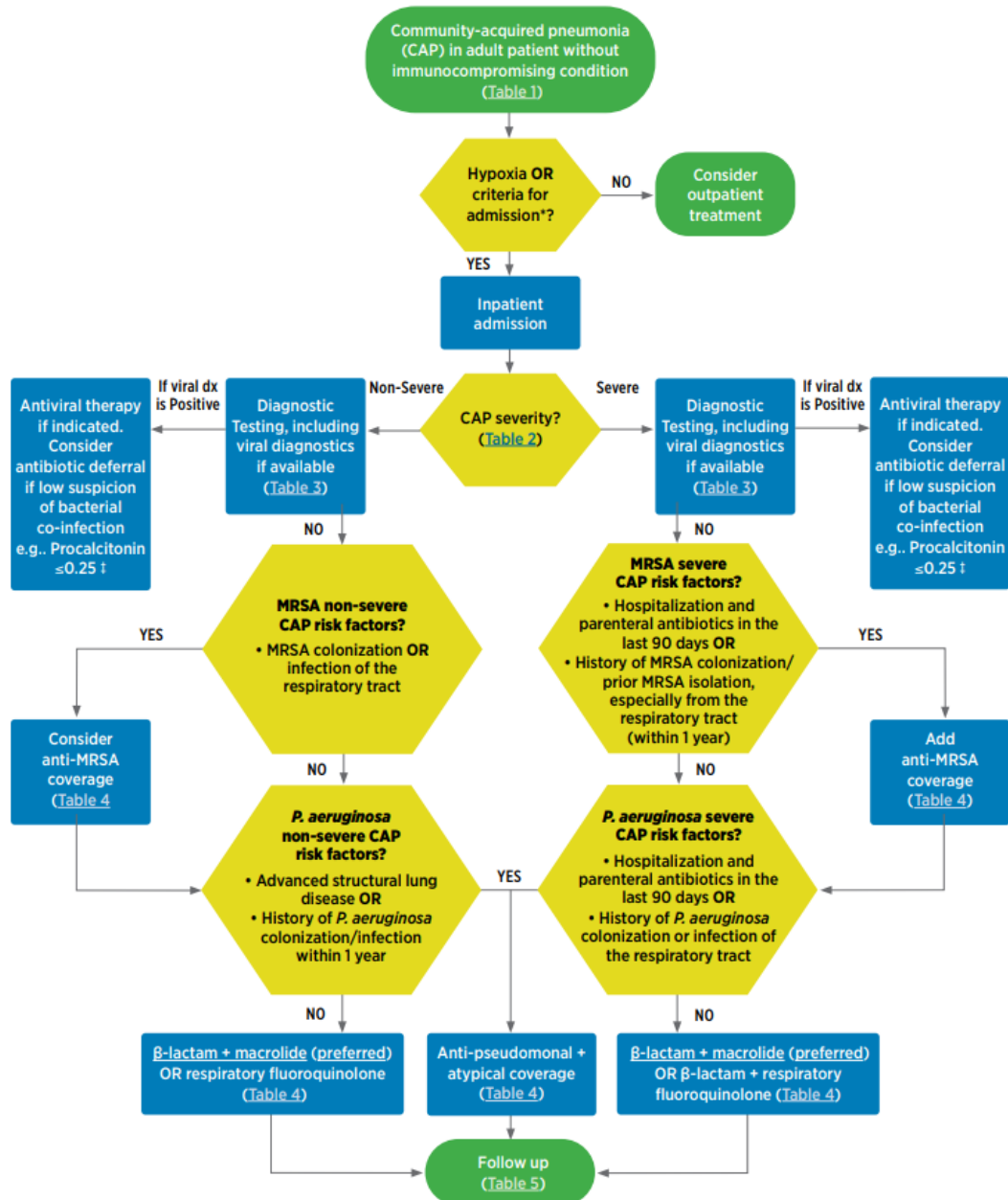


Stony Brook University Hospital Treatment Guidelines:
Management of Community Acquired Bacterial Pneumonia (CABP) in Adult Patients



*e.g. CURB-65, PSI
† This is a clinical practice enhancement to the ATS/IDSA CAP clinical practice guideline

<https://www.idsociety.org/globalassets/idsa/practice-guidelines/community-acquired-pneumonia-in-adults/cap-clinical-pathway-final-online.pdf>

1. Background

1. SBUH has incorporated national guidelines in its creation of hospital-wide treatment guidelines for the management of CABP in adult patients to guide appropriate antibiotic use.

