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# Open fracture management

## Critical issues

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### Abstract

Open fractures are commonly encountered injuries worldwide and are often complicated by infection. Many present significant treatment challenges, where surgeons' early decision-making can affect long-term outcomes. While evidence-based recommendations exist to guide some of these decisions, several treatment areas continue to be controversial. This supplement seeks to outline critical treatment elements for open fractures, including antibiotic administration, surgical timing, bone defect management, and soft-tissue coverage as well as management of fracture-related infections. The expectation is that a better understanding of these issues will help improve the future care of these potentially disabling injuries.

**Keywords:** antibiotic, bone defect, open fracture, timing, wound

### 1. Introduction

Open fractures are among the most commonly encountered musculoskeletal injuries.<sup>[1]</sup> Open tibia fractures, in particular, have received increased attention due to their prevalence and severity.<sup>[2]</sup> These fractures are the second-most common open bone injury,<sup>[3]</sup> occurring in nearly 1-quarter of all tibial diaphyseal fractures,<sup>[4]</sup> with estimates of 17 to 23 open tibia fractures per 100,000 person years.<sup>[5]</sup> Additionally, approximately 60% of open tibial fractures result from higher energy injuries, which are associated with severe soft tissue lesions.<sup>[6]</sup> Ultimately, these can lead to significant complications that include infection, wound-healing problems, and impaired bone healing,<sup>[7,8]</sup> potentially leading to long-term disability.

The management goals are to achieve well-aligned bone union, avoid complications, and restore function. While some of the factors that contribute to the ultimate outcomes are patient-related, others are influenced by treatment choices. Perhaps as critical as any acute care decisions they face, surgeons' early management of open injuries may significantly influence long-term outcomes. Although evidence-based practice recommenda-

tions to guide decision-making continue to grow, several areas remain inconclusive.

With the goal of summarizing the current understanding of best evidence for the acute treatment of open fractures, this supplement addresses many of the most critical controversies. The topics include antibiotic selection and administration, surgical timing, management of bone defects, and coverage of soft-tissue wounds as well as management of fracture-related infections. Further, this summary will address gaps in the literature and needs for future study to improve care of these injuries worldwide.

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