Clinical Guideline
Community Acquired Pneumonia (CAP)

Pediatric Emergency & Hospital Medicine

Inclusion criteria:
• Suspected CAP in patients > 90 days old (up to 18 years)

Exclusion Criteria:
• History of immunodeficiency (e.g. HIV, SCID, etc)
• Known lung disease (other than asthma, e.g. BPD, CF)
• Neuromuscular disease
• Prior or current trach/ventilator dependence
• Congenital heart disease
• Sickle cell disease
• Hospital acquired or institutional acquired pneumonia (e.g. any antibiotic in the last 90 days or a resident of a long-term care facility)
• Complicated pneumonia (with pleural effusion, empyema, or lung abscess)

Definition of Under-Immunized:
• < 6 months of age or did not complete first series

Definition of Complicated Pneumonia:
• CAP with pleural effusion or empyema

<table>
<thead>
<tr>
<th>Categorizing Severity of Illness</th>
<th>MILD (meets ALL criteria below)</th>
<th>MODERATE (meets ANY criteria below)</th>
<th>SEVERE (meets ANY criteria below)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygenation</td>
<td>Oxygen Saturation &gt;90% on room air</td>
<td>Oxygen saturation persistently &lt;90% on room air</td>
<td>Oxygen saturation &lt;90% despite supplemental oxygen on 50% FiO2; apnea, bradypnea, or hypercarbia</td>
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<tr>
<td>Work of Breathing</td>
<td>None or minimal (i.e. no grunting, flaring, retractions, apnea)</td>
<td>Increased/moderate respiratory distress (i.e. grunting, retractions, nasal flaring)</td>
<td>Need for mechanical ventilation or non-invasive positive pressure ventilation; severe respiratory distress or concern for impending respiratory failure</td>
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<tr>
<td>Hydration</td>
<td>Able to tolerate fluids and medication by mouth</td>
<td>Signs of dehydration; persistent vomiting; inability to take oral medications</td>
<td>Systemic signs of inadequate perfusion, including fluid refractory shock, hypotension, sustained tachycardia, need for pharmacologic support of blood pressure or perfusion</td>
</tr>
<tr>
<td>Appearance</td>
<td>Not significantly ill or toxic appearing</td>
<td>Ill-appearing</td>
<td>Toxic or septic appearing and/or altered mental status</td>
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</tbody>
</table>

From the AAP Section on Emergency Medicine Committee on Quality Transformation Clinical Algorithm for Emergency Management Evaluation and Management of Pediatric Community Acquired Pneumonia

For questions concerning this guideline, contact: chorclinicalguidelines@vcuhealth.org

Last updated: August 2018
Next expected update: August 2021
**ED Phase**

Clinical exam suggestive of CAP

Respiratory assessment

**Mild**
- CBC and blood culture not indicated
- Consider CXR if uncertain of diagnosis
- Consider RPP if uncertain of viral or bacterial pneumonia

**Moderate**
- CXR – PA and lateral; consider bedside US to evaluate for pleural effusion
- Consider CBC with diff, blood culture, RPP

**Severe/Sepsis**
- CBC with diff, blood culture, CRP, BMP, RPP, VBG with lactate
- CXR- PA and lateral; consider formal US to evaluate for pleural effusion

**Mild Treatment**
- Oral antibiotics for 7 days
  - Fully immunized: amoxicillin
  - <6 month or not completed primary series: Augmentin or omnicef
  - Penicillin allergy: clindamycin
  - Add azithromycin for atypical pneumonia in child >5 years, if RPP+, otherwise add if suspicious for atypical pneumonia
  - If suspicious for influenza, test and treat, if positive

**Moderate Treatment**
- Parenteral antibiotics:
  - Fully immunized: Ampicillin
  - < 6 m or not complete primary series: Ceftriaxone
  - Penicillin allergy: Clindamycin
  - Add Azithromycin for atypical pneumonia in child >5 years, if + RPP, otherwise add if suspicious for atypical pneumonia
  - If suspicious for influenza, test and treat, if positive
  - If pleural effusion/empyema: see complicated pneumonia guideline

