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Prehospital antibiotic administration for suspected open fractures: importance and implementation

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The recent American College of Surgeons Committee on Trauma (COT), the Orthopedic Trauma Association (OTA), the American College of Emergency Physicians (ACEP), the National Association of EMS Physicians (NAEMSP), and the National Association of Emergency Medical Technicians (NAEMT) joint position statement entitled 'Prehospital Antibiotic Administration for Suspected Open Fractures' emphasizes the importance of prehospital antibiotics to help minimize and mitigate fracture-related infection.[1] Deep infections after open fractures underscore this urgency, with infection rates as high as 27% for severe open tibia fractures, with multiple factors contributing to this risk, including degree of contamination, injury severity, and delayed treatment.[2] The sequela of these infections can have multiple significant patient impacts, lead to prolonged hospitalization, necessitate additional operations, and ultimately affect long-term functional recovery. Early antibiotic administration (ideally within the first hour after injury) has been shown to help prevent serious complications and improve outcomes.[3]

Infection risk increases proportionally with delays in antibiotic delivery, and EMS administration of antibiotics permits a median of 15 minutes earlier infusion compared with hospital administration, with 99% of patients receiving antibiotics within 1 hour of EMS dispatch.[2 3] Additionally, this time interval benefit lengthens with helicopter transport, where EMS crews have been shown to deliver antibiotics as long as 30 min earlier with a 40.3% relative risk reduction in infection.[4] Safety concerns regarding prehospital antibiotic administration have also been examined, with no reported complications among patients receiving antibiotics during ground ambulance transport.[5] The prevalence of life-threatening cephalosporin allergies is also relatively low, with the incidence of cephalosporin-induced anaphylaxis found to be 6.8 per 100 000 exposures, and fatal anaphylaxis occurring in only 0.1 patients per 100 000 exposures.[6 7]

The implementation of prehospital antibiotics within EMS systems requires consideration of several factors including medication acquisition and resupply, treatment protocol development, training and education, and quality management. Additionally, this treatment must be appropriately integrated into other prehospital management priorities including patient resuscitation, bleeding control, and fracture stabilization. Importantly, as stated in the guidelines, antibiotic (cefazolin) administration should not delay transport or the management of immediate life threats. This practice is beneficial in children, with pediatric patients <50 kg receiving 1 gm and those above 50 kg receiving 2 gms.[1] As a growing number of EMS systems are now beginning to implement this practice, these essential points must be emphasized. The benefit is clear: for prehospital patients with open fractures, incorporating antibiotic delivery in the prehospital setting can significantly reduce infection rates and improve patient outcomes.

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Competing interests ML is a consultant with Stryker Medical Education and Cresilon. He is the uncompensated chair of the non-profit Stop the Bleed Coalition. He is a member of the Scientific Advisory Council of the American Red Cross and is the Medical Director of EMS Education for the American Red Cross.

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