lavage

important adjunct

FLOW trial

(very) low pressure saline

lots of it



coverage

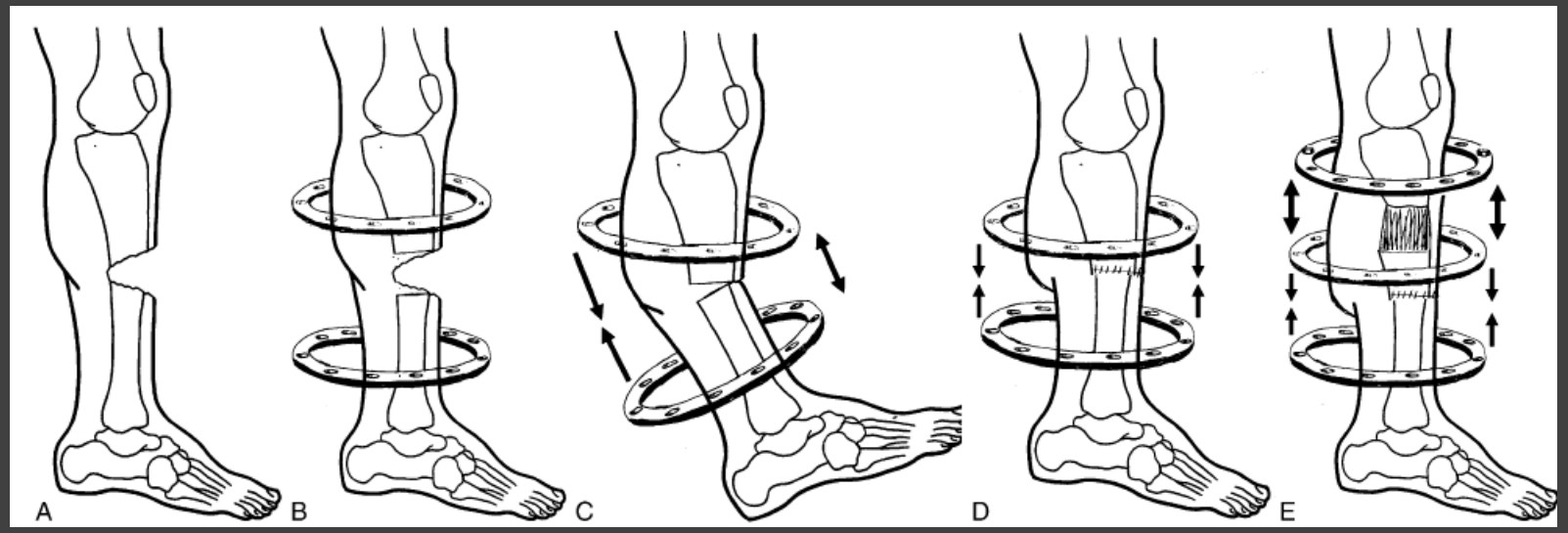
type I and II primary closure

must be tension free!

type III within 72 hours
dpc, regional or free flaps

infection rates increase after 7 days





can also shorten







NPWT

closed suction system – clean, comfortable

reduces number of dressing changes

reduces swelling / bacterial count

enhances granulation tissue







NOT substitute for primary closure

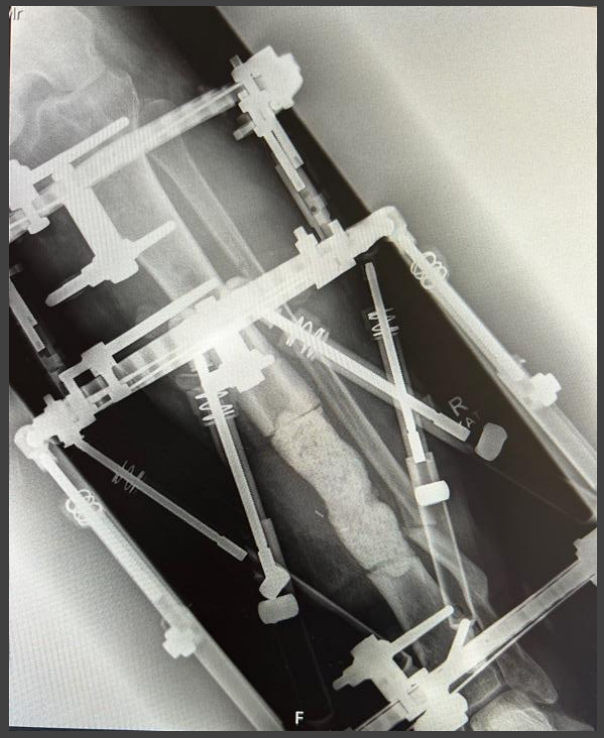
NOT for infected wounds

NOT the magic solution

dead space management

dead space = infection. MUST avoid

shortening
drains
vacuum dressing
muscle
bone cement
ab beads
syringes





bone stabilisation in an ideal world:

GA I and II – IF or EF no difference

GA III A and B - circular fix or nail

GA III C - best results with circular fixation

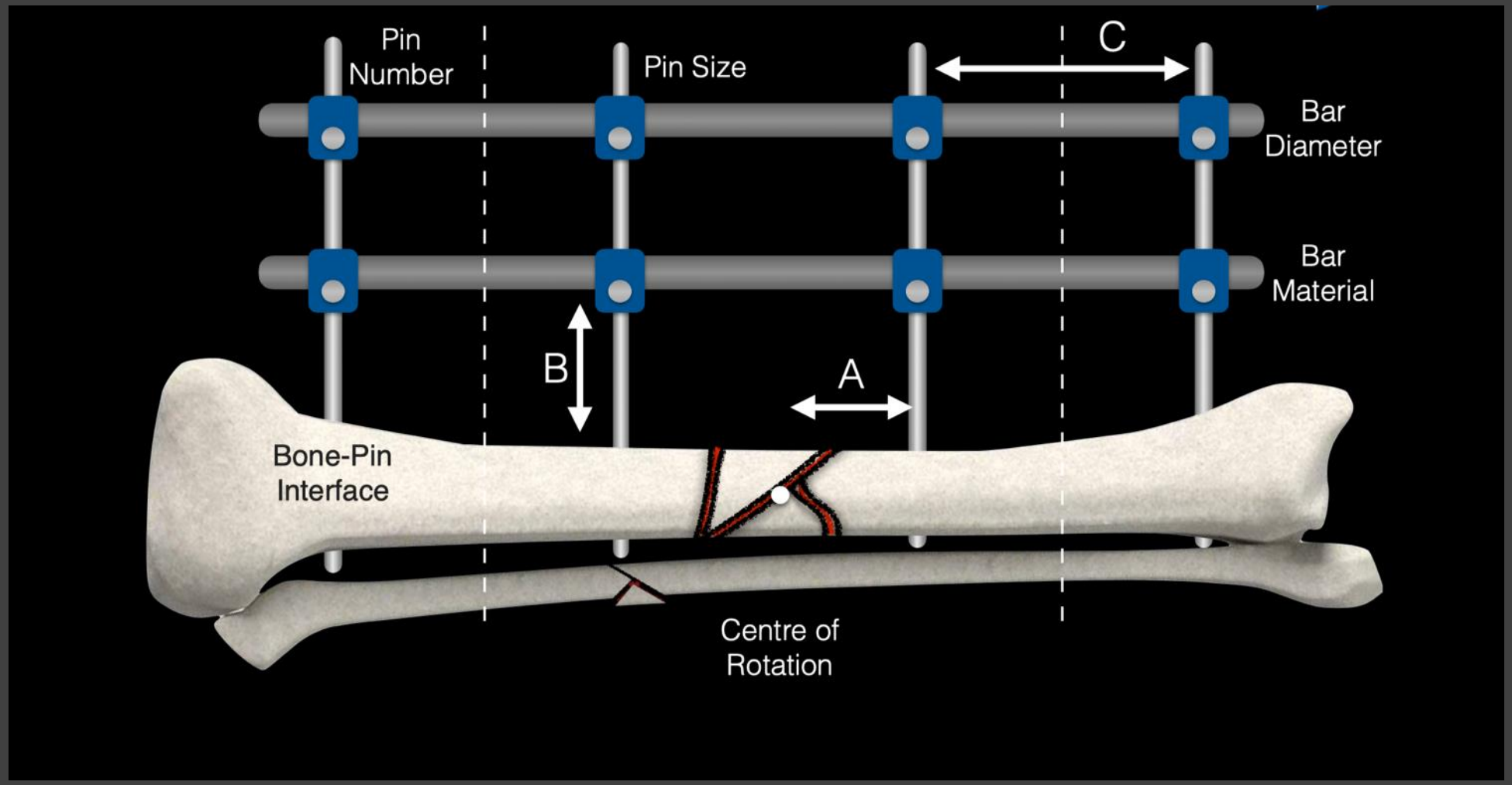




however,…

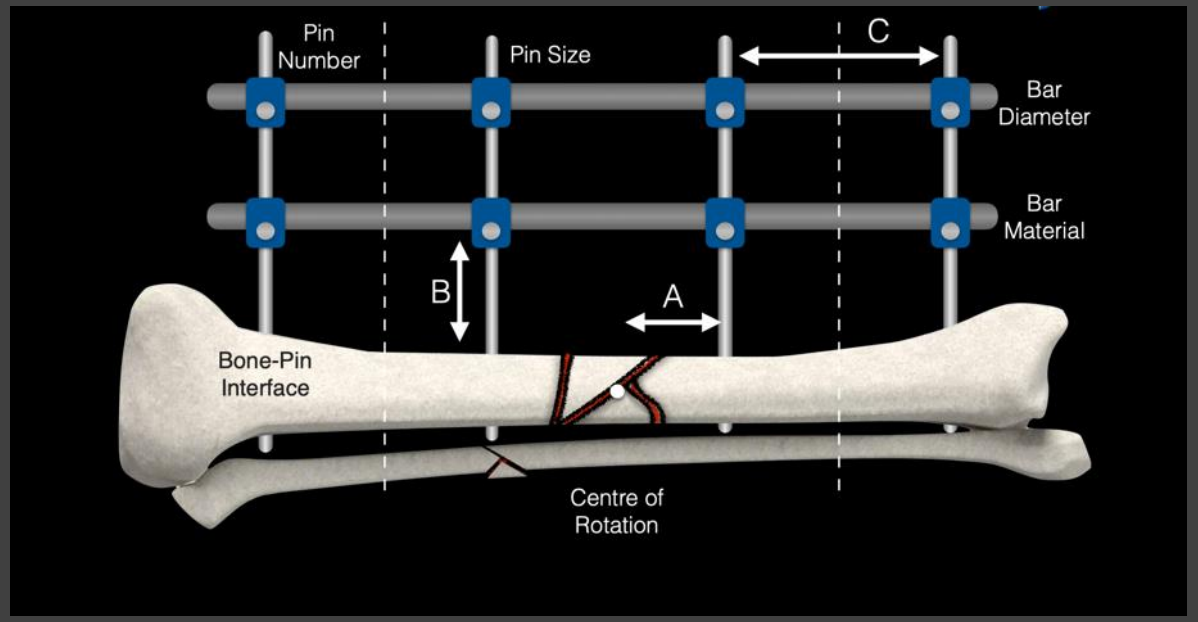


we need to get it right



we need to get it right

pin placement
pin number
pin diameter
rod placement
rod material
rod number



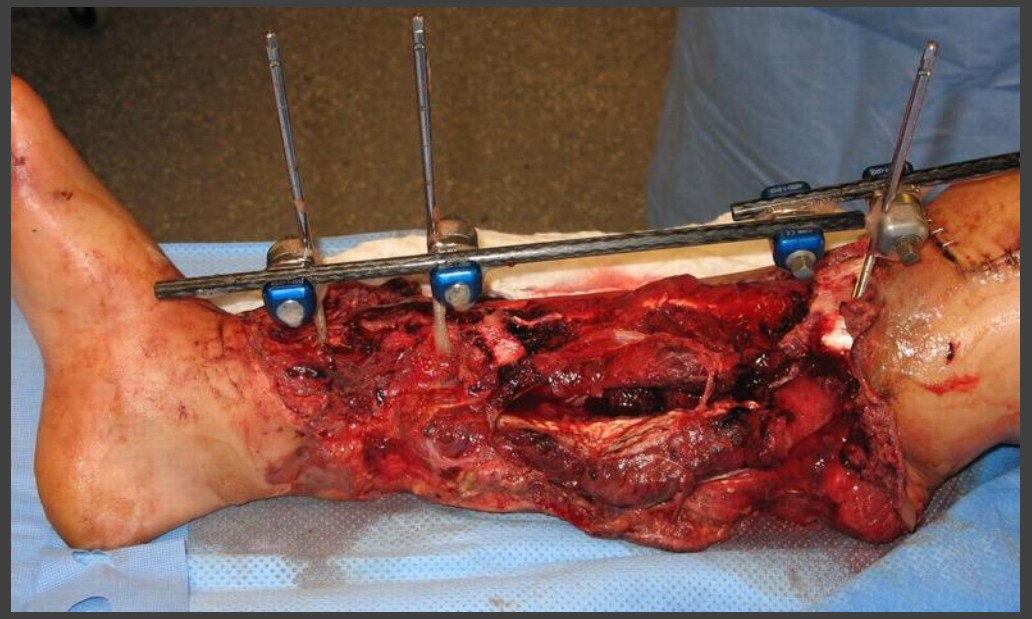
it's all about biomechanics



beware of the ornamental ex fix - do not over or under-build

it's all about biomechanics





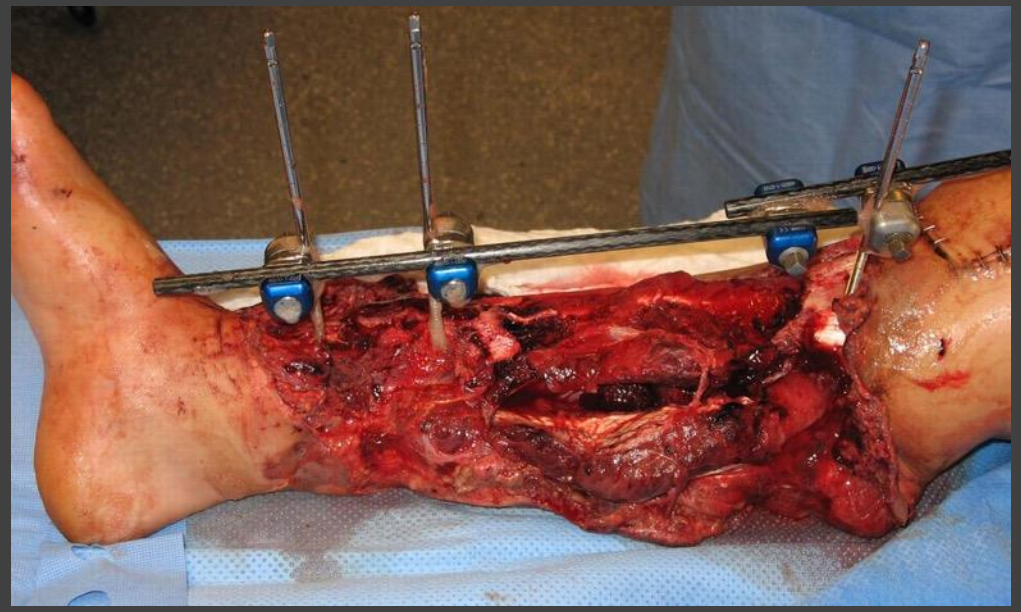
beware of the ornamental ex fix - do not over or under-build

too rigid

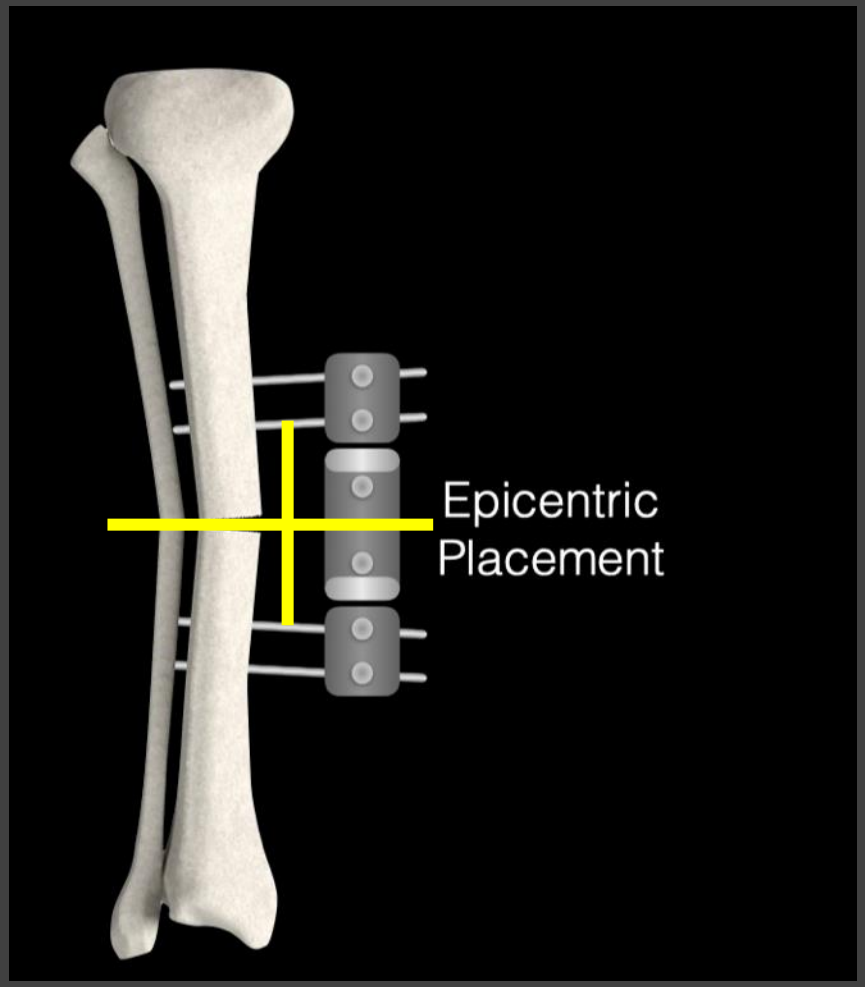
non and delayed union
disuse osteoporosis

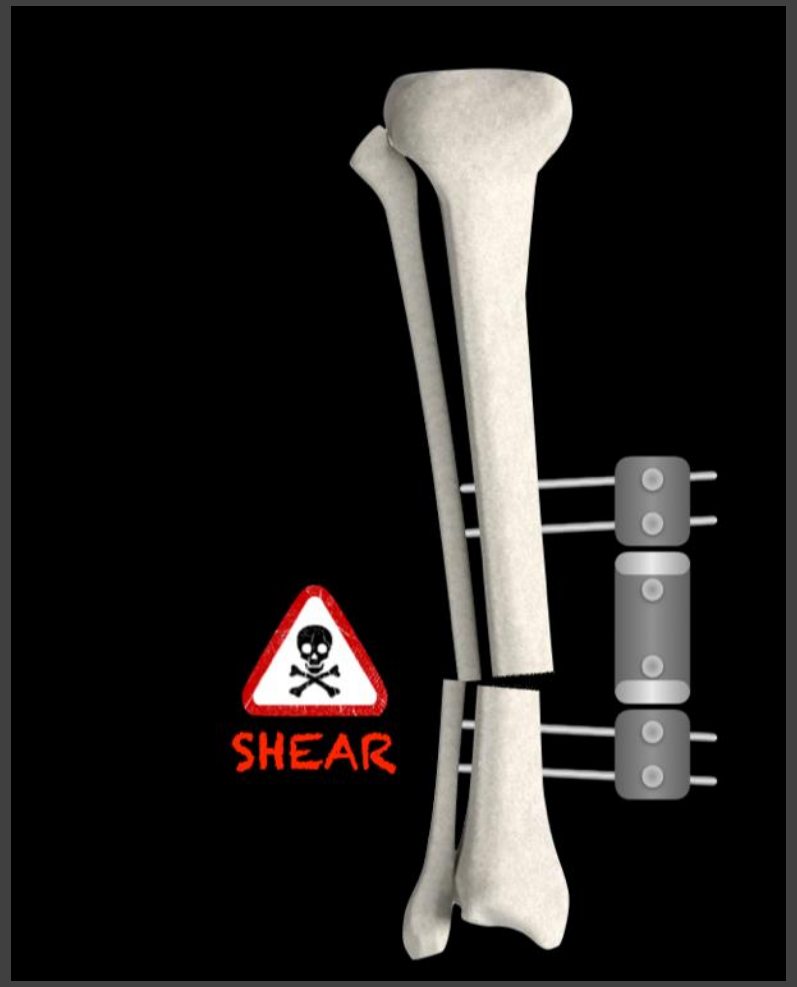
too flexible

mal and nonunion
infection
pin problems



we need to get it right





pin diameter ≤ 1/3 bone diameter

perpendicular to each other

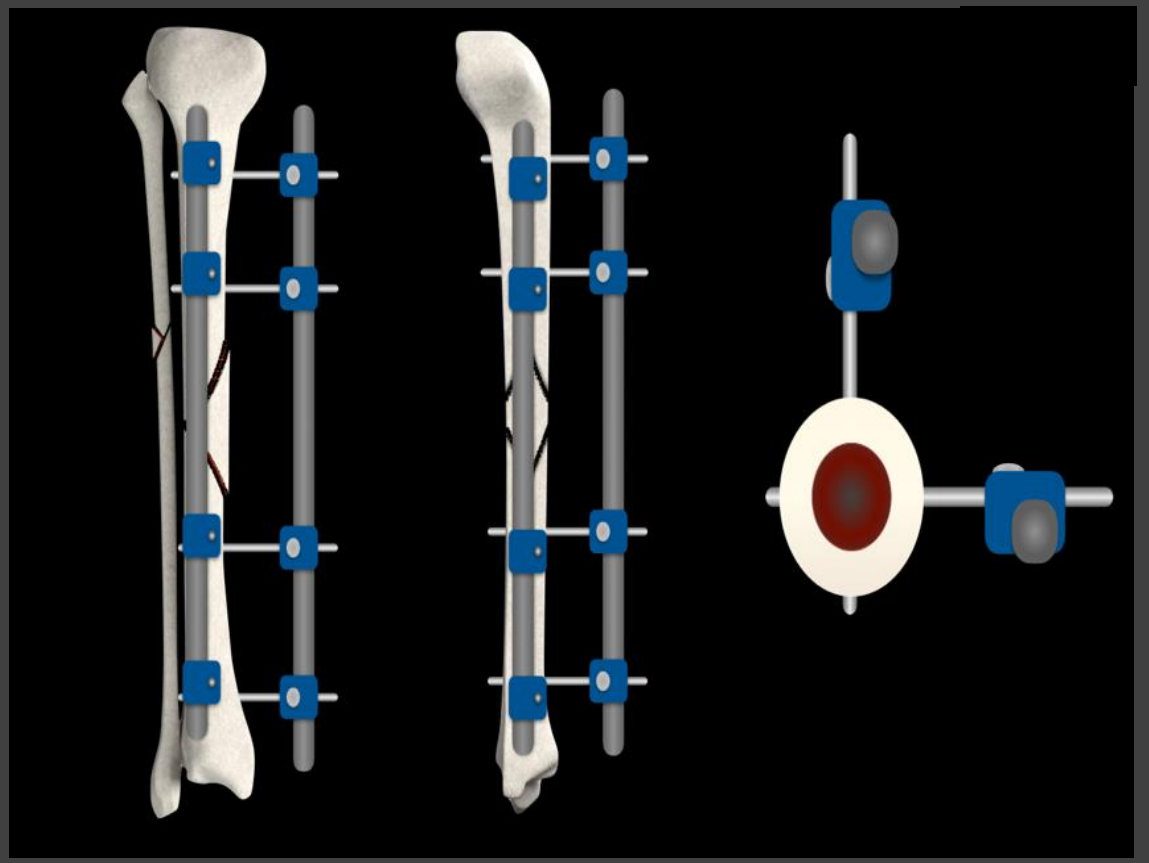
rod in line with load axis

not in the fracture

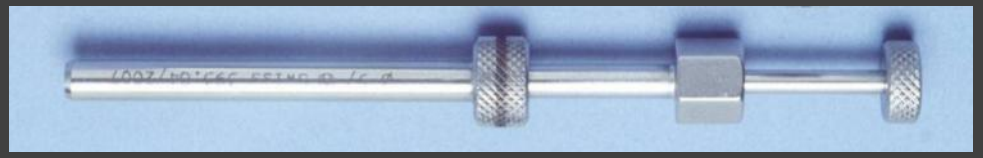
in doubt put more pins

2 rods stiffer

carbon rods stiffer



pin insertion technique



incise skin

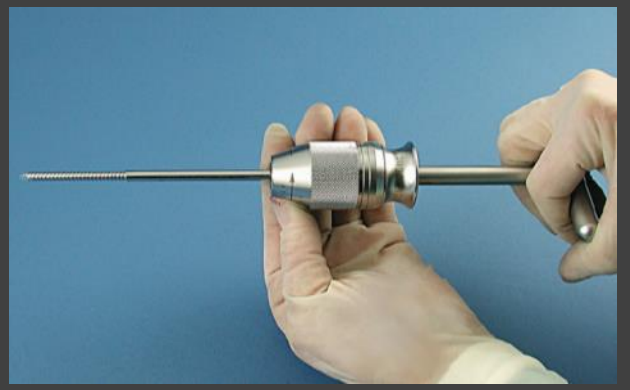
spread soft tissues to bone

use sharp drill with sleeve

irrigate while drilling

place pin with sleeve



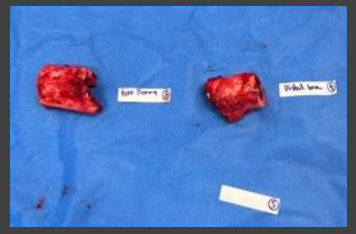


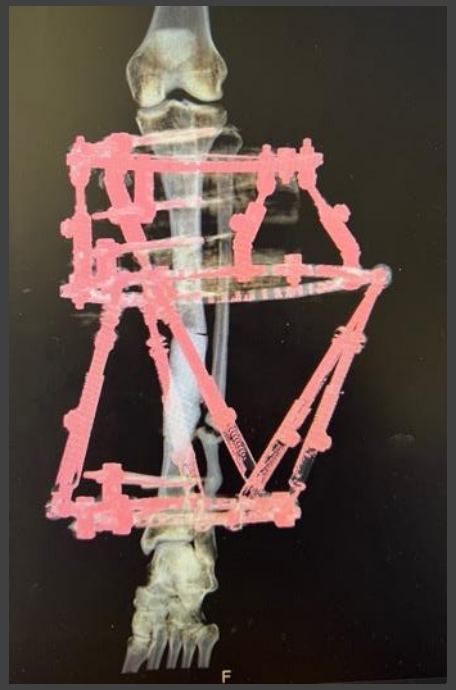
avoid soft tissue damage and bone heat necrosis

think of:

safe insertion sides
future flaps
easy access to wounds
future internal fixation







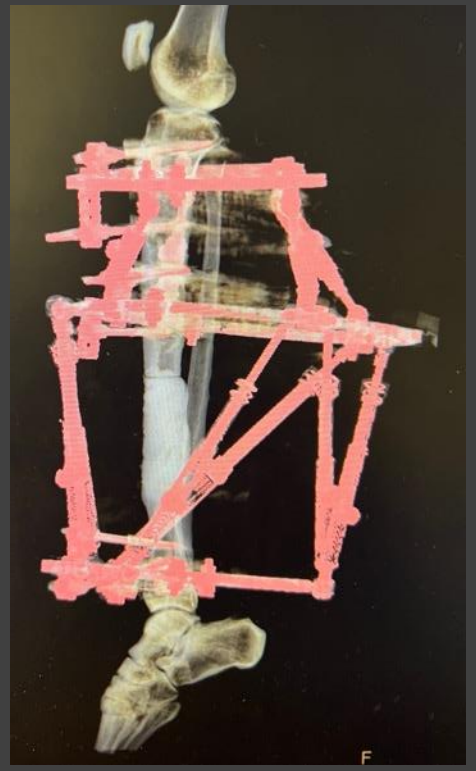






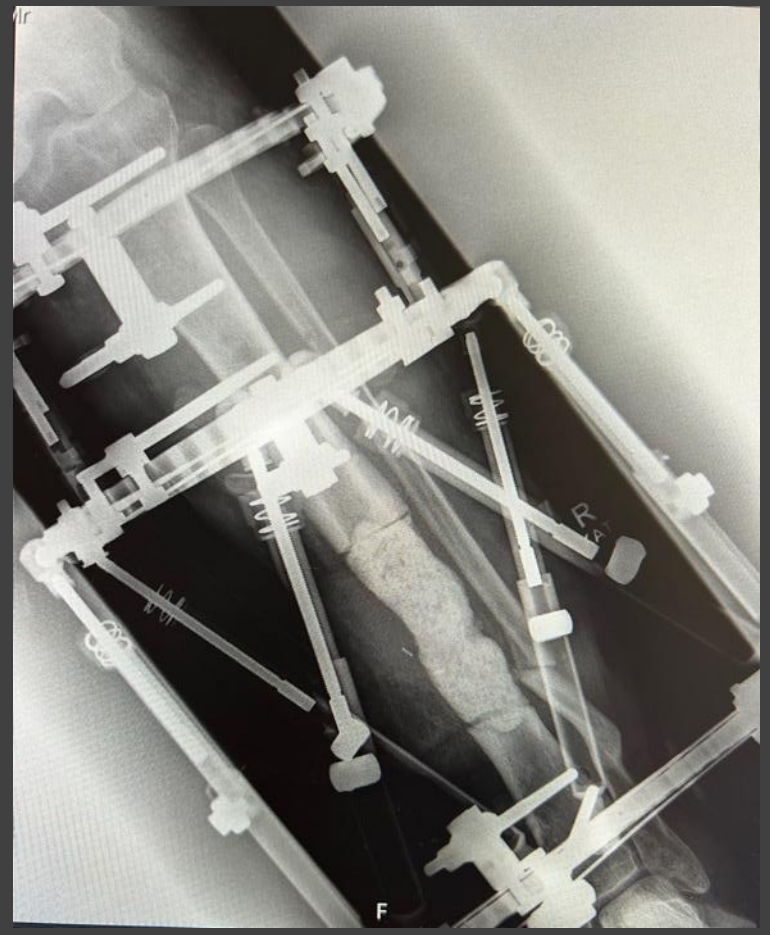
Figure 7. *Professor Ilizarov smoking while on break in the operating room (photo courtesy of RISC).*

ring fixator most versatile
lengthening/correction/transport

needs some training

uncomfortable for the patient but very comfortable for the bone

for long time application
for large bone defects



the other, VERY important stuff

physiotherapy

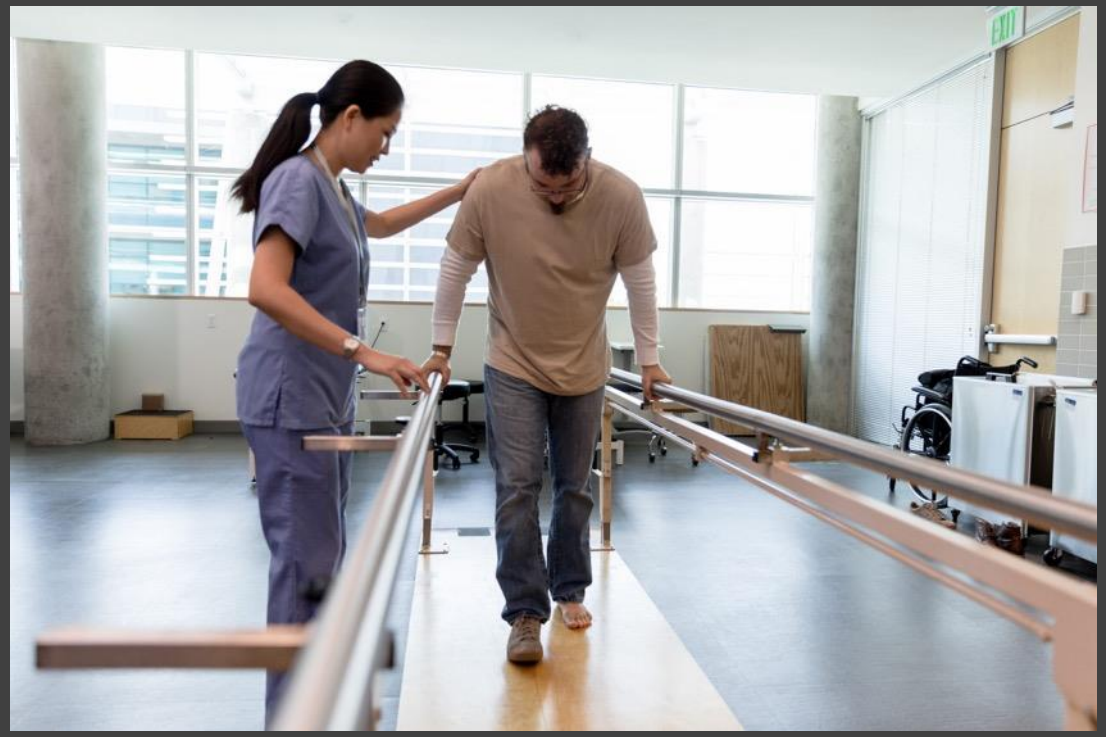
dietician

labarotory

dressing protocol

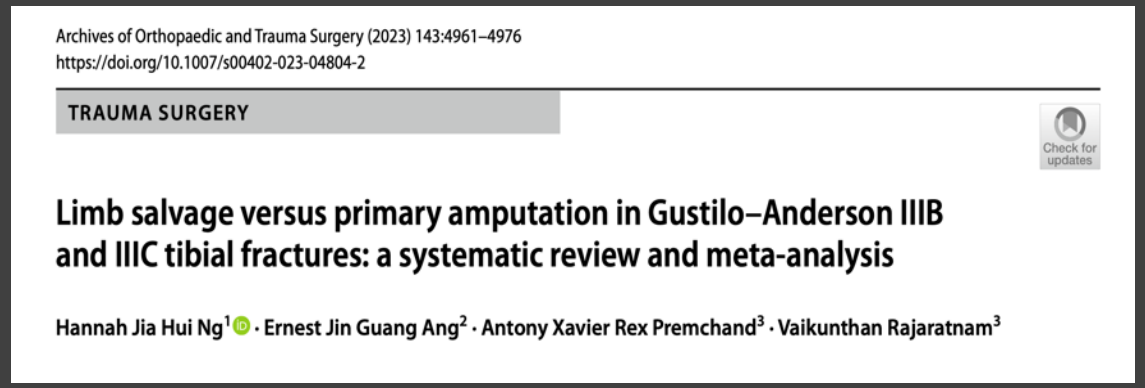
flap care protocols

pin site protocols



multidisciplinary team sport

amputation vs salvage



Archives of Orthopaedic and Trauma Surgery (2023) 143:4961–4976
https://doi.org/10.1007/s00402-023-04804-2

TRAUMA SURGERY

Check for updates

Limb salvage versus primary amputation in Gustilo–Anderson IIIB and IIIC tibial fractures: a systematic review and meta-analysis

Hannah Jia Hui Ng[1] · Ernest Jin Guang Ang[2] · Antony Xavier Rex Premchand[3] · Vaikunthan Rajaratnam[3]

most studies on GA III C tibia fractures

LEAP study 1987 – amputation better

all other studies no difference:

patient reported outcomes
function
return to work / sport
quality of life

but:



poor quality studies, retrospective

different patient collective to MSF

severe ankle fractures w flaps: BKA better outcomes

what do we know?

outcomes are the same

scoring systems don't work

plantar sensation not predictive

amputation more expensive

salvage more complications





amputation vs salvage



should we save the limb?

can we save the limb?

what is the cost of our decision?
money + psychological

what is the predictable functional outcome?

bottom line

do I have the skills to save AND the resources the patient needs to save their limb?

YES



continue assessment / treatment

NO



refer if possible

amputate

take home message

soft tissues are most important

good debridement is mandatory

the best antibiotic is surgical steel

your cut cannot be too large

mechanical stability is key

get help from a friend

involve the patient at every step

be ready for complications