2. Definitions¹

1. Pneumonia: Infection of the pulmonary parenchyma characterized by the filling of the alveoli with fluid
 - i. Can result if there is a defect in the host's defense or if the host's defense is overcome by high inoculum or virulence
2. Community-acquired bacterial pneumonia: Pneumonia acquired either from the community setting or that occurs within 48 hours of a hospital admission, from a confirmed or presumed bacterial etiology

3. Symptoms²

1. Fever, chills, cough, dyspnea, pleuritic chest pain, headache, myalgia

4. Diagnosis²

1. Identification of infiltrate or effusion on chest radiograph or other imaging technique with clinical symptoms of pneumonia
2. Pre-treatment gram stains, respiratory secretion cultures, and blood cultures are recommended in the hospital setting only in certain situations
 - i. Severe CABP, especially if intubated
 - ii. Risk factors for methicillin-resistant *S. aureus* (MRSA) or *P. aeruginosa*

5. Risk Factors for MRSA or *P. aeruginosa*

1. Prior respiratory isolation of MRSA or *P. aeruginosa*
2. Recent hospitalization **and** parenteral antibiotics in the last 90 days

6. Severity Classification of CABP²

1. If patients do **not** meet these criteria, they are considered to have non-severe CABP

Table 1. Criteria for Defining Severe CABP

Either 1 Major Criterion OR ≥ 3 Minor Criteria

Major Criteria

1. Septic shock with need for vasopressors
2. Respiratory failure requiring mechanical ventilation

Minor Criteria

1. Respiratory rate ≥ 30 breaths/min
2. $\text{PaO}_2/\text{FiO}_2 \leq 250$
3. Multilobar infiltrates
4. Confusion or disorientation
5. Uremia ($\text{BUN} \geq 20$ mg/dL)
6. Leukopenia ($\text{WBC} < 4,000$ cells/ μL)
7. Thrombocytopenia (platelets $< 100,000/\mu\text{L}$)
8. Hypothermia (temperature $< 36^\circ\text{C}$)
9. Hypotension requiring aggressive fluid resuscitation

7. Criteria for IV to PO conversion

Table 2. Criteria for IV to PO conversion

Criteria for IV to PO Conversion

1. Heart rate < 100 beats/min
2. Respiratory rate < 20 breaths/min
3. Blood pressure stable
4. Temperature $< 38^\circ\text{C}$ for 24 hours
5. $\text{WBC} < 15,000$ cells/ μL
6. Hemodynamically stable
7. Patient able to tolerate PO medications

8. Antibiotic Selection²

1. SBUH Antibiogram Data

- i. Please consult SBUH Antibiogram for institutional susceptibility patterns when selecting therapy (<https://renaissance.stonybrookmedicine.edu/medicine/asp>)
2. **Table 3** lists treatment options for empiric therapy in adult patients with CABP.
 - i. Ceftriaxone with either azithromycin or doxycycline is the preferred treatment for non-severe CABP
 1. Doxycycline may be used instead of azithromycin in persons with a known history of cardiac arrhythmia or prolonged QTc intervals on ECG
 - ii. Fluoroquinolone monotherapy may be considered in persons with suspected or confirmed *Legionella* infection
3. If patient has risk factors for (refer to Section 5) OR a known history of infection with MRSA or *P. aeruginosa*, please refer to **Table 4** for targeted treatment options
 - i. If MRSA surveillance results with no growth, MRSA coverage can be de-escalated
 - ii. If microbiology results without isolation of these organisms, broad coverage can be de-escalated as treatment regimen should be targeted based on microbiological results
4. Addition of anaerobic coverage (i.e. metronidazole) is **not recommended** for suspected aspiration pneumonia
5. Use of broad-spectrum antibiotic coverage such as meropenem, piperacillin-tazobactam, and cefepime is usually **not** needed for CABP treatment if the patient has recent healthcare system exposure (i.e. nursing home, hemodialysis)
 - i. Use of a validated clinical decision support tool such as the Drug Resistance in Pneumonia (DRIP) score (<https://www.mdcalc.com/calc/4050/drug-resistance-pneumonia-drip-score>) is recommended
6. Recommended treatment duration for most CABP patients is **5-7 days**

