Craig J, Fuchs T, et al. Systematic review and meta-analysis of the additional benefit of local prophylactic antibiotic therapy for infection rates in open tibia fractures treated with intramedullary nailing. International Orthop 2014;38:1025-1030.

Design: meta-analysis of observational studies

Purpose of study: to estimate the effectiveness of local antibiotics in reducing infection rates in the setting of open tibia fractures treated with intramedullary nailing

Reasons not to cite as evidence:

- The authors could not include any randomized trials in their analysis of the data and report the level of evidence as Level III, which generally refers to retrospective studies and systematic reviews of retrospective studies
- For issues dealing with the effectiveness of interventions for health conditions, Level III studies do not rise to the level which supports evidence statements regarding their effectiveness
- Analysis was made somewhat more difficult by the fact that infection rates are low for lower-grade tibial fractures, and effectiveness of treatment is more readily detected in the setting of the more severe but less common fractures, where the sample sizes are smaller
- The article does not furnish sufficient data on the fracture rates in the different studies (i.e., no forest plots in Table 1) to allow the reader to see the event rates with and without antibiotics in the various fracture grades; only summary odds ratios are given in that table
- However, the authors did find that the number of infections for higher grades of tibial fractures is substantially lower in Gustilo-Anderson Grade III fractures with odds ratios which are too large to be accounted for by bias in the retrospective studies, and this information can be incorporated into the guideline for the fracture section

Information supported by the article

- Numerous retrospective studies have documented a substantially lower risk of infection in open tibial fractures treated with intramedullary nailing when local antibiotics are used at the fracture site. Most studies use polymethylmethacrylate bead chains impregnated with vancomycin or tobramycin, which were placed directly on the fracture site during the peri-operative period and removed as healing progressed