

MANAGEMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

[2nd Edition]



QUICK REFERENCE FOR HEALTHCARE PROVIDERS



Ministry of Health Malaysia



Academy of Medicine Malaysia



Malaysian Thoracic Society

Diagnosis and Assessment of COPD

A diagnosis of COPD should be considered in any individual with symptoms of chronic cough, sputum production or dyspnoea and a history of exposure to risk factors for the disease, especially cigarette smoking.

The diagnosis should be confirmed by spirometry showing a post-bronchodilator FEV_1/FVC ratio of less than 70%.

COPD severity should be assessed based on the severity of spirometric abnormality, symptoms, exercise capacity, complications and the presence of co-morbidities.

Table 1: Classification of COPD Severity Based on Spirometric Impairment and Symptoms

| COPD stage | Severity | Classification by post-bronchodilator spirometric values | Classification by symptoms and disability |
|------------|-------------|---|---|
| I | Mild | $FEV_1/FVC < 0.70$ $FEV_1 \geq 80\%$ predicted | Shortness of breath when hurrying on the level <i>or</i> walking up a slight hill (MMRC 1) |
| II | Moderate | $FEV_1/FVC < 0.70$ $50\% \leq FEV_1 < 80\%$ predicted | Walks slower than people of the same age on the level because of breathlessness; <i>or</i> stops for breath after walking about 100 m or after a few minutes at own pace on the level (MMRC 2 to 3) |
| III | Severe | $FEV_1/FVC < 0.70$ $30\% \leq FEV_1 < 50\%$ predicted | Too breathless to leave the house <i>or</i> breathless when dressing or undressing (MMRC 4) |
| IV | Very severe | $FEV_1/FVC < 0.70$ $FEV_1 < 30\%$ predicted <i>or</i> $FEV_1 < 50\%$ predicted plus chronic respiratory failure | Presence of chronic respiratory failure <i>or</i> clinical signs of right heart failure |

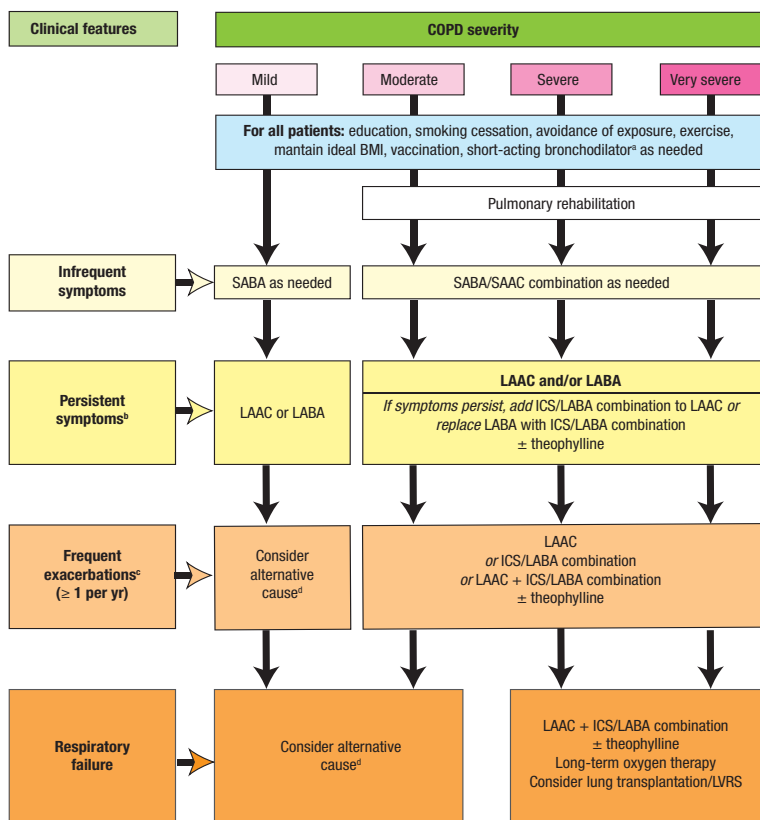
**Should there be disagreement between FEV_1 and symptoms, follow symptoms*

