Antimicrobial Therapy for Acute Exacerbation of Chronic Obstructive Pulmonary Disease

(NB Provincial Health Authorities Anti-Infective Stewardship Committee, May 2019)

Treatment Criteria

- The use of antibiotics in acute exacerbations of chronic obstructive pulmonary disease (AECOPD) is controversial
- Antimicrobial therapy is only recommended when AECOPD are accompanied by all 3 cardinal symptoms or at least 2 of the 3 cardinal symptoms, if increased sputum purulence is one of the 2 symptoms:
  1. Increased dyspnea
  2. Increased sputum volume
  3. Increased sputum purulence
- Patients receiving invasive or non-invasive ventilation for AECOPD should be initiated on intravenous antimicrobial therapy
- Antibiotic selection should be based on patient symptoms and risk factors
- If infiltrate on chest x-ray or pneumonia suspected, then treat as per pneumonia treatment guidelines

Risk Stratification	Probable Organism	Preferred Empiric Regimen	Alternative Empiric Regimens	Duration	Comments
Acute Bronchitis • patients presenting with only 1 of the 3 cardinal symptoms	Viral in most cases	Antimicrobial therapy **not** recommended Symptomatic therapy only			
Simple (Low-Risk Patients) • Less than 4 exacerbations per year	*Streptococcus pneumoniae* *Haemophilus influenzae* *Moraxella catarrhalis*	doxycycline 200 mg PO for 1 dose then 100 mg PO q12h	sulfamethoxazole+trimethoprim 800+160 mg PO q12h* **OR** cefuroxime 500 mg PO q8-12h* **OR** clarithromycin 500 mg PO q12h*	5 days	• If a patient has received an antibiotic in the last 3 months the therapy chosen should be a regimen based on a different mechanism of action regardless of the clinical success • Tailor antibiotic therapy for sputum culture results if available
Complicated (High Risk Patients) At least one of: • Forced expiratory volume in 1 second (FEV_1) less than 50% predicted • Greater than or equal to 4 exacerbations per year • Ischemic heart disease • Use of home oxygen • Chronic steroid use	As in simple plus: Klebsiella spp and other Gram-negatives, Increased probability of beta-lactam resistance	Oral Therapy: amoxicillin+clavulanate 875+125 mg PO q12h* Intravenous Therapy: cefTRIAXone 1-2 g IV q24h	Oral Therapy: cefuroxime 500 mg PO q8-12h* **OR** levoFLOXacin 750 mg PO q24h* Intravenous Therapy: levoFLOXacin 750 mg IV q24h*	5-7 days	• If a patient has received an antibiotic in the last 3 months the therapy chosen should be a regimen based on a different mechanism of action regardless of the clinical success • Tailor antibiotic therapy for sputum culture results if available
Bronchiectasis/ End-stage Lung Disease	As in simple and complicated plus: *Pseudomonas aeruginosa,* *Staphylococcus aureus,* MRSA Other non-fermenting Gram negative bacilli	Oral Therapy: amoxicillin+clavulanate 875+125 mg PO q12h* **±** ciprofloxacin 750 mg PO q12h* (if *Pseudomonas aeruginosa* is suspected) Intravenous Therapy: cefTRIAXone 1-2 g IV q24h **OR** piperacillin+tazobactam 4.5 g IV q6h* (if *Pseudomonas aeruginosa* is suspected)	Oral Therapy: levoFLOXacin 750 mg PO q24h* Intravenous Therapy: levoFLOXacin 750 mg IV q24h*	10-14 days	• **Tailor antibiotic therapy for sputum culture results (past or current)**

Clinical Pearls

- Macrolides are not recommended as first line empiric therapy due to growing resistance rates for *Streptococcus pneumoniae* and *Haemophilus influenzae*
- Fluoroquinolones should be reserved for only severe cases, failure of first-line options or in complicated cases due to the potential for increasing resistance, risk of *Clostridium difficile* infection and their importance in the management of other infections
- Empiric therapy for atypical organisms (*Mycoplasma pneumoniae* & *Chlamydophilia pneumoniae*) not recommended
- Based on patient evaluation, consider obtaining cultures before start of antimicrobial therapy and/or repeat if not improving after 72 hours of antimicrobial therapy
- Consider systemic corticosteroids for moderate to severe exacerbations of COPD (prednisone 40 – 50 mg PO once daily for 5 days)
- Influenza vaccination and pneumococcal vaccination recommended

*Dose adjustment required in renal impairment

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