

# STANDARD TREATMENT WORKFLOW (STW)

## OPEN FRACTURES

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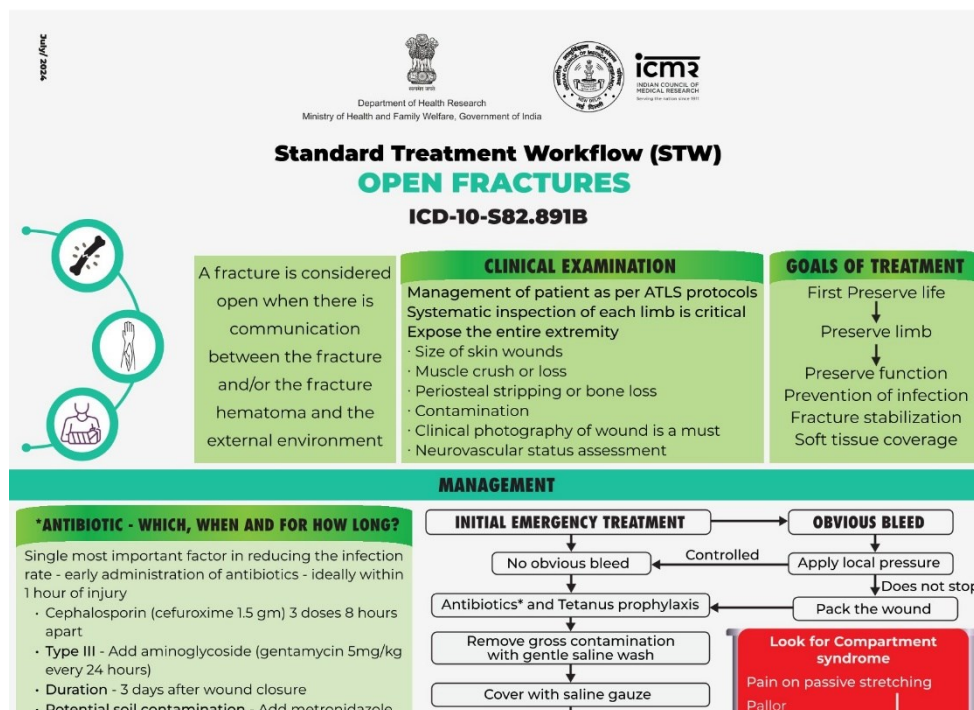
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**Standard Treatment Workflow (STW)  
OPEN FRACTURES**  
ICD-10-S82.891B



A fracture is considered open when there is communication between the fracture and/or the fracture hematoma and the external environment

**CLINICAL EXAMINATION**

Management of patient as per ATLS protocols  
Systematic inspection of each limb is critical  
Expose the entire extremity

- Size of skin wounds
- Muscle crush or loss
- Periosteal stripping or bone loss
- Contamination
- Clinical photography of wound is a must
- Neurovascular status assessment

**GOALS OF TREATMENT**

First Preserve life  
↓  
Preserve limb  
↓  
Preserve function  
Prevention of infection  
Fracture stabilization  
Soft tissue coverage

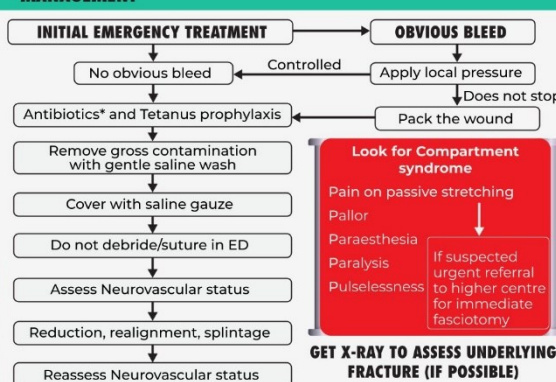
**MANAGEMENT**

**\*ANTIBIOTIC - WHICH, WHEN AND FOR HOW LONG?**

Single most important factor in reducing the infection rate - early administration of antibiotics - ideally within 1 hour of injury

- Cephalosporin (cefuroxime 1.5 gm) 3 doses 8 hours apart
- Type III - Add aminoglycoside (gentamycin 5mg/kg every 24 hours)
- Duration - 3 days after wound closure
- Potential soil contamination - Add metronidazole 500 mg IV every 8 hours

Consider Aspirin in case of prolonged immobilisation  
Look for signs of DVT and embolism



**REFERRAL**

Ensure Splintage is done, Analgesic IV/IM Diclofenac single dose is given. Patient is kept NPO and IV fluid (RL) is started

At primary centre after initial management is done

GA Type I to III A


Refer to secondary centre

GA Type III B

Refer to tertiary centre

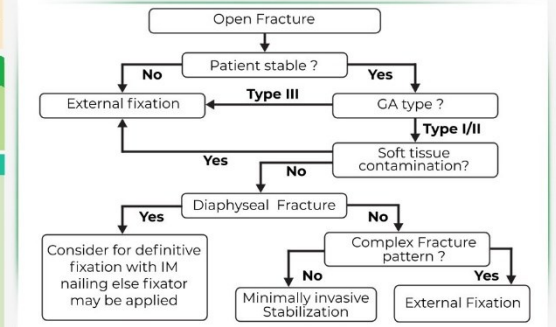
**GUSTILO-ANDERSON CLASSIFICATION**

	I	II	III-A	III-B	III-C
Energy of mechanism	Low	Moderate	High	High	High
Wound size	<1 cm	1 to 10 cm	>10 cm	>10 cm	>10 cm
Soft tissue injury	Low	Moderate	Extensive	Extensive	Extensive
Contamination	No	Low	Severe	Variable	Variable
Fracture pattern/ comminution	Simple /no	Simple/ Some	Complex /Severe	Complex /Severe	Complex /Severe
Soft tissue coverage	Yes	Yes	Yes	No	Variable
Vascular injury	No	No	No	No	Yes



**SURGICAL WOUND DECONTAMINATION**

- Prior to formal debridement the wound should be handled only to remove gross contamination
- 'Mini-washouts' outside the operating theatre environment are not indicated
- Debride all devitalized structures - skin, muscle, bones ('When in doubt, take it out')
- Irrigation: Low to medium pressure; normal saline
- Rule of 3 (Type 1 - 3L; Type 2 - 6L; Type 3 - 9L)
- Send cultures
- Fracture stabilization with fresh instruments once debridement is complete
- Grade I to IIIA - Early internal fixation - With definitive skin cover
- Grade IIIA and IIIB - Provisional stabilization of fracture with wound management when definitive skin cover is not possible



**GA TYPE III B/III C**

Managed at tertiary centre  
Multidisciplinary approach - 'Orthoplastic'  
III C injuries may require CT angiogram/doppler study

**WOUND CLOSURE**

- Recommendation is primary closure of Type I, Type II and a few selected Type IIIA fracture - but avoid tension at closure site
- Coverage of III A and III B - after proper debridement and cleaning. May require one or two or more formal debridements
- Definitive soft tissue closure or coverage should be aimed within 72 hours of injury if it cannot be performed at the time of debridement

**ABBREVIATIONS**

**ATLS:** Advanced Trauma Life Support  
**CT:** Computed Tomography  
**ED:** Emergency Department

**GA:** Gustilo Anderson  
**IM Nail:** Intramedullary Nail  
**IV/IM:** Intravenous/Intramuscular

**NPO:** Nil Per Oral  
**RL:** Ringer's Lactate

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**EARLY ADMINISTRATION OF ANTIBIOTICS AND REFERRAL AS PER RESOURCE SETTING**

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