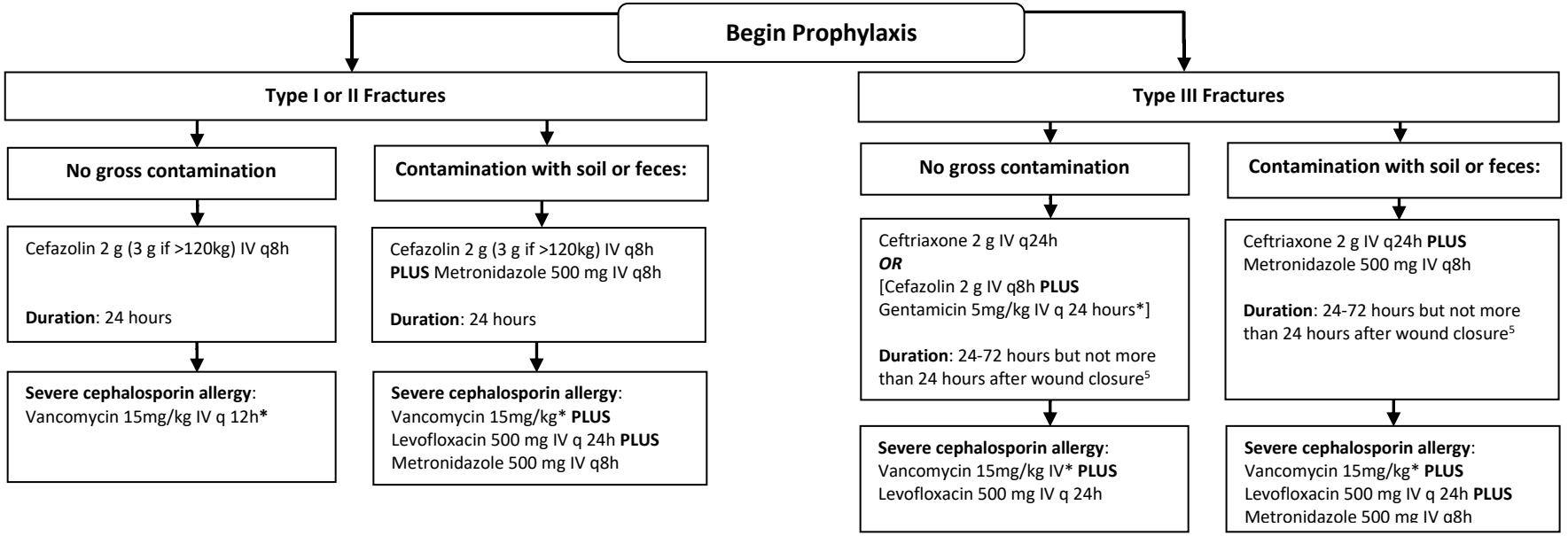
Trauma Center Practice Management Guideline

Iowa Methodist Medical Center — Des Moines

Open Fracture Clinical Pathway for Trauma Patients
IMMC/ILH Adult Acute Care

ADULT **Practice Management Guideline**	**Effective:**
Contact: Trauma Center Medical Director	**Initiated: 05/2017, Reviewed: 04/2024**

Open Fracture Gustilo Classification	
Type I Fracture	Open fracture with clean wound <1 cm long
Type II Fracture	Open fracture with laceration >1 cm but < 10 cm long without extensive soft tissue damage
Type III Fracture	Open segmental or comminuted fracture, open fracture with extensive soft tissue damage, >10 cm wound or traumatic amputation



*Pharmacy will adjust doses if indicated based on renal function and are available to manage vancomycin or gentamicin therapy when consulted.

For known MRSA colonization in all fracture types: Utilize Vancomycin 15 mg/kg IV q12h
For contamination with standing water in all fracture types**:** change to Piperacillin/tazobactam dosed per policy.
For contamination with standing water and a severe penicillin allergy, use vancomycin 15mg/kg PLUS levofloxacin 500mg IV q24h PLUS Metronidazole 500mg IV q8h.

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 and lower rates of acute kidney injury with ceftriaxone as compared with cefazolin plus gentamicin in Type III Fractures.[1, 9]
- Aminoglycosides should be dosed once daily as this may decrease side effect risk.[2]
- Even for Type III Fracture, one day of antibiotics may be as effective as longer courses.[4]
- All patients should be evaluated for tetanus prophylaxis.
- Extended antibiotic prophylaxis, defined as >72 hours duration post-closure, was associated with a significantly lower odds of developing a deep surgical site infection in patients with severe wound contamination. Severe contamination was defined as massive contamination that is due to high-risk environmental contaminants, such as clothes, grass, or fecal matter, or any contaminates deeply imbedded in bone or deep soft tissues.[7]
- Extended antibiotic prophylaxis was associated with higher odds of deep surgical site infection in mildly contaminated wounds.[7]
- Patients with a history of an unverified non-anaphylactic penicillin allergy, any cephalosporin can be administered routinely without testing or additional precautions. Patients with a history of anaphylaxis to penicillin, a non–cross-reactive cephalosporin (e.g., cefazolin) can be administered routinely without prior testing.[11]

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:

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