Methicillin-resistant *Staphylococcus aureus* Nasal Screening Adds Limited Value to the Choice of Empiric Antibiotics in Community-acquired Pneumonia

TO THE EDITOR—We read with great interest the work by Parente et al [1]. In this meta-analysis of nasal screening for methicillin-resistant *Staphylococcus aureus* (MRSA) to rule out MRSA pneumonia, Parente et al conclude that nasal screening has a positive predictive value (PPV) of 44.8% and negative predictive value (NPV) of 96.5%. The authors calculate PPV and NPV for both community-acquired/healthcare-associated pneumonia (CAP/HCAP) and ventilator-associated pneumonia (VAP). They assume a prevalence of MRSA VAP of 8% and do not specify a prevalence for MRSA CAP/HCAP. With these numbers, they conclude that nasal screening has PPVs of 56.8% for CAP/HCAP and 35.7% for VAP and NPVs of 98.1% for CAP/HCAP and 94.8% for VAP.

We write to illustrate the importance of prevalence in calculating PPV and NPV. Parente et al use pooled estimates of MRSA prevalence from studies identified in their systematic review. The authors acknowledge that there is wide variability in MRSA pneumonia prevalence, but reach the conclusion that nasal screening may be helpful for CAP/HCAP patients to preclude anti-MRSA antimicrobials. The broad application of nasal MRSA screening for antimicrobial stewardship is a laudable goal, but must be used in the right setting. Combining prevalence rates for CAP and HCAP may be misleading. As an example, 2 recent studies of MRSA CAP found a prevalence of only 0.7–3.0% [2, 3]. In such a setting, clinicians need a test endowed with a high PPV. Recalculating the PPV using the current prevalence rates renders a result of only 6.9–24.7%. In areas with such a low prevalence of MRSA in CAP, nasal

screening and vancomycin should not be used. Nasal screening will only be useful if it changes the post-test probability to a level where anti-MRSA coverage would be initiated.

The authors conclude that nasal screening is insufficient to rule out MRSA pneumonia in patients with VAP, due to low sensitivity (40.3%). Therefore, we are left with a conundrum: in what patient population do we use nasal screening? As we point out above, with a low prevalence of MRSA in CAP, nasal screening is of little value. The ideal patient cohorts for nasal screening may be those in regions with highly-endemic MRSA or patients with risk factors for MRSA, such as those of low socioeconomic status, those with a recent influenza infection, those with a history of skin infections, and those using intravenous drugs, among others. Local prevalence will be a key factor in determining when to utilize MRSA nasal screening. We agree that MRSA nasal screening, when used appropriately, is a boon to antimicrobial stewardship and better for patient care. When used in the wrong setting, screening will increase costs with no return on investment.

Note

Potential conflicts of interest. All authors: No reported conflicts. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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Reply to Burnham, Kakol, and Vazquez-Guillamet

TO THE EDITOR—We thank Drs. Burnham, Kakol, and Vazquez-Guillamet for their thoughtful letter and interest in our work, “The Clinical Utility of Methicillin-Resistant *Staphylococcus aureus* (MRSA) Nasal Screening to Rule Out MRSA Pneumonia: A Diagnostic Meta-analysis With Antimicrobial Stewardship Implications” [1, 2]. Our meta-analysis does not highlight the use of positive predictive value, but rather the negative predictive value of MRSA nares screens to rule out MRSA pneumonia. Given the low prevalence of MRSA in community-acquired pneumonia, we agree with the conclusion that a majority of adult patients admitted to the general medical ward might not benefit from a nasal screen or anti-MRSA therapy. However, even with a low prevalence of MRSA in community-acquired pneumonia, anti-MRSA therapy is still frequently used empirically [3]. Therefore, the MRSA nares screen can still be an impactful antimicrobial stewardship tool in institutions with a low prevalence of MRSA pneumonia but with a high empiric use of anti-MRSA therapy.