Managing Stable COPD

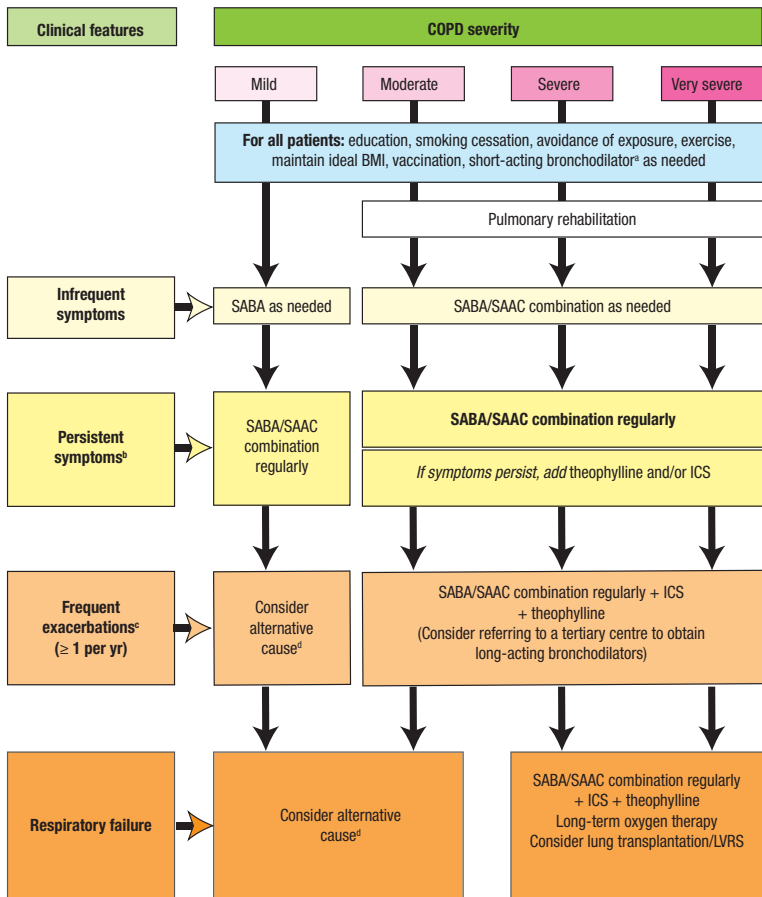
Objectives of managing stable COPD:

1. Prevent disease progression
2. Relieve symptoms
3. Improve exercise tolerance
4. Improve lung function and general health
5. Improve quality of life
7. Prevent exacerbations
8. Prevent and treat complications
9. Reduce mortality.

Figure 1: Algorithm for Managing Stable COPD



Notes for Figure 1 (Please refer to the bottom of the next page)

Figure 2: Algorithm for Managing Stable COPD in Resource-Limited Settings**Notes:**

- SABA – Short-acting β_2 agonist; SAAC – Short-acting anticholinergic; LAAC – Long-acting anticholinergic; LABA – Long-acting β_2 agonist; ICS – Inhaled corticosteroid; LVRS – lung volume reduction surgery
- ICS dose per day should be at least 500 μg of fluticasone or 800 μg of budesonide
- a. All COPD patients, irrespective of disease severity, should be prescribed SABA or SABA/SAAC combination (Berodual[®]/Combivent[®]) as needed. SABA has a more rapid onset of bronchodilatation than SAAC.
- b. Defined as need for rescue bronchodilators more than twice a week.
- c. Frequent exacerbation is defined as one or more episodes of COPD exacerbation requiring systemic corticosteroids \pm antibiotics and/or hospitalisation over the past one year
- d. Consider alternative causes - it is less common for patients with mild COPD to have frequent exacerbations; similarly, respiratory failure is uncommon in patients with mild to moderate COPD severity. Hence, in such patients, an alternative cause should be explored even if the COPD diagnosis is firmly established.

Table 2: Evidence-based Interventions in Stable COPD

| Intervention | Outcome | Level of evidence* |
|--|---|--------------------|
| Smoking cessation | ↓ FEV ₁ decline, ↓ mortality | I |
| Influenza vaccination | ↓ COPD exacerbations, ↓ all-cause mortality (in patients aged ≥ 65 years during influenza season) | II-1 |
| Pneumococcal vaccination | ↓ community-acquired pneumonia | II-2 |
| Inhaled short-acting β ₂ -agonists | ↑ post-bronchodilator FEV ₁ , ↓ dyspnoea | I |
| Inhaled long-acting β ₂ -agonists | ↑ post-bronchodilator FEV ₁ , ↓ symptoms, ↑ QoL, ↓ COPD exacerbations | I |
| Inhaled short-acting anticholinergic | ↑ post-bronchodilator FEV ₁ , ↓ dyspnoea | I |
| Inhaled long-acting anticholinergic (tiotropium) | ↑ post-bronchodilator FEV ₁ , ↓ symptoms, ↑ exercise tolerance, ↑ QoL, ↓ COPD exacerbations, ↓ mortality | I |
| Inhaled corticosteroids | ↑ FEV ₁ , ↑ QoL, ↓ COPD exacerbations | I |
| Inhaled long-acting β ₂ -agonist and inhaled corticosteroid combination [Seretide Accuhaler (salmeterol 50 µg/fluticasone 500 µg) twice daily, and Symbicort Turbuhaler (budesonide/formoterol 320/9 µg) twice daily] | ↑ post-bronchodilator FEV ₁ , ↑ QoL, ↓ COPD exacerbations | I |
| Oral theophylline | Small ↑ FEV ₁ , ↓ symptoms | II-1 |
| Long-term oxygen therapy | ↓ mortality (in patients with respiratory failure) | I |
| Pulmonary rehabilitation | ↓ dyspnoea, ↑ exercise capacity, ↑ QoL, ↓ anxiety and depression associated with COPD | I |
| | ↓ number of hospitalisations and days in hospital | II-1 |
| | ↑ peripheral muscle strength | II-2 |
| Lung volume reduction surgery | ↑ FEV ₁ , ↑ exercise tolerance, ↑ QoL, ↓ mortality | I |

