Reviewer’s report

Title: A risk score for identifying Methicillin-resistant Staphylococcus aureus in patients presenting to the hospital with pneumonia

Version: 1 Date: 4 January 2013

Reviewer: Adam Cohen

Reviewer’s report:

This is a review of MS 6493456897881013 "A risk score for identifying Methicillin-resistant Staphylococcus aureus in patients presenting in the hospital with pneumonia" by Shorr et al. The topic is an important one to clinicians, and the goal--creating a score that can be easily used to identify patients at risk for MRSA to guide treatment--is worthwhile. The score that was developed, however, has a low positive predictive value. It is fairly good at identifying those that do not have MRSA (the negative predictive value) and there may be some usefulness there, because patients could be identified that would not need coverage for MRSA. However, even the NPV is not so high that some clinicians wouldn't still want to cover patients with a low risk score for MRSA empirically if they were severely ill. From this analysis, those patients with a score of 0 or 1 still had nearly 10% chance of having MRSA. I believe that this score could still be useful, but the authors should be clearer and more practical about how and when the score should be used. A score with 11 variables may be difficult to implement in many facilities. In addition, there are some areas that need more explanation in the manuscript and some additional analysis that should be considered before publication.

Major comments

1. Methods: Please provide more information on the Health Facts database and the 62 hospitals included. Are these hospitals geographically representative? Urban or rural? Tertiary or primary? Is there heterogeneity in the hospitals ability to detect MRSA and clinical treatment patterns? Has this database been used to develop similar scores or look at treatment patterns before? What bias may be introduced by using an administrative database such as this?

2. Methods and Results: By excluding patients that did not have a bacterial etiology, a distinct bias could be introduced. What percentage of patients were excluded for this reason?

3. Methods: The validation makes this analysis stronger.

4. Methods: I would recommend applying this score to other organisms to prove that what is seen is specific for MRSA. For example, how does it perform in predicting pneumonia from Streptococcus pneumoniae, another gram positive organism? How does it perform in predicting pneumonia from methicillin-sensitive Staph aureus?

5. Table 2: Not enough description is given for how these variables were chosen
and not all of these variables were included in Table 1. For example, why were the age cutoffs 30 and 79 years used? What was the risk for other age groups? Why were some variables given 1 point and others 2? More transparency is needed to understand the risk score.

Minor comments
1. Background, 2nd paragraph: Haemophilus and Legionella are less common than the leading causes of pneumonia. The author’s also don’t consider viral causes (such as influenza) that may be more prevalent and would need antiviral treatment.
2. Methods: How did you define HAP and VAP for exclusion?
3. Methods: What was done if more than one bacterial etiology was identified?
4. Results, second paragraph: The comparison group (those with bacterial etiology that is not MRSA) is a poor comparison because it includes all sorts of bacteria, including MSSA. Some of the findings in this comparison seem a bit odd--for example, why would MRSA pneumonia be more associated with congestive heart failure, COPD, CVD, stroke, and dementia. These are not necessarily common associations with MRSA infection. The authors should describe the published literature on these underlying conditions.
5. Discussion: The authors should describe other risk scores (e.g. CURB-65) and how this score is similar or different.