Community-Acquired Pneumonia Guidelines

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**Objectives:** I have no financial disclosures

1. Discuss the incidence and prevalence of pneumonia.

2. Describe the etiology of pneumonia.

3. Interpret assessment and examination findings to diagnose pneumonia.

4. Formulate treatment plans, considering both risks and benefits, for PNA.

5. List both pharmacological and non-pharmacological treatments for PNA.

6. Consider the cost, side effects, and cultural preferences of a patient with PNA.
Infectious Disease Society of America

- Community-Acquired Pneumonia (CAP) is the leading cause of hospitalizations, ICU admissions, and death internationally.


- Utilization of treatment guidelines improves outcomes.
New criteria to define severe CAP

▪ Nine suggested minor criteria

▪ Recommendation that patients with three or > criteria, be admitted to the ICU.

▪ The criteria validated to predict 30-day mortality, ICU admission, and need for mechanical ventilation or vasopressor use.
New criteria to define severe CAP

- CURB-65 not a good predictor of mortality but used to judge severity.

- Some have suggested that it needs to be expanded to include a total of 8 parameters, similar to the IDSA/ATS parameters.
Criteria currently used to define severe CAP

**CURB-65:**

- Confusion
- Uremia
- Respiratory rate
- Blood pressure
- Age > 65-years old
Any of:
• **Confusion***
• **Urea > 7 mmol/l**
• **Respiratory rate ≥30/min**
• **Blood pressure (SBP < 90 mm Hg or DBP ≤ 60 mm Hg)**
• **Age ≥ 65 years**

CURB-65 score

0 or 1

**GROUP 1**
Mortality low (1.5%)
(n = 324, died = 5)

Treatment options

Likely suitable for home treatment

2

**GROUP 2**
Mortality intermediate (9.2%)
(n = 184, died = 17)

Consider hospital supervised treatment
Options may include:
(a) short stay inpatient
(b) hospital supervised outpatient

3 or more

**GROUP 3**
Mortality high (22%)
(n = 210, died = 47)

Manage in hospital as severe pneumonia
Assess for ICU admission especially if CURB-65 score = 4 or 5

*defined as a Mental Test Score of 8 or less, or new disorientation in person, place or time
Severity indices

Assessment of Severity

C = Confusion (new)
U = Urea >7mmol/L
R = Respiratory Rate >30/min
B = Blood pressure
<90mmHg systolic OR 60mmHg diastolic
65 = Age >65 years

Score = 1 each per criteria e.g. C + R + >65 = 3

<table>
<thead>
<tr>
<th>CURB-65</th>
<th>0-1</th>
<th>Discharge on ABOs</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURB-65</td>
<td>2</td>
<td>Admit to hospital</td>
</tr>
<tr>
<td>CURB-65</td>
<td>3-5</td>
<td>Likely, ICU admission</td>
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</tbody>
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## Diagnostic criteria

<table>
<thead>
<tr>
<th>Test</th>
<th>Criteria</th>
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| Sputum                      | • Low sensitivity approximately 50%  
• Will grow upper respiratory tract bacteria, which may or may not be the cause of CAP  
• Microscopy and culture for acid fast bacilli in tuberculosis |
| Blood cultures              | • Positive in ≤ 25% of cases                                               |
| Urine antigens              | • *Streptococcus pneumoniae*  
• *Legionella pneumophila* serogroup 1                                      |
| Blood                       | • Serology in paired samples 10-14 days apart, complement fixation tests for  
*Chlamydia* sp., *Mycoplasma* sp., viruses                                 |
| Bronchoalveolar Lavage (BAL) | • Bypasses upper respiratory tract flora  
• Can be directed or non-directed  
• Especially useful for tuberculosis and PCP                                |
| Tap pleural effusion        | • For microscopy, culture and sensitivity  
• Empyema = pH <7.2, glucose <2.2mol/L, LDH >1000IU/L                       |
CXR findings of Pneumonia

Most common CAP pathogens

- *Streptococcus pneumoniae*
- *Haemophilus influenzae*
- *Moraxella catarrhalis*
- *Staphylococcus aureus*

Most common viral pathogens:

- Rhinovirus
- Influenza
Antibiotic therapy

a. **Outpatient**: Azithromycin, Erythromycin, Clarithromycin.

b. **Inpatient/non-ICU Preferred**: Cefotaxime, Ceftriaxone, or Ampicillin.
Antibiotic therapy

ICU admission required? >48hrs from onset of symptoms? Treat with oseltamivir or zanamivir to reduce ICU length of stay but will not affect morbidity/mortality (if you suspect influenzae/during flu season).
Antibiotic therapy

Inpatient/ICU:

- Beta lactam + Fluoroquinolone
  - PCN allergy? Fluoroquinolone + Aztreonam.
  - Dangers of Fluoroquinolones?
According to the IDS’s update of 2016, fluoroquinolones should be reserved for patients where the benefits outweigh the risks and there are no other treatment options d/t serious side effects.
Risk factors for *Pseudomonas aeruginosa*

- chronic oral steroid administration
- severe underlying bronchopulmonary disease/COPD, alcoholism,
- frequent antibiotic therapy.
- Antibiotics or hospitalized previous 90 days.
Treatment for CAP due to *P. aeruginosa*

*Pseudomonas* infection needs anti-pseudomonal/pneumococcal b-lactam therapy:

a. piperacillin-tazobactam, Cefepime,

a. Imipenem, or Meropenem + either ciprofloxacin or levofloxacin 750mg dose.
Therapy duration for CAP

Duration of therapy:

- 5 days,
- Should be afebrile 48-72 days and be hemodynamically stable.
- Once hemodynamically stable and ingesting oral medications with an intact gut, transition from IV to PO antibiotic therapy.
Case Study:

A 75yo afebrile, Caucasian female with a PMH of RA on monthly infusions of Remicade, COPD, tobacco use of 2ppd/30 years, quite two years ago, esophageal stricture w/history of dilatation x 2, drug-related anaphylaxis requiring emergent intubation, and malignant HTN, presents to the Urgent Care with c/o the following: chills, productive cough, malaise and loss of appetite, for the past 5 days.

She presented to her PCP 4 days ago and he prescribed Levaquin 750mg PO daily with Prednisone taper and Albuterol INHL QID. Her symptoms have not improved and she now reports dyspnea but was unable to get into her PCP’s office to be seen.

BP: 92/70, HR 100bpm, RR 20, temporal temperature is 99F, pulse ox 89% on room air that improves to 95% on 2L 02. CXR has a LLL infiltrate, WBC: 4.3, lactate 2.5.
Medical Decision-making:

1. What type of Pneumonia is most likely in this patient? **HAP vs CAP.**

2. What places her at risk for treatment failure? **On an immunosuppressant,** previous smoking history, known chronic obstructive pulmonary disease, age.

3. Would you continue to treat her outpatient or have her admitted to the hospital? On what finding would you base your decision? **The fact that she is not improving on her current treatment regimen after 5d, and her borderline hypotension with hypoxia helps guide your decision.**
1. How will you treat her Pneumonia? What about MDRO coverage? (review IDSA guidelines). **Provide MDRO coverage based upon her immunosuppressed state/exposure to healthcare for Remicade injections/month. Prednisone 50mg PO x 7d; What about adding Merrem/Carbapenem? Want to keep giving Levaquin? What about a Macrolide?**

2. What is the most likely bacterium causing her Pneumonia? **Pseudomonas a. is most likely based upon her COPD but could also have Strep. Pneumoniae.**

3. What about the use of steroids as a part of her treatment?
Blum CA, Nigro N, Briel M, et al. **Adjunct prednisone therapy for patients with community-acquired pneumonia: a multicenter, double-blind, randomized, placebo-controlled trial.** Lancet 2015; 385: 1511-8. This, the largest trial in this population to date, randomized 785 patients with community acquired pneumonia of varying severity (only 5% in the ICU) to prednisone 50 mg x 7 days vs placebo and found a 1.4 day reduction in "time to clinical stability" (24 consecutive hours of stable vitals) and a 1-day reduction in duration of hospital stay in the steroid group. Death, ICU admission, duration of ICU admission, and duration of antibiotics did not differ.
References


