Antimicrobial Therapy for Acute Exacerbation of Chronic Obstructive Pulmonary Disease  
(NB Provincial Health Authorities Anti-Infective Stewardship Committee, November 2015)

**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>
<tbody>
<tr>
<td><strong>Acute Bronchitis</strong></td>
<td>Viral in most cases</td>
<td>Antimicrobial therapy <strong>not</strong> recommended Symptomatic therapy only</td>
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<td>• patients presenting with only 1 of the 3 cardinal symptoms</td>
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<tr>
<td><strong>Simple (Low-Risk Patients)</strong></td>
<td>Streptococcus pneumoniae Haemophilus influenzae Moraxella catarrhalis</td>
<td>doxycycline 100 mg po q12h</td>
<td>amoxicillin/clavulanate 875/125 mg po q12h* OR sulfamethoxazole/trimethoprim 800/160 mg po q12h* OR cefuroxime 500 mg po q12h* OR clarithromycin 500 mg po q12h</td>
<td>5 days</td>
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<td>• Less than 4 exacerbations per year</td>
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<td><strong>Complicated (High Risk Patients)</strong></td>
<td>As in simple plus: Klebsiella spp and other Gram-negatives, Increased probability of beta-lactam resistance</td>
<td>Oral Therapy: amoxicillin/clavulanate 875/125 mg po q12h* Intravenous Therapy: cefTRIAXone 1-2 g IV q24h</td>
<td>Oral Therapy: cefTRIAXone 500 mg po q12h* OR clarithromycin 500 mg po q12h* OR levofloxacin 750 mg po q24h* Intravenous Therapy: levofloxacin 750 mg IV q24h*</td>
<td>5 – 10 days</td>
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<td>At least one of:</td>
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<td>• Forced expiratory volume in 1 second (FEV1) less than 50% predicted</td>
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<td>• Greater than or equal to 4 exacerbations per year</td>
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<td>• Ischemic heart disease</td>
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<td>• Use of home oxygen</td>
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<td>• Chronic steroid use</td>
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<tr>
<td><strong>Bronchiectasis/ End-stage Lung Disease</strong></td>
<td>As in simple and complicated plus: Pseudomonas aeruginosa, Staphylococcus aureus, MRSA Other non-fermenting Gram negative bacilli</td>
<td>Oral Therapy: amoxicillin/clavulanate 875/125 mg po q12h* ± ciprofloxacin 500 -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)</td>
<td>Oral Therapy: levofloxacin 750 mg po q24h* Intravenous Therapy: levofloxacin 750 mg IV q24h*</td>
<td>7 – 14 days</td>
</tr>
</tbody>
</table>

**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 β-lactam allergy in complicated cases due to the potential for increasing resistance, risk of *Clostridium difficile* infection and their importance in the management of other infections.
- Consider obtaining cultures if not improving after 72 hours of antimicrobial therapy.
- Empiric therapy for atypical organisms (*Mycoplasma pneumoniae* & *Chlamydophila pneumoniae*) not recommended.
- Consider systemic corticosteroids for moderate to severe exacerbations of COPD (prednisone 40 mg po once daily for 5 days).
- Influenza vaccination and pneumococcal vaccination recommended.

*Dose adjustment required in renal impairment*
References: