

“...the bone is a plant, with its roots in the soft tissue, and when its vascular connections are damaged, it often requires, not techniques of a cabinet maker, but the patient care and understanding of a gardener.”



Girdlestone

Lasse bayer
Overlæge
Nordsjællands Hospital Hillerød

En fraktur involverer:

- Hud og underhud
- Muskler og sener
- Kar og nerver
- Periost og knogle



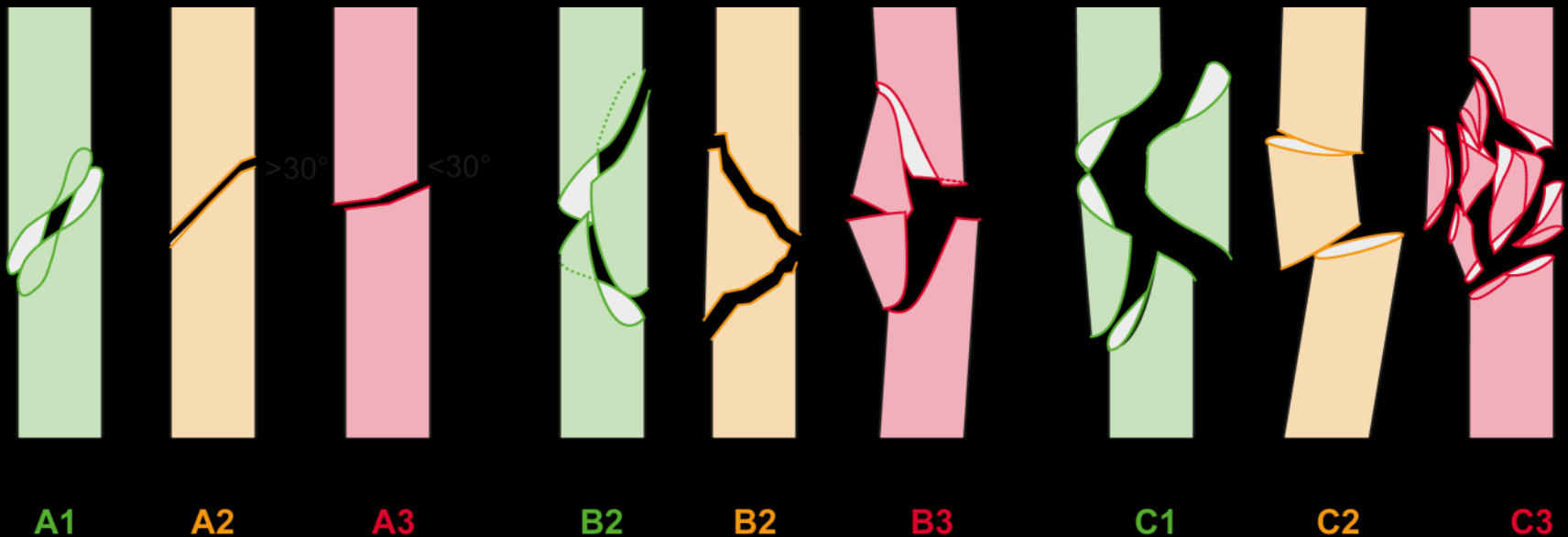






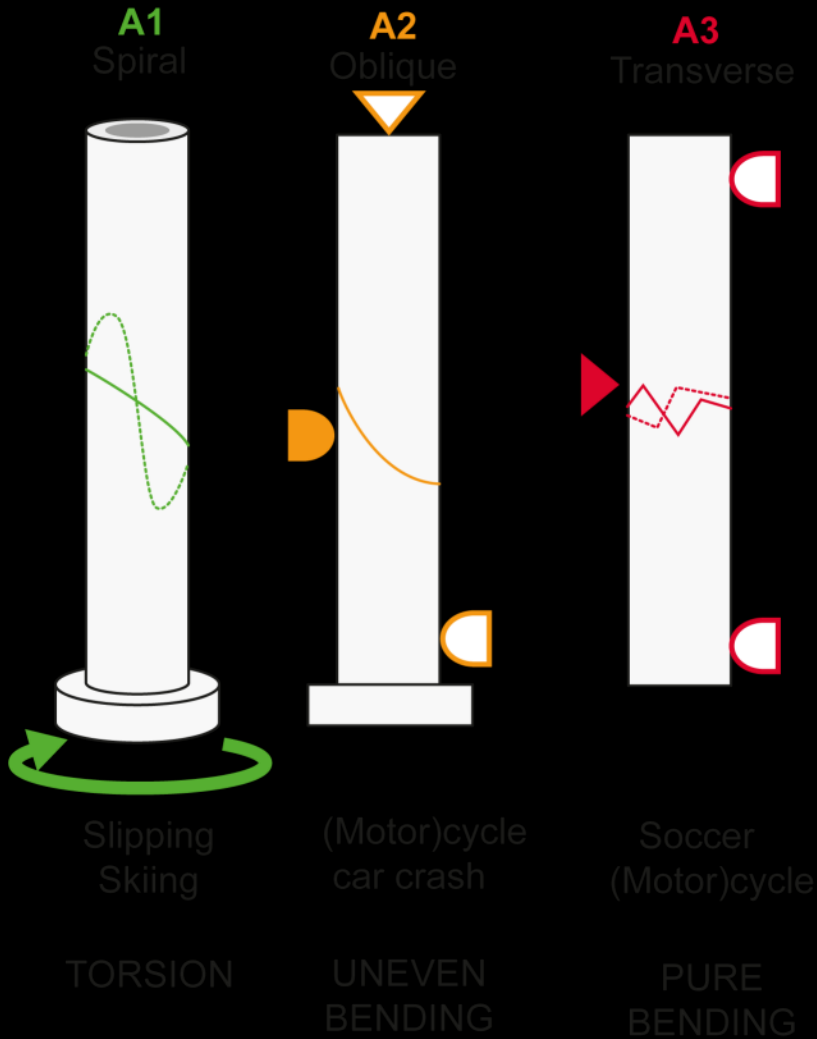
Fraktur-mekanismer diafysen

- Torsion (ski)
- Bøjning (indirekte)
- Kompression (fald fra højde)
- Kontusion (direkte, Kofangerskade)
- Kombinationer



