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 infectious and non-infectious etiologies

Diagnosis

Assessment
- Comorbidities such as:
  - cardiac disease
  - heart failure
  - diabetes mellitus
  - renal disease
- Severity of illness based on prior spirometry if available
- Frequency of exacerbations
- Smoking history
- Medication history (inhaler use, frequency, route)
- Vaccination history (influenza and pneumococcal)

Physical Exam
- Hemodynamics
- Respiratory effort-tachypnea, accessory muscles, work of breathing, cyanosis
- 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, has severe airflow limitation or requires mechanical ventilation

Management

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

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
- Use of COPD orderset(s) is recommended

Pharmacotherapies

Bronchodilators
- Patients with exacerbations should be placed on short-acting bronchodilators
  - Schedule bronchodilators for severe exacerbations, then re-order as PRN if stabilized
  - Beta-2 agonists and antimuscarinic can be used in combination
  - Use a metered-dose inhaler with a spacer or a nebulizer
  - Transition to long-acting bronchodilators once stable

Systemic Corticosteroids
- Oral route generally preferred, if tolerated
- Prednisone 40mg a day for 5 days
- If IV, methylprednisolone 0.5 mg/kg to 1 mg/kg daily, change to oral when tolerated
  - Consider IV therapy in patients who have failed outpatient oral therapy as or patients admitted to the ICU
Antibiotics
- Indicated if symptoms include: increased sputum purulence with increased dyspnea or sputum volume OR if using NPPV or intubated
- Oral route preferred, if tolerated:
  - Duration: 5-7 day course
- Oral options include:
  - Levofloxacin 750mg daily
  - Azithromycin 500mg on day 1, followed by 250mg daily
  - Doxycycline 100mg q12 hours
  - Amoxicillin-clavulanic acid 875 mg q12 hours
- The patient's prior exposure to antibiotics, hospital bacteria resistance patterns, and/or patient's bacterial sensitivities from sputum can help direct antibiotic therapy
- In patients with radiographic evidence of pneumonia utilize anti-pseudomonals (Fluoroquinolones or Pipercillin-Tazobactam) if ≥ 2 exacerbations per year, severe COPD (FEV1<50% predicted), or NPPV/ventilator support

Discharge Planning
- Indications for discharge include:
  - Dyspnea symptoms returning to baseline
  - Tolerating 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

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) 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?
Order Sets

- OSU IP PUL: Admission COPD Exacerbation
- OSU IP PUL: COPD (Secondary Diagnosis)
- OSU IP ED: Dyspnea (aka COPD)
- OSU IP ED: CDU/OBS Asthma/ COPD Exacerbation
- OSU IP ED: Asthma/COPD Exacerbation

Quality Measures

- Length of stay
- Readmission rate
- Steroid and antibiotic use
- Discharge with a long acting inhaler
- Pulmonary Consultation
- Use of COPD ordersets

Reference


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Disclaimer: Clinical practice guidelines and algorithms at The Ohio State University Wexner Medical Center (OSUWMC) are standards that are intended to provide general guidance to clinicians. Patient choice and clinician judgment must remain central to the selection of diagnostic tests and therapy. OSUWMC’s guidelines and algorithms are reviewed periodically for consistency with new evidence; however, new developments may not be represented.