**Module B: Acute Exacerbation**

1. Patient with acute exacerbation of COPD presenting to primary care

2. Assess patient's condition

3. Is it exacerbation (W)不是

4. Initiate drug therapy with bronchodilators (T)

5. Assess patient's condition

6. Obtain medical history, physical examination, and laboratory tests to rule out other alternative diagnoses

**Table 1. Severity of COPD Based on FEV1**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Severity</th>
<th>Post-bronchodilator FEV1/FVC</th>
<th>FEV1 % predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>At-Risk (1)</td>
<td>≥ 0.7</td>
<td>≥80</td>
</tr>
<tr>
<td>1</td>
<td>Mild</td>
<td>≤ 0.7</td>
<td>≥80</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
<td>≤ 0.7</td>
<td>50 - 79.9</td>
</tr>
<tr>
<td>3</td>
<td>Severe</td>
<td>≤ 0.7</td>
<td>30 - 49.9</td>
</tr>
<tr>
<td>4</td>
<td>Very Severe</td>
<td>≤ 0.7</td>
<td>&lt;30</td>
</tr>
</tbody>
</table>

(1) Patients who smoke or are exposed to pollutants, and have cough, sputum or dyspnea, or have family history of respiratory disease. (There is insufficient evidence to support this category)

FEV1: forced expiratory volume in one second; FVC: forced vital capacity

**Table 2. Severity of COPD Based on Dyspnea (3)**

<table>
<thead>
<tr>
<th>Severity</th>
<th>Score</th>
<th>Level of Breathlessness</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0</td>
<td>Not troubled with breathlessness except with strenuous exercise</td>
</tr>
<tr>
<td>Mild</td>
<td>1</td>
<td>Troubled by shortness of breath when hurrying or walking a short uphill slope</td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
<td>Walks slower than people of the same age due to breathlessness or has to stop for breath when walking at own pace on the level</td>
</tr>
<tr>
<td>Severe</td>
<td>3</td>
<td>Stops for breath after walking approximately 100 meters or after a few minutes on the level</td>
</tr>
<tr>
<td>Very Severe</td>
<td>4</td>
<td>Too breathless to leave the house or breathlessness when dressing or undressing</td>
</tr>
</tbody>
</table>

(3) Modified Medical Research Council (MMRC) Dyspnea Scale

**Table 3: Evaluation of Patient with Mild/Moderate COPD**

- **Prevention**
  - Smoking status & readiness to quit
  - Vaccination
    - Symptom control
      - Breathlessness
        - Exercise tolerance
      - Exacerbation frequency
      - Sleep disturbance
      - Cough & sputum
  - Use of drug treatment
    - Adherence
    - Inhaled technique
  - Manage complications (in severe COPD)
    - Presence of cor pulmonale
    - Presence of depression
    - Need for home oxygen therapy
    - Change nutritional status
  - Need for pulmonary rehabilitation
  - Vaccination
  - Smoking status & readiness to quit
  - Diet
  - Nutritional status
  - Need for lung volume reduction surgery
  - Need for LTOT
  - Presence of cor pulmonale
  - Presence of depression
  - Need for home oxygen therapy
  - Change nutritional status
  - Need for pulmonary rehabilitation

**Measurements**

- Spirometry FEV1 & FVC
- Calculate BMI
- MRC dyspnea score

**Module A: Management of COPD**

**Sidebar A**

- Smoking status & readiness to quit
- Vaccination
- Symptom control
- Exacerbation frequency
- Sleep disturbance
- Cough & sputum
- Use of drug treatment
- Manage complications (in severe COPD)
- Need for pulmonary rehabilitation

**Sidebar B**

- Prevention & risk reduction (including smoking cessation, vaccination and patient education)
- Stabilization & management of exacerbations
- Use of drug treatment
- Manage complications (in severe COPD)
- Need for pulmonary rehabilitation

**Pocket Guide**

VA/DoD Clinical Practice Guideline Management of COPD Pocket Guide

**Cutting Guides**

VA access to full guideline: http://www.qmo.amedd.army.mil

DoD access to full guideline: http://www.qmo.amedd.army.mil

VA/DoD Clinical Practice Guideline Management of COPD Pocket Guide

**Sidebar A**

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- Vaccination
- Symptom control
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**Sidebar A**