9. Vaccination

1. If the patient is not up-to-date with their vaccinations for respiratory pathogens (*Streptococcus pneumoniae*, influenza, SARS-CoV-2, RSV) they should be offered prior to hospital discharge or advised to obtain as an outpatient
 - i. Per New York Public Health Law §2805-h, vaccines for influenza and pneumococcal disease must be offered to all admitted patients age 65 or older
2. Providers should refer to the ACIP vaccination schedule for age appropriate and comorbidity related recommendations
 - i. <https://www.cdc.gov/vaccines/schedules/hcp/index.html>
3. Vaccines available in the hospital
 - i. *S. pneumoniae* (PCV20)
 - ii. Influenza
 - iii. SARS-CoV-2

Table 3. Antibiotic Selection for Empiric Therapy in Adults with CABP and NO Risk Factors for MRSA or *P. aeruginosa*

Non-Severe CABP
Ceftriaxone 1 g IV Q24 + Azithromycin 500 mg IV /PO Q24
Severe CABP
Ceftriaxone 1-2 g IV Q24 + Azithromycin 500 mg IV/PO Q24
IV to PO Conversion for Non-Severe or Severe CABP
Amoxicillin/clavulanate 875/125 mg PO BID <u>OR</u> Cefpodoxime 200 mg PO BID + Azithromycin 500 mg PO Q24

^aFor severe beta-lactam allergy, consider **levofloxacin 750 mg IV Q24**

^bCan be substituted for **doxycycline 100 mg IV/PO BID**

^cCan be substituted for **doxycycline 100 mg PO BID**

Table 4. Antibiotic Selection for Empiric Therapy in Adults with CABP and Risk Factors for MRSA or *P. aeruginosa*

Non-Severe CABP		
Recent hospitalization & parenteral antibiotics in the last 90 days^a	Prior respiratory isolation of MRSA^b <u>OR</u> MRSA nasal PCR positive^b	Prior respiratory isolation of <i>P. aeruginosa</i>
<p>Ceftriaxone 1-2 g IV Q24 + Azithromycin^e 500 mg IV/PO Q24 x 3 days</p>	<p>Ceftriaxone 1-2 g IV Q24 + Azithromycin^e 500 mg IV/PO Q24 x 3 days + Vancomycin See SBUH empiric dosing guidelines</p>	<p>Cefepime 2 g IV Q8 <u>OR</u> Piperacillin/tazobactam 4.5 g IV Q8 + Azithromycin^e 500 mg IV/PO Q24 x 3 days</p>
Severe CABP		
Recent hospitalization and parenteral antibiotics in the last 90 days^c	Prior respiratory isolation of MRSA^b <u>OR</u> MRSA nasal PCR positive^b	Prior respiratory isolation of <i>P. aeruginosa</i>^d
<p>Cefepime 2 g IV Q8 <u>OR</u> Piperacillin/tazobactam 4.5 g IV Q8 + Azithromycin^e 500 mg IV/PO Q24 x 3 days + Vancomycin See SBUH empiric dosing guidelines</p>	<p>Ceftriaxone 1-2 g IV Q24 + Azithromycin^e 500 mg IV/PO Q24 x 3 days + Vancomycin See SBUH empiric dosing guidelines</p>	<p>Cefepime 2 g IV Q8 <u>OR</u> Piperacillin/tazobactam 4.5 g IV Q8 + Azithromycin^e 500 mg IV/PO Q24 x 3 days</p>

^aFor severe beta-lactam allergy, consider **levofloxacin 750 mg IV Q24**

^bFor severe beta-lactam allergy, consider **levofloxacin 750 mg IV Q24 + vancomycin IV**

^cFor severe beta-lactam allergy, consider **levofloxacin 750 mg IV Q24 + aztreonam 2 g IV Q8 OR meropenem 1 g IV Q8 + vancomycin IV**

^dFor severe beta-lactam allergy, consider **levofloxacin 750 mg IV Q24 + aztreonam 2 g IV Q8 OR meropenem 1 g IV Q8**

^eCan be substituted for **doxycycline 100 mg IV/PO BID**

Table 5. IV to PO Conversion for MRSA + *P. aeruginosa*

IV to PO for MRSA
Linezolid 600 mg PO BID
IV to PO for <i>P. aeruginosa</i>
Levofloxacin 750 mg PO Q24
IV to PO for MRSA + <i>P. aeruginosa</i>
Linezolid 600 mg PO BID + Levofloxacin 750 mg PO Q24

10. References

1. Regunath H, Oba Y. Community-Acquired Pneumonia. [Updated 2020 Aug 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK430749/>.
2. Metlay JP, Waterer GW, Long AC, et al. 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. *American Journal of Respiratory and Critical Care Medicine*. 2019;200(7). doi:10.1164/rccm.201908-1581st.