classification

gustilo-anderson

open fractures ISTP e round 9/23

gustilo classification 1976/1984



reflection of amount of energy imparted

some prognostic implications

1. skin wound size
2. level of contamination
3. extent of soft tissue injury/ periosteal stripping
4. fracture configuration

classification must be done *AFTER* debridement

type I

wound < 1cm
minimal soft tissue injury
inside-out
clean wound
minimal contamination
minimal contusion
minimal energy
simple fracture
no crush mechanism





type II

wound > 1 cm

moderate soft tissue injury

moderate crush

no extensive soft tissue damage, flaps or avulsions

simple fracture

minimal comminution





type III – high energy

open segmental / comminuted fracture
severe soft tissue damage
severe crush injury
severe contamination

traumatic amputation
gunshot injuries
farm injury
open fracture with vascular injury

type III

additions to original classification

type III divided into A B C

Gustillo, Mendoza, Williams (1984)

injuries > 8 hours are type III

Gustillo, Gruniger, Davis (1987)

type III A

extensive soft tissue injury

outside – in

segmental / comminuted

NOT dependant on wound size





does NOT require flap

primary closure possible

skin graft OK

type III B

severe periosteal stripping and bone exposure

severe contamination

severe comminution

REQUIRES free or local flap





type III C

ANY open fracture with vascular injury that needs repair

1 major artery intact = III A/B

independent of soft tissue injury

impaired blood supply:
- higher infection risk
- delayed healing

if vascular repair not possible = amputation



most widely used

communication / research tool

prognostic importance – complication rate type III ⬆

interobserver agreement 60%

definition not uniform

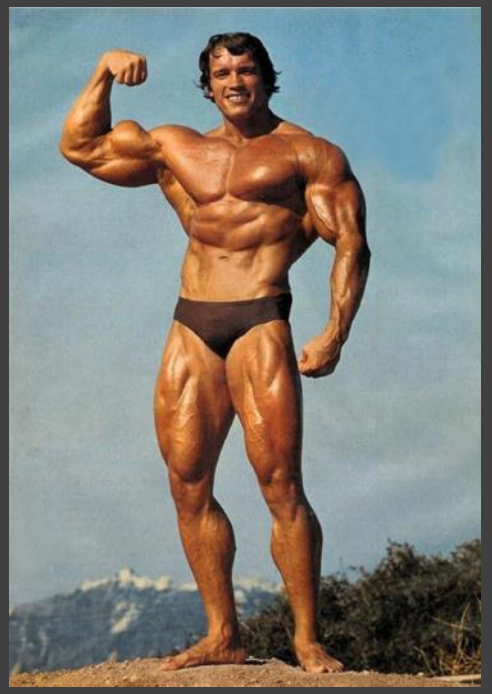
does not look at skin/bone/muscle separately

does not address salvage - GHOIS

prognostic factors - patient

- age
- obesity
- malnutrition
- habits
  - smoking / drugs
- immune compromise
  - diabetes/HIV





the bad news

injury and patient factors are not in your control

the good news

your treatment can make prognosis better

antibiotics
debridement
bone stabilisation
dead space management
soft tissue coverage



ED treatment

primary / secondary survey
antibiotics / tetanus
examine wound once
remove gross contamination
sterile dressing / betadine
splint the limb
reduce, but
skin tension beats bony reduction



ED treatment

take photos

neuro and vascular status

compartments

bleeding – the finger is mightier than the clamp

