Community Acquired Pneumonia

Viruses are the leading cause of pneumonia in healthy young children, followed by bacteria and rarely, other organisms. This document focuses on uncomplicated community acquired pneumonia (CAP).

Initial Assessment

HISTORY & PHYSICAL EXAMINATION

- Signs and symptoms cannot be used to differentiate etiology of CAP.
- Relevant history includes: cough, nasal congestion, shortness of breath, wheezing, abdominal or chest pain, presence and duration of fever, oral intake, urine output, vomiting, and sick contacts.
- While no individual examination finding is sensitive or specific for making the diagnosis,[1] hypoxemia and work of breathing have better correlation with radiographic pneumonia than other findings. Published clinical prediction rules suggest that combinations of findings (age, fever duration, hypoxemia, rales, diminished breath sounds) may be more useful than individual findings, but these rules require validation.[2,3]
- Wheezing is negatively associated with radiographic pneumonia.[4]

IMAGING

- For children with mild CAP (i.e., no substantial respiratory distress or hypoxemia) or where the history and physical are more suggestive of bronchiolitis (i.e., children <2 years old with symptoms of an upper respiratory infection and diffuse coarse breath sounds or wheezing), imaging is not indicated as it does not change outcomes and leads to antimicrobial overuse. Refer to **TREKK Recommendations on Bronchiolitis**.
- Chest radiography (CXR) should be obtained if:
    - the diagnosis of CAP is uncertain,
    - there is concern for complicated pneumonia,
    - and/or the patient requires hospitalization.
- In outpatients, it is reasonable to treat empirically without CXR when clinical suspicion is high.
- Intra- and inter-rater reliability for the identification of streaky or interstitial infiltrates on CXR is limited, though reliability is better for lobar consolidations.
- Children with no infiltrate on CXR are extremely unlikely to have CAP. The presence of an infiltrate on CXR does not necessarily mean that the child has bacterial disease.[5]
- Chest ultrasound may serve a role in diagnosing CAP and may be a suitable replacement for CXR in the presence of a trained provider.[6] Ultrasound can identify and characterize parapneumonic effusions and empyemas.

BLOOD TESTING

- Laboratory testing (e.g., complete blood count, C-reactive protein, or procalcitonin) is not helpful in the diagnosis of CAP but may be helpful in cases where CXRs are indeterminate or to assist with prognostication, particularly for hospitalized patients.
- Blood cultures are not advised for patients with CAP unless they are ill-appearing or require hospitalization with moderate to severe disease, due to the low yield of pathogenic bacteria and risk of contaminated culture in most children with CAP.[7]

Disposition

- Most children with CAP can be managed as outpatients.[7]
- The presence of older age, abnormal vital signs for age, impaired oxygenation, significant retractions, prolonged capillary refill, and medical comorbidities are associated with greater disease severity.[8,9]
- Consult Pediatrics/Pediatric Referral Centre/Transport Team as required.

Discharge Home	Admission to Hospital	Admission to PICU
– Normal vital signs – O_2 saturation >90% in room air – Ability to tolerate PO medication – No/minimal respiratory distress – Ability to maintain hydration – Ability to access follow up as required	– O_2 saturation <90% in room air – Need for IV/NG hydration – Inability to tolerate PO medication – Increased/moderate respiratory distress (e.g., significant retractions, grunting) – Significant parapneumonic effusion/empyema – Concerns regarding access to follow up ***Other features to consider:*** – Younger than 3 months – Complex underlying medical problem(s) (e.g., sickle cell disease (**TREKK Recommendations on Sickle Cell Disease**), immunosuppression/deficiency, neuromuscular disease, tracheostomy))	– Need for non-invasive or positive pressure ventilatory support – Impending respiratory failure (e.g., decreased level of consciousness, lethargy, cyanosis, decreased respiratory effort, rising PCO_2) – Hypotension, inadequate perfusion – Septic shock – Altered mental status
The above are suggested guidelines for disposition and are subject to clinician discretion.		

Antimicrobial Treatment

- Most cases of CAP in preschool children well enough to be managed as outpatients are viral in origin. In such cases, **mild CAP should be treated with supportive care and does not necessarily require antibiotics.**[7]
- When antibiotics are prescribed for CAP, the following are recommended:

Clinical Scenario	Antibiotic	Notes
Outpatient	Amoxicillin 45 mg/kg/day PO divided TID **-OR-** 90 mg/kg/day PO divided TID or BID (MAX 3 – 4 g/day)*	Amoxicillin is first-line treatment for CAP. Treat for 5 days.[10,11]
Hospitalized	Ampicillin 200 mg/kg/day IV divided q6h (MAX 8 g/day)	IV ampicillin is first-line if unable to tolerate amoxicillin/need hospitalization.
For known penicillin allergy or if prior life-threatening allergy refer to **TREKK CAP Antimicrobial Treatment table**.		

*Use higher range of dosing divided TID in regions with higher rates of pneumococcal resistance to beta-lactams.

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