Overview
Definitive diagnosis of community-acquired pneumonia (CAP) is complicated by lack of gold standard as clinical and radiographic findings may be discordant. This algorithm applies to children for whom the clinician has diagnosed uncomplicated CAP by clinical or imaging findings. Base antibiotic choice and dosing on local resistance patterns and MICS of prevalent bacterial organisms causing pneumonia (S. pneumoniae, Group A Streptococcus, S. aureus, H. influenzae, M. pneumoniae, C. pneumoniae). This algorithm was developed through the efforts of the American Academy of Pediatrics Section on Emergency Medicine in the interest of advancing pediatric healthcare. Ultimately, the patient’s physician must determine the most appropriate care.

Scope
Emergency Department (ED) Setting

Includes
Patients 3–months to 18-years of age with community acquired pneumonia (include patients with asthma or reactive airways disease)

Excludes
Immunocompromised, tracheostomy/ventilator dependent, or children with chronic conditions such as cystic fibrosis

Suspected hospital-acquired pneumonia or aspiration pneumonia

Diagnoses

MILD
(meets ALL criteria below)

SEVERE
(meets ANY criteria below)

Oxygenation
Oxygen saturation ≥ 90% on room air
Oxygen saturation persistently <90% on room air

Work of Breathing
None or minimal (i.e., no grunting, retractions, apnea)
Increased/moderate respiratory distress (i.e., grunting, retractions, nasal flaring)

Hydration
Able to tolerate fluids and medication
Signs of dehydration; persistent vomiting; inability to take oral medications

Appearance
Not significantly ill or toxic appearing
Ill appearing

Complicated Pneumonia – Out of scope of algorithm. Refer to USA guidelines.

TREATMENT

MILD

TREATMENT

- Initiate oral antibiotic therapy: Amoxicillin 90 mg/kg/day divided TID (max dose 3 g/day), see footnote for children with penicillin allergy and/or underimmunized children.
- If suspicion of atypical pneumonia (mycoplasma), for age < 5 yr add azithromycin.
- Influenza treatment if clinical or laboratory diagnosis per current CDC recommendations

SEVERE

Complicated Pneumonia – Out of scope of algorithm. Refer to USA guidelines.

TREATMENT

- Initiate parenteral antibiotic therapy: Ampicillin 150-200 mg/kg/day divided q 6 hrs – max dose 4 g/day; see footnote for children with penicillin allergy and/or underimmunized children.
- If suspicion of atypical pneumonia (mycoplasma), for age < 5yr add azithromycin.
- Influenza treatment if clinical or laboratory diagnosis per current CDC recommendations

Viral testing

Influenza treatment if clinical or laboratory diagnosis per current CDC recommendations - www.cdc.gov/flu/professionals/

Footnotes:
1 – If penicillin allergy, administer cephalosporin (oral cefadroxil, cefuroxime, or cefpizil; parenteral ceftriaxone or cefotaxime)
2 – In underimmunized children: oral amoxicillin-clavulanate or parenteral 3rd generation cephalosporin (ceftriaxone, cefotaxime)
3 – Effusion > 10 mm r/o or >1/4 hemothorax opacified
4 – If severe penicillin allergy: Levofloxacin OR Clarithromycin OR Linezolid
5 – Azithromycin: IV-10 mg/kg (max dose 500 mg) day 1 and 2, then transition to oral; Oral—10 mg/kg (max dose 500 mg) once on day 1, then 5 mg/kg (max dose 250 mg) once daily on days 2-5

Note: This algorithm does not represent AAP policy and was not reviewed or approved by the AAP Board of Directors.


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# Community Acquired Pneumonia

<table>
<thead>
<tr>
<th>Causes</th>
<th>Birth – 20 days</th>
<th>3 weeks – 3 months</th>
<th>3 months – 5 years</th>
<th>5 years – Adolescent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common: Perinatal acquired</td>
<td>Group B. streptococcus</td>
<td>Common</td>
<td>S. pneumoniae</td>
<td>M. pneumonia</td>
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<tr>
<td>Listeria monocytogenes</td>
<td>S. aureus</td>
<td>Common</td>
<td>S. pneu</td>
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<tr>
<td>Gram negative rods</td>
<td>H. influenza</td>
<td>Common</td>
<td>S. pyogenes</td>
<td>S. pneumonia</td>
</tr>
<tr>
<td>E. coli</td>
<td>Viruses: RSV, parainfluenza, influenza</td>
<td>Less Common</td>
<td>S. aureus</td>
<td>S. pyogenes</td>
</tr>
<tr>
<td>Klebsiella pneumonia</td>
<td>Less Common</td>
<td>Less Common</td>
<td>M. Pneumonia</td>
<td>Viruses: influenza</td>
</tr>
<tr>
<td>Non-typeable H. influenza</td>
<td>C. trachomatis (after 2 weeks)</td>
<td></td>
<td>C. Pneumonia</td>
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<tr>
<td>Enterococci</td>
<td>Bordetella pertussis</td>
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<td>Staph aureus</td>
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<th>Treatments</th>
<th>Inpatient</th>
<th>Outpatient</th>
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<tr>
<td>Birth – 20 days</td>
<td>Ampicillin IV plus Gentamicin IV w or w/o Cefotaxime IV</td>
<td>None</td>
</tr>
<tr>
<td>3 weeks – 3 months</td>
<td>Inpatient</td>
<td>Outpatient</td>
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<tr>
<td></td>
<td>Cefotaxime IV ( &lt; 4-6 weeks) or Ceftriaxone plus Azithromycin 10mg/kg</td>
<td>&lt; 3 month consider admission</td>
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<td>If concern for MRSA Vancomycin</td>
<td>Amoxicillin 80-90mg/kg divided BID x 10 days</td>
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<tr>
<td></td>
<td>Consider antivirals if concern for influenza</td>
<td>If pcn allergy: Consider Cephalosporin and/or Azithromycin</td>
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<td></td>
<td>Follow-up 24 – 48 hours</td>
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<td>3 months – 5 years</td>
<td>Inpatient</td>
<td>Outpatient</td>
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<tr>
<td></td>
<td>Ceftriaxone IV plus Azithromycin</td>
<td>Azithromycin</td>
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<tr>
<td></td>
<td>Consider antivirals for influenza</td>
<td>Antivirals if high risk</td>
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<td>5 years – Adolescent</td>
<td>Inpatient</td>
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**Suggested Admission Criteria:**
- SpO2 ≤ 93%
- Moderate to severe respiratory distress
- Failed outpatient treatment
- Age < 3 months
- Severe dehydration
- Not tolerating POs
- Unsafe home environment
- Pleural effusion/empyema

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Cincinnati Children’s Hospital Medical Center. Evidence based care guideline for community acquired pneumonia in children 60 days through 17 years of age. Cincinnati (OH): Cincinnati Children’s Hospital Medical Center. Jul. 2006.
