Influence of a “no MRSA, no *Pseudomonas*” comment to a respiratory culture in antibiotic utilization during treatment of lower respiratory tract infection

J McBride, MD1; L Schulz, PharmD2; J DiPoto, PharmD3; N Sippel, PharmD1; K Osterby1; B Fox, MD2
1 University of Wisconsin Hospital and Clinics; 2 University of Wisconsin School of Pharmacy; 3University of Wisconsin-Madison School of Medicine and Public Health

### Abstract

**Background:** Community-acquired pneumonia (CAP) and health care associated pneumonia (HCAP) have an extensive impact health care expenditure and outcomes. Strategies to minimize unnecessary and excessive broad spectrum antibiotics (Abx) use are essential. In our experience, misclassification of CAP, and over-treatment of CAP and HCAP, is common. These errors lead to increased utilization of Abx with methicillin-resistant *Staphylococcus aureus* (MRSA) and *Pseudomonas aeruginosa* coverage when they may not be required. As patients improve on therapy, clinical inertia makes Abx de-escalation challenging. Our microbiology lab added the comment “no MRSA and no *Pseudomonas*” on negative sputum cultures or those with normal respiratory flora growth (Figure 1).

**Methods:** The comment was added to respiratory cultures beginning January 2011. An observational, retrospective, analysis was performed on patients still hospitalized 72 hours later, with a negative expectorated, induced or tracheal aspirate respiratory culture from 1/2010 through 1/2012. Abx utilization was evaluated on day-1 and day 3.

**Results:** 129 patients were treated for pneumonia with a negative respiratory culture or normal respiratory flora result during the 24 month timeframe. 68 patients were receiving Abx on day 3. The total number of Abx decreased from 2.31 to 1.87 (p=0.009), broad spectrum use decreased from 1.94 to 1.44 Abx (p=0.004), anti-MRSA and anti-Pseudomonal agent use decreased from 0.71 to 0.49 Abx (p=0.008) and 1.24 to 0.96 Abx (p=0.02) respectively. The use of parenteral medications decreased from 1.51 to 1.16 Abx (p=0.009).

**Conclusion:** The addition of a clear and purposeful “no MRSA, no *Pseudomonas*” comment improves Abx utilization. The comment highlights the absence of anticipated nosocomial pathogens on negative or normal respiratory flora cultures analogously to the presence of pathogens in a positive culture. Since this comment provides no additional microbiologic information, it emphasizes that clinicians may need reassurance prior to de-escalation and raises questions about the psychology of prescribing. The “No MRSA, no *Pseudomonas*” comment is one piece to a respiratory culture based antibiotic stewardship program.

### Methods

- Comment was added to respiratory cultures beginning Jan 2011.
- An observational, retrospective, analysis was performed on patients still hospitalized 72 hours following collection of a negative expectorated, induced or tracheal aspirate respiratory culture from 1/2010 through 1/2012.
- Pediatric patients and patients discharged before day +3 were excluded. Also, patients with respiratory cultures obtained for evaluation of tuberculosis were excluded.
- Abx utilization was evaluated on day 0 and day +3. Day 0 was defined as the day of respiratory sample acquisition.
- Antibiotic utilization was compared using a Student’s T-test
- Antibiotic spectrum was defined previously (Schulz et al. ICHE. 2013;34(12):1259-1265).

### Results

<table>
<thead>
<tr>
<th>Comment included in respiratory culture</th>
<th>Discharged from hospital on day 0, +1, or +2</th>
<th>n = 61</th>
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<tbody>
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<td>129 patients treated for pneumonia with a negative respiratory culture or normal respiratory flora result in 24 months</td>
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68 patients hospitalized on day +3

### Conclusion

- A clear and purposeful “no MRSA, no *Pseudomonas*” comment may improve Abx utilization by highlighting the absence of anticipated nosocomial pathogens on negative or normal respiratory flora cultures.
- This comment is analogous to the comments identifying pathogens in a positive culture.
- Further studies comparing Abx utilization pre and post initiation of comment are needed
- Since this comment provides no additional microbiologic information, it emphasizes that clinicians may need reassurance prior to de-escalation and raises questions about the psychology of prescribing.
- Further study is warranted to evaluate the role this comment plays in the antibiotic utilization of all pneumonia patients.

### Purpose

Analyze the impact of the statement, “Negative for S.aureus/MRSA and P. aeruginosa” on antibiotic utilization in patients treated for pneumonia

**Antibiotic Utilization for 68 hospitalized patients at day +3**

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<th>Phone: 608-263-0946 Email: <a href="mailto:Jmcbride@uwhealth.org">Jmcbride@uwhealth.org</a></th>
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Joseph A. McBride, MD
600 Highland Ave MC 1530 Madison, WI 53792

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