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**Sidebar B**

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VA/DoD Clinical Practice Guideline Management of COPD Pocket Guide
### Table 5: Step-Care Pharmacotherapy in COPD

<table>
<thead>
<tr>
<th>Step</th>
<th>Symptoms</th>
<th>Maintenance Therapy</th>
<th>Rescue Therapy</th>
<th>Other Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Asymptomatic</td>
<td>No medication indicated</td>
<td>—</td>
<td>Smoking cessation; influenza, and other vaccinations</td>
</tr>
<tr>
<td>B</td>
<td>Symptoms less than daily</td>
<td>No scheduled medication indicated</td>
<td>SABA 1</td>
<td>Smoking cessation; influenza, and other vaccinations</td>
</tr>
<tr>
<td>C</td>
<td>Symptoms not controlled with rescue therapy or daily symptoms</td>
<td>Scheduled SAAC or Combination SABA + SAAC 1</td>
<td>SABA</td>
<td>Smoking cessation; influenza, and other vaccinations</td>
</tr>
<tr>
<td>D</td>
<td>Symptoms not controlled 2</td>
<td>Combination SAAC + LABA or LAAC 1</td>
<td>SABA</td>
<td>Consider Pulmonary Rehabilitation 1</td>
</tr>
<tr>
<td>E</td>
<td>Symptoms not controlled 3</td>
<td>Combination LABA + LAAC 1</td>
<td>SABA</td>
<td>Consider Pulmonary Rehabilitation 1</td>
</tr>
<tr>
<td>F</td>
<td>Exacerbations of &gt; 1 per year and severe disease (FEV1 &lt; 50%)</td>
<td>Consider adding an inhaled glucocorticoid 1</td>
<td>SABA</td>
<td>Smoking cessation; influenza, and other vaccinations. Refer to Pulmonary Rehabilitation 1</td>
</tr>
</tbody>
</table>

#### Table 4: Inhaled Glucocorticoids

<table>
<thead>
<tr>
<th>Inhaled Glucocorticoid</th>
<th>Usual dosing interval</th>
<th>Low dose (µg/day)</th>
<th>Medium dose (µg/day)</th>
<th>High dose (µg/day) Max dose per MFR (µg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beclomethasone 150 µg</td>
<td>q12h</td>
<td>&gt; 2000 (&lt;10 puffs)</td>
<td>&gt; 2000 (&lt;10 puffs)</td>
<td>&gt; 2000 (&lt;10 puffs)</td>
</tr>
<tr>
<td>Beclomethasone 220 µg</td>
<td>q12h</td>
<td>&gt; 2000 (&lt;10 puffs)</td>
<td>&gt; 2000 (&lt;10 puffs)</td>
<td>&gt; 2000 (&lt;10 puffs)</td>
</tr>
<tr>
<td>Budesonide 200 µg (MDI)</td>
<td>q12h</td>
<td>100-200 (&lt;5 puffs)</td>
<td>200-400 (&lt;10 puffs)</td>
<td>400-800 (&lt;20 puffs)</td>
</tr>
<tr>
<td>Budesonide 80 µg (MDI)</td>
<td>q12h</td>
<td>100-200 (&lt;5 puffs)</td>
<td>200-400 (&lt;10 puffs)</td>
<td>400-800 (&lt;20 puffs)</td>
</tr>
<tr>
<td>Fluticasone 500 µg (MDI)</td>
<td>q12h</td>
<td>200-400 (&lt;10 puffs)</td>
<td>400-800 (&lt;20 puffs)</td>
<td>&gt; 800 (&gt;20 puffs)</td>
</tr>
<tr>
<td>Fluticasone 100 µg (MDI with built-in spacer)</td>
<td>q6h or every 12 h</td>
<td>100-200 (&lt;5 puffs)</td>
<td>200-400 (&lt;10 puffs)</td>
<td>400-800 (&lt;20 puffs)</td>
</tr>
</tbody>
</table>

