GOLD Guidelines 2019 :

Management of Stable COPD

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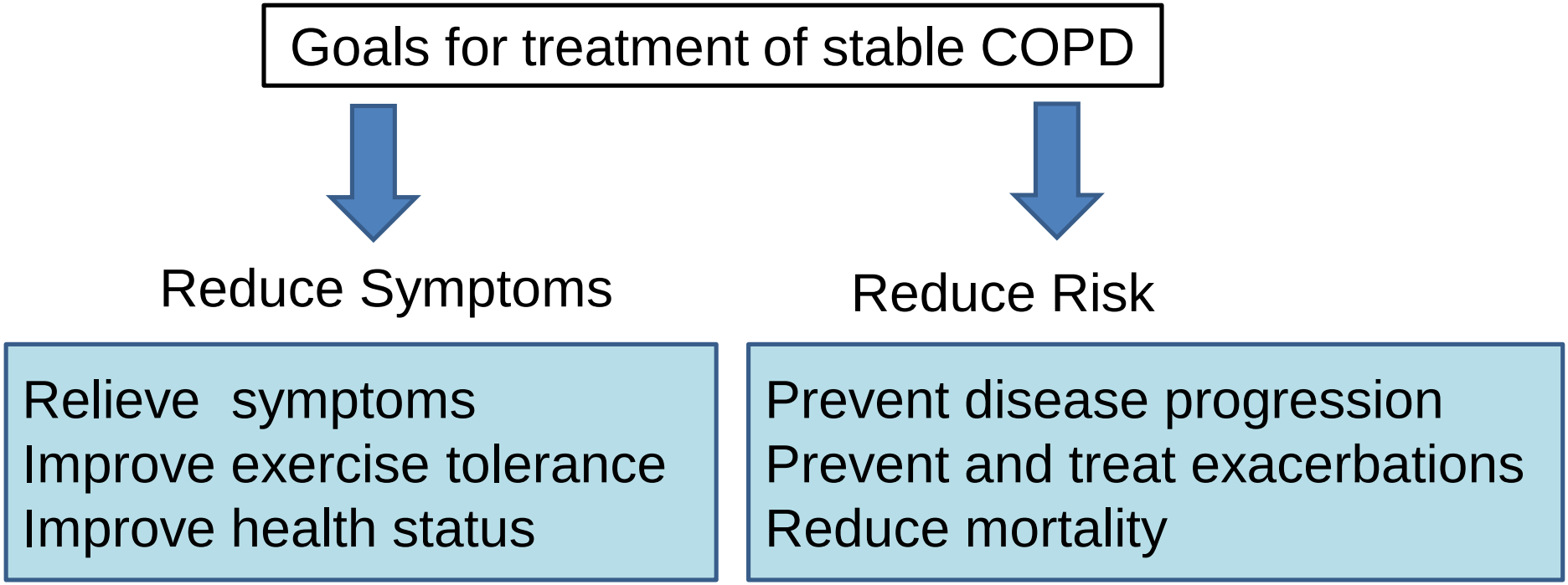
Modes of treatment of stable COPD

- Pharmacological
- Non Pharmacological

Goals for treatment of stable COPD

Once COPD has been diagnosed, effective management should be based on an individualized assessment to reduce both current symptoms and future risks of exacerbations



2019 Global Initiative for Chronic Obstructive Lung Disease

Pharmacological

- Choice depends on the availability, cost of medication and favourable clinical response balanced against side effects.

- Needs to be individualized as the relationship between severity of symptoms, airflow limitation, and severity of exacerbations can differ between patients.

- No conclusive clinical trial has shown that any existing medications for COPD modify the long-term decline in lung function.

Medications

Generic Name	Inhaler Type	Nebuliser	Oral	Injection	Duration of Action
BETA$_2$ AGONISTS					
Short Acting (SABA)					
Levalbuterol	MDI	✓			6-8hrs
Salbutamol	MDI, DPI	✓	Pills, Syrup, ER tablet	✓	4-6hrs, 12hrs(ERT)
Terbutaline	DPI		pill	✓	4-6hrs
Long Acting (LABA)					
Formoterol	DPI	✓			12hrs
Indacaterol	DPI				24hrs
Salmeterol	MDI, DPI				12hrs
ANTICHOLINERGICS					
Short Acting (SAMA)					
Ipratropium Br	MDI	✓			6-8hrs
Long Acting (LAMA)					
Tiotropium	DPI, SMI				24hrs
Glycopyrronium Br	DPI	✓	Solution	✓	12-24hrs

