

Timely Antibiotic in Femur/Tibia Open Fractures

Siebler, J., Ogden, B., Deans, C., McCarthy, M., Lyden, E., Hewlett, A., & Mormino, M. (2020). A Performance Improvement Project in Antibiotic Administration for Open Fractures. *Journal of the American Academy of Orthopaedic Surgeons*, 28(1), e34-e40. doi:10.5435/jaaos-d-18-00528. This single-center retrospective cohort study compared patients with open fractures before and after implementation of a performance improvement project addressing timely antibiotic administration. Percent of patients receiving antibiotics within 1 hr improved from 34% to 84%, while those receiving antibiotics within 3 hrs improved from 91% to 99%.

Harper, K. D., Quinn, C., Eccles, J., Ramsey, F., & Rehman, S. (2018). Administration of intravenous antibiotics in patients with open fractures is dependent on emergency room triaging. *PLoS ONE*, 13(8), e0202013. doi:10.1371/journal.pone.0202013. This single-center retrospective cohort study of 117 open fracture patients were evaluated for timeliness to antibiotic administration and compared by triaging discipline. Patients received IV cefazolin significantly faster when trauma surgeons evaluated the patient rather than emergency medicine.

Johnson, J. P., Goodman, A. D., Haag, A. M., & Hayda, R. A. (2017). Decreased Time to Antibiotic Prophylaxis for Open Fractures at a Level One Trauma Center. *Journal of Orthopaedic Trauma*, 31(11), 596-599. doi:10.1097/bot.0000000000000928. This single-center retrospective cohort study of 100 adult open fracture patients compared before and after implementation of a QI effort to improve timeliness of IV antibiotic administration. After protocol implementation, time from admission to antibiotic administration decreased significantly from 123.1 to 35.7 minutes ($P = 0.0003$). Each time component decreased significantly: admission to order decreased from 94.1 to 26.1 minutes, and order to administration decreased from 29.0 to 9.5 minutes ($P = 0.0046$ and $P = 0.0003$).

Lack, W. D., Karunakar, M. A., Angerame, M. R., Seymour, R. B., Sims, S., Kellam, J. F., & Bosse, M. J. (2015). Type III open tibia fractures: immediate antibiotic prophylaxis minimizes infection. *Journal of Orthopaedic Trauma*, 29(1), 1-6. doi:10.1097/bot.0000000000000262. This single-center observational study of antibiotic timing in type III open tibia fractures showed that time from injury to antibiotics and to wound coverage independently predict infection of Type III open tibia fractures. Both should be achieved as early as possible, with coverage being dependent on the condition of the wound. Given the relatively short therapeutic window for antibiotic prophylaxis (within an hour of injury), prehospital antibiotics may be warranted.

Collinge, C. A., McWilliam-Ross, K., Kelly, K. C., & Dombroski, D. (2014). Substantial improvement in prophylactic antibiotic administration for open fracture patients: results of a performance improvement program. *Journal of Orthopaedic Trauma*, 28(11), 620-625. doi:10.1097/bot.0000000000000090. This single-center retrospective comparative cohort study of open fracture patients compared before and after implementation of a QI effort to improve timeliness of IV

antibiotic administration. Significant improvement in the timing and reproducibility of antibiotic administration was noted. One hour is an appropriate benchmark for antibiotics to be administered to open fracture patients at a busy trauma center.

Hoff, W. S., Bonadies, J. A., Cachecho, R., & Dorlac, W. C. (2011). East Practice Management Guidelines Work Group: Update to practice management guidelines for prophylactic antibiotic use in open fractures. *Journal of Trauma*, 70(3), 751-754. doi:10.1097/TA.0b013e31820930e5. This EAST guideline notes that antibiotics are an important adjunct to the management of open fractures and should be initiated as soon as possible. Gram-positive coverage is recommended for Type I And Type II Fractures. Broader antimicrobial coverage is recommended for type III fractures.