**Initial management**

- IV antibiotics should be administered within one hour of presentation (time sensitive). Update tetanus as indicated.
- Orthopaedic on call resident should be called immediately upon diagnosis of open fracture for evaluation, reduction, and stabilization
- Open lacerations overlying fracture sites should be covered with moist sterile gauze and covered with sterile dressing until initial orthopaedic evaluation
- Debridement of gross contaminants to be performed by orthopaedic resident on call
- Loose bone fragments should not be removed from wound or discarded
- Wound exposure to be kept at a minimum until formal OR debridement (Cover and keep covered)
- Direct pressure should be used to control active bleeding, prevent use of tourniquets or clamps unless conservative measures fail
- Scout film of open fracture extremity should be attempted in trauma bay barring critical conditions where time/space not available

**Antibiotics to be initiated STAT at initial diagnosis of open fracture**

**General Guidelines in ED:**

- Open wound <10cm with low energy mechanism: Ancef 2gm IV
- Open wound >10cm or high energy mechanism and severe soft tissue trauma: Ceftriaxone 2gm IV
- GSW: Ancef 2gm IV

**Intraoperative Diagnosis and continuing management:**

**Gustilo Type I, II:** Ancef 1-2gm IV Q8H, continued until 24hrs post-definitive fixation and wound closure*

**Cephalosporin allergy or history of anaphylaxis with penicillin:** Clindamycin 600 mg IV Q8H, continued until 24hrs post-definitive fixation and wound closure*

**Gustilo Type III:** Ceftriaxone 2gm IV Q24H, continued until 24hrs post-definitive fixation and wound closure*

**Cephalosporin allergy or history of anaphylaxis with penicillin:** Clindamycin 600mg IV Q8H + Aztreonam 2gm IV Q8H, continued until 24hrs post-definitive fixation*
Placement of wound vats are considered closure. Antibiotics should be discontinued after seven days even if the wound is technically still open except under special circumstances. Discuss with orthopedics about the need for ongoing antibiotics.

Update tetanus prophylaxis as indicated upon initial evaluation

**Gustilo classification:**

Type I: Wound <1cm, minimal soft tissue and periosteal disruption

Type II: Wound >1cm but <10cm, without extensive bone loss, soft tissue/periosteal damage, or contamination

Type IIIA: Wound with extensive soft tissue/periosteal damage and/or bone loss

Type IIIB: Fracture with extensive soft tissue injury requiring soft tissue transfer procedure

Type IIIC: Open fracture with vascular injury requiring vascular repair

**Supporting Evidence:**

Open fractures have a high rate of infection, with increasing rates correlating with higher Gustilo type.\(^1\,\text{2}\) Infection rates following type III fractures are reported as high as 44%.\(^1\,\text{2}\) Multiple studies have shown infection rates correlating with increased time to antibiotics, with published increased rates of infection from delays as short as 66 minutes post injury.\(^4\) Protocols decreasing time to hospital administration of antibiotics have shown decreased rates of infection following open fractures.\(^5\) Meticulous handling of open fracture wounds is also essential as increased handling of wounds leads to colonization by nosocomial pathogens. Bedside irrigation and wound handling can lead to increased bacterial permeation deeper into the wound versus sharp controlled debridement in the sterile operating theatre.\(^6\) Excessive devascularization to an open fracture site can result in avascular necrosis of critically ischemic structures, leading to soft tissue and orthopaedic sequelae long term. Open fractures/dislocations may have segmental components or additional injuries directly affecting reduction, and a scout film should be obtained at a minimum prior to manipulation.

**References**