

INCLUSION CRITERIA

- Patients ≥ 3 months of age who present with fever, cough, and/or increased work of breathing concerning for pneumonia

EXCLUSION CRITERIA

- Atypical pneumonia
- Complicated pneumonia
- Immunodeficiency
- Lung disease other than asthma
- Malignancy
- Neuromuscular disease
- Prior to current tracheostomy or ventilator
- Risk for aspiration
- Sepsis
- Sickle cell disease
- Significant cardiac anomaly

MEASURES

- Percent of patients returning for a second antibiotic within 7-30 days
- Number of prescribed antibiotic days
- Percent of patients treated with Amoxicillin

ATYPICAL PNEUMONIA¹

- Treatment may vary

COMPLICATED PNEUMONIA²

- Opacified hemithorax
- Moderate/large effusion ($> \frac{1}{4}$ of the thorax)
- Empyema
- Lung Abscess
- Necrotizing pneumonia

Initial Assessment

- Obtain Vital Signs
- Obtain history
- Complete physical exam
- Provide oxygen or respiratory support PRN
- Treat fever PRN

Evaluate Severity of Disease

Mild Disease

- Mild or no work of breathing
- Mild tachypnea
- SpO₂ $> 90\%$

Moderate or Severe Disease

- Tachypnea or SpO₂ $< 90\%$
- Retractions and/or dyspnea
- Poor PO intake

Diagnostic Workup

- Chest x-ray
- Consider influenza testing for high risk patients¹ or respiratory pathogen panel if it will influence clinical management

Suspected viral etiology?
(Consider influenza or viral testing for high risk patients¹)

No

Yes

Observation/Watchful Waiting

- Provide supportive care recommendations
- Provide clear return precautions including difficulty breathing, fever ≥ 5 days, lethargy, or inability to tolerate fluids with concern for dehydration

Concern for Atypical¹ or Severe Disease?

Yes

No

Refer to

Complicated Pneumonia²

Clinical Pathway

Moderate Disease Treatment
Duration: 5 days

Immunized

First line: IV ampicillin

Mild PCN allergy⁴: IV ceftriaxone

Severe PCN allergy⁴: IV clindamycin or IV levofloxacin

Under immunized (< 2 HiBs)

First line: IV ampicillin-sulbactam

Mild PCN allergy⁴: IV ceftriaxone

Severe PCN allergy⁴: IV levofloxacin

HIGH RISK PATIENTS³

- <2 years old
- Underlying chronic conditions
- BMI > 40
- Resident of a long-term care facility
- Pregnant or post partum
- Chronic aspirin therapy

PENICILLIN ALLERGY⁴

Mild PCN allergy type IV: Delayed maculopapular rash without urticaria, blistering, desquamation, mucosal involvement, systemic symptoms

Severe PCN allergy type I/IgE mediated: Allergist confirmed history of urticaria, angioedema, wheezing, respiratory distress or anaphylaxis

SPECIAL CONSIDERATION⁵

- Levofloxacin suspension may require prior authorization, consider tablets in children >25kg

**Mild Disease Treatment
Duration: 5 days**

Immunized

First line: PO amoxicillin

Mild PCN allergy⁴:

FL: PO cefdinir

DV: PO clindamycin

Severe PCN allergy⁴: PO clindamycin or PO levofloxacin⁵

Failed treatment or Amoxicillin in past 30 days: PO amoxicillin-clavulanate or clindamycin

Under immunized (<2 HiBs)

First line: PO amoxicillin-clavulanate

Mild PCN allergy⁴: PO cefdinir

Severe PCN allergy⁴: PO levofloxacin⁵

Off Respiratory Support and Tolerating PO?

No

Yes

Admit to Hospital

Consider Acute Care for:

- Hypoxemia (<90%)
- Inability to tolerate PO intake
- Retractions and/or tachypnea
- Inability to follow-up outpatient

Consider PICU for:

- Hemodynamic instability
- Altered mental status
- Positive pressure ventilation
- Apnea

Discharge Patient

- Provide related educational resources
- Return to ED for worsening work of breathing, inability to tolerate PO, or PO antibiotics.

Antibiotic Dosing

Medication	Route	Dosage	Max per Dose
Amoxicillin	PO	45 mg/kg/dose BID	1500 mg
	PO	30 mg/kg/dose TID (preferred for moderate/severe disease)	1000 mg
Amoxicillin-clavulanate*	PO	ES suspension (amoxicillin 600 mg/clavulanate 42.9 mg/5mL) 45 mg/kg/dose of amoxicillin BID	1800 mg
	PO	ES suspension (amoxicillin 600 mg/clavulanate 42.9 mg/5mL) 30 mg/kg/dose of amoxicillin TID (preferred for moderate/severe disease)	1000 mg
	PO	Tablet (amoxicillin 875 mg/clavulanate 125 mg per tablet) for weight ≥40 kg 875 mg of amoxicillin BID	875 mg
	PO	Chewable tablet (amoxicillin 400 mg/clavulanate 57 mg per tablet) for weight ≥40 kg 800 mg of amoxicillin BID	800 mg
Ampicillin	IV	50 mg/kg/dose Q6H	2000 mg
Ampicillin/sulbactam	IV	50 mg/kg/dose Q6H	2000 mg
Cefdinir	PO	7 mg/kg/dose BID	300 mg
Ceftriaxone	IV	75 mg/kg/dose Q24H	2000 mg
Clindamycin	PO	10 mg/kg/dose TID	600 mg
	IV	13.3 mg/kg/dose Q8H	900 mg
Levofloxacin	IV/PO	≥6 months to <5 years 10 mg/kg/dose BID	375 mg
		≥5 years 10 mg/kg/dose Q24H	750 mg

*For patients <12 years of age, consider the use of amoxicillin-clavulanate suspension to achieve higher doses of amoxicillin

Mild Tachypnea in Children	
Age	Respiratory Rate
3-11 months	51-59
12-23 months	41-44
2-3 years	35-39
4-5 years	31-35
6-12 years	27-30
≥13 years	24-27

Abbreviations			
Abbreviation	Terminology	Abbreviation	Terminology
BID	Twice a day	mL	Milliliter
BMI	Body mass index	PC	Primary Care
DE	Delaware	PCN	Penicillin
DV	Delaware Valley	PCP	Primary Care Physician
ED	Emergency Department	PO	By mouth
FL	Florida	PRN	As needed
HiB	Haemophilus Influenzae type B	Q6H	Every 6 hours
IgE	Immunoglobulin E	Q8H	Every 8 hours
IM	Intramuscular	Q24H	Every 24 hours
IV	Intravenous	SpO2	Peripheral Oxygen Saturation
kg	Kilogram	TID	Three times a day
mg	Milligram	UC	Urgent Care

Disclaimer: The clinical pathways are based upon publicly available medical evidence and/or a consensus of medical practitioners at Nemours Children's Health ("Nemours") and are current at the time of publication. These clinical pathways are intended to be a guide for practitioners and may need to be adapted for each specific patient based on the practitioner's professional judgment, consideration of any unique circumstances, the needs of each patient and their family, and/or the availability of various resources at the health care institution where the patient is located.

VERSION MANAGEMENT

- Version 1.0 (10/24/2023): Go Live.
- Version 2.0 (7/28/2026): Look back review completed - updates made as appropriate including dosage for ceftriaxone and inclusion of viral cause and observation/waiting guidance.

Questions about this pathway should be directed to **clinicalpathways@nemours.org**.

AUTHORS & REFERENCES

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