Medications

Generic Name	Inhaler Type	Nebuliser	Oral	Injection	Duration of Action
COMBINATION SHORT ACTING BETA$_2$ AGONISTS + ANTICHOLINERGIC IN ONE DEVICE (SABA + SAMA)					
Salbutamol/Ipratropium	SMI, DPI	✓			6-8hrs
COMBINATION LONG ACTING BETA$_2$ AGONISTS + ANTICHOLINERGIC IN ONE DEVICE (LABA + LAMA)					
Formoterol/Glycopyrronium	MDI	✓			12hrs
Indacaterol/Glycopyrronium	DPI				12-24hrs
METHYLXANTHINES					
Aminophylline			Solution	✓	Up to 24hrs
Theophylline SR			Pill	✓	24hrs
Glycopyrronium Br	DPI	✓	Solution	✓	12-24hrs
COMBINATION LONG ACTING BETA$_2$ AGONISTS + CORTICOSTEROIDS IN ONE DEVICE (LABA + ICS)					
Formoterol/Beclometasone	MDI				
Formoterol/Budesonide	MDI,DPI				
Salmeterol/Fluticasone	MDI, DPI				

Medications

Generic Name	Inhaler Type	Nebuliser	Oral	Injection	Duration of Action
TRIPLE COMBINATION IN ONE DEVICE (LABA/LAMA/ICS)					
Beclometasone/Formoterol/ Glycopyrronium	MDI				
PHOSPHODIESTERASE-4 INHIBITORS					
Roflumilast			Pill		
MUCOLYTICS					
Erdostein			Pill		

Bronchodilators In Stable COPD

- Inhaled bronchodilators are central to symptom management
- Regular and as needed use of SABA or SAMA improves FEV_1 & symptoms
- LABAs & LAMAs significantly improve lung function dyspnea health status and reduce exacerbation rates
- LAMAs > LABAs wrt exacerbation reduction & hospitalisation rates

Bronchodilators In Stable COPD (cont.)

- LABA+LAMA increases FEV_1 and reduces symptoms, exacerbations compared to monotherapy
- Tiotropium improves effectiveness of pulmonary rehab in increasing exercise performance
- **Methylxanthines** (Theophylline) – small bronchodilator effect (modest symptomatic benefit).

Anti-inflammatory Therapy In Stable COPD

- **Inhaled Corticosteroids (ICS)**
  - ICS + LABA (combination therapy) is more effective than the individual components in improving pulmonary function.
  - ICS+LABA+LAMA (triple therapy) improves lung function & reduces exacerbations compared to dual / mono therapy.
  - The treatment effect of ICS containing regimens (ICS/LAMA/LABA and ICS/LABA vs LABA/LAMA) is higher in patients with high exacerbation risk (≥ 2 exacerbations and / or 1 hospitalization in the previous year).

Anti-inflammatory Therapy In Stable COPD (cont.)

- Oral Glucocorticoids: Long-term use has numerous side effects(myopathy, osteoporosis, AVN) no proven benefit in stable COPD.

- PDE4 Inhibitors: Roflumilast OD, has no bronchodilator activity, decreases exacerbations in patients on fixed dose combination of LABA+ICS.

Anti-inflammatory Therapy In Stable COPD

- **Antibiotics**
  - Long-term therapy with azithromycin and erythromycin reduces exacerbations over 1 year
  - Azithromycin 250mg/day or 500mg 3 times a week /year
  - Erythromycin 500mg BD for a year
  - Azithromycin therapy Is associated with drug resistance and hearing impairment

Anti-inflammatory Therapy In Stable COPD

- **Mucoregulators & Antioxidant agents**
  - Regular treatment with mucolytics e.g. Carbocystine , NAC reduces exacerbation in select population
  - Decreases exacerbations in patients on fixed dose combination of LABA+ICS

- **Other Anti-inflammatory Agents**
  - Statins have a postive effect on patients of COPD with cardiac and metabolc indications of statin use.

Other Pharmacological Agents In Stable COPD

- Alpha1 antitrypsin augmentation therapy(IV) – slows down emphysema progression
- Antitussives - no conclusive evidence of beneficial role
- Vasodilators –approved for primary pulmonary hypertension may worsen oxygenation without improving the outcome.

