

Inclusion Criteria

Children \geq 60 days to 18 years old with suspected/proven community-acquired pneumonia managed in the outpatient, emergency department, inpatient, or intensive care setting

Exclusion Criteria

- Children $<$ 60 days old
- Tracheostomy or ventilator dependent
- Immunocompromised or immunosuppressed
- Cystic fibrosis or other chronic lung disease (except asthma)
- Concern for aspiration
- Hospital or institutional-acquired pneumonia

Severity & Complexity Definitions

Mild:

- No retractions, grunting, nasal flaring, apnea or
- Pulse oximetry $>$ 90% in room air or
- Non-toxic appearance

Moderate:

- Moderate dyspnea, including: retractions, grunting, nasal flaring, apnea or
- Pulse oximetry $<$ 90% in room air or
- Need for HFNC or other non-invasive mechanical ventilation not meeting severe criteria

Severe:

- Hypoxemic or hypercarbic respiratory failure requiring invasive mechanical ventilation or non-invasive mechanical ventilation with high (e.g., $>$ 40%) or escalating FiO₂ requirement or
- Systemic signs of inadequate perfusion (change in mental status, hemodynamic instability)

Complicated CAP:

- Moderate effusion (1/4-1/2 of thorax involved) or large effusion ($>$ 1/2 thorax involved) or
- Empyema, pneumothorax, lung abscess, bronchopleural fistula, or necrotizing pneumonia

Additional Antibiotic Info

- Consider using nasal MRSA PCR to determine ability to discontinue MRSA coverage
- Clindamycin is preferred for MRSA coverage in uncomplicated CAP. At Duke, 88% of MRSA isolates are sensitive to clindamycin.
- Transition to oral antibiotics:
 - If on Ampicillin or CTX \rightarrow amoxicillin 90 mg/kg/day q12h (max 4g/day)
 - If on CTX & severe allergy to first line β -lactam \rightarrow clindamycin 40 mg/kg/day q8h (max 600 mg/dose)
- If concerned for atypical pneumonia, \geq 5y, and no improvement after 48-72h of therapy, may consider azithromycin 10 mg/kg PO once (max: 500 mg/day) on day 1, then 5 mg/kg PO q24h (max: 250 mg/day) on days 2-5

Eligible patient with suspected community acquired pneumonia (CAP)

Severity based on clinical exam?

Mild

Treat as outpatient CAP

- No labs or CXR indicated (unless Dx uncertain)

Treatment:

- Amoxicillin 90 mg/kg/day PO q12h (max: 4g/day)
- Severe allergy to first line β -lactam: clindamycin 40 mg/kg/day PO q8h (max: 600 mg/dose)
- Treat for a total of 5 days

Moderate

Admit to inpatient or PICU

- Consider obtaining CBC/d
- Consider obtaining CXR (PA & lateral) based on level of suspicion for complicated pneumonia

Effusion on CXR?

No or CXR not obtained

Treat as moderate uncomplicated CAP

- Amoxicillin 90 mg/kg/day PO q12h (max: 4g/day) OR ampicillin 75 mg/kg/dose IV q6h (max: 2g/dose)
- Severe allergy to first line β -lactam: ceftriaxone 100 mg/kg/day IV q24h or q12h OR clindamycin 40 mg/kg/day IV/PO q8h (max: 900 mg/dose IV, 600 mg/dose PO)
- Treat for a total of 5 days (IV + PO combined)

Severe

Admit to PICU

- Obtain CBC/d, BMP, and blood culture
- Obtain CXR (PA & lateral)

Effusion on CXR?

No

Treat as severe uncomplicated CAP

- Ceftriaxone 100 mg/kg/day IV q24h or q12h \pm
- Clindamycin 40 mg/kg/day IV/PO q8h (max: 900 mg/dose IV, 600 mg/dose PO)
- Treat for a total of 5-7 days (IV+PO combined)

Yes

Assess effusion size

Yes

Small effusion ($<$ 1/4 thorax involved)

Moderate (1/4-1/2 thorax involved) or large effusion ($>$ 1/2 thorax involved)

Complicated CAP

Treat as moderate/severe complicated CAP

- Obtain ultrasound chest to evaluate for free flowing fluid v. loculations/empyema
- Consider drainage with pigtail catheter or thoracentesis
- Consult surgery for large effusion, empyema, or loculated effusion with need for respiratory support to consider chest tube
- Consult pediatric ID

Treatment:

- Ceftriaxone 100 mg/kg/day IV q12h or q24h AND vancomycin dosed by levels to achieve goal trough of 15-20 mcg/mL
- Severe allergy to first line β -lactam: clindamycin 40 mg/kg/day IV q8h (max: 900 mg/dose IV) AND levofloxacin 6m-4y: 10 mg/kg/dose IV/PO q12h, \geq 5y: 10 mg/kg/dose IV/PO q24h (max: 750 mg/dose)
- Duration dependent on clinical course and culture data

Discharge Criteria

Must meet all of the following:

- Tolerating oral antibiotic
- Maintaining adequate hydration
- No signs of respiratory distress
- Oxygen saturation \geq 90% on room air