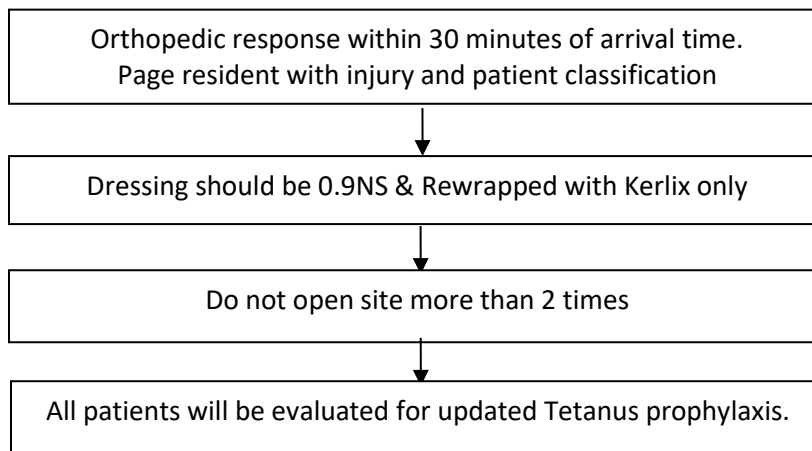




## INITIAL EVALUATION OF THE ADULT TRAUMA PATIENT WITH OPEN EXTREMITY FRACTURES

### ED Guideline 02-12-099



Open fracture type	Characteristics of Gustilo Grade Open Fracture	Infection Rate	Amputation Rate
Type I	Clean wound smaller than 1 cm in diameter, simple fracture pattern, no skin crushing.	0-2%	0%
Type II	A laceration larger than 1 cm but without significant soft tissue crushing, including no flaps, degloving, or contusion. Fracture pattern may be more complex.	2-7%	0%
Type III	An open segmental fracture or a single fracture with extensive soft tissue injury. Also included are injuries older than 8 hours. Type III injuries are subdivided into three types:		
Type III A	Adequate soft tissue coverage of the fracture despite high energy trauma or extensive laceration or skin flaps.	5-10%	2.5%
Type III B	Inadequate soft tissue coverage with periosteal stripping. Soft tissue reconstruction is necessary.	10-50%	5.6%
Type III C	Any open fracture that is associated with an arterial injury that requires repair.	25-50%	25%
Type of Open Fx	Recommended Antibiotic	Alternate if PCN Allergy	
I or II	<b>Cefazolin</b> * 2 g IV q8h** for 24 hrs <sup>#</sup>	<b>Vancomycin</b> <sup>#</sup>	
III	<b>Ceftriaxone</b> * 2 g IV q24h for 48 hrs <sup>#</sup>	<b>Vancomycin</b> + <b>Aztreonam</b> 2 g IV q8h** for 48 hrs <sup>#</sup>	

\* For extensive soil exposure (e.g., farming accident), add **metronidazole** 500 mg PO/IV q8h

\*\*[Dose adjust based on renal function](#)

<sup>#</sup>Antibiotic prophylaxis should be provided for 24 hours but may be extended for up to 48 hours if needed. Also Duration may need to be extended if surgery is delayed due to patient instability. Vancomycin dosing per pharmacy.

**REFERENCES:**

1. Hauser CJ, Adams AA, Eachempati SR. Prophylactic Antibiotic Use in Open Fractures: An Evidence-Based Guideline. [Surgical Infections 2006;7,4. 379-405.](#)
2. Luchette FA, Bone LB, Born CT, et al. EAST Practice management guidelines for prophylactic antibiotic use in open fractures. [www.east.org/tpg/openfrac.pdf](http://www.east.org/tpg/openfrac.pdf).
3. Okike K, Bhattacharyya T. Trends in the management of open fractures. A critical analysis. [J Bone Joint Surg Am 2006;88:2739-2748.](#)
4. Holtom PD. Antibiotic prophylaxis: Current recommendations. [J Am Acad Orthop Surg 2006;14:S98-100.](#)
5. Gustilo RB, Anderson JT. Prevention of infection in the treatment of 1,025 open fractions of long bones: retrospective and prospective analysis. [J Bone Joint Surg Am 1976 Jun;58\(4\):453-8](#)
6. Rodriguez L, Jung HS, Goulet JA, et al. Evidence-based protocol for prophylactic antibiotics in open fractures: Improved antibiotic stewardship with no increase in infection rates. [J Trauma Acute Care Surg 2014;77:400-408.](#)

Author: Chris Wagner

Revised: Tejal N. Gandhi & David A. Machado-Aranda

Antimicrobial Subcommittee Approval: 06/2021	Originated: 05/2012
P&T Approval: N/A	Last Revised: 12/2021
Revision History: 12/21: Revised type and treatment recommendations.	

*The recommendations in this guide are meant to serve as treatment guidelines for use at Michigan Medicine facilities. If you are an individual experiencing a medical emergency, call 911 immediately. These guidelines should not replace a provider's professional medical advice based on clinical judgment, or be used in lieu of an Infectious Diseases consultation when necessary. As a result of ongoing research, practice guidelines may from time to time change. The authors of these guidelines have made all attempts to ensure the accuracy based on current information, however, due to ongoing research, users of these guidelines are strongly encouraged to confirm the information contained within them through an independent source.*

*If obtained from a source other than med.umich.edu/asp, please visit the webpage for the most up-to-date document.*