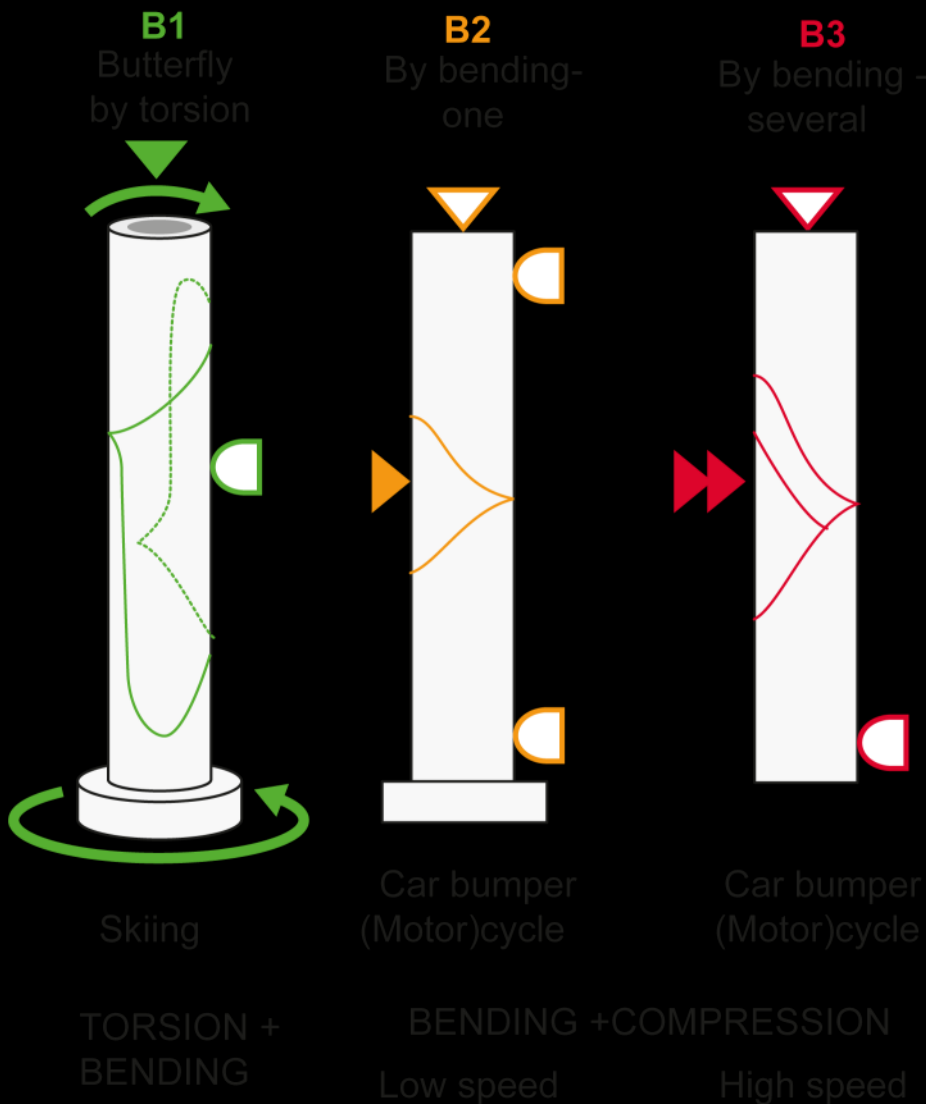
Lav-energi fraktur-mønstre

SIMPLE

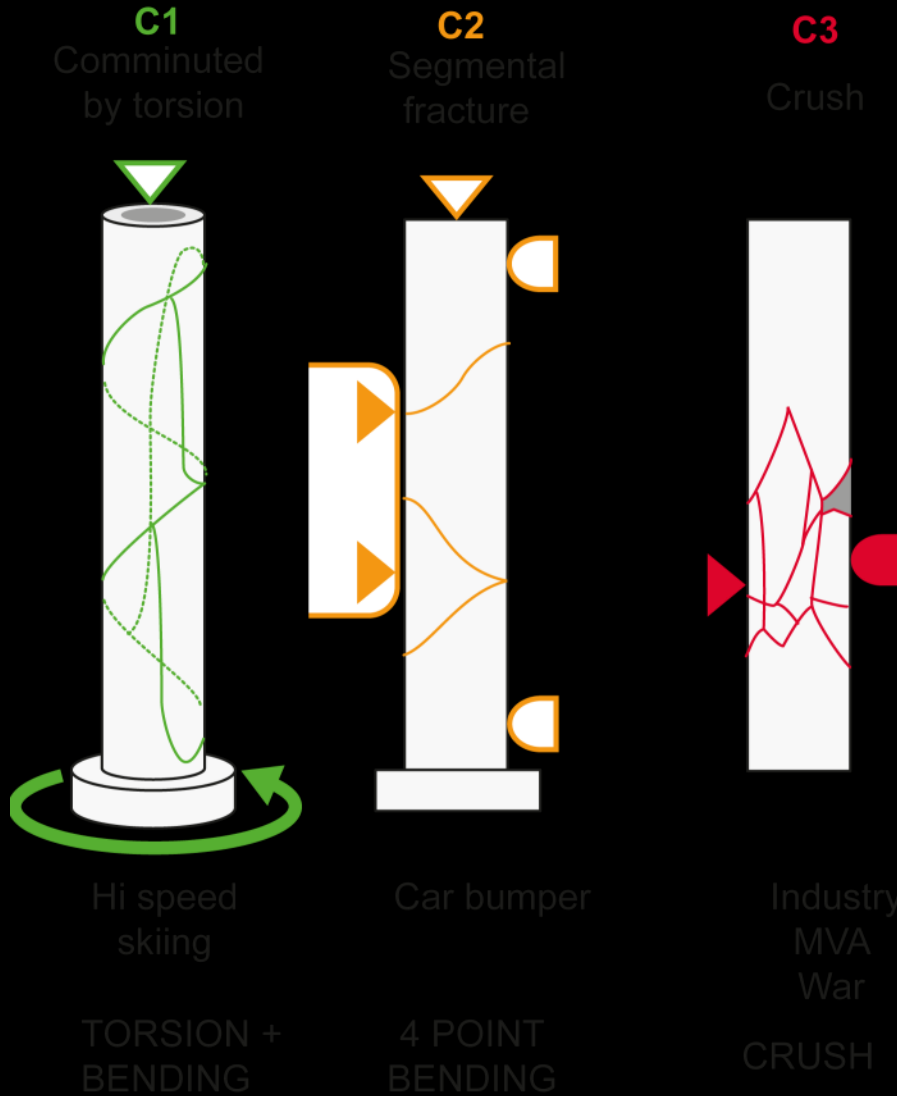


Medium-energi fraktur mønstre

BUTTERFLY

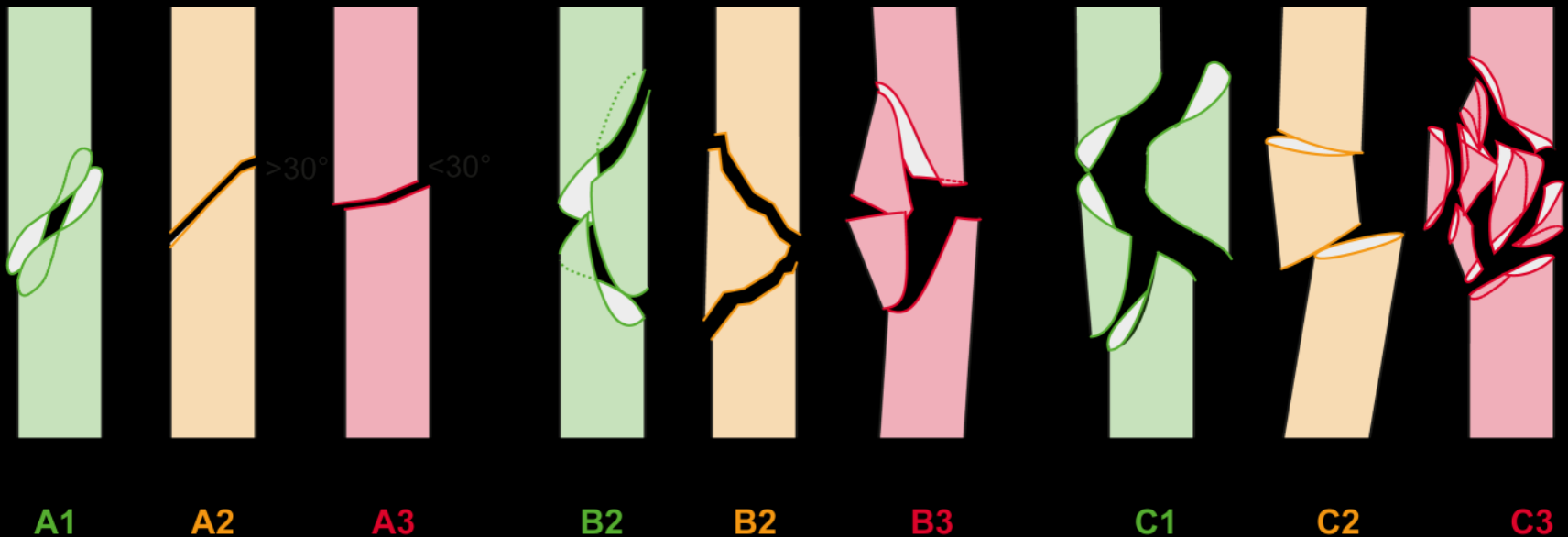


Høj-energi fraktur-mønstre



Fraktur-mekanismer diafysen

- Torsion (ski)
- Bøjning (indirekte)
- Kompression (fald fra højde)
- Kontusion (direkte, Kofangerskade)
- Kombinationer

