

# Antibiotic Treatment for Low-Velocity Gunshot Fractures: An Updated Systematic Review

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**INTRODUCTION:** Low-velocity gunshot fractures (LVGFs) are a common type of ballistic trauma with long-term consequences such as local infections. The effectiveness of antibiotic therapy in LVGFs remains uncertain, leading to ongoing debate about the appropriate treatment. In this systematic review, we evaluate recent updates on the current understanding of antibiotic therapy in LVGFs and how previous studies have investigated the use of antibiotics in LVGFs. Also, we address the current state of institutional policies and protocols for treating LVGFs with antibiotics.

**METHODS:** We conducted a systematic review of PubMed, Embase, Web of Science, CINAHL, and Cochrane databases per PRISMA guidelines to identify studies that investigated the use of antibiotics in LVGFs after the last systematic review in 2013. We included studies that met our predefined inclusion criteria and excluded studies that did not. Data extraction was performed independently by two reviewers using a pre-designed data extraction sheet. We categorized the outcomes based on the anatomical location of the LVGFs.

**RESULTS:** After evaluating 67 publications with the necessary qualifications out of 578 abstracts, 17 articles were included. The sample size of the studies ranged from 17 to 239 patients. The antibiotics used in the studies varied, and the follow-up period ranged from 4 weeks to 10 years. The included studies investigated the use of antibiotics in the treatment of LVGFs at various anatomic locations, including the humerus, forearm, hand and wrist, hip, femur, tibia, and foot and ankle. Our analysis revealed that antibiotics did not significantly reduce the infection rate for fractures treated nonoperatively (3.7% with antibiotics versus 8.6% without). There was also no significant difference in infection rates when gram-negative coverage was added, either in nonsurgically treated fractures (1.7% versus 2.8%) or in operatively treated fractures (0.9% versus 2.2%).

**DISCUSSION AND CONCLUSION:** Our study provides updated evidence for the use of antibiotics in LVGFs and highlights the need for further research to establish evidence-based guidelines. We also highlight the lack of institutional policies for treating LVGFs and the heterogeneity in treatments among institutions with protocols. A single-dose antibiotic approach could be cost-effective for patients with nonsurgically treated LVGFs. We suggest that a national or international registry for gunshot injuries, antibiotics, and infections could serve as a valuable resource for collecting and analyzing data related to these important healthcare issues.

