# 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

<table>
<thead>
<tr>
<th>Probable Organism</th>
<th>Preferred Empiric Regimen</th>
<th>Alternative Empiric Regimens</th>
<th>Duration</th>
<th>Comments</th>
</tr>
</thead>
</table>
| **Acute Bronchitis**
  - patients presenting with only 1 of the 3 cardinal symptoms | Viral in most cases Antimicrobial therapy not recommended Symptomatic therapy only | 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 |
| **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 | Oral Therapy: amoxicillin-clavulanic acid 875+125 mg PO q12h* Intravenous Therapy: ceftaxime 1-2 g 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 |
| **Complicated (High Risk Patients)**
  - At least one of:
    - Forced expiratory volume in 1 second (FEV1) 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-clavulanic acid 875+125 mg PO q12h* Intravenous Therapy: ceftaxime 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* | 10-14 days | Tailor antibiotic therapy for sputum culture results (past or current) |
| **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-clavulanic acid 875+125 mg PO q12h* ± ciprofloxacin 750 mg PO q12h* (if Pseudomonas aeruginosa is suspected) Intravenous Therapy: ceftaxime 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* & *Chlamyphila 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*
References:


