



OHSU HEALTH
Pneumonia Empiric Antibiotic Guidelines - Adult

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Reviser (Title): Antimicrobial Subcommittee of CKTEC	Owner (Title): CKTEC	

PURPOSE:

To provide guidance on empiric antibiotic selection for adult patients with bacterial pneumonia.

PERSONS AFFECTED:

This procedure applies to OHSU workforce members involved in prescribing, dispensing or administering antibiotics for the treatment of pneumonia.

DEFINITIONS:

- CAP: Community-acquired pneumonia
- DRESS: Drug reaction with eosinophilia and systemic symptoms
- HAP: Hospital-acquired pneumonia
- MRSA: Methicillin-resistant *Staphylococcus aureus*
- VAP: Ventilator-associated pneumonia
- RSV: Respiratory syncytial virus

GUIDELINE REQUIREMENTS:

Refer to Table 1 below.

RELEVANT REFERENCES:

- Metlay JP et al. 2019. Diagnosis and treatment of adults with community-acquired pneumonia. An official clinical practice guideline of the American Thoracic Society and Infectious Diseases Society of America. *Am J Respir Crit Care Med.* 200(7): e45-e67.
- Kalil AC et al. 2016. Management of adults with hospital-acquired and ventilator-associated pneumonia: 2016 clinical practice guidelines by the Infectious Diseases Society of America and the American Thoracic Society. *Clin Infect Dis.* 63(5): e61–e111.
- Parente DM, Cunha CB, Mylonakis E, Timbrook TT. 2018. The clinical utility of methicillin-resistant *Staphylococcus aureus* (MRSA) nasal screening to rule out MRSA pneumonia: a diagnostic meta-analysis with antimicrobial stewardship implications. *Clin Infect Dis.* 67(1): 1-7.

APPROVING COMMITTEE(S):

Antimicrobial Subcommittee of CKTEC
 CKTEC

Table 1. Bacterial pneumonia empiric antibiotic guidelines

Community-Acquired Pneumonia (CAP)				Hospital-Acquired Pneumonia (HAP) Ventilator-Associated Pneumonia (VAP)
Severity	Outpatient Low-Risk	Outpatient High-Risk	Inpatient	
Pathogens	<ul style="list-style-type: none"> Common causes of CAP include: <i>Streptococcus pneumoniae</i>, <i>Haemophilus influenzae</i>, <i>Moraxella catarrhalis</i>, <i>Mycoplasma pneumoniae</i>, <i>Chlamydia pneumoniae</i>, respiratory viruses <i>Legionella</i> is not a common outpatient CAP pathogen MRSA and <i>Pseudomonas</i> are not common CAP pathogens 			MRSA, <i>Pseudomonas</i> , other aerobic gram-negative bacilli (e.g., <i>E. coli</i> , <i>Klebsiella pneumoniae</i>)
Risk Factors	<ul style="list-style-type: none"> High-risk group includes age >64; recent antibiotic use; chronic disease of heart, lungs, liver, kidneys; diabetes mellitus; alcoholism; malignancy; asplenia 			<ul style="list-style-type: none"> HAP: not present on admission and occurs >48h after admission VAP: occurs after >48h intubation
Labs	<ul style="list-style-type: none"> Check sputum culture and blood cultures for patients with severe CAP and patients with risk factors for or empirically treated for MRSA and/or <i>Pseudomonas</i> Check urine pneumococcal and <i>Legionella</i> antigens for severe CAP Check urine <i>Legionella</i> antigen if risk factors present (recent outbreak or travel) Test for respiratory viruses during seasonal epidemics (e.g. influenza, RSV) and COVID-19 			<ul style="list-style-type: none"> Check pre-treatment blood cultures, respiratory culture Check MRSA nasal PCR in patients started on empiric MRSA coverage – it has 96.5% NPV for MRSA pneumonia³ Recommend early re-assessment and de-escalation of antibiotics based on culture and nasal MRSA PCR results
Preferred Agent	Amoxicillin 1g PO TID	Amoxicillin-clavulanate 875/125mg PO TID OR Cefuroxime 500 mg BID OR Cefpodoxime 200mg BID PLUS EITHER	Ceftriaxone 2g IV daily AND Azithromycin 500mg PO daily x 3 days	Cefepime 2g IV Q8h AND Vancomycin IV, pharmacy to dose
Potential Alternative Agent(s)	Doxycycline 100mg PO BID	Azithromycin 500mg PO daily x 3 days OR Doxycycline 100mg PO BID	<i>Replace ceftriaxone with:</i> Ampicillin-sulbactam 3g IV q6 hrs <i>In NON-SEVERE CAP ONLY*, may replace azithromycin with: doxycycline 100 mg PO BID x5 days</i>	<ul style="list-style-type: none"> Piperacillin-tazobactam may be used in place of cefepime Caution that the combination of vancomycin and piperacillin-tazobactam is associated with nephrotoxicity, especially when used for >48-72h Please contact ID or ID/stewardship pharmacist if an alternative to vancomycin is needed
Additional Comments	<ul style="list-style-type: none"> Consider covering MRSA or <i>Pseudomonas</i> for inpatients if one of the following is present: <ul style="list-style-type: none"> Isolation of MRSA and/or <i>Pseudomonas</i> on culture, especially a respiratory culture, within the past year Hx of hospital admission AND receipt of IV antibiotics within the past 90d For empiric MRSA coverage: add vancomycin, pharmacy to dose For empiric <i>Pseudomonas</i> coverage: use cefepime 2g Q8h in place of ceftriaxone 			
Duration	<ul style="list-style-type: none"> Usual duration: 5 days (azithromycin's long half-life allows it to be dosed for three days) A longer duration may be needed if there is inadequate clinical response or in those with complications (e.g., empyema, lung abscess) Clinical failure or rapid recurrence should prompt workup for unusual pathogens and alternative diagnoses. 			<ul style="list-style-type: none"> Usual duration: 7 days
Clinical Pearls	<p>*In severe CAP where azithromycin is contraindicated, may substitute levofloxacin 750mg daily x 5d but this may have a higher mortality risk. If the patient does not meet ATS/IDSA criteria for severe CAP (see Table 1), substitute with doxycycline instead.</p> <p># Azithromycin monotherapy for low-risk outpatients with CAP should only be used if other agents are contraindicated.</p> <p># Respiratory fluoroquinolones should only be used for non-severe CAP if there is a severe beta-lactam allergy (e.g., anaphylaxis, DRESS).</p> <p># Anaerobic coverage not routinely needed for aspiration but is appropriate for lung abscess or empyema.</p>			



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REVISION HISTORY

Revision History Table

Document Number and Revision Level	Final Approval by	Date	Brief description of change/revision
HC-CKT-175-GUD Rev. 030221	CKTEC	02/25/2021	<ul style="list-style-type: none">• New guideline xreated