Open Fractures

Key Facts:

- Open fractures are fractures with direct communication to the external environment.
- Treatment depends on location of the fracture but generally requires immediate IV antibiotics and urgent irrigation and debridement followed by surgical fixation as needed.
- They tend to be caused by high energy trauma.

STOP

Always remember to start with ABC in any trauma patient. The open fracture may be the most obvious injury but not the most dangerous….

Classification of Open Fractures

They are often categorised using the Gustilo classification (see below). Management varies slightly based on this classification.

	I	II	III-A	III-B	III-C
Energy of mechanism	Low	Moderate	High	High	High
Wound size	<1 cm	>1 cm	Usually >10 cm	Usually >10 cm	Usually >10 cm
Soft tissue injury	Low	Moderate	Extensive	Extensive	Extensive
Contamination	NO	Low	Severe	Variable	Variable
Conminution/ Fracture pattern	No/ Simple	Some/ Simple	Severe/ Complex	Severe/ Complex	Severe/ Complex
Soft tissue coverage	Yes	Yes	Yes	No, requires reconstructive procedure	Variable
Vacular injury injury	No	No	No	No	Yes, require reparation

Management

1. Do not be distracted by the open fracture - start with your ABC's

2. Check the neurovascular status distal to the fracture. If concerns perfusion inadequate needs immediate reduction - **CALL ORTHO AND ED CONSULTANT**

3. Commence antibiotics as per table at the bottom of the document.
   -Studies show increased infection rate when antibiotics are delayed for more than 3 hours from time of injury.

4. Give tetanus toxoid 0.5ml IM to all patients.
   *Consider immunoglobulin in patients with incomplete primary immunization or if longer than 10 years since their last booster *

5. **Irrigation**
- There is little evidence to support aggressive irrigation in the ED, as this can push debris further into wound.
- Remove gross debris from wound, do not remove any bone fragments
- Place sterile saline-soaked dressing on the wound

6. **Stabilisation**
- Use a splint, brace, or traction for temporary stabilisation
- This decreases pain, minimises soft tissue trauma, and prevents disruption of clots.

All open fractures should be referred to orthopaedics immediately for definitive management.

Which Antibiotics Should I Use in Kijabe?

Patient Description	First Line Antibiotic
Gustilo type I and II	Adult Cefazolin 2g TDS IV For Children - Cefazolin 30mg/kg IV TDS(max 2g)
Gustilo type III	Adults Cefazolin 2g (Children 30mg/ Kg) TDS IV plus Gentamicin 5mg/Kg OD. (If using Gentamicin monitor renal function)
Farm injuries, heavy contamination, or possible bowel contamination	Cefazolin 2g TDS IV plus Metronidazole 500mg TDS IV. For children - Cefazolin 30mg/kg TDS IV and metronidazole 10mg/kg TDS IV.
Fresh water wounds	Ciprofloxacin 500mg BD PO (Avoid in children) or Ceftriaxone 1g BD IV. In Children Ceftriaxone 50mg/Kg BD IV.
Salt water wounds	Doxycycline 100mg BD PO + Ciprofloxacin 500mg BD PO. **For children - discuss with consultant.**

- References:

  - Jorge-Mora, A., Amhaz-Escanlar, S., González, I. C., Teso, C. L.-D., Gómez, R., Jorge-Mora, T., … Pino-Mínguez, J. (2018). Management of Open Fracture. Trauma Surgery. doi: 10.5772/intechopen.74280
  - https://www.orthobullets.com/trauma/1004/open-fractures-management - accessed March 10th 2023