**Assessment of Surgical Prophylaxis Choice in Patients Undergoing Joint Replacement or Spine Surgery**

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**Background:** Surgical site infections are associated with morbidity and recurrent complications. Screening and decolonization of *Staphylococcus aureus* (*S. aureus*) decreases perioperative infection rates and improves patient outcomes. Polymerase chain reaction (PCR)-based testing for *S. aureus* is highly sensitive and specific. This project evaluated the impact of pharmacist-led antibiotic prophylaxis for joint replacement or spine surgery.

**Methods:** This prospective, single-health system study compared surgeon selected preoperative antibiotics to pharmacist-led antibiotic optimization in *S. aureus-*colonized patients. Patients with methicillin-resistant *S. aureus* (MRSA) or methicillin-sensitive *S. aureus* (MSSA) positive PCR and undergoing joint replacement or spine surgery between March 2017 and March 2021 were reviewed. In April 2019, a new process of pharmacist-led antibiotic optimization was initiated. Pharmacists reviewed all preoperative nasal PCRs and surgeon-ordered antibiotics. In cases of PCR and antibiotic mismatch, pharmacists optimized antibiotics based on institution protocol. Cefazolin was preferred if MSSA-positive, and vancomycin plus cefazolin if MRSA-positive. The primary outcome was the rate of MRSA-colonized patients who received either vancomycin or clindamycin preoperatively. Secondary outcomes included appropriate antibiotic dose and timing, and surgical site infection rate by surgery type and causative organism.

**Results:** Baseline characteristics were similar in both groups. Pre- and post-intervention groups displayed similar rates of *S. aureus* colonization with approximately 18% of patients who were MRSA positive. The primary outcome of MRSA-positive patients receiving appropriate antibiotics was greater when compared to the pre-intervention (85.3% vs 61.2%); with greatest improvement observed in spine, knee, and hip procedures. Antibiotic dosing was appropriate and consistent across both groups and all surgery types. While the rate of appropriate timing of administration relative to procedure start was similar (97.5% vs 95.2%), a decline was seen with vancomycin (92.1% vs 82.2%).

**Conclusions:** This study supports pharmacist involvement in perioperative antimicrobial stewardship. Pharmacist-led antibiotic optimization resulted in more accurate preoperative antibiotic selection. The greatest improvement was seen in spine and knee procedures. Antibiotic dosing was overall appropriate and consistent across groups and surgery types.

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