Open Fracture Gustilo Classification

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Open fracture with clean wound &lt;1 cm long</td>
</tr>
<tr>
<td>II</td>
<td>Open fracture with laceration &gt;1 cm but &lt; 10 cm long without extensive soft tissue damage</td>
</tr>
<tr>
<td>III</td>
<td>Open segmental fracture, open fracture with extensive soft tissue damage, &gt;10 cm or traumatic amputation</td>
</tr>
</tbody>
</table>

Begin Prophylaxis

Type I or II Fractures

Cefazolin 2 g (3 g if >120 kg) IV q8h

If contamination with soil or feces:
Add Metronidazole 500 mg IV q8h + Penicillin G 4 million Units IV q4h

Duration of prophylaxis: 24 hours

Severe Penicillin (PCN) allergy:
Clindamycin 900 mg IV q8h OR Vancomycin 15 mg/kg IV q12h**

Severe PCN allergy AND soil/feces contamination:
Levofloxacin 500 mg IV q 24h + Metronidazole 500 mg IV q8h

Type III Fractures

No gross contamination

Ceftriaxone 2 g IV q24h
OR Cefazolin 2 g IV q8h + Gentamicin 5mg/kg IV q 24 hours**

Duration: 24-72 hours but not more than 24 hours after wound closure³

Severe PCN allergy:
Clindamycin 900 mg IV q8h + Levofloxacin 500 mg IV q 24h

Contamination with soil or feces:
Ceftriaxone 2 g IV q24h + Metronidazole 500 mg IV q8h + Penicillin G 4 million Units IV q4h

Duration: 24-72 hours but not more than 24 hours after wound closure⁵

Severe PCN allergy:
Levofoxacin 500 mg IV q 24h + Metronidazole 500 mg IV q8h

Contamination with standing water:

Piperacillin/tazobactam dosed per policy**

Duration: 24-72 hours but not more than 24 hours after wound closure⁵

Severe PCN allergy:
Levofoxacin 500 mg IV q 24h + Metronidazole 500 mg IV q8h

For known MRSA colonization in all fracture types: Utilize Vancomycin 15 mg/kg IV q12h**

**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.\(^5\)
- Type I or II fractures necessitate gram positive coverage while Type III fractures require the addition of gram negative coverage.\(^2\)
- Studies have found similar efficacy with ceftriaxone as compared with cefazolin plus gentamicin in Type III Fractures.\(^1\)
- Fluoroquinolones may be detrimental to fracture healing\(^5\) and may result in higher infection rates in Type III Fractures.\(^2\)
- Aminoglycosides should be dosed once daily as this may decrease side effect risk.\(^2\)
- Even for Type III Fracture, 1 day of antibiotics may be as effective as longer courses\(^4\)
- All patients should be evaluated for Tetanus prophylaxis.

**Irrigation, debridement and skin closure\(^6\):**

- 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:**