

### Do Local Antibiotics Lead to Antimicrobial Resistance in Fracture-Related Infection?

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**Purpose:** We evaluated antimicrobial resistance (AMR) patterns following local antibiotic use in a large cohort of fracture patients from the PREP-IT trial, and hypothesized that patients who develop surgical site infection (SSI) after receiving local antibiotic therapy are no more likely to have a cultured pathogen with AMR.

**Methods:** This was a secondary analysis of all patients who developed SSI in the PREP-IT trial. Patients who received local antibiotics in any form prior to or at definitive fixation were compared to those who did not. The 2 groups were compared based on demographics, injury characteristics, and the primary outcome of the presence of a resistant SSI.

**Results:** 555 SSIs in 546 patients were included. 268 fractures (264 patients) received local antibiotics. There were more Gustilo-Anderson type IIIB/C fractures in the local antibiotic group (20% vs 14%,  $P = 0.14$ ). Other baseline and fracture characteristics were similar between groups. Local antibiotics received are shown in Table 1. One patient who received local vancomycin and tobramycin developed vancomycin resistant SSI. 8 patients (5.6%) who received tobramycin and 13 patients (3.2%) who did not receive tobramycin developed a multidrug-resistant SSI ( $P = 0.30$ ).

**Conclusion:** We found no differences in AMR with or without use of local antibiotics in our analysis of a randomized trial between various skin preparation solutions for extremity trauma surgery.

**Table 1 – Local Antibiotic Use in Participants with a Fracture-Related Infection**

	Local Antibiotics (N=268 fractures in 264 participants)
Delivery Method and Type of Antibiotic, n (%)*	
Powder	229 (85.4)
Vancomycin	227 (99.1)
Tobramycin	99 (43.2)
Ceftazidime	7 (3.1)
Cefazolin	1 (<1.0)
Cement	65 (24.3)
Vancomycin	61 (93.8)
Tobramycin	52 (80.0)
Gentamycin	10 (15.4)
Meropenem	1 (1.5)
Zosyn	1 (1.5)
Bio-absorbable	10 (3.7)
Vancomycin	9 (90.0)
Tobramycin	8 (80.0)
Amphotericin B	1 (10.0)

\*More than one type of antibiotic could be used in each surgery for each fracture