

# Outcomes associated with pharmacist-driven MRSA nasal screenings in patients with suspected pneumonia

## Abstract:

**Purpose:** Methicillin-resistant *Staphylococcus aureus* (MRSA) is a drug resistant pathogen commonly covered empirically in patients with hospital acquired pneumonia (HAP), ventilator acquired pneumonia (VAP) and community acquired pneumonia (CAP) if multi-drug resistant organism risk factors are present per recommendations from the Infectious Diseases Society of America (IDSA). Clinicians are often reluctant to de-escalate therapy if respiratory cultures have not finalized, which may lead to extended periods of exposure to MRSA-targeted antibiotics. Unnecessary exposure to antibiotics may increase the risk for adverse events, antimicrobial resistance, drug-drug interactions and also increases costs. The purpose of this study is to determine the impact of pharmacist-ordered MRSA nasal screening on duration of empiric MRSA-targeted antibiotic exposure in patients with suspected pneumonia.

**Methods:** This was a single-center, pre- and post-intervention analysis of patients who received vancomycin or linezolid for pneumonia before and after implementing a protocol allowing pharmacists to order MRSA nasal cultures. The pre-intervention group included patients admitted from July 1, 2020 to October 31, 2020. The post-intervention group included patients admitted from December 1, 2020 to February 28, 2021. Patients were included if they were admitted to the hospital and had an order for vancomycin or linezolid with an indication of “pneumonia, lower respiratory infection.” Patients were excluded if they had a positive MRSA nasal screening, MRSA isolated from a respiratory culture, presence of another infection requiring MRSA coverage, were less than 18 years old, pregnant, or incarcerated. The primary outcome was days of therapy (DOT) of MRSA-targeted antibiotics in patients being treated for pneumonia. Secondary outcomes included length of stay, pharmacist adherence to MRSA nasal screening guideline, number of doses administered, and number of trough levels obtained.

**Results:** 136 and 83 patients in the pre-intervention and post-intervention group met inclusion and exclusion criteria, respectively. The median DOT in the pre- and post-intervention groups were 3 and 2 ( $p=0.84$ ), respectively. Patients in the post-intervention group had lower numbers of total doses received, trough levels obtained, and length of stay, without reaching statistical significance. MRSA screening rates in the pre- and post-intervention groups were 11.8% and 65.1%, respectively. Patients in the post-intervention group had significantly higher weight ( $p=0.04$ ), BMI ( $p=0.03$ ), COVID-19 infection rates ( $p < 0.00001$ ), and rates of death or withdrawal of care ( $p < 0.01$ ). Exploratory subgroup analyses did not reveal any statistically significant differences when excluding patients with COVID-19 infection or excluding patients in the post-intervention group that did not receive an MRSA nasal screening.

**Conclusions:** The implementation of a pharmacist-driven MRSA screening protocol increased screening rates but did not significantly decrease average duration of MRSA targeted therapy in patients with pneumonia. Subgroup analyses that attempted to control for between group differences yielded similar results. Due to the presence of significant confounders, interpretation of these results are limited. Polymerase chain reaction (PCR) assays, as opposed to traditional plate cultures utilized in this study, will be needed to further evaluate the effectiveness of this protocol.

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