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Review of the 2019 IDSA/ATS Practice Guidelines for the Management of Community-acquired Pneumonia (CAP)

Background

Community-acquired pneumonia (CAP) is one of the most prevalent and morbid conditions encountered in clinical practice, accounting for over 1.5 million unique hospitalizations each year in the US.[1] The Infectious Diseases Society of America (IDSA) and American Thoracic Society (ATS) recently published updated guidelines designed to provide guidance on the management of CAP in immunocompetent adults and serve as the basis for development and implementation of locally adapted guidelines.[2] While these guidelines reaffirm many recommendations made in the 2007 guidelines, there are several major changes, including:

- ☐ IDSA/ATS criteria used to determine CAP severity
- ☐ HCAP no longer recognized as a clinical entity
- ☐ empiric MRSA/*Pseudomonas* treatment guided by local epidemiology, patient-specific risk factors, and prior culture history
- ☐ sputum and blood cultures indicated for patients with severe CAP and all patients empirically treated for MRSA/*Pseudomonas*
- ☐ additional anti-anaerobic coverage not recommended for aspiration pneumonia in the absence of abscess and/or empyema
- ☐ procalcitonin not recommended to guide need for initial antibacterial therapy
- ☐ corticosteroids not recommended, but may be considered for patients with septic shock
- ☐ routine follow-up chest imaging not recommended

This newsletter will describe components of the new CAP guidelines that are most useful for stewardship programs in DASON hospitals.

Non-Severe vs Severe CAP:

In prior CAP guidelines, site of care served as a surrogate marker for CAP severity (e.g., patients in the medical ward were considered non-severe vs ICU patients were considered severe).[3] The new CAP guidelines recommend the validated 2007 IDSA/ATS Criteria for Defining Severe CAP (Table 1).

Table 1. 2007 IDSA/ATS Criteria for Defining Severe CAP

Severe CAP = 1 major or ≥ 3 minor criteria
Major Criteria:
☐ septic shock with need for vasopressors
☐ respiratory failure requiring mechanical ventilation
Minor Criteria:
☐ respiratory rate > 30 breaths/min
☐ PaO2/FIO2 ratio < 250
☐ multilobar infiltrates
☐ confusion/disorientation
☐ uremia (BUN level > 20 mg/dL)
☐ leukopenia (WBC ≤ 4,000 cells/mL)
☐ thrombocytopenia (platelets < 100,000/mL)
☐ hypothermia (< 36°C)
☐ hypotension requiring aggressive fluid resuscitation

Removal of HCAP:

The 2005 IDSA/ATS HAP/VAP guidelines introduced "Healthcare Associated Pneumonia" (HCAP) in an attempt to address the increased risk of resistant infection in some patients; however, substantial data published since that time suggest HCAP patients are not at high risk for multidrug-resistant pneumonia. In light of these data, the 2016 HAP/VAP guidelines abandoned "HCAP" and noted further recommendations would be included in the updated CAP guidelines.[4,5] Indeed, the 2019 CAP guidelines also recommend abandoning HCAP. In place of HCAP, the new guidelines recommend using validated risk factors for respiratory infection with MRSA or *Pseudomonas aeruginosa* (Table 2).

Table 2. Risk Factors for MRSA and *Pseudomonas*

When to Cover MRSA and/or *Pseudomonas*
☐ prior isolation of MRSA and/or *Pseudomonas*, especially from the respiratory tract
☐ recent hospitalization (within 90d) and exposure to IV antibiotics

In addition to the risk factors listed in Table 2, the new guidelines recommend evaluating local data to determine whether or not MRSA or *Pseudomonas* is prevalent in patients with CAP and what the risk factors for infection are at the local level.

Microbiologic Diagnosis:

Similar to prior guidelines, the new guidelines recommend collecting sputum and blood cultures in all patients with severe CAP. However, there is a new recommendation to collect sputum and blood cultures in all patients that are treated empirically for MRSA and/or *Pseudomonas* in order to facilitate de-escalation of broad-spectrum antibiotic therapy. Further, the new guidelines note that nasal MRSA PCR tests may be used to discontinue anti-MRSA therapy given the fact that this test has a very high negative predictive value (99.2%) for ruling out MRSA pneumonia.[6] Table 3 highlights additional diagnostic testing recommendations, including culture.

Table 3. Culture and Diagnostic Recommendations

	Influenza*	Pneumococcal	Legionella	Resp. Culture	Blood Culture	Nasal MRSA PCR**
Non-Severe CAP	X					
Severe CAP	X	X	X	X	X	
Additional Patient-Specific Factors:						
prior MRSA in resp. culture *or* receiving anti-MRSA therapy				X	X	X
prior *P. aeruginosa* in resp. culture *or* receiving anti-Pseudomonal therapy				X	X	
recent travel within 2-weeks	X					

*during flu season; **if available at your institution

Empiric Treatment:

Treatment regimens in the new CAP guidelines are largely similar to the prior recommendations with a few minor exceptions that warrant further discussion. First, beta-lactam/macrolide combination therapy and fluoroquinolone (FQ) monotherapy are given equal weight as first-line agents for treatment of non-severe CAP. However, the new guidelines highlight there are stronger data in favor of beta-lactam/macrolide combination therapy. Therefore, respiratory FQ therapy should be reserved for patients with a clear contraindication to beta-lactam or macrolide therapy. Second, anti-MRSA and/or anti-Pseudomonal therapy should only be initiated in patients with prior positive respiratory cultures or in patients with severe CAP that were hospitalized within the prior 90 days and received intravenous antibiotics. In both of these scenarios, broad-spectrum therapy should be de-escalated on the basis of culture results. Third, in patients that test positive for influenza, an anti-influenza agent should be added to standard antibacterial treatment regardless of time since onset of flu-like symptoms. In this scenario, antibacterial therapy may be discontinued after 48- to 72-hours if there is no evidence of bacterial infection and the patient improves clinically. Lastly, it is no longer recommended to add anti-anaerobic coverage in patients with aspiration pneumonia unless an abscess and/or empyema is suspected. Table 4 outlines empiric treatment regimens for patients with CAP.

Table 4. Empiric Treatment Regimens for CAP

	Standard Regimen	Prior MRSA / *Pseudomonas* in Respiratory Culture	Hospitalized within 90d *plus* IV antibiotics *plus* local risk factors
Non-Severe	• no cultures • ceftriaxone + azithromycin OR • respiratory FQ	• order cultures • treat empirically • de-escalate if negative cultures & improving	• order cultures • hold empiric treatment for MRSA/*Pseudomonas* • treat if culture(s) return positive
Severe	• order cultures • ceftriaxone + azithromycin • ceftriaxone + respiratory FQ	• order cultures • treat empirically • de-escalate if negative cultures & improving	• order cultures • treat empirically for MRSA/*Pseudomonas* • de-escalate if negative cultures and improving

Duration of Therapy:

Similar to prior recommendations, the new guidelines recommend a treatment duration of at least 5-days for patients with CAP that have achieved clinical stability. Clinical stability is defined as resolution of vital sign abnormalities (HR, RR, blood pressure, oxygen saturation, and temperature), ability to eat, and normal mentation. In patients with CAP caused by *Pseudomonas* or MRSA, the duration of therapy should be 7 days in accordance with the 2016 HAP/VAP guidelines.

Take Home Points:

1. HCAP is no longer recognized as a clinical entity.
2. Avoid macrolide monotherapy for treatment of outpatient CAP due to local resistance (Figure 1).
3. Blood and sputum cultures should be reserved for patients with severe CAP and any patient initiated on broad-spectrum antibiotics, regardless of severity.
4. Most patients with CAP should be treated with beta-lactam/macrolide combination therapy, and respiratory fluoroquinolones should be reserved for patients with severe and substantiated allergies.
5. Decisions to add coverage for MRSA and/or *Pseudomonas* should be based on prior isolation of these pathogens in the respiratory tract and recent history of hospitalization and parenteral antibiotics.
6. Emphasis should be placed on de-escalating broad-spectrum antibiotic therapy if cultures are negative.
7. It is not necessary to add anti-anaerobic coverage for patients with aspiration pneumonia unless abscess or empyema suspected.
8. Most patients with CAP can be successfully treated with 5 days of antibiotic therapy.
9. Routine follow-up chest imaging is not recommended.

References:

1. Ramirez JA, Wiemken TL, Peyrani P, et al. Adults Hospitalized With Pneumonia in the United States: Incidence, Epidemiology, and Mortality. *Clin Infect Dis.* 2017;65(11):1806-1812.
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. *Am J Respir Crit Care Med.* 2019;200(7):e45-e67.
3. Mandell LA, Wunderink RG, Anzueto A, et al. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis.* 2007;44 Suppl 2:S27-72.
4. American Thoracic S, Infectious Diseases Society of A. Guidelines for the management of adults with hospital-acquired, ventilator-associated, and healthcare-associated pneumonia. *Am J Respir Crit Care Med.* 2005;171(4):388-416.
5. Kalil AC, Metersky ML, Klompas M, et al. Executive Summary: 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.* 2016;63(5):575-582.
6. Dangerfield B, Chung A, Webb B, Seville MT. Predictive value of methicillin-resistant Staphylococcus aureus (MRSA) nasal swab PCR assay for MRSA pneumonia. *Antimicrob Agents Chemother.* 2014;58(2):859-864.
7. Blondeau JM, Theriault N. Application of the Formula for Rational Antimicrobial Therapy (FRAT) to Community-Acquired Pneumonia. *Journal of Infectious Diseases Therapy*. 2017;5(1):313.

Figure 1. Azithromycin Resistance for *S. pneumoniae*[7]