Inhalation Therapy

- Education and training
- Choice of device (Cost, access, prescriber, patient preferance)
- Assessment of inhaler technique necessary before labelling inhalational therapy as a failure.

Initial pharmacological treatment

≥ 2 moderate exacerbations or ≥ 1 leading to hospitalization	**Group C** LAMA	**Group D** LAMA or LAMA + LABA* or ICS + LABA** * Consider if highly symptomatic ** Consider if eosinophil ≥ 300
0 or 1 moderate exacerbations (not leading to hospital admission)	**Group A** A Bronchodilator	**Group B** A Long Acting Bronchodilator (LABA or LAMA)

Initial pharmacological treatment

Rescue short-acting bronchodilators should be prescribed to all patients for immediate symptom relief

Group A

- bronchodilator treatment based on its effect on breathlessness. SABA/LABA
- This should be continued if benefit is documented.

Group B

- Long acting bronchodilator. Long-acting inhaled bronchodilators are superior to short-acting bronchodilators taken as needed i.e., *pro re nata* (prn). Choice based on the patient's perception of relief.

Initial pharmacological treatment

Group B (CONT)

- Patients with severe breathlessness initial therapy with two bronchodilators may be considered.
- Co existing comorbidities may add to these patients' symptomatology and impact their prognosis, and these possibilities should be investigated

Group C

- Initial therapy should consist of a single long acting bronchodilator.

  LAMA was found to be superior to LABA, regarding exacerbation prevention, so starting therapy with a LAMA is recommended

Initial pharmacological treatment

Group D

- Started with a LAMA as it has effects on both breathlessness and exacerbations

- Patients with more severe symptoms (order of magnitude of CAT > 20), especially driven by greater dyspnea or exercise limitation, LAMA/LABA may be chosen as the initial treatment

- An advantage of LABA/LAMA over LAMA for exacerbation prevention has not been consistently demonstrated, so the decision to use LABA/LAMA as initial treatment should be guided by the level of symptoms