**Severe Treatment**
- Parenteral antibiotics: Ceftriaxone + Vancomycin
- Add Azithromycin for atypical pneumonia in child > 5yr
- If suspicious for influenza, test and treat, if positive
- If pleural effusion/empyema: see complicated pneumonia guideline
- Respiratory support as needed – supplemental O2 to maintain O2 saturations > 90%, NIPPV or intubation with mechanical ventilation
- IV fluids for signs/symptoms of shock; pressors as needed to maintain blood pressure and perfusion

**MEET DISCHARGE CRITERIA?**
- Minimal respiratory distress
- Tolerating PO Caregiver support
- PMD follow up within 48-72 hours

**Yes**
- Discharge home

**No**
- Admit to acute care floor
  - If chest tube, consider PPCU or PICU

**Admit to Acute care floor**

**Admit to PICU**

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## Inpatient Phase continued

### Inpatient Admission Criteria:
- Hypoxemia (SpO2 < 90%)
- Presence of increased WOB, respiratory distress, or tachypnea
- Lethargy
- Concern for compliance and adequate follow-up
- Signs/symptoms of severe dehydration, persistent vomiting, inability to take oral medications
- All infants 3-6 months with suspected bacterial CAP
- Signs/symptoms of shock

### CDU Admission Criteria:
- Poor PO intake/mild dehydration
- Mild respiratory distress for short observation (SpO2 ≥ 90%)

### Continue Antibiotics

#### FULLY IMMUNIZED: Ampicillin
- If with PCN allergy consider Ceftriaxone
- If with severe PCN allergy consider IV Clindamycin or Levofloxacin.
- May also consider Vancomycin.
- If start Levofloxacin, obtain EKG prior and consult Pediatric Infectious Disease

#### UNDER IMMUNIZED: Ceftriaxone
- If with severe PCN allergy or Cephalosporin allergy consider IV Clindamycin or Levofloxacin. May also consider Vancomycin.
- If start Levofloxacin, obtain EKG prior and consult Pediatric Infectious Disease

#### If with complicated pneumonia:
- Consult Pediatric Surgery/PICU and Pediatric Infectious Disease and see complicated pneumonia guideline

### Clinical Improvement

#### DC criteria:
- Afebrile for >12 hours
- Oxygen saturation ≥90% on room air for at least 12h
- No or minimal increased WOB/ respiratory distress, and well-appearing
- Tolerating PO intake and PO medications (transition to at least one PO dose of antibiotic prior to DC)
- Rx filled/sent
- Follow-up in 48-72 hours established
- No social concerns

#### Consider transfer to PICU for:
- Concern for AMS
- Impending respiratory failure
- Worsening sepsis
- Maximum respiratory support with persistent hypoxia (FiO2 > 50%)
- Need for positive pressure ventilation/ higher levels of support

### Clinical Worsening or Not Improving as Expected

#### O2 as needed for O2 saturations < 90%
- IVF as needed, encourage PO
- If severe pneumonia (see chart) obtain CBC/Diff, blood culture, CXR if not yet obtained (consider in moderate pneumonia)

#### If with complicated pneumonia:
- Consult Pediatric Surgery/PICU and Pediatric Infectious Disease and see complicated pneumonia guideline

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- Consult Pediatric Surgery/PICU and Pediatric Infectious Disease and see complicated pneumonia guideline

#### Consider transfer to PICU for:
- Concern for AMS
- Impending respiratory failure
- Worsening sepsis
- Maximum respiratory support with persistent hypoxia (FiO2 > 50%)
- Need for positive pressure ventilation/ higher levels of support

#### If in the CDU, refer for admission based on admission criteria ***

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Pneumonia Guideline

Executive Summary

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References


John S. Bradley, Carrie L. Byington, Samir S. Shah, Brian Alverson, Edward R. Carter, Christopher Harrison, Sheldon L. Kaplan, Sharon E. Mace, George H. McCracken, Matthew R. Moore, Shawn D. St Peter, Jana A. Stockwell, Jack T. Swanson; The Management of Community-Acquired Pneumonia in Infants and Children Older Than 3 Months of Age: Clinical Practice Guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America, Clinical Infectious Diseases, Volume 53, Issue 7, 1 October 2011, Pages e25–e76, https://doi.org/10.1093/cid/cir531


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Retrieval website: http://www.chrichmond.org/clinical-pathway-pneumonia

Example: