Antibiotic Prophylaxis in Open Fractures

BACKGROUND

Open fractures are high energy injuries with an increased risk of infection due to potential exposure of bone and deep tissue to a variety of environmental debris. Infection can lead to serious complications including nonunion of wounds and osteomyelitis. Antimicrobial prophylaxis is indicated in open fractures and should be based upon the risk of infection. An order set severity based guidance is available in One Chart.

DEFINITIIONS

The Gustilo-Anderson classification system is the most commonly used grading system for open fractures. Fractures are designated as one of three types based on wound size, soft tissue involvement, contamination, and fracture pattern.

Table 1: Gustilo-Anderson Classification System

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

RECOMMENDATIONS

Type I and II Fractures

- Preferred: Cefazolin 2 g (3 g if > 120 kg) IV q8h
- Severe beta-lactam allergy: Clindamycin 900 mg IV q8h
- Known MRSA colonization: Add vancomycin 15 mg/kg IV q12h
- Duration of prophylaxis: 24 hours

Type III Fractures

- No gross contamination:
    - Preferred: Ceftriaxone 2g IV q24h
    - Severe Beta-lactam allergy: Clindamycin 900 mg IV q8h + levofloxacin 500 mg IV q24h
    - Known MRSA colonization: Add vancomycin 15 mg/kg IV q12h
    - Duration of prophylaxis: 48 hours or 24 hours after wound closure, whichever is shorter

- Contamination with soil or fecal material:
    - Preferred: Ceftriaxone 2 g IV q24h + metronidazole 500 mg IV q8h
    - Severe Beta-lactam allergy: Levofloxacin 500 mg IV q24h + metronidazole 500 mg IV q8h
    - Acutely intoxicated patients: Piperacillin/tazobactam 4.5 g IV q8h *(Change to ceftriaxone + metronidazole when intoxication resolved)*
    - Acutely intoxicated patients with Severe Beta-lactam allergy: Clindamycin 900 mg IV q8h + levofloxacin 500 mg IV q24h *(Change to levofloxacin + metronidazole once intoxication resolved)*
    - Known MRSA colonization: Add vancomycin 15 mg/kg IV q12h
    - Duration: 48 hours after wound closure
    - **Consider infectious diseases consult**

- Contamination with standing water:
    - Preferred: Piperacillin/tazobactam 4.5 g IV q8h
    - Severe Beta-lactam allergy: Levofloxacin 500 mg IV q24h + metronidazole 500 mg IV q8h
    - Acutely intoxicated patients with Severe Beta-lactam allergy: Clindamycin 900 mg IV q8h + levofloxacin 500 mg IV q24h *(Change to levofloxacin + metronidazole once intoxication resolved)*
    - Known MRSA colonization: Add vancomycin 15 mg/kg IV q12h
    - Duration: 48 hours after wound closure
    - **Consider infectious diseases consult**

REFERENCES

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