

## **Empowering Pre-hospital Care Providers to Better Manage Open Fractures**

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**Purpose:** The early administration of antibiotics has been shown to significantly reduce the incidence of early infections in open fractures. As a result, national clinical governing bodies recommend early intravenous (IV) antibiotic administration, ideally within 1 hour from the time of injury. This target is difficult to achieve unless antibiotics are administered by prehospital care providers. Physician-led prehospital air ambulance care teams exist throughout the country. By engaging with this group, there is an opportunity to improve the early management of open fractures. A previous study undertaken in 2016 showed low prehospital antibiotic administration rates of 51%. The aim of this study is to demonstrate how an ongoing educational and governance program, combined with engagement from orthopaedic staff, can lead to improvements in care.

**Methods:** Following the results of the 2016 study, regular educational updates were undertaken with prehospital care providers via the weekly case review meetings and monthly governance meetings. All new staff in the service also had to complete a formal assessment that tested their knowledge of clinical protocols. A repeat retrospective review of records from January 2017 to December 2018 was completed to determine if there was an improvement in performance. The primary intervention being reviewed was prehospital IV antibiotic administration. Other interventions that were reviewed included documentation of clinical examination findings, use of splints, and appropriate triage of patients to a major trauma center or orthoplastics center. This study received ethical approval from the prehospital care provider's IRB.

**Results:** 126 patient suffered open fractures and were treated by the Air Ambulance Service between 2017 and 2018. Results showed an improved antibiotic administration rate of 68%. In patients with isolated open fractures, the rate of IV antibiotic administration was considerably higher at 79%. In those with multi-system injury, the rate was slightly lower at 51%. There were also associated improvements in the accuracy of clinical documentation, use of splints, and appropriate triage of patients to major trauma centers.

**Conclusion:** By engaging with prehospital care services, early interventions in the management of open fractures can be safely completed in the field prior to hospital arrival. Such engagement helps provide a more integrated approach to patient care and helps a trauma network work more effectively. This study highlights the continued importance of ongoing education, regular case discussion, and audits in order to improve and maintain an effective and efficient service.