Key Points
- Chronic Obstructive Pulmonary Disease (COPD) exacerbations can be defined as:
  - A patient with diagnosed COPD (or presumed if presenting initially with exacerbation).
  - A change in the patient’s baseline level of dyspnea, cough, and/or sputum beyond day-to-day variability.
- Exacerbations are triggered by infections and non-infectious etiologies.

Diagnosis

Assess
- Comorbidities such as:
  - cardiac disease
  - heart failure
  - diabetes mellitus
  - renal disease
- Severity of illness based on GOLD’s Classification of Severity of Airflow Limitation in COPD (page 11)
- Frequency of exacerbations
- Smoking history
- Medication history (inhaler use, frequency, and route)
- Vaccination history:
  - influenza
  - pneumococcal

Physical Exam
- Hemodynamics
- Respiratory effort-tachypnea, accessory muscles, work of breathing
- Presence of findings after initial therapy

Diagnostic Examinations
- Oxygen saturation
- Arterial blood gas (ABG)
- Chest radiograph
- Electrocardiogram (ECG)
- Complete blood count, serum electrolytes, renal function, and glucose
- Sputum gram stain and culture if patient has failed antibiotics or suspected resistance

Patient Disposition
- Indications for hospitalization include:
  - The presence of high risk comorbidities such as pneumonia, heart failure, cardiac arrhythmias, renal failure, liver failure, diabetes
  - Failed outpatient management
  - Respiratory distress
  - Inability to eat or drink due to symptoms
  - Hypoxemia (beyond baseline)
  - Hypercapnia (beyond baseline)
  - Altered mental status
  - Inability to care for self
  - Unclear diagnosis
- Indications for admission to the ICU include:
  - Severe dyspnea that does not respond to initial therapy
  - Mental status changes
  - Persistent hypoxemia (PaO₂ < 40 mmHg) despite supplemental oxygen and/or severe respiratory acidosis (pH < 7.25) despite noninvasive ventilation
  - Presence of other end-organ failure
  - Hemodynamic instability

Management
- Indications for the use of non-invasive positive pressure ventilation (NPPV):
  - If acute or acute-on-chronic respiratory failure is suspected, obtain ABG
  - If pH < 7.36, consider NPPV
  - If pH < 7.30, begin NPPV and monitor in progressive care unit or ICU
  - If pH < 7.25, begin NPPV and monitor in ICU with readily available intubation support
  - If excessive breathlessness and/or increase work of breathing, start NPPV
  - Re-check ABG after one hour and re-assess response
  - Worsening acidosis or persistent respiratory distress should prompt a transfer to the ICU
- Use of NPPV requires frequent monitoring and respiratory care
- A combination of pressure support and CPAP should be used
- Supplemental Oxygen
  - Goal SaO₂ 88-92% (PaO₂ > 60 mmHg)
  - Adjust oxygen delivery device to achieve oxygenation and patient comfort

Pharmacotherapies
- Bronchodilators
  - Patients with exacerbations should be placed on short-acting beta-2 agonist
    - Ipratropium can be used in combination with a short-acting beta-2 agonist
  - Use a metered-dose inhaler with a spacer or a nebulizer
- **Systemic Corticosteroids**
  - Oral route preferred, if tolerated
  - Prednisone 40 mg a day for 5 days
  - If IV, methylprednisolone 0.5 mg/kg to 1 mg/kg daily, and change to oral when tolerated

- **Antibiotics**
  - Oral route preferred, if tolerated:
    - Levofloxacin 750mg daily for 5-7 day course is the preferred antibiotic
  - Other oral options include:
    - Azithromycin 500mg on day 1, followed by 250mg daily for 4 additional days
    - Doxycycline 100mg q12 hours
  - If IV antibiotics are needed:
    - Ceftriaxone 1gm q24 hours
    - Piperocillin-Tazobactam 4.5gm q8 hours (Pseudomonas risk)
  - Base antimicrobial therapy on patient's exposure to antibiotics, hospital bacteria resistance patterns, and/or patient's bacterial sensitivities from sputum.

**Consults and Rehabilitation**

- **Pulmonary Rehabilitation**
  - Consider inpatient pulmonary rehabilitation consult for assistance in ambulation and patient education.
  - Consult may be placed to pulmonary rehab in IHIS.

- **Pulmonary Consultation**
  - If a patient is a patient of the OSU Lung Center, consider a pulmonary consultation
  - Patients who are not improving with therapy, have worsening respiratory status, and/or a questionable diagnosis should be considered for pulmonary consultation

- **Tobacco Cessation**
  - All patients who are currently smoking should be provided with cessation counseling and the appropriate pharmacotherapy and/or nicotine replacement therapy
  - See OSUWMC’s Inpatient Tobacco Cessation protocol

- **Vaccinations**
  - Patients with underlying lung disease should receive pneumococcal vaccination.
    - If < 65 years of age, give the pneumococcal 23-valent vaccination once and then once again when > 65 years of age.
  - If ≥ 65 years of age and have not previously received pneumococcal vaccine or whose pneumococcal vaccine history is unknown, give Pneumococcal 13-Valent (PCV13) followed by Pneumococcal 23-Valent (PPSV23) 6–12 months later.
  - For adults, if the patient has already received PPSV23, wait 12 months before giving PCV13.

  - All patients with underlying lung disease should receive yearly influenza vaccinations.
  - See CDC Recommended Adult Immunization Schedule Based on Medical and Other Indications or CDC Pneumococcal Vaccination Who Needs It?

**Discharge Planning**

- Indications for discharge include:
  - Symptons returning to baseline (i.e., dyspnea)
  - Ability to tolerate oral medications and intake
  - Hemodynamic stability
  - Oxygenation returning to baseline.
  - Less frequent inhaler requirements that are no more than every 4 hours
  - Ambulating
  - Patient and/or caregiver understand medication plan
  - Coordination of follow-up completed

- Patients admitted for acute exacerbation of COPD should be seen by their primary care provider or pulmonologist within 1-2 weeks of discharge (or pulmonary transition clinic)

- Patients admitted with an acute exacerbation of COPD should be discharged on a long-acting anticholinergic inhaler or combination inhaled corticosteroid-Plus-long acting beta2-agonist.
  - Ask case management about medication/insurance compatibility before discharge
  - These agents have been shown to be effective in preventing exacerbations.

- Patients requiring oxygen during hospitalization should be evaluated for the need for home oxygen.
  - Order “Home Oxygen Qualification” (PUL546)
- Consider referral to the OSU Lung Center for evaluation and pulmonary rehabilitation
  - Office: 614-293-4925

- Patient medications should be reconciled and discharged on home inhalers, as appropriate.
• For guidelines regarding appropriate outpatient medical management of COPD please refer to the GOLD guidelines.

• Comprehensive discharge planning and discharge instructions should address:
  o A discharge follow-up appointment should be scheduled with pulmonary rehabilitation
  o Use of long acting bronchodilator

Order Sets

• OSU IP PUL: Admission COPD Exacerbation [2362]
• OSU IP PUL: COPD (Secondary Diagnosis) [3217]
• OSU IP ED: Dyspnea (aka COPD) [2399]
• OSU IP ED: CDU/OBS Asthma/COPD Exacerbation [2402]
• OSU IP ED: Asthma/COPD Exacerbation [1764]

Quality Measures

• Length of stay
• Readmission rate
• Steroid and antibiotic use
• Discharge with a long acting inhaler

Reference


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Guideline Approved