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## Clinical Practice Pathway: Community-Acquired Pneumonia (CAP)

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### Background/Rationale and Purpose

Broad-spectrum antibiotics have not demonstrated better clinical or patient-centered outcomes compared to narrow-spectrum antibiotics in treating children with acute respiratory tract infections. Broad-spectrum antibiotics are also associated with a higher risk of adverse events.

This guideline provides evidence-based recommendations for managing children with uncomplicated community-acquired pneumonia (CAP) and supports the use of narrow-spectrum antibiotics for most children with acute respiratory tract infections.

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### Guideline Eligibility

#### Inclusion Criteria:

- **Children aged 6 months to 12 years** with uncomplicated CAP in the **ambulatory setting**.

#### Exclusion Criteria:

- Pneumonia onset **≥48 hours after hospital admission** (i.e., healthcare-acquired).
  - **Aspiration pneumonia.**
  - **Immunocompromised children.**
  - **Chronic lung disease**, e.g., cystic fibrosis, primary ciliary dyskinesia, sickle cell disease
  - **Tracheostomy presence.**
  - **Complicated pneumonia** with parapneumonic effusion or lung abscess.
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### Recommendations (Appendix D)

#### Diagnosis

- **Clinical Diagnosis:** Consider CAP in children presenting with **fever, cough**, and abnormal clinical examination findings of **lower airway disease**. Diagnosis in the outpatient setting is primarily **clinical**.
- **Blood Cultures:** Not routinely recommended for **nontoxic, fully immunized children** managed as outpatients but may be useful for those requiring hospitalization.
- **Laboratory Testing:** Evaluations such as **ESR, CRP, or procalcitonin** do not reliably distinguish between viral and bacterial CAP and are not recommended for children with mild disease.

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- **Chest Radiographs:** Not necessary to confirm CAP in children **well enough for outpatient treatment**. Consider imaging if diagnosis is uncertain, if there is inadequate response to treatment, or in hospitalized children with **respiratory distress**.
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## Antibiotic Therapy

- **First-line Treatment:**
    - Use **high-dose amoxicillin** targeting *Streptococcus pneumoniae* for **mild CAP** in outpatient settings.
  - **Penicillin Allergies:**
    - For **non-severe/ non-type 1 allergic reactions to penicillin**, consider a second or **third-generation cephalosporin** (e.g., cefdinir or cefpodoxime), note lower lung concentrations with cefdinir
    - For **severe/ type 1 beta-lactam allergies**, prescribe **clindamycin** or **levofloxacin**.
    - Severe penicillin allergy includes anaphylaxis, angioedema, cardiac arrest, respiratory distress, severe cutaneous reaction (e.g., Stevens-Johnson syndrome, erythema multiforme, DRESS and TEN).
  - **Monitoring and Escalation:**
    - If the child **fails to improve after 48 hours** of appropriate antibiotic therapy, consider:
      - **Atypical pneumonia** (e.g., *Mycoplasma pneumoniae*)
      - **Complicated pneumonia** (e.g., parapneumonic effusion)
      - **Resistant pathogens** (e.g., *methicillin-resistant Staphylococcus aureus*)
    - Consider **imaging** and **Pediatric Infectious Disease consultation** if needed.
  - **Treatment Duration:**
    - **Uncomplicated CAP: 5-day** antibiotic course.
    - **Complicated CAP:** Longer duration based on clinical response and severity.
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## Goals and Metrics

- Rates of broad-spectrum antibiotics as a proportion of all antibiotics prescribed for Community Acquired Pneumonia  $\leq 10\%$

	Narrow Spectrum	Broad Spectrum
Community Acquired Pneumonia	Amoxicillin	Amoxicillin-Clavulanate Cefpodoxime Cefdinir Cefprozil Cefuroxime Clindamycin Levofloxacin

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## Patient and family education:

- EPIC patient education links:
  - Community-Acquired Pneumonia, Child
  - Community-Acquired Pneumonia, Infant
  - Fever, pediatric
  - Cough, pediatric