* Refer to Table 4

↓ : reduces, ↑ : increases or improves, QoL : quality of life

Managing Acute Exacerbations of COPD

Objectives of managing exacerbations of COPD:

- Relieve symptoms and airflow obstruction
- Maintain adequate oxygenation
- Treat any co-morbid conditions that may contribute to the respiratory deterioration
- Treat any precipitating factor such as infection

Table 3: Evidence-based Interventions in Acute Exacerbations of COPD

| Intervention | Outcome | Level of evidence* |
|--|---|--------------------|
| Inhaled short-acting β_2 -agonists | ↑ FEV ₁ , ↓ dyspnoea | I |
| Inhaled short-acting anticholinergic | ↑ FEV ₁ , ↓ dyspnoea | I |
| Intravenous aminophylline | ↑ FEV ₁ , ↓ dyspnoea | II-1 |
| Systemic corticosteroids | ↑ FEV ₁ , shorten recovery time, ↓ hypoxaemia | I |
| Antibiotics | ↓ short-term mortality, ↓ treatment failure, ↓ sputum purulence (in patients with purulent sputum and increased dyspnoea or increased sputum volume, and in patients requiring ventilatory support) | II-1 |
| Supplemental oxygen | ↓ hypoxaemia | III |
| Non-invasive ventilation | ↓ intubation, ↓ mortality, ↓ length of hospital stay (in acute respiratory failure) | I |

* Refer to Table 4

↓ : reduces, ↑ : increases or improves

Table 4: US / Canadian Preventive Services Task Force Level of Evidence Scale

| | |
|--------|---|
| I | Evidence obtained from at least one properly randomized controlled trial |
| II - 1 | Evidence obtained from well-designed controlled trials without randomization |
| II - 2 | Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group |
| II - 3 | Evidence obtained from multiple time series with or without intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence |
| III | Opinions of respected authorities, based on clinical experience; descriptive studies and case reports; or reports of expert committees |

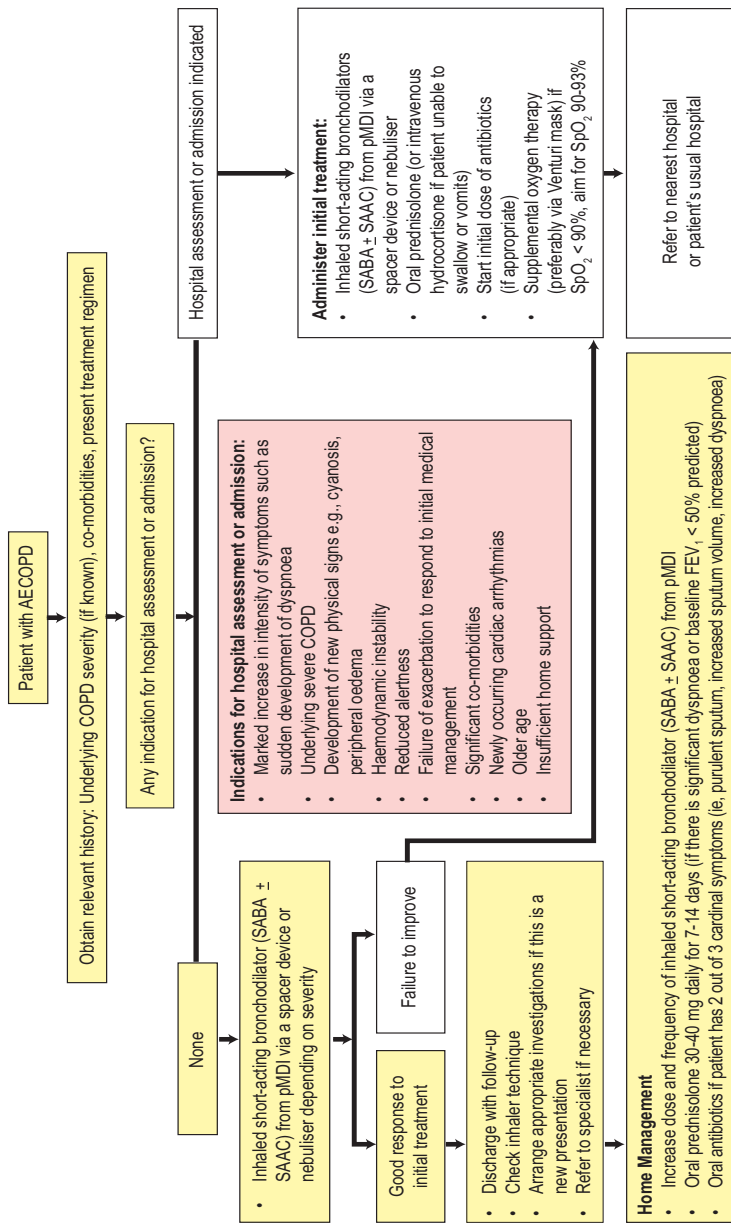
Figure 3: Algorithm for Managing Acute Exacerbations of COPD: Home Management

Figure 4: Algorithm for Managing Acute Exacerbations of COPD: Hospital Management