SHC Community Acquired Pneumonia: Antimicrobial Selection Guidelines

**Diagnosis:** Infiltrate on chest radiograph or other imaging technique AND clinical symptoms of pneumonia (fever, dyspnea, cough, and sputum production)

- Healthcare-associated pneumonia (HCAP) is no longer a recognized clinical entity because previously associated risk factors (e.g. dialysis, nursing home residence) do not strongly correlate with incidence of resistant organisms. Consider instead the risk factors mentioned below.
- Procalcitonin of uncertain value at time of diagnosis. Negative procalcitonin should not be used to withhold antibiotics at diagnosis. Procalcitonin may be useful in decision to discontinue ongoing antibiotic therapy. (see Procalcitonin Guide)

**Treatment, Outpatient (ED Discharge, Urgent Care, Primary Care)**
- When appropriate, assess for influenza (see Influenza Guidelines).
- Respiratory and blood cultures are not routinely indicated for outpatient CAP

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Antibiotic Regimena</th>
<th>Duration</th>
</tr>
</thead>
</table>
| No comorbidities (below) | **Preferred Regimen:**<sup>c</sup>  
Amoxicillin 1,000 mg PO TID<sup>d</sup>  
**Alternative Regimens (e.g. allergies or contraindications):**  
Cefpodoxime 200 mg PO BID<sup>d,e</sup>  
Levofloxacin 750 mg PO daily<sup>d,f</sup> | 5 days |
| No risk factors for MRSA or *Pseudomonas aeruginosa*b |  |
| Presence of co-morbidities, including:  
Chronic heart, lung, liver, or renal disease  
Diabetes  
Alcoholism  
Malignancy  
Asplenia | **Preferred Regimens:**  
Amoxicillin/Clavulanate 875/125 mg PO BID<sup>d</sup> PLUS Azithromycin 500 mg PO x 1 on first day followed by 250 mg PO daily on days 2-5<sup>g</sup>  
Cefpodoxime 200 mg PO BID<sup>d,e</sup> PLUS Azithromycin 500 mg PO x 1 on first day followed by 250 mg PO daily on days 2-5<sup>g</sup>  
**Alternative Regimens (e.g. allergies or contraindications):**  
Levofloxacin 750 mg PO daily<sup>d</sup> | 5 days |

<sup>a</sup> Certain patient-specific circumstances may dictate different management strategies from this guideline  
<sup>b</sup> No history of hospitalization AND receipt of IV antibiotics in last 90 days and no prior respiratory isolation of MRSA or *Pseudomonas aeruginosa*  
<sup>c</sup> Azithromycin and doxycycline monotherapy for outpatient CAP is no longer recommended due to high levels of *Streptococcus pneumoniae* resistance at SHC.  
<sup>d</sup> Requires dose adjustment in renal impairment (see Table 2)  
<sup>e</sup> Cefpodoxime may be substituted with Cefuroxime 500 mg PO BID (requires renal dose adjustment, see Table 2)  
<sup>f</sup> Levofloxacin may be substituted with Moxifloxacin 400 mg PO daily  
<sup>g</sup> Azithromycin may be substituted with Doxycycline 100 mg PO BID

**Original Date:** 01/30/2020  
**ABX Subcommittee approved:** 03/02/2020  
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Treatment, Inpatient

**Respiratory culture within the last year positive for MRSA or Pseudomonas aeruginosa?**

- **Yes**
  - MRSA only
    - Obtain respiratory and blood cultures
    - **Ceftriaxone** 1-2 grams IV q24H
    - **Azithromycin** 500 mg IV daily
    - **Vancomycin** IV
  - **Pseudomonas aeruginosa only**
    - Obtain respiratory and blood cultures
    - **Cefepime** 2 grams IV q8H
    - **Azithromycin** 500 mg IV daily
  - **MRSA and Pseudomonas aeruginosa**
    - Obtain respiratory and blood cultures
    - **Cefepime** 2 grams IV q8H
    - **Azithromycin** 500 mg IV daily
    - **Vancomycin** IV

- **No**
  - Prior hospitalization AND receipt of IV antibiotics in last 90 days?
    - **Yes**
      - **Severe Disease** (See Table 1)
      - **Non-Severe Disease** (See Table 1)
    - **No**
      - Obtain respiratory cultures
      - **Ceftriaxone** 1-2 grams IV q24H
      - **Azithromycin** 500 mg IV q24H

**Suspected aspiration pneumonia**

Addition of metronidazole (anaerobic GNR coverage) is NOT recommended unless presence of lung abscess or empyema can be demonstrated.

**De-Escalation:** If empiric anti-MRSA or anti-pseudomonal coverage started and microbiologic results without isolation of these organisms, this coverage can be discontinued. Treatment regimen should be targeted based on microbiologic results.

**Duration of Therapy:** Duration of therapy for inpatient CAP is 5 days with clinical improvement, resolution of hypoxia, and absence of complicating factors (e.g. meningitis, endocarditis, other deep-seated infection).

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*a* Certain patient-specific circumstances may dictate different management strategies from this guideline

*b* When appropriate, assess and treat for acute influenza (see Influenza Guidelines). Obtain Legionella and Pneumococcal urinary antigen in severe disease.

*² In severe beta lactam allergy, consider Vancomycin IV plus Levofloxacin 750 mg IV q24

*⁴ In severe beta lactam allergy, consider Vancomycin IV plus Aztreonam 2 grams IV q8H plus Levofloxacin 750 mg IV q24

*⁵ In severe beta lactam allergy, consider Levofloxacin 750 mg IV q24

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Table 1. Pneumonia Severity Assessment

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Major Criteria</th>
<th>Minor Criteria</th>
</tr>
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<tbody>
<tr>
<td>Severe pneumonia defined as either:</td>
<td>1. Septic shock with need for vasopressors</td>
<td>1. Respiratory rate &gt; 30 bpm</td>
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<tr>
<td>One Major criterion</td>
<td>2. Respiratory failure requiring mechanical ventilation</td>
<td>2. PaO2/FiO2 ratio &lt; 250</td>
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<tr>
<td>Three or more Minor criteria</td>
<td></td>
<td>3. Multi-lobar infiltrates</td>
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<tr>
<td></td>
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<td>4. Confusion/Disorientation</td>
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<tr>
<td></td>
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<td>5. Uremia (BUN &gt;20 mg/dL)</td>
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<td></td>
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<td>6. Leukopenia*(WBC &lt; 4 K cells/mL)</td>
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<td></td>
<td></td>
<td>7. Thrombocytopenia (Platelets &lt; 100 K cells/mL)</td>
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<td></td>
<td></td>
<td>8. Hypothermia (core temperature,368C)</td>
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<td></td>
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<td>9. Hypotension requiring aggressive fluid</td>
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<td></td>
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<td>10. Resuscitation</td>
</tr>
</tbody>
</table>

* Does not include drug-induced leukopenia (e.g. chemotherapy)

Table 2. Antimicrobial Drug Dosing in Renal Impairment

<table>
<thead>
<tr>
<th>Route</th>
<th>Antimicrobial Drug</th>
<th>Dosage Regimen in Renal Impairment (Creatinine Clearance*)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&gt;50 ml/min</td>
</tr>
<tr>
<td>Oral</td>
<td>Amoxicillin</td>
<td>1,000 mg PO TID</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin/Clavulanate</td>
<td>875/125 mg PO BID</td>
</tr>
<tr>
<td></td>
<td>Cefpodoxime</td>
<td>200 mg PO BID</td>
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<tr>
<td></td>
<td>Cefuroxime</td>
<td>500 mg PO BID</td>
</tr>
<tr>
<td></td>
<td>Levofloxacin</td>
<td>750 mg PO daily</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intravenous</td>
<td>Aztreonam</td>
<td>2 grams IV q8H</td>
</tr>
<tr>
<td>Intravenous</td>
<td>Cefepime</td>
<td>&gt;60 ml/min: 2 grams IV q8H</td>
</tr>
<tr>
<td>Intravenous</td>
<td>Levofloxacin</td>
<td>30-60 ml/min: 2 grams IV q12H</td>
</tr>
<tr>
<td>Intravenous</td>
<td>Vancomycin</td>
<td>500 mg IV daily</td>
</tr>
</tbody>
</table>

*Creatinine clearance (CrCl) is calculated via the Cockcroft-Gault method
**For drug dosing in hemodialysis, please refer to the SHC Antimicrobial Dosing Reference Guide

References:

Recommendations adapted from


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