Suspected Bacterial Pneumonia in Adult Patients (Solid Tumors)

Disclaimer: *This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. Local microbiology and susceptibility/resistance patterns should be taken into consideration when selecting antibiotics. This algorithm should not be used to treat pregnant women.*

ASSESSMENT

History, physical exam, lab data[1], and imaging[2] compatible with pneumonia[3]

TREATMENT [5]

Outpatient[4]

- Amoxicillin-clavulanate **plus** (doxycycline or azithromycin) **or**
- Cefpodoxime **plus** (doxycycline or azithromycin) **or**
- Levofloxacin

Inpatient non-ICU

Patient not high risk[6] or neutropenic

- Ceftriaxone **plus** (doxycycline or azithromycin)[7] **or**
- Levofloxacin

High risk[6] or neutropenic

- Cefepime[8] **plus** (doxycycline or azithromycin)[7] **plus** (vancomycin or linezolid) **or**
- If anaphylaxis/serious allergy to both cephalosporins and penicillins: aztreonam **plus** levofloxacin **plus** (vancomycin or linezolid)

Suspicion of post-obstructive pneumonia/ aspiration, or known structural lung abnormalities

- Piperacillin-tazobactam[8] **plus** (doxycycline or azithromycin)[7] **plus** (vancomycin or linezolid)[9] **or**
- Cefepime[8] **plus** metronidazole **plus** (doxycycline or azithromycin)[7] **plus** (vancomycin or linezolid) **or**
- If anaphylaxis/serious allergy to both cephalosporins and penicillins: aztreonam **plus** metronidazole **plus** levofloxacin **plus** (vancomycin or linezolid)

ICU

- Cefepime[8] **plus** (azithromycin or levofloxacin)[7] **plus** (vancomycin or linezolid)
  - If anaphylaxis/serious allergy to both cephalosporins and penicillins: **Switch** to aztreonam **plus** levofloxacin **plus** (vancomycin or linezolid)
  - If requiring mechanical ventilation or vasopressors: **consider** adding amikacin
  - If suspicion of post-obstructive pneumonia/aspiration, or known structural lung abnormalities, either:
    - **Add** metronidazole if cefepime or aztreonam is used **or**
    - **Use** piperacillin-tazobactam[8] instead of cefepime

EVALUATION

Day 3 reassessment:

- Negative MRSA swab without post-obstructive pneumonia: discontinue vancomycin or linezolid
- Non-neutropenic only: if procalcitonin < 0.25 or decreased at least 80% from peak, positive viral swab and negative bacterial culture: consider discontinuing antibiotics (likely isolated viral pneumonia)
- Modify beta lactam and stop aminoglycoside (if used) based on culture and susceptibility results

Days 5-10 reassessment:

- Non-neutropenic patients only:
  - If vital signs are normal or returned to baseline and clinically stable: discontinue antibiotics
  - If any of the vital signs are abnormal, but procalcitonin < 0.25 or decreased at least 80% from peak: consider discontinuing antibiotics

If proven post-obstructive pneumonia, cavitary abnormality, or neutropenic: treat according to clinical course[9]

[1] Lab data: sputum culture, Methicillin-resistant *S. aureus* (MRSA) nasal swab, respiratory multiplex PCR panel, serum procalcitonin for 3 days, blood cultures (from peripheral site and each existing lumen of CVC or two peripheral cultures if no CVC present). *Legionella* and *Streptococcus* urine antigen for patients admitted in the ICU.

[2] Chest X-ray (for all neutropenic patients or those with structural lung disease, substitute with CT chest). Consider baseline electrocardiogram (EKG).

[3] Empiric treatment selection should consider prior culture history, antibiotic exposure, and allergies. In case of carbapenem-resistant or other multidrug-resistant organism history, obtain Infectious Diseases consultation.

[4] Appropriate for outpatient treatment: clinically stable, sound mentation, non-neutropenic, ability to take oral medications, no history of drug-resistant pathogens and not treated for bacterial infection in last 90 days. Consider hospitalization for Community Acquired Pneumonia (CAP) patients based on clinical judgement and those with Pneumonia Severity Index (PSI) class 3-5 (≥ 71 points).

[5] Refer MD Anderson Cancer Center Adult Antimicrobial Dosing Guide (internal use only) for dosing recommendations

[6] High risk: hospitalization for ≥ 2 days in the last 90 days, received parenteral antibiotics in the last 90 days, or colonization with multidrug resistant organisms

[7] Atypical coverage is not required if pneumonia onset is ≥ 48 hours after admission

[8] Replace with meropenem for patients with history of extended spectrum beta-lactamase (ESBL) - producing pathogens

[9] Consider pulmonary medicine consultation for bronchoscopy with bronchoalveolar lavage if clinically warranted

Department of Clinical Effectiveness V6
Approved by the Executive Committee of the Medical Staff on 12/17/2024

SUGGESTED READINGS

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DEVELOPMENT CREDITS

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