Uncomplicated Community Acquired Pneumonia (CAP) Pathway: ED, UC, and Inpatient Management

Patients 2 Months -18 Years Of Age With Signs And Symptoms Of Community Acquired Pneumonia (Viral And Bacterial)

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Children's Healthcare of Atlanta

Patient Presents To ED/UC With: Fever, And/Or Increased Work Of Breathing

Clinical Exam: Abnormal Auscultatory Findings
(Crackles, Decreased Or Abnormal Breath Sounds)
Suspicious For Pneumonia

Interventions

- Provide O2 To Keep Sats >90%
- Administer Antipyretics For Temp ≥ 101
- Hydrate With Oral Fluids If Tolerated

Reassess

- Inadequate Oral Intake/ Dehydration? — Yes → Provide hydration: Oral or Place IV & hydrate with NS
- Signs & Symptoms of Respiratory Distress?[1] — Yes → Consider Chest X-ray[3] (2 View)

No / No → Does Patient meet discharge criteria?[2]

Discharge:
- Discharge Teaching (Refer To Teaching Sheet)
- Prescription, See Medication Chart If Bacterial Pathogen Suspected
- Follow-Up With PCP Within 48 Hours

Yes

No

Admit to Inpatient Floor[3]

Interventions

- Provide O2 To Keep Sats >90%
- Fluids As Needed Oral Or IV
- Antibiotics If Bacterial Pathogen Suspected See Medication Chart Pg. 2
- Obtain CXR If Not Already Done

Does Patient Meet Discharge Criteria?[2]

No → (back to Interventions)

Yes →

Discharge:
- Discharge Teaching (Refer To Teaching Sheet)
- Prescription, If Appropriate
- Follow-Up With PCP Within 48 Hours

If No Improvement After ≥ 48 Hours Consider Further Imaging Or Labs Or Consider Placing Patient On The Complicated Pneumonia Pathway

Exclusion Criteria

- Immunocompromised
- Cystic Fibrosis
- Infants <2 Months Of Age
- Nosocomially Acquired Pneumonia (>48 Hrs)
- Moderate To Severe Effusion, Empyema/ abscess, Necrosis
- Medically Complex Patients
- Multilobar Pneumonia
- Suspected Aspiration Pneumonia

[1]Signs And Symptoms Of Respiratory Distress

Tachypnea, Respiratory Rate, Breaths/min:
- Age 2 To 12 Months: >60
- Age 18 To 35 Months: >55
- Age 3 To 6 Years: >50
- Age >6 Years: >40

Signs:
- Dyspnea
- Grunting
- Nasal Flaring
- Apnea
- Altered Mental Status
- Pulse Ox <90% On RA
- Retractions (Suprasternal, Intercostal Or Subcostal)

[2] Discharge Criteria

- Adequate PO Intake
- No Respiratory Distress, Reference Box 1 Above
- Parents Able To Follow-Up With PCP Within 48 Hours Or Access Emergency Care If Needed.
- If Needed, Consult Case Management For Prior Approvals

[3]Diagnostic Testing

ED/Outpatient Consider:
- 2 View CXR:
  - If signs and symptoms of respiratory distress
  - If diagnosis is uncertain, **OR**
  - Failed initial therapy

Not Recommended:
- CBCD
- CRP
- Blood Culture

Inpatient Recommended:
- CXR

Consider:
- Procalcitonin (PCT):
  - Consider holding antibiotics if PCT< 0.25 ng/ml
- Viral Respiratory Panel

Blood culture *only if*:
- Failure of first line antibiotic therapy with Lobar Consolidation, **OR**
- Moderate to Severe (Presumed) bacterial CAP (Especially if complicated pneumonia; Defer to Complicated Pneumonia Pathway)

[4]Admission Criteria

Criteria:
- Sign And Symptoms Of Respiratory Distress
- Vomiting/poor PO Intake
- Inability To Manage Patient At Home
- Lack of Improvement On Outpatient Therapy
- Consider If ≤ 6 Months With Lobar Consolidation

Consider PICU If:
- Fi02 >40%
- PCO2 >55
- PEWS ≥ 5
- Fluid Refractory Hypotension
- HFNC exceeding floor limits (see HFNC BPR)

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	IV choice for admitted patients	Dose & Schedule	Max Single Dosage	PO Step Down and/or Discharge Medications	Dose & Schedule	Max Single Dosage	Total Length
First Line [A]	Ampicillin	75mg/kg q6h	2000mg	Amoxicillin	40mg/kg BID	1000mg	Minimum of 5 days (return to care or see PCP if not improving or still febrile 3-4 days after starting antibiotics)[F]
First Line with Penicillin Allergy	Clindamycin	13mg/kg q8h	900 mg	Clindamycin	10mg/kg TID	600mg	
Second Line with Penicillin Allergy[B]	Levofloxacin	<5yo:10mg/kg q12h ≥ 5yo:10mg/kg q24h	750mg	Levofloxacin[B]	<5yo:10mg/kg BID ≥ 5yo:10mg/kg QD	750mg	
If Not Fully Immunized against *H.influenzae* or *S.pneumoniae*[C]	Ceftriaxone	75mg/kg q24h	2000mg	Amoxicillin/ Clavulanate[D]	40mg/kg BID	1000mg	
For Atypical Pathogen Coverage[E] Add	Azithromycin	10mg/kg x 1 then 5mg/kg daily x 4 days **OR** 10 mg/kg x3 days	500mg	Azithromycin	10mg/kg x 1 then 5mg/kg daily x 4 days **OR**	500 mg, then 250 mg	5 days
					10 mg/kg x3 days	500 mg	3 days

[A]Known susceptibility should be used to guide therapy

[B]Consider Levofloxacin in patients with Penicillin allergy AND 1) severe disease OR 2) not fully immunized against *H.influenzae* or *S.pneumoniae*

[C]Definition of fully immunized against *H.influenzae* or *S.pneumoniae:* Up to date for age

[D]Concentration of Amoxicillin/Clavulanate suspensions vary, preferred formulation for patients <40kg is suspension with 600mg Amoxicillin-42.9mg Clavulanate/5mL . For patients ≥ 40kg use the 875mg Amoxicillin-125mg Clavulanate tablets or 400mg Amoxicillin – 57mg Clavulanate/5mL suspension.

[E] If patient on Levofloxacin, atypical pathogens are covered and an addition of azithromycin is not needed.

[F] For outpatients with pneumonia, 5 days of treatment is generally sufficient. Among inpatients, further treatment may be reconsidered after the initial 5 day course based on disease severity.

Lack of improvement on outpatient first line therapy:

- **Ensure patient has been compliant and on appropriate first line therapy for a minimum of 48-72 hrs.**
- **Consider viral (<2 yr.)/atypical (>5 yr.) pneumonia if no response to antibiotic**
- **If bacterial pathogen is suspected:**
  - If patient needs admission, start IV Ampicillin
  - If patient is stable for discharge:
    - ❑ May consider Augmentin if not fully immunized
    - ❑ May consider Clindamycin if fully immunized

    Note: 2nd and 3rd generation oral cephalosporins (Cefprozil, Cefdinir, Cefopodoxime) have **less** activity against pneumococcus than Amoxicillin

Consult SOAP team or Infectious Disease before giving Ceftriaxone or Levofloxacin for patient being discharged home from ED or UC