



## Nothing to Sneeze At: MRSA Nasal Screening in Pneumonia

The anterior nares serve as a primary site for methicillin-resistant *Staphylococcus aureus* (MRSA) colonization in humans.<sup>1</sup> MRSA nasal screening has become a popular tool for antimicrobial stewardship programs to guide antibiotic de-escalation in pneumonia.<sup>2,3</sup> How can MRSA nasal screening guide [anti-MRSA antibiotics](#)?

### What types of MRSA nasal screening are there?

Two types of nasal screening exist: nasal cultures and polymerase chain reaction (PCR). Although these tests have a high positive concordance rate, PCR has the added benefits of faster turnaround time and higher sensitivity in patients on concurrent antibiotics.<sup>4,5</sup> However, PCR testing is more expensive than culture screening.<sup>6</sup>

### What is a negative and positive predictive value?

A negative predictive value (NPV) describes how likely a negative test reflects the true absence of disease in a patient, while a positive predictive value (PPV) is the likelihood of true presence of disease after a positive result.<sup>7</sup> A higher NPV provides greater confidence in ruling out disease, whereas a high PPV can confirm disease presence. Predictive values are affected by the prevalence of disease.<sup>7</sup> A meta-analysis showed the NPV and PPV of MRSA nasal screening was 96.5% and 44.8%, respectively when the pooled prevalence of MRSA was 10%.<sup>2</sup> Low PPV suggests that a positive MRSA screen does not confirm a diagnosis of MRSA pneumonia.

### What do guidelines recommend?

Community-acquired pneumonia (CAP) guidelines suggest that a negative MRSA screen can be used to stop empiric MRSA antibiotics.<sup>3</sup> Less data is available to support the use of MRSA nasal screens in hospital-associated pneumonia or ventilator associated pneumonia and therefore not recommended in the guidelines.<sup>8</sup> Conversely, positive results do not necessarily indicate MRSA pneumonia.<sup>9</sup> In patients with a positive MRSA nasal screen, empiric MRSA antibiotics are recommended in severe CAP and suggested in non-severe CAP. Respiratory cultures should be obtained if empiric MRSA antibiotics are started and stopped if respiratory cultures do not isolate MRSA.<sup>3</sup>

### What is the evidence?

De-escalation with negative MRSA nasal screens are associated with reduced ICU length of stay and duration of anti-MRSA antibiotics.<sup>9</sup> Protocolized de-escalation in pneumonia with negative MRSA nasal screens is associated with no differences in in-hospital mortality despite reduced length of empiric MRSA antibiotics.<sup>10</sup> A randomized controlled trial assessing the utility of MRSA nasal screening to guide antibiotic de-escalation in critically ill patients with CAP is currently underway.<sup>11</sup>

**Key Takeaway:** Empiric anti-MRSA antibiotics can be stopped in patients with low risk for MRSA pneumonia and a negative MRSA nasal screen. Anti-MRSA antibiotics should be de-escalated in pneumonia with positive nasal screen if respiratory cultures do not isolate MRSA.

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