Initial pharmacological treatment

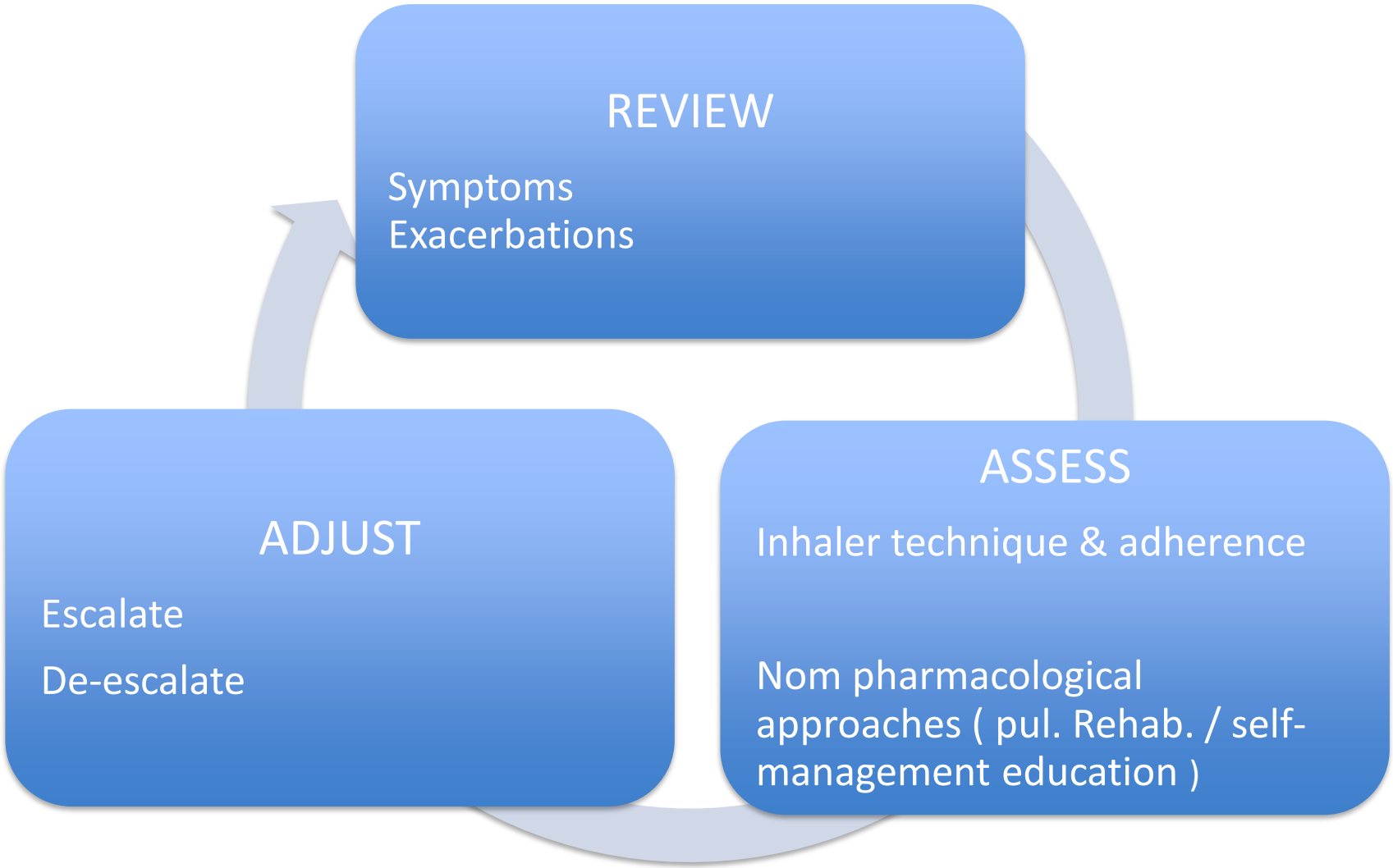
Group D

- In some patients, initial therapy with LABA/ICS may be the first choice; this treatment has the greatest likelihood of reducing exacerbations in patients with blood eosinophil counts ≥ 300 cells/μL

- LABA/ICS may also be first choice in COPD patients with a history of asthma

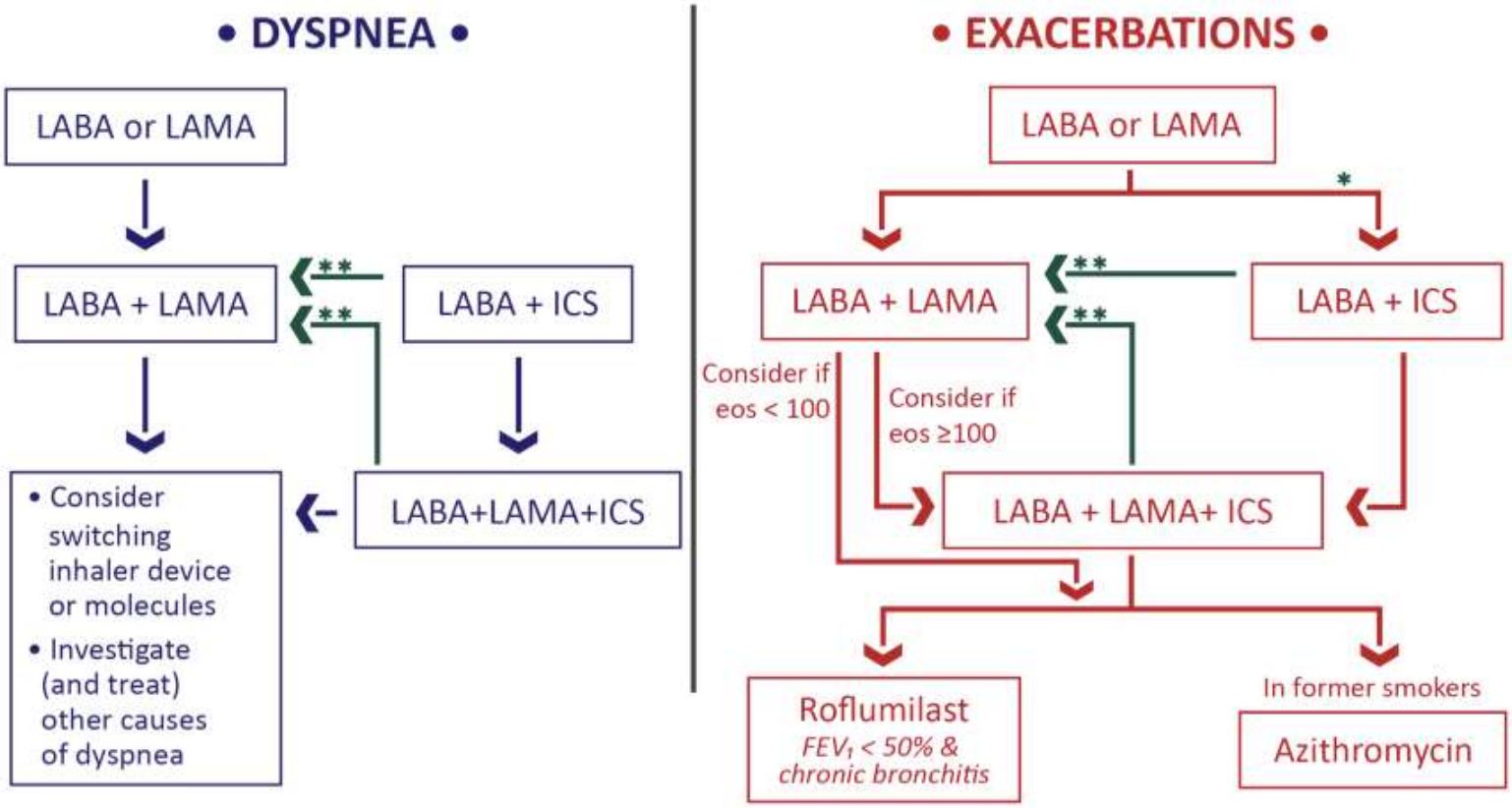
- ICS may cause side effects such as pneumonia, so should be used as initial therapy only after the possible clinical benefits versus risks have been considered

Follow up of pharmacological treatment



Follow up of pharmacological treatment

1. **IF RESPONSE TO INITIAL TREATMENT IS APPROPRIATE, MAINTAIN IT.**
2. **IF NOT:**
   - ✓ Consider the predominant treatable trait to target (dyspnea or exacerbations)
     - Use exacerbation pathway if both exacerbations and dyspnea need to be targeted
   - ✓ Place patient in box corresponding to current treatment & follow indications
   - ✓ Assess response, adjust and review
   - ✓ These recommendations do not depend on the ABCD assessment at diagnosis



eos = blood eosinophil count (cells/µL)

** Consider if eos ≥ 300 or eos ≥ 100 AND ≥2 moderate exacerbations / 1 hospitalization*

*** Consider de-escalation of ICS or switch if pneumonia, inappropriate original indication or lack of response to ICS*

Follow up of pharmacological treatment

- Dyspnoea due to other causes (not COPD) should be investigated and treated appropriately. Inhaler technique and adherence should be considered as causes of inadequate response.

- Persistent breathlessness or exercise limitation on long acting bronchodilator monotherapy is an indication for use of two bronchodilators

- If the addition of a second long acting bronchodilator does not improve symptoms, treatment could be stepped down again to monotherapy. Switching inhaler device or molecules can also be considered.

Follow up of pharmacological treatment

- For patients with persistent breathlessness or exercise limitation on LABA+ICS treatment, LAMA can be added to escalate to triple therapy

- Alternatively, switching from LABA+ICS to LABA+LAMA should be considered if
  - ✓ Original indication for ICS was inappropriate
  - ✓ Lack of response to ICS treatment
  - ✓ ICS side effects warrant discontinuation

Non – Pharmacologic Management of COPD

Patient group	Essential	Recommended	Depending on local guidelines
A	Smoking cessation (can include pharmacological Tt.)	Physical Activity	Flu Vaccination Pneumococcal vaccination
B-D	Smoking cessation (can include pharmacological Tt.) Pulmonary rehab	Physical Activity	Flu Vaccination Pneumococcal vaccination

Non – pharmacologic management of COPD

- Smoking cessation interventions
- Influenza vaccine recommended for all patients with COPD
- Pneumococcal vaccination – PCV13, PPSV23 for all patients > 65yrs / younger patients with chronic heart / lung disease
- Nutritional supplementation to be considered in malnourished patients

Non – pharmacologic management of COPD (cont.)

- Education and self-management
- Physical activity
- Pulmonary rehabilitation programs
- Exercise training
- Oxygen therapy.

Summary

- Strategy for stable COPD management-predominantly based on the individualized assessment of symptoms & future risk of exacerbations

- Goals are reduction of symptoms and future risk of exacerbations

- Pharmacologic treatments should be complemented by non-pharmacologic interventions

- Smokers - Encouraged and supported to quit