#### Table 6: Inhaled Bronchodilators

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage (Max dose)</th>
<th>Nebulizer dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmeterol 50 µg</td>
<td>12 puffs every 12 h</td>
<td>Not available</td>
</tr>
<tr>
<td>Ipratropium 18 µg</td>
<td>2 puffs every 6 h</td>
<td>Not available</td>
</tr>
</tbody>
</table>

#### Table 6: Inhaled Bronchodilators

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dosage (Max dose)</th>
<th>Nebulizer dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abuterol 90 µg</td>
<td>1-2 puffs q8-12 h</td>
<td>Not available</td>
</tr>
<tr>
<td>Metaproterenol 0.65 mg</td>
<td>2.5 mg q4-6h</td>
<td>Not available</td>
</tr>
<tr>
<td>Piritorex 300 µg</td>
<td>2.5 mg q4-6h</td>
<td>Not available</td>
</tr>
</tbody>
</table>

### Notes:

1. **Step-pattern**: a- Diurnal; b-Night
2. **Step-Care**: a. Dosing information obtained from AHFS Drug Information 2005 and product package inserts.
   b. These are usual recommended maintenance doses, although they may be modified in particular clinical circumstances.
   c. Maximum doses per manufacturer’s recommendations, although higher doses have been used clinically.
   d. Also available in the following combination products: fluticasone 100 µg/salmeterol 50 µg; fluticasone 250 µg/salmeterol 50 µg; fluticasone 500 µg/salmeterol 50 µg.

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**MFR** - Metered Dose Inhaler

**DPI** - Dry Powder Inhaler

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**SAAC** - Short-acting anticholinergic

**SABA** - Short-acting beta-agonist

**LABA** - Long-acting inhaled beta-agonist

**LAAC** - Long-acting anticholinergic

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**Asthma Management and Prevention 2004 update**


**FEV1** - Forced expiratory volume in 1 second

**FEV1/VC** - FEV1/forced vital capacity

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**spirometry** is essential to confirm the presence of airflow obstruction (low FEV1 and FEV1/VC ratio). Baseline therapy on symptoms, but consider alternate diagnoses (heart disease, pulmonary embolism, etc.) if not in proportion to spirometry.

2. Use the lowest level of therapy that comfortably relieves symptoms and maximizes activity level. Assess compliance and proper use of medications before escalating therapy. It is unusual for patients with COPD with FEV1 above 75% to require therapy beyond short-acting bronchodilators. Patients with FEV1 > 70% who do not improve should be considered for alternate diagnoses.

3. Consider use of inhailer containing both a short-acting beta 2-agonist and an anticholinergic. Nighttime symptoms are frequently better controlled with long-acting inhaled beta 2-agonist.

4. Consider adding a theophylline trial (slow release theophylline adjusted to the level of 9 to 12 µg/ml). Theophylline should be used with caution because of the potential for severe side effects. Nighttime respiratory symptoms are frequently controlled, but theophylline may lead to insomnia. Theophylline should be discontinued if a symptomatic benefit is not evident within several weeks.

5. Consider high dose inhaled glucocorticoids in patients with severe COPD (FEV1 < 50%) and at least one exacerbation in the prior year. A combination of a high dose inhaled glucocorticoid and a long-acting beta 2-agonist may help provide long-term maintenance for symptomatic COPD and improve quality of life (QOL). The use of oral glucocorticoids for maintenance therapy is discouraged.

6. Inhaled long-acting beta 2-agonists should not be used as rescue therapy. Short-acting inhaled beta 2-agonists (less than 12 puffs/day) may continue to be used as needed.

7. Pulmonary rehabilitation should be offered to patients who, despite optimal medical therapy, have reduced exercise tolerance and/or dyspnea limiting exercise.

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**References**

- **Asthma Management and Prevention 2004 update**
- **Dosing information obtained from AHFS Drug Information 2005 and product package inserts**
- **These are usual recommended maintenance doses, although they may be modified in particular clinical circumstances**
- **Maximum doses per manufacturer’s recommendations, although higher doses have been used clinically**
- **Also available in the following combination products: fluticasone 100 µg/salmeterol 50 µg; fluticasone 250 µg/salmeterol 50 µg; fluticasone 500 µg/salmeterol 50 µg**