## Abbreviations

CAP, community-acquired pneumonia

CRP, C-reactive protein

ESR, erythrocyte sedimentation rate

MRSA, methicillin-resistant *Staphylococcus aureus*

## Related resources

- URI PEDS SMARTSET
- Related ICD-10 codes: J18.0-18.9

## Basis for Recommendations

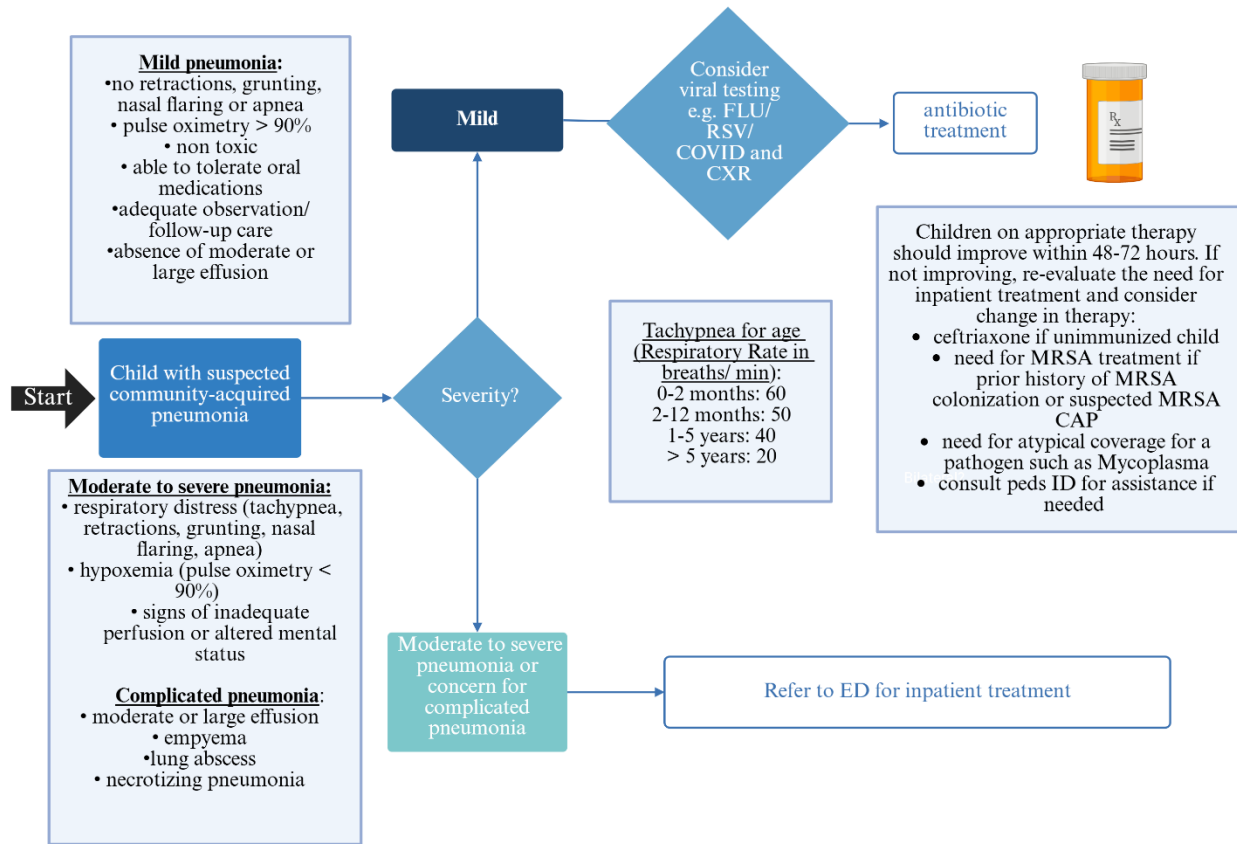
1. The Management of Community-Acquired Pneumonia in Infants and Children Older Than 3 Months of Age: Clinical Practice Guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America John S. Bradley, Carrie L. Byington, Samir S. Shah et al., *Clinical Infectious Diseases* July 2011.
2. Williams DJ, Creech CB, Walter EB, et al; The DMID 14-0079 Study Team. Short- vs Standard-Course Outpatient Antibiotic Therapy for Community-Acquired Pneumonia in Children: The SCOUT-CAP Randomized Clinical Trial. *JAMA Pediatr.* 2022 Mar 1;176(3):253-261. doi: 10.1001/jamapediatrics.2021.5547. PMID: 35040920; PMCID: PMC8767493.
3. Gerber JS, Ross RK, Bryan M et al. Association of Broad- vs Narrow-Spectrum Antibiotics With Treatment Failure, Adverse Events, and Quality of Life in Children With Acute Respiratory Tract Infections. *JAMA.* 2017 Dec 19;318(23):2325-2336. doi: 10.1001/jama.2017.18715. PMID: 29260224; PMCID: PMC5820700
4. Red Book: 2024–2027 Report of the Committee on Infectious Diseases By: Committee on Infectious Diseases, American Academy of Pediatrics. Edited by: David W. Kimberlin, MD, FAAP, Ritu Banerjee, MD, PhD, FAAP, Elizabeth D. Barnett, MD, FAAP, Ruth Lynfield, MD, FAAP, Mark H. Sawyer, MD, FAAP, <https://doi.org/10.1542/9781610027373>

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Version	Date	Author(s)	Reviewer(s)	Revisions
1.0		Debbie-Ann Shirley, MD	Maria Kelly, MD Rachel Reise, pharmD Matthew Garber, MD Kalen Manasco, pharmD	-

Please note this information reflects the best information as of the revised date above, and is provided as a general guide for our patient care. Clinical judgment and critical thinking regarding a particular patient remains with the patient’s provider.

## APPENDIX D: TREATMENT OF COMMUNITY ACQUIRED PNEUMONIA (CAP)



First-line treatment of mild CAP:	Alternative therapy for Beta-lactam allergy:
<p><b>Amoxicillin, PO</b> 90 mg/kg/day divided twice or three times daily (max 4,000 mg/day) x 5 days</p>	<p><b>NON-SEVERE PCN ALLERGY</b> <b>Cefpodoxime, PO</b> 10 mg/kg/day divided q12hrs (max 200 mg/dose)</p>
<p><b>Atypical pneumonia</b></p> <p><b>Azithromycin, PO</b> 10 mg/kg/dose on day one (max 500 mg/day) followed by 5 mg/kg/dose once daily on days 2-5 (max 250 mg/day)</p> <p><b>Levofloxacin, PO</b> &lt; 50 kg: 16 mg/kg in 2 doses, max 500 mg per day &gt;= 50 kg: 500 mg per dose, once daily</p>	<p><b>Cefdinir, PO*</b> 14 mg/kg per day in 2 divided doses (max 600 mg/day)</p> <p><b>SEVERE PCN ALLERGY</b> <b>Clindamycin, PO</b> 30 mg/kg/day divided 3 times daily (max = 600 mg/dose) x 10 days</p> <p><b>Levofloxacin, PO</b> &lt; 50 kg: 16 mg/kg in 2 doses, max 500 mg per day &gt;= 50 kg: 500 mg per dose, once daily</p>

\*Cefdinir has decreased bioavailability, higher protein binding and shorter half-life than cefpodoxime