

Decreased Time to Antibiotic Prophylaxis for Open Fractures at a Level One Trauma Center

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Purpose: Open fractures present a unique treatment dilemma to orthopedic surgeons. Prophylactic antibiotics have been shown through multiple studies to decrease the incidence of infection in open fractures. Our study seeks to determine whether time to administration of antibiotics decreased following the implementation of an open fracture working group at a Level I trauma center.

Methods: 50 consecutive patients were enrolled prior to the implementation of our working group, and 50 patients were enrolled following the implementation of our working group. Age, gender, type of fracture, time of admission, time of ordering antibiotics, and time of administration of antibiotics were all recorded. Upon the initiation of our working group, we started an educational conference with Emergency Medicine (EM) providers about the importance of antibiotic prophylaxis for open fractures, our pharmacy began premixing bags of cephazolin, we altered the trauma ordering system to ease ordering of antibiotics for trauma patients, and posted educational posters throughout the Emergency Department. Standard descriptive statistics were used, chi-squared tests were used to evaluate categorical variables, and paired t tests were used to analyze for statistical significance of time differences pre- and post-protocol; significance was set to $P < 0.05$ a priori.

Results: After protocol implementation, time from admission to antibiotic administration decreased significantly from 123.1 to 35.7 minutes, 87.4 minutes shorter (71.0% sooner, $P = 0.0003$). Each component also decreased significantly: admission to order decreased 72.3% from 94.1 to 26.1 minutes, and order to administration decreased 67.0% from 29.0 to 9.5 minutes ($P = 0.0046$ and $P = 0.0003$, respectively).

Conclusion: Administration of prophylactic antibiotics has been demonstrated to reduce the risk of infection following open fractures in several large studies. While the idea that the antibiotics should be given for prophylaxis as early as possible has long been accepted based on animal models, only recently was the time point of 65 minutes after injury shown to be an independent risk factor for infection following type III open tibia fractures. Our study demonstrates a significantly reduced time to antibiotic prophylaxis for patients with open fractures following the implementation of a multidisciplinary working group. We hope that this provides a model for other institutions to improve care and outcomes of these challenging injuries.