

## DIVISION OF TRAUMA AND SURGICAL CRITICAL CARE

**ORTHOPEDIC PROPHYLACTIC ANTIBIOTIC PROTOCOLS****Rationale:**

The rate of infections in open fractures is significantly related with the degree of soft tissue injury, contamination, blood supply to the area, and to the management of the wound<sup>1-3</sup>. Most commonly open fractures are classified by the Gustilo classification system:

Type I	wound < 1 cm in length, clean with minimal soft tissue loss or injury
Type II	wound > 1 cm but without extensive soft tissue injury, tissue loss, or contamination
Type III	A: wound with heavy contamination B: soft tissue loss and/or heavy contamination with extensive soft tissue injury C: open fracture with arterial injury and ischemia

Infection rate increases significantly as the grade of the injury increases (0-2% for type I, to 25-50% for type IIIC). As the grade increases, the pathogens shift towards nosocomial pathogens related to wound handling and colonization of open wounds by hospital bacterial flora. Thus, meticulous wound management greatly reduces infectious complications and has a greater impact than antibiotics delivered after the injury has occurred.

**Protocol and Order Set:**Open Fractures:

## 1. Antibiotics:

- Types I and II:
  - a. Cefazolin 2 grams IV now and q8h x 3 doses
  - b. Penicillin allergic: Clindamycin 900 mg IV now and q8h x 3 doses
- Type III (>10cm and/or severe contamination):
  - a. Vancomycin per EPIC dosing advisor x 24h
  - b. Ceftriaxone 2 grams IV now q24h x 1
  - c. Penicillin allergic: Levofloxacin 750mg IV now and q24h X 1
    - If multiple debridements are required, redose perioperatively with antibiotics utilized for initial Gustilo classification

**\*\*If open facial fracture, please refer to the Craniofacial PMG**

Ballistic Fractures:

## 1. Antibiotics:

- High Velocity: Treat as Grade III Gustilo (see regimens above)
- Low Velocity
  - a. Extremity (operative): Cefazolin 2 grams IV now and q8h x 3 doses perioperatively
  - b. Extremity (Non-operative): no prophylaxis required
  - c. Hip and pelvic fractures with concomitant bowel injury: Cefoxitin 2 grams IV now and q6h X 4 doses preoperatively
  - d. Hip and pelvic fractures with no bowel contamination:
    - Non-operative: no prophylaxis required
    - Operative: Cefazolin 2 grams IV now and q8h x 3 doses

## References

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4. Dunkel N, Pittet D, Tovmirzaeva, et al. Short duration of antibiotic prophylaxis in open fractures does not enhance risk of subsequent infection. *Bone Joint J.* 2013;95-B:831-837.
5. Nguyen MP, Savakus JC, O'Donnell JA, et al. Infection rates and treatment of low-velocity extremity gunshot injuries. *J Orthop Trauma.* 2017;31:326-329.
6. Papasoulis E, Patzakis MJ, Zalavras CG. Antibiotics in the treatment of low-velocity gunshot-induced fractures. *Clin Orthop Relat Res.* 2013;471:3937-3944.
7. Vasanth S, Thakore RV, Stinner DJ, et al. Gunshot-induced fractures of the extremities: a review of antibiotic and debridement practices. *Curr Rev Musculoskelet Med.* 2015;8:276-289.

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Bradley Dennis, MD

Robert Boyce, MD,

Leanne Atchison, PharmD

Jennifer Beavers, PharmD, BCPS