

Chronic Obstructive Pulmonary Disease (COPD) – Acute & Chronic Management

1. Definition

- **Chronic Obstructive Pulmonary Disease (COPD):** A progressive, irreversible airflow limitation due to **chronic bronchitis and/or emphysema**, primarily caused by smoking or biomass fuel exposure.
- **Acute Exacerbation of COPD (AECOPD):** Sudden worsening of respiratory symptoms (increased dyspnea, cough, and sputum production) requiring medical intervention.

2. Classification (If Needed)

- **Mild COPD (GOLD 1):** $FEV_1 \geq 80\%$ predicted
- **Moderate COPD (GOLD 2):** FEV_1 50-79% predicted
- **Severe COPD (GOLD 3):** FEV_1 30-49% predicted
- **Very Severe COPD (GOLD 4):** $FEV_1 < 30\%$ predicted

3. Presenting Clinical Features

A. Chronic COPD Symptoms

- **Chronic productive cough** (worse in the morning)
- **Progressive dyspnea** (initially exertional, later at rest)
- **Wheezing, chest tightness**
- **Cyanosis, pursed-lip breathing** (in severe cases)

B. Acute Exacerbation (AECOPD) Symptoms

- **Increased dyspnea, cough, sputum volume or purulence**
- **Wheezing, chest tightness, accessory muscle use**
- **Confusion or lethargy** (if hypercapnia develops, $PaCO_2 > 45$ mmHg)

4. Initial Evaluation

- **Spirometry ($FEV_1/FVC < 70\%$ Confirms COPD)** – Not useful during acute exacerbation.
- **ABG (If severe exacerbation, $SpO_2 < 92\%$)** – Check for respiratory acidosis.
- **Chest X-ray** (To rule out pneumonia, pneumothorax, or pulmonary edema).
- **ECG** (If cardiac involvement suspected, rule out cor pulmonale).
- **CBC, CRP** (Check for infection or anemia).
- **Sputum Culture** (If severe exacerbation with infection suspicion).

5. Management

A. Chronic COPD Management (Stable Disease)

Severity	Preferred Treatment
Mild (GOLD 1)	SABA or SAMA PRN (Salbutamol 100 mcg MDI OR Ipratropium 20 mcg MDI)
Moderate (GOLD 2)	LABA or LAMA (Tiotropium 18 mcg DPI OR Formoterol 12 mcg DPI BID)
Severe (GOLD 3-4)	LABA + LAMA OR LABA + ICS (Tiotropium + Indacaterol OR Formoterol + Budesonide)

Additional Measures for Chronic COPD

- Pulmonary Rehabilitation (Breathing exercises, endurance training)
- Annual Influenza & Pneumococcal Vaccination
- Smoking Cessation (Nicotine patches, counseling, varenicline/bupropion)
- Long-Term Oxygen Therapy (LTOT) if PaO₂ <55 mmHg or SpO₂ <88%

B. Acute Exacerbation of COPD (AECOPD) Management

1. Oxygen Therapy (Maintain SpO₂ 88-92%)

- Start with Nasal Cannula 1-2 L/min → Escalate to Venturi Mask if needed.
- Avoid high-flow oxygen in CO₂ retainers!

2. Bronchodilators (First-Line Treatment)

- **SABA ± SAMA Nebulization** (every 1-2 hours initially, then spaced out):
 - Salbutamol 2.5 mg Neb + Ipratropium 500 mcg Neb Q4-6H PRN

3. Systemic Corticosteroids

- Prednisolone 30-40 mg PO daily x 5-7 days
- If severe, IV Hydrocortisone 100 mg Q6H

4. Antibiotics (If Increased Sputum Purulence, Fever, or CRP >40 mg/L)

- Amoxicillin-Clavulanate 625 mg TID x 5-7 days (First-line)
- Azithromycin 500 mg OD x 3-5 days (If penicillin allergy)
- Levofloxacin 500 mg OD x 5 days (If Pseudomonas risk or previous hospitalization)

5. Non-Invasive Ventilation (NIV) if Severe Exacerbation

- **Indications for BiPAP:**
 - pH <7.35 (Respiratory acidosis)
 - PaCO₂ >45 mmHg
 - Severe dyspnea with accessory muscle use
 - **Indications for Intubation:**
 - pH <7.25 despite BiPAP
 - Respiratory fatigue, altered mental status
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6. Monitoring & Follow-Up

- **Hospitalized patients:** Monitor SpO₂, ABG, and respiratory rate every **4-6 hours**.
 - **Post-exacerbation:** Step-up maintenance therapy if needed.
 - **Re-evaluate spirometry & modify treatment every 3-6 months.**
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7. Red Flags – When to Refer

- **Severe respiratory distress or silent chest (impending respiratory failure).**
 - **Altered mental status (CO₂ narcosis, confusion, lethargy).**
 - **Frequent exacerbations (>2 per year despite optimal therapy).**
 - **Suspected lung cancer (unexplained weight loss, hemoptysis).**
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💡 Additional Notes & Insights

💡 "Pink Puffers" vs "Blue Bloaters" is an oversimplification!

- **Pink Puffers (Emphysema Predominant)** → Dyspnea, weight loss, pursed-lip breathing, barrel chest.
- **Blue Bloaters (Chronic Bronchitis Predominant)** → Cyanosis, productive cough, edema (cor pulmonale).

💡 Smoking Cessation is the Only Intervention That Slows Disease Progression!

- Medications help symptoms, but quitting smoking is the only thing that changes COPD progression.

💡 Oxygen in CO₂ Retainers – Be Cautious!

- **High-flow O₂ can worsen CO₂ retention** due to loss of hypoxic drive.
- **Target SpO₂ 88-92%** in these patients.

💡 **COPD Patients Have High Cardiovascular Risk!**

- Many COPD deaths are due to **MI, stroke, or heart failure**.
- Consider **low-dose aspirin & statins** in high-risk patients.

💡 **Pulmonary Hypertension & Cor Pulmonale Can Develop in Severe COPD!**

- **Signs:** Peripheral edema, loud P₂, raised JVP.
- **Management:** Oxygen therapy, diuretics (for edema).

💡 **Avoid Long-Term Oral Steroids in Chronic COPD!**

- **Prednisolone >3 months leads to osteoporosis, diabetes, muscle wasting.**
 - Use **ICS (inhaled steroids)** instead in select cases.
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