

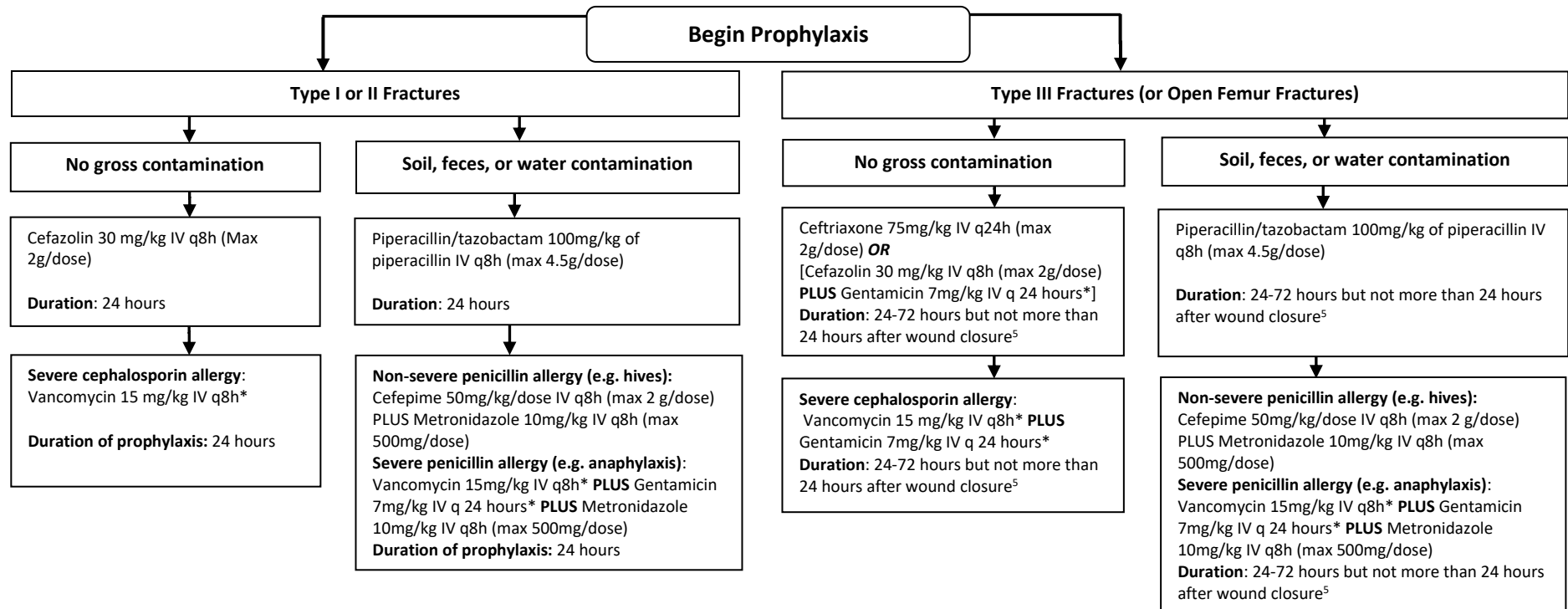
Trauma Center Practice Management Guideline

Iowa Methodist Medical Center — Des Moines

Open Fracture Clinical Pathway for Pediatric Trauma Patients Blank Pediatrics

PEDIATRIC Practice Management Guideline	Effective: 07/2017
Contact: Trauma Center Medical Director	Reviewed: 04/2026

Open Fracture Gustilo Classification	
Type I Fracture	Open fracture with clean wound <1 cm long
Type II Fracture	Open fracture with laceration >1 cm but < 10 cm long without extensive soft tissue damage
Type III Fracture	Open segmental fracture, open fracture with extensive soft tissue damage, >10 cm or traumatic amputation



For known MRSA colonization in all fracture types: Utilize Vancomycin 15 mg/kg IV q8h*

*Pharmacy will adjust doses if indicated based on renal function and are available to manage vancomycin or gentamicin therapy when consulted.

