

QUESTION 8: Does the methicillin-resistant *Staphylococcus aureus/epidermidis* (MRSA/MRSE) colonization status of operating room (OR) personnel affect the hospital's rate of surgical site infections/periprosthetic joint infections (SSIs/PJIs)?

RECOMMENDATION: Unknown. While OR personnel have previously been reported to contribute to environmental contamination, the literature provides insufficient data to establish strong correlations between OR staff colonization with MRSA/MRSE and a potential for increased infections in patients after orthopaedic procedures.

LEVEL OF EVIDENCE: Limited

DELEGATE VOTE: Agree: 90%, Disagree: 4%, Abstain: 6% (Super Majority, Strong Consensus)

RATIONALE

MRSA is a common source of nosocomial infections and has been reported as a potential cause of SSIs and PJIs leading to major complications [1,2]. The prevalence of healthcare worker MRSA colonization is estimated to be between 4.6 and 7.9% [3–5]. Some reports have even been published demonstrating higher incidences of up to 76% in special populations [6].

Nasal carriage of *S. aureus* is known to be a major risk factor for SSIs [7,8]. However, the transmission of MRSA from a staff member to a patient is believed to be an uncommon event with only 11 of 191 (5.8%) confirmed outbreaks occurring in this manner in one study [9]. Nevertheless, 41% of nosocomial outbreaks (including all pathogens) transmitted by a contaminated staff member occurred in the OR [10].

A total of 10 articles relevant to orthopaedic staff MRSA colonization were included in this review [11–20]. The MRSA colonization rate of orthopaedic staff members in the literature averages at 7.8% (range 0 to 31%, median 4.2%) in 941 screened staff [12–18,20]. Of the studies reviewed, Portigliatti-Barbos et al. (31% penicillin-resistant *S. aureus*), Chang et al. (13.9% MRSA), Faibis et al. (2.3% MRSA) and Schwarzkopf et al. (1.5% MRSA) screened exclusively OR personnel [16–18,20].

Most identified publications did not investigate the infection rates of patients in the context of OR staff colonization with MRSA, thus the available data is limited. De Lucas-Villarrubia et al. [12] evaluated decolonized contaminated staff members and patients and added a broad spectrum antibiotic to their surgical prophylaxis. By introducing these precautionary measures, the SSI rates dropped from 5.9 to 3.0%, the MRSA infection rates from 1.2 to 0.3% and the MRSA PJI rates from 9.7 to 1.0%. Mullen et al. [11] implemented a decolonization protocol of colonized staff and patients and reported a decreased rate of SSIs from 1.76 to 0.33%. Despite reporting the highest staff colonization rates (31% of theater staff), Portigliatti-Barbos et al. [16] showed a reduction of the already low SSI rates of 0.6 to 0% after a five-day decolonization course of intranasal mupirocin ointment for affected orthopaedic surgical team members. Dilogo et al. [13] did not identify any MRSA colonized orthopaedic staff members and concluded that there were no significant associations between MRSA staff colonizations and infections. We did not identify a relevant study investigating (MRSE) within the context of the question.

There is insufficient data available to establish a strong correlation between OR staff MRSA/MRSE colonization and the potential for increased infection rates in patients undergoing orthopaedic procedures. None of the studies re-evaluated the rate of staff colonization after decontamination protocols were initiated. The data sets across the included studies are heterogeneous which impedes pooled statistical analyses. Hence, a direct correlation between reduction in staff colonization and the reduction in MRSA-associated SSIs and PJIs cannot be confirmed, but is currently presumed.

The identified studies support current public health efforts to minimize nosocomial infections in the hospital setting with the focus on best possible patient outcomes. Additional studies are required to screen for MRSA colonization in staff members before and after decolonization, while monitoring the subsequent infection rates in patients.

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