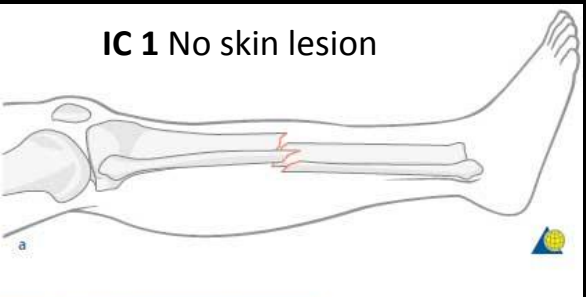




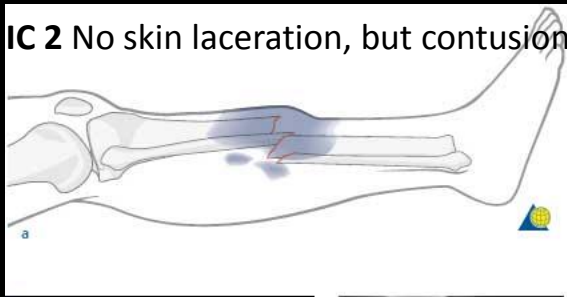


AO soft-tissue classification: closed skin lesions

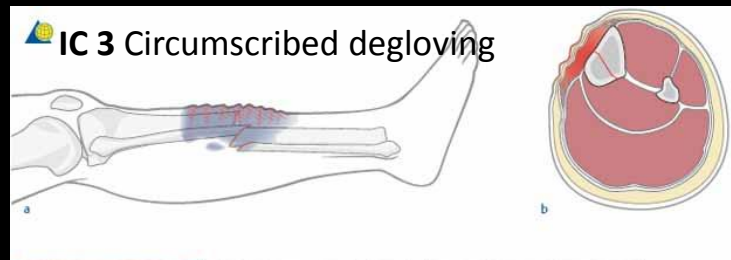
IC 1 No skin lesion



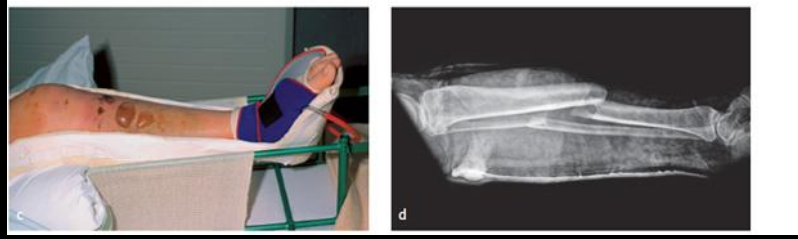
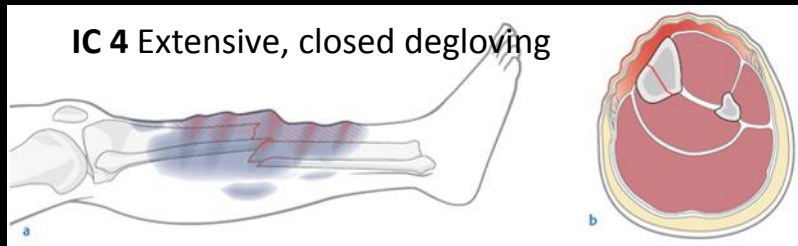
IC 2 No skin laceration, but contusion



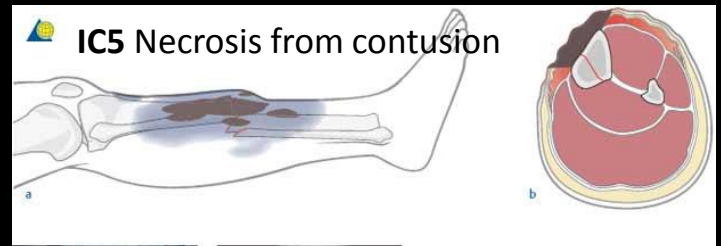
IC 3 Circumscribed degloving



IC 4 Extensive, closed degloving

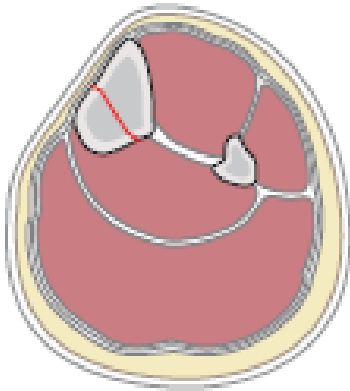


IC 5 Necrosis from contusion



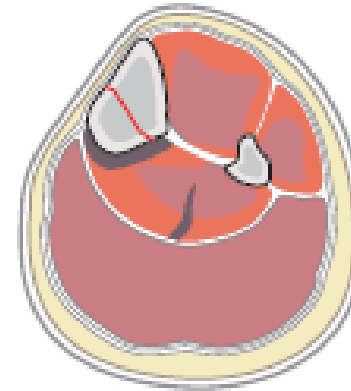
AO soft-tissue classification: MT=Muscle and tendon

MT 1



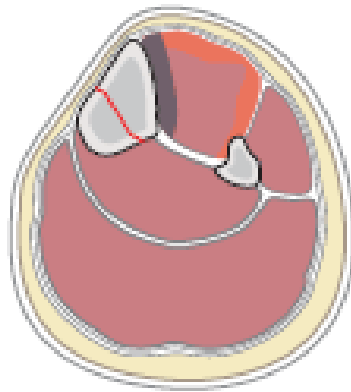
No muscle injury

MT 4



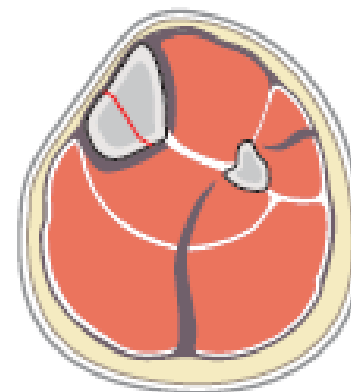
Muscle defect,
tendon laceration,
extensive muscle
contusion

MT 2



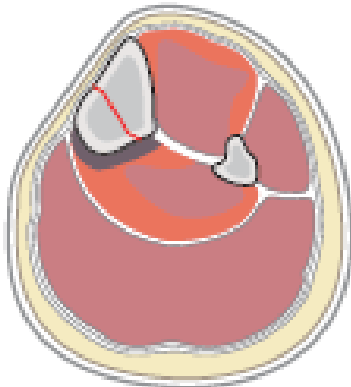
Circumscribed
muscle injury, one
compartment only

MT 5

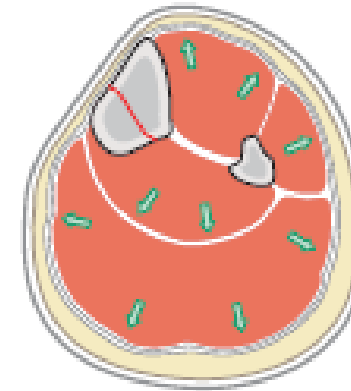


Compartment
syndrome/crush
syndrome with wide
injury zone

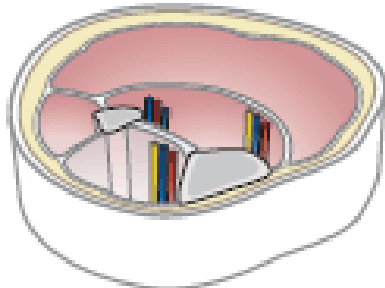
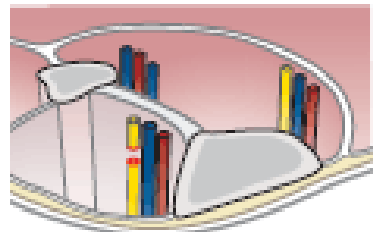
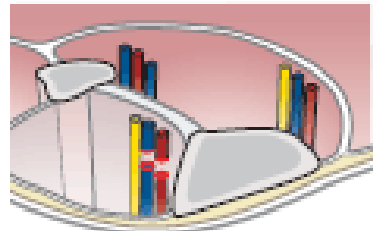
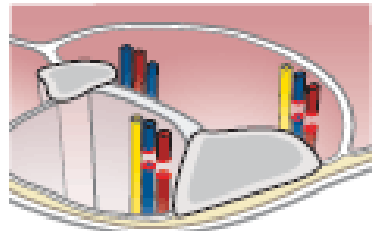
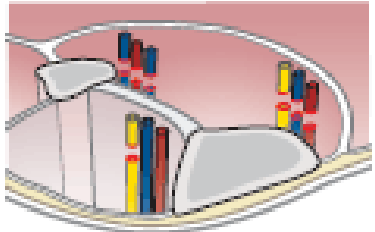
MT 3

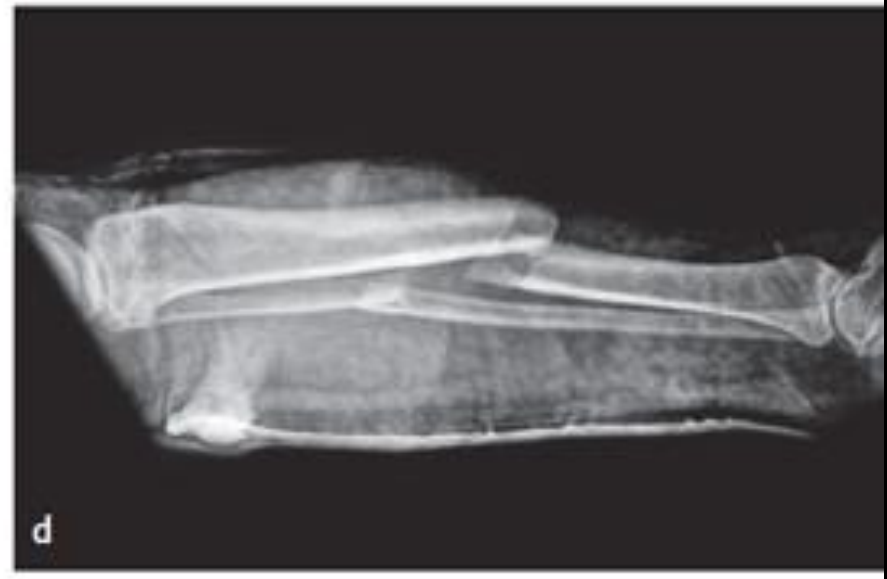
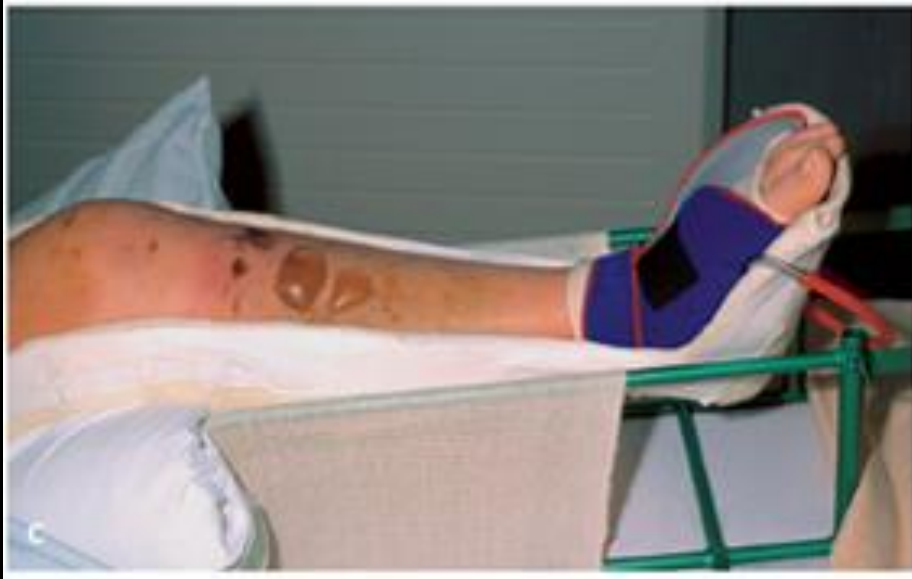


Considerable muscle
injury,
two compartments



AO soft-tissue classification: NV=nerve and vessel

NV 1		No neurovascular injury
NV 2		Isolated nerve injury
NV 3		Localized vascular injury
NV 4		Extensive segmental vascular injury
NV 5		Combined neurovascular injury, including subtotal or even total amputation



42-A2/IC4-MT5-NV1

Midtskafts tibiafraktur - simpel oblique

Massiv bløddelsskade:

- Vabler og mistanke om omfattende degloving
- Mistanke om omfattende muskelkontusion and compartment syndrom
- Ingen NV-skade

Skånsom bløddelshåndtering

Incisioner

- “Minimally invasive” \neq lille incision
 - Hvis små incisioner ikke tillader tilstrækkelig visualisering, bliver voldsom reaktion ofte brugt
 - Korrekt placering af incisionen er ofte mere kritisk når der laves små incisioner
 - Små incisioner sikrer ikke mod at kirurgen stripper knoglen
- Incidér vinkelret på huden



At holde til side

- Undgå at trække mere end nødvendigt for visualisering
- Slæk trækket når det ikke er nødvendigt
- Om muligt undgå selvholdende sårhager da de ofte “glemmes”



Pincetter

- Ikke klemme/mose huden
- Brug pincetten som en sårhage
- Brug små pincetter til huden

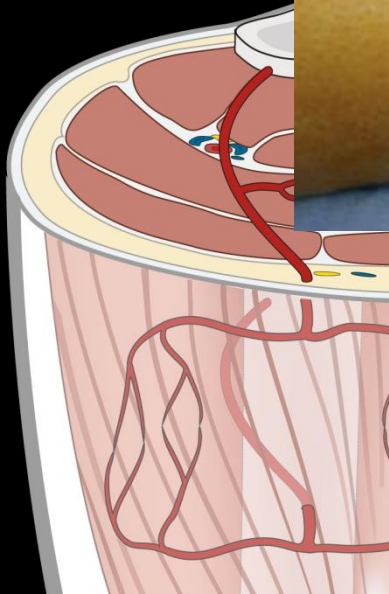


Diss

- Undgå a (derhud og fascie)



derhud og