Antibiotic Considerations:

- Prophylaxis should begin as soon as possible and within 3 hours of injury because infection risk increases significantly beyond this time frame.⁵
- Cultures immediately post-injury are not useful in directing antimicrobial prophylaxis.⁵
- Studies have found similar efficacy and lower rates of acute kidney injury with ceftriaxone as compared with cefazolin plus gentamicin in Type III Fractures.^{1,9}
- Even for Type III Fracture, one day of antibiotics may be as effective as longer courses.⁴
- All patients should be evaluated for tetanus prophylaxis.
- Extended antibiotic prophylaxis, defined as >72 hours duration post-closure, was associated with a significantly lower odds of developing a deep surgical site infection in patients with severe wound contamination. Severe contamination was defined as massive contamination that is due to high-risk environmental contaminants, such as clothes, grass, or fecal matter, or any contaminates deeply embedded in bone or deep soft tissues.⁷
- Extended antibiotic prophylaxis was associated with higher odds of deep surgical site infection in mildly contaminated wounds.⁷
- Patients with a history of unverified non-anaphylactic penicillin allergy, any cephalosporin can be administered routinely without testing or additional precautions.
- Patients with a history of anaphylaxis to penicillin, a non-cross-reactive cephalosporin (e.g., cefazolin) can be administered routinely without prior testing.¹¹

Irrigation, debridement and skin closure⁶:

- Patients with open fractures should be taken to the operating room for irrigation and debridement within 24 hours of initial presentation whenever possible.
- Patients with severe fractures associated with gross wound contamination should be brought to the operating room more quickly, and as soon as clinically feasible, based on the patient's condition and resources available.
- Whenever possible, skin defects overlying open fractures should be closed at the time of initial debridement.
- Soft tissue coverage should be completed within seven days of injury for open fractures associated with wounds requiring skin grafting or soft tissue transfers.

References:

1. 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(3):400-7.
2. Hoff WS, Bonadies JA, Cachecho R, et al. East Practice Management Guidelines Work Group: update to practice management guidelines for prophylactic antibiotic use in open fractures. *J Trauma.* 2011;70(3):751-4.
3. Hauser CJ, Adams CA Jr, Eachempati SR. Surgical infection society guideline: prophylactic antibiotic use in open fractures: an evidence-based guideline. *Surg Infect (Larchmt).* 2006;7(4):379-405.
4. Dunkel N, Pittet D, et al. Short duration of antibiotic prophylaxis in open fractures does not enhance risk of subsequent infection. *Bone Joint J.* 2013;95-B:831-7.
5. Anderson A, Miller AD, Bookstaver PB. Antimicrobial prophylaxis in open lower extremity fractures. *Open Access Emergency Medicine.* 2011;3:7-11.
6. ACS TQIP best practices in the management of orthopaedic trauma. 2015. Available at: https://www.facs.org/media/mkbnhqtw/ortho_guidelines.pdf.
7. Stennett CA, O'hara NN, Sprague S, et al. Effect of Extended Prophylactic Antibiotic Duration in the Treatment of Open Fracture Wounds Differs by Level of Contamination. *Journal of Orthopaedic Trauma.* 2020;34(3):113-120. doi:10.1097/bot.0000000000001715
8. Garner MR, Sethuraman SA, Schade MA, et al. Antibiotic Prophylaxis in Open Fractures. *Journal of the American Academy of Orthopaedic Surgeons.* 2020;28(8):309-315. doi:10.5435/jaaos-d-18-00193
9. Bankhead-Kendall B, Gutierrez T, Murry J, et al. Antibiotics and open fractures of the lower extremity: less is more. *European Journal of Trauma and Emergency Surgery.* 2017;45(1):125-129. doi:10.1007/s00068-017-0847-x
10. Károly Péter Sárvári & Dzsenerifer Schoblocher (2020) The antibiotic susceptibility pattern of gas gangrene-forming Clostridium spp. clinical isolates from South Eastern Hungary, *Infectious Diseases*, 52:3, 196-201, DOI: 10.1080/23744235.2019.1696472
11. Khan DA, Banerji A, Blumenthal KG, et al. Drug allergy: A 2022 practice parameter update. *J Allergy Clin Immunol.* 2022;150(6): 1333-93.
12. Makarewich CA, McNeely LW, Gohel S, et al. Open fractures in pediatric orthopaedics-Can pathways improve care? A 1-year pre and post implementation analysis. *J Pediatr Orthop.* 2022;52(9):e937-42.