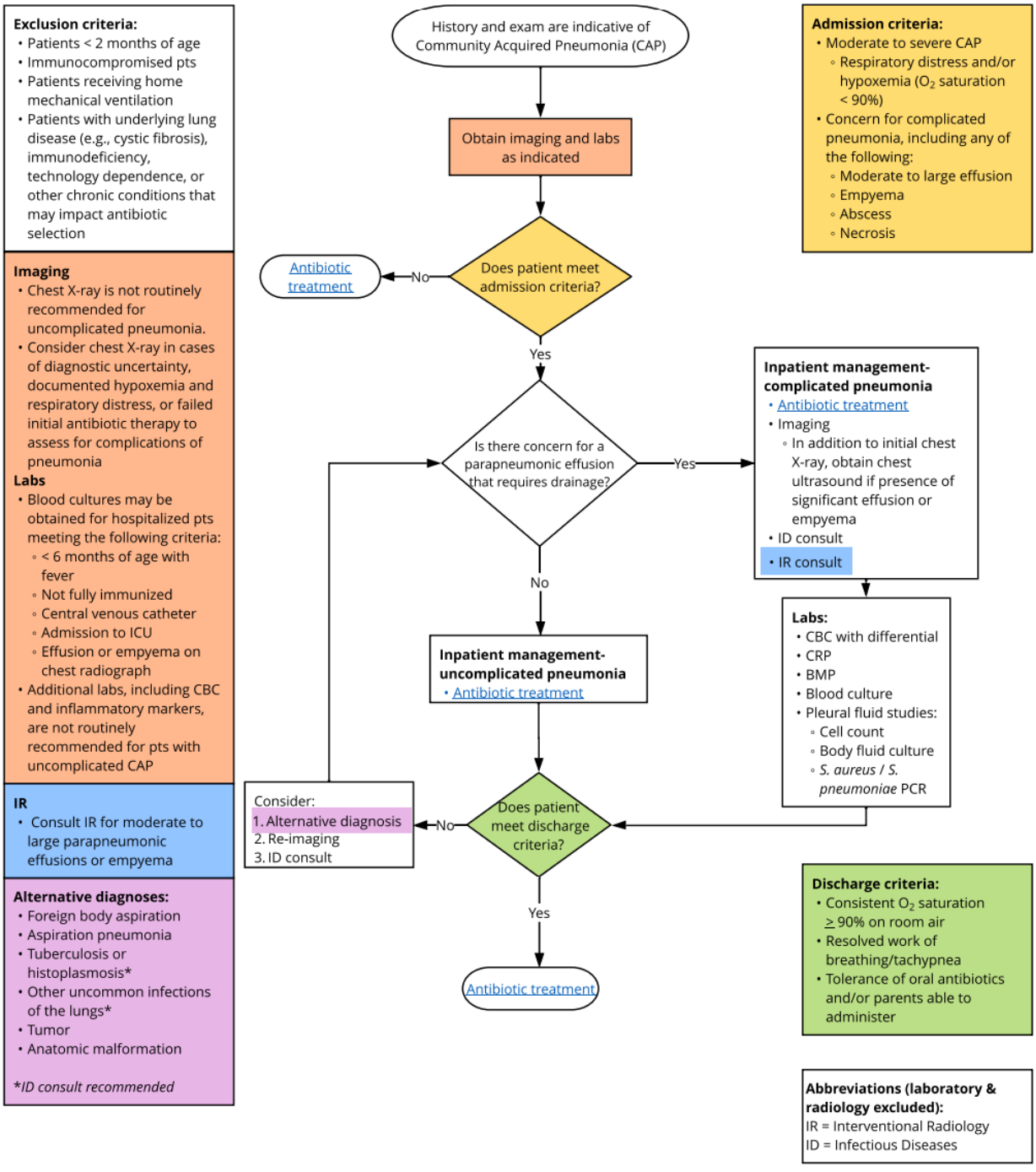
Community Acquired Pneumonia
Clinical Pathway Synopsis

Community Acquired Pneumonia Algorithm



** These clinical pathways do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time. It is impossible to anticipate all possible situations that may exist and to prepare a clinical pathway for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.*

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Objective of Clinical Pathway

The objective of the Community Acquired Pneumonia Clinical Pathway is to provide standards of care for patients presenting with community acquired pneumonia (CAP). The aim of this pathway is to minimize variation of care through guidance for evaluation and treatment for complicated and uncomplicated CAP.

Background/Epidemiology

CAP is a lower respiratory tract infection that is acquired outside of a hospital setting. In the US, CAP accounts for millions of outpatient visits and is one of the most prevalent and costly indications for hospitalization (Gill et al., 2021; Katz & Williams, 2018). Globally, CAP remains a leading cause of death for children under 5-years-old (WHO, 2022). Patients with CAP frequently experience fever, cough, tachypnea, and increased work of breathing. Physical examination may demonstrate cough, signs of respiratory distress (e.g., tachypnea, grunting, nasal flaring, or retractions), and findings on auscultation (e.g., decreased breath sounds, crackles, rales). The diagnosis of CAP can be made clinically, with chest radiographs reserved for cases of diagnostic uncertainty with a high clinical suspicion or those requiring hospitalization to assess for complicated disease (e.g., effusion, empyema, or necrotizing pneumonia). CAP is caused by several pathogens including viruses and bacteria. Among bacterial etiologies, *S. pneumoniae* remains the most frequently identified pathogen (Popovsky et al., 2022). Other common bacterial etiologies include non-typable *H. influenzae*, *S. pyogenes*, and *S. aureus*.

Target Users

- Physicians (Urgent Care, Emergency Medicine, Hospital Medicine, Ambulatory, Fellows, Residents)
- Nurse Practitioners
- Nurses

Target Population

Inclusion Criteria

- Patients ≥ 2 months with a clinical exam indicative of CAP

Exclusion Criteria

- Patients < 2 months of age
- Immunocompromised patients
- Patients receiving home mechanical ventilation
- Patients with chronic conditions or underlying lung disease (such as cystic fibrosis)

AGREE II

The Pediatric Infectious Diseases Society (PIDS) and the Infectious Diseases Society of America (IDSA) national guideline provided guidance to the Community Acquired Pneumonia Committee (Bradley et al., 2011). See Table 1 for AGREE II.

Table 1

AGREE II[a] Summary for the The Management of Community-Acquired Pneumonia in Infants and Children Older than 3 Months of Age: Clinical Practice Guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America, Bradley et al. (2011)

Domain	Percent Agreement	Percent Justification^
Scope and purpose	96%	The aim of the guideline, the clinical questions posed, and target populations **were** identified.
Stakeholder involvement	65%	The guideline **was developed** by the appropriate stakeholders and represents the views of its intended users. However, the guideline **did not** include review by other appropriate stakeholders (such as patients and families).
Rigor of development	56%	The process used to gather and synthesize the evidence, the methods to formulate the recommendations and to update the guidelines **were** explicitly stated. The guideline developers **did not** provide how the guidelines will be updated.
Clarity and presentation	94%	The guideline recommendations **are** clear, unambiguous, and easily identified; in addition, different management options are presented.

Applicability	38%	The guideline **did not** completely address implementation barriers and facilitators, utilization strategies, nor resource costs associated implementation.
Editorial independence	65%	The recommendations **were not** biased with competing interests.
See Practice Recommendations		

Note: Four EBP Scholars completed the AGREE II on this guideline.
^Percentage justification is an interpretation based on the Children's Mercy EBP Department standards.

Practice Recommendations

Please refer to The Management of Community-Acquired Pneumonia in Infants and Children Older than 3 Months of Age: Clinical Practice Guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America (Bradley et al., 2011) for full practice recommendations, evaluation, and treatment recommendations. Of note, the 2011 guideline is archived, and a new guideline is in development.

Additional Questions Posed by the Clinical Pathway Committee

In pediatric patients with uncomplicated community-acquired pneumonia (CAP), is three days of antibiotic treatment noninferior to a longer duration for clinical cure?

Updates from Previous Versions of the Clinical Pathway

- Inclusion and exclusion criteria were added.
- Admission and discharge criteria have been added.
- Clarification is provided to determine when imaging is needed, and which labs should be collected.
- Recommendations for antibiotic treatment length for non-hospitalized patients with uncomplicated, mild or moderate pneumonia have been changed from 5 -7 days to 3 – 5 days.

Recommendation Specific for Children's Mercy

Children's Mercy adopted most of the practice recommendations made by the PIDS/IDSA Clinical Practice Guideline (Bradley et al, 2011). Variations include:

- *For patients with uncomplicated, mild, or moderate CAP, a strong recommendation is made for a shorter course of antibiotic treatment (3-5 days) for patients < 5 years of age. Considerations for longer antibiotic treatment (5 – 7 days) should be made for hospitalized patients with CAP or patients ≥ 5 years of age. Data on shorter courses for hospitalized children or children > 5 years old are not as robust. Generally, 5 days is sufficient in most cases of uncomplicated CAP. See Critically Appraised Topic for substantiation of recommendations.*
- Though the PIDS/IDSA CAP guidelines state their document was developed for patients older than 3 months of age, this clinical pathway includes patients older than 2 months of age to align with the CMH Febrile Infant Clinical Pathway.

Measures

- Utilization of the Community Acquired Pneumonia Clinical Pathway
- Antibiotic utilization including narrow-spectrum antibiotic use concordant with the clinical pathway
- Antibiotic duration

Value Implications

The following improvements may increase value by reducing healthcare costs and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families and reducing costs and resource utilization for healthcare facilities.

- Decreased risk of overdiagnosis/underdiagnosis of complicated CAP
- Decreased risk of overtreatment (i.e., longer duration of antibiotics than what is necessary)
- Decreased frequency of admission
- Decreased inpatient length of stay
- Decreased unwarranted variation in care

Organizational Barriers and Facilitators

Potential Barriers

- Variability of acceptable level of risk among providers
- Challenges with follow-up faced by some families

Potential Facilitators

- Collaborative engagement across care continuum settings during clinical pathway development
- High rate of use of the clinical pathway
- Standardized order set for Urgent Care Clinic, Emergency Department, Hospital Medicine, and Pediatric Intensive Care

Diversity/Equity/Inclusion

Our aim is to provide equitable care. These issues were discussed with the Committee, reviewed in the literature, and discussed prior to making any practice recommendations.

Power Plans

- ED: EDP Community Acquired Pneumonia (CAP) Pathway
- Inpatient: Pneumonia Inpatient Pathway

Associated Policies

- There are no policies associated with this pathway.

Education Materials

- There are no educational materials associated with this pathway.

Clinical Pathway Preparation

This pathway was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Community Acquired Pneumonia Clinical Pathway Committee composed of content experts at Children's Mercy Kansas City. Literature analysis for additional questions posed by the Community Acquired Pneumonia Committee was performed by EBP Scholars and the EBP team. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

Community Acquired Pneumonia Clinical Pathway Committee Members and Representation

- Jessica Markham, MD, MSc | Hospital Medicine | Committee Chair
- Stephanie Bolger Theut, DO | Radiology | Committee Member
- Alaina Burns, PharmD | Pharmacy | Committee Member
- Marsha Dannenberg, MD | Urgent Care | Committee Member
- Megan Gubichuk, MD | Pulmonology | Committee Member
- Josh Herigon, MD, MPH, MBI | Infectious Diseases | Committee Member
- Sobia Khan, MD | General Academic Pediatrics | Committee Member
- Frances Turcotte-Benedict, MD, MPH, FAAP | Emergency Medicine | Committee Member

Patient/Family Committee Member

- Kirsten Finn | Committee Member
- Rachel Rolf | Committee Member

EBP Committee Members

- Todd Glenski, MD, MSHA, FASA | Anesthesiology, Evidence Based Practice
- Megan Gripka, MT (ASCP) SM | Evidence Based Practice

Clinical Pathway Development Funding

The development of this clinical pathway was underwritten by the following departments/divisions:

- Hospital Medicine
- Infectious Diseases
- Emergency Medicine
- General Academic Pediatrics
- Urgent Care
- Pulmonology
- Radiology
- General Academic Pediatrics
- Evidence Based Practice

Conflict of Interest

The contributors to the Community Acquired Pneumonia Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed.

Approval Process

- This pathway was reviewed and approved by the Community Acquired Pneumonia Committee, Content Expert Departments/Divisions, and the EBP Department; after which they were approved by the Medical Executive Committee.
- Pathways are reviewed and updated as necessary every 3 years within the EBP Department at CMKC. Content expert teams are involved with every review and update.

Review Requested

Department/Unit	Date Obtained
Hospital Medicine	February 2024
Infectious Diseases	February 2024
Emergency Medicine	February 2024
General Academic Pediatrics	February 2024
Urgent Care	February 2024
Radiology	February 2024
Pharmacy	February 2024
Pulmonology	February 2024
Evidence Based Practice	January 2024

Version History

Date	Comments
October 2018	Version one – Development of pathway to standardize care of patients with CAP utilizing the PIDS/IDSA Clinical Practice Guideline (Bradley et al., 2011)
March 2020	Version two – Update pathway with guidance for imaging, lab testing (including CBC, CRP, procalcitonin, ESR, blood cultures and viral testing), antibiotic selection, dosing, and duration, and clinical considerations for diagnosis of atypical pneumonia
February 2024	Version three- Update antibiotic duration for non-hospitalized patients with uncomplicated CAP based on review of current literature

Date for Next Review

- January 2027

Implementation & Follow-Up

- Once approved, the pathway was presented to appropriate care teams and implemented. Care measurements will be assessed and shared with appropriate care teams to determine if changes need to occur.
- Order sets/power plans consistent with recommendations were updated for each care setting
- "Quick Orders" were updated for Urgent Care and Emergency Department.
- Education was provided to all stakeholders:

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  - Providers from the departments of Hospital Medicine, Infectious Diseases, Emergency Medicine, Urgent Care, Radiology, and Pulmonology
  - Resident physicians
- Additional institution-wide announcements were made via email, hospital website, and relevant huddles.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the power plan(s) that accompany the clinical pathway.

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