risk of COPD exacerbations.

Use LAMA vs LABA[1]

ERS Experts suggest using a LAMA over LABA alone for people with COPD who have medium to bad air block and had one or more flare-ups last year to stop more flare-ups (strong advice, okay proof level).

Roflumilast for COPD: Preventing Exacerbations in Patients with Chronic Bronchitis.[1]

The ERS suggests using the drug roflumilast for people with COPD. This is for those who have really bad trouble breathing, signs of long-term coughing, and health dips even though they take their usual breath-helping meds. They say it might help stop worse health issues (this advice isn't super strong, but it's backed by some solid proof).

Consultations for managing patients with COPD

Consultations for managing patients with COPD involve a multidisciplinary team of healthcare professionals, including:

¾ Pulmonologists

¾ Thoracic surgeons (if surgery is needed)

¾ Intensivists

¾ Respiratory therapists

¾ Palliative care specialists[8]

Clinical outcomes

A prospective randomized trial included patients with acute respiratory failure due to COPD diagnosed between January and December 2018. Only patients experiencing either hypercapnic or hypoxemia respiratory failure for the full year were included in this study. Hypercapnic was identified as PaCO2 > 50 mm Hg and pH < 7.30. Cases were defined as

arterial blood partial pressures of oxygen (PaO2) less than 60 mm Hg. If the patient's laboratory results and clinical examination supported it, pulmonologists and critical care experts would combine non-invasive positive pressure ventilation. NIPPV or invasive positive pressure ventilation (IPPV) were mentioned as therapies.[9-10]

An additional meta-analysis of 13 observational studies involving over 1,500 immunology compromised patients admitted to intensive care units due to acute respiratory failure revealed that the timely implementation of NIPPV significantly decreased hospital mortality (odds ratio: 0.43, p = 0.007) and 30-day mortality (odds ratio: 0.34, p-value).[11]

Lee H. et al. looked at patients with airflow obstruction (FEV1/FVC ratio <0.7) and bronchiectasis from January 2005 to December 2021 in this retrospective research. Spirometry readings are study's primary goals. Adverse events and changes in yearly FEV1 are its secondary endpoints. BEC is the basis for subgroup analysis. 179 patients were split up into three groups. These groups were based on recommended course of treatment: ICS/LABA/LAMA (32.4%) ICS/LABA (29.5%) and LABA/LAMA (38.5%). There was more airway blockage. Also, there was more severe bronchiectasis in the ICS/LABA/LAMA group. Patients whose BEC was less than 300/μL showed a decreased likelihood of moderate-to-severe exacerbations. This occurred when prescribed ICS/LABA/LAMA and ICS/LABA instead of LABA/LAMA. A correlation was discovered between ICS/LABA treatment and quicker drop in FEV1 in patients with BEC < 200/μL as opposed to LABA/LAMA. In summary, this research indicates that ICS/LABA/LAMA is more effective than ICS/LABA in lowering exacerbations in those with greater BEC. Meanwhile ICS/LABA treatment is linked to a quicker drop in those with lower BEC. The authors advocate for more research on BEC as a biomarker to direct use of ICS in treatment of airflow restriction and bronchiectasis.[12]

Both budesonide/formoterol and fluticasone/salmeterol are believed to lessen exacerbations of COPD to comparable extent. Nevertheless, exacerbation rates between these two combinations have not been evaluated in any double-blind prospective RCTs. The challenges associated with comparing research done in various COPD populations place restrictions on available data. Several inclusion criteria were employed in studies. They also made use of endpoints and treatment duration, as well as concurrent medication. The effectiveness of these two combinations seems to be comparable. Calverley et al. examined effects of combination treatment using single device containing 500 mg of fluticasone propionate and 50 mg of salmeterol in TRISTAN trial. For full year both specific component and a placebo

were used in this. Lung function was improved by all active therapies. In comparison to placebo the patient's health was shown to be improved. The number of exacerbations each patient year decreased. Salmeterol and fluticasone propionate alone were inferior to combination treatment.[13-14]

Patient education[5]

Patients with COPD need to be taught all of the above in order for them to take care and help prevent or slow down progression of their condition.

- Smoking cessation
- Limiting exposure to second-hand smoke
- Limiting exposure to additional offending agents, which may be inorganic (e. g., asbestos, beryllium, carbon dusts, silica and chromium compounds) or more organic substances such as thermophilic fungi species avian droppings bacterial species
- Correct inhaler technique, and the need to regularly use your inhalers
- Getting and staying on follow-up visits, plans of care
- Recognizing that symptoms were getting worse
- Attending a Pulmonary Rehabilitation Class

CONCLUSION

COPD has always been prevalent to be a deadly disease and the therapy keeps changing. Healthcare professionals urge for timely updates associated with the COPD therapy. COPD therapy updates keep healthcare professionals rationalized. Health care workers are in urge of therapeutic updates of critical diseases. The therapeutic updates in any form can be helpful to make the therapist aware about what has been evicted and what has been added or replaced in the therapeutic management of some critical diseases.

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