# Trust the Guidelines; Know Your Resistance Data

NAHUM KOVALSKI, BSC, MDCM

In each issue, *JUCM* will challenge your diagnostic acumen with a glimpse of x-rays, electrocardiograms, or photographs of dermatologic conditions that real urgent care patients have presented with.

This month, we depart slightly from our typical format in order to explore one such case in greater detail.

If you would like to submit a case for consideration, please e-mail the relevant images and presenting information to *editor@jucm.com*.

**Initial Presentation: Primary Care**

The patient is a 45-year-old woman (herself a surgeon) who presented three weeks after first visiting her family physician with a cough, at which time the x-ray shown in **Figure 1** was taken.

She was started on erythromycin for 10 days.

After finishing that course of antibiotics with no improvement, she was started on amoxicillin-clavulanic acid.

Four days later, there was still no improvement in her status.

**Second Presentation: Urgent Care**

By the time the patient presented to urgent care on June 5 of this year, her complaints included back pain and weakness, in addition to the cough.

Noting that she has insulin-dependent diabetes mellitus, she also reported that her home glucose readings were "high."

Vital signs at the time of presentation to urgent care were as follows:

- Temp: 36.5°C
- Sat 94%
- Pulse 104
- BP 153/82.

Her second film (**Figure 2**), taken at the urgent care center, showed a large right-sided infiltrate/process.

**Nahum Kovalski** is an urgent care practitioner and assistant medical director/CIO at Terem Emergency Medical Centers in Jerusalem, Israel.

**Resolution**

This patient was referred to hospital, where she underwent a CT which confirmed an empyema. At the time of publication, she has a chest tube in place for drainage and is on IV antibiotics.

**Teaching Points**

This case serves as an important reminder that empyema is still a very real entity, even in patients who are treated early with antibiotics. Here, the failure of both a macrolide and a beta-lactam should raise suspicion of resistant pneumococcus.

The Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on the Management of Community-acquired Pneumonia in Adults note that the presence of certain comorbidities—diabetes mellitus among them—calls for aggressive, empiric treatment of community-acquired pneumonia (CAP):

- A respiratory fluoroquinolone (moxifloxacin, gemifloxacin, or levofloxacin [750 mg]) (strong recommendations; level I evidence)
- A beta-lactam *plus* a macrolide (strong recommendation; level I evidence), with high-dose amoxicillin (e.g., 1 g three times daily) or amoxicillin-clavulanate (2 g twice daily) preferred. Alternatives include:
  - ceftriaxone, cefpodoxime, and cefuroxime (500 mg twice daily)
  - doxycycline (level II evidence) in place of the macrolide

**Table 1. Recommended Empirical Antibiotics for Community-acquired Pneumonia**

**Outpatient Treatment**

1. Previously healthy and no use of antimicrobials within the previous 3 months:
   - A macrolide (strong recommendation; level I evidence)
   - Doxycyline (weak recommendation; level III evidence)
2. Presence of comorbidities such as chronic heart, lung, liver or renal disease; diabetes mellitus; alcoholism; malignancies; asplenia; immunosuppressing conditions or use of immunosuppressing drugs; or use of antimicrobials within the previous 3 months (in which case an alternative from a different class should be selected):
   - A respiratory fluoroquinolone (moxifloxacin, gemifloxacin, or levofloxacin [750 mg]) (strong recommendation; level I evidence)
   - A beta-lactam *plus* a macrolide (strong recommendation; level I evidence)
3. In regions with a high rate (>25%) of infection with high-level (MIC≥16 mg/mL) macrolide-resistant *Streptococcus pneumoniae,* consider use of alternative agents listed above in (2) for patients without comorbidities (moderate recommendation; level III evidence)

**Inpatient, Non-ICU Treatment**

- A respiratory fluoroquinolone (strong recommendation; level I evidence)
- A beta-lactam *plus* a macrolide (strong recommendation; level I evidence)

**Inpatient, ICU Treatment**

- A beta-lactam (cefotaxime, ceftriaxone, or ampicillin-sulbactam) *plus* either azithromycin (level II evidence)

*or*

- A respiratory fluoroquinolone (level I evidence) (strong recommendation) (for penicillin-allergic patients, a respiratory fluoroquinolone and aztreonam are recommended)

**Special Concerns**

**If *Pseudomonas* is a consideration:**

- An anti-pneumococcal, anti-pseudomonal beta-lactam (piperacillin-tazobactam, cefepime, imipenem, or meropenem) *plus* either
- ciprofloxacin or levofloxacin (750 mg)

*or*

- the above beta-lactam plus an aminoglycoside and azithromycin

*or*

- the above beta-lactam plus an aminoglycoside and an anti-pneumococcal
- fluoroquinolone (for penicillin-allergic patients, substitute aztreonam for above beta-lactam) (moderate recommendation; level III evidence)

If CA-MRSA is a consideration, add vancomycin or linezolid (moderate recommendation; level III evidence)

CA-MRSA=community-acquired methicillin-resistant *Staphylococcus aureus*
ICU=intensive care unit

Source: 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:S27-72.

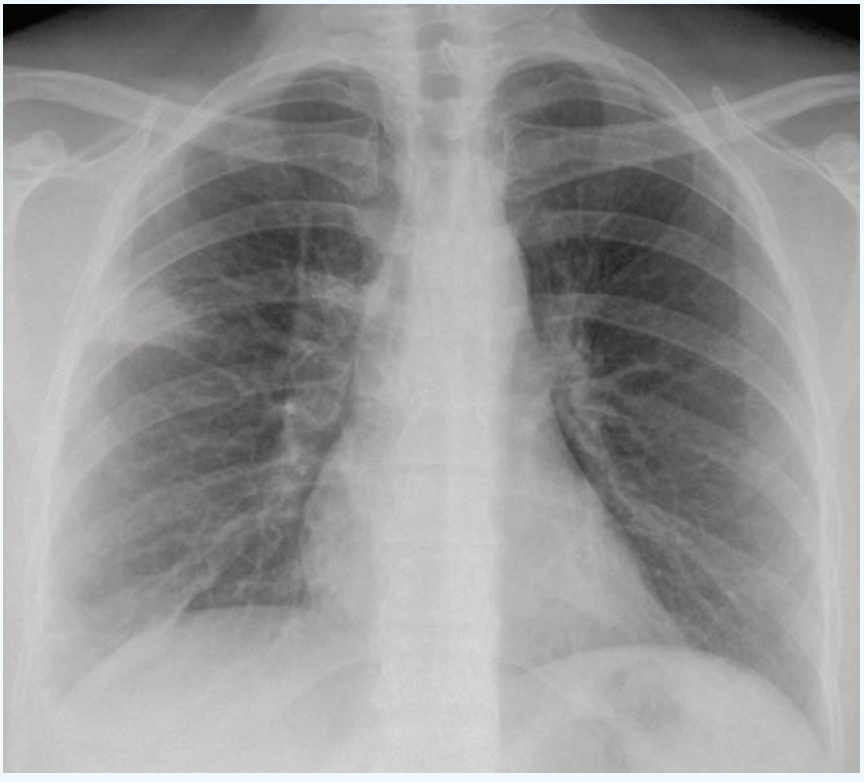

**Figure 1—First presentation.**

**Figure 2—Three weeks later.**

In regions where the rate of infection with high-level (MIC, ≥16 mcg/mL) macrolide-resistant *Streptococcus pneumoniae* exceeds 25%, the IDSA/ATS guidelines recommend that we consider using the alternative agents for any patient even in patients with no comorbidities (moderate recommendation; level III evidence).

The recommendations for empiric use of antibiotics for CAP are summarized in **Table 1**.

Pneumococcal resistance is particularly high in the U.S., but varies by region. Local health departments are an invaluable resource and should be consulted to determine pneumococcal resistance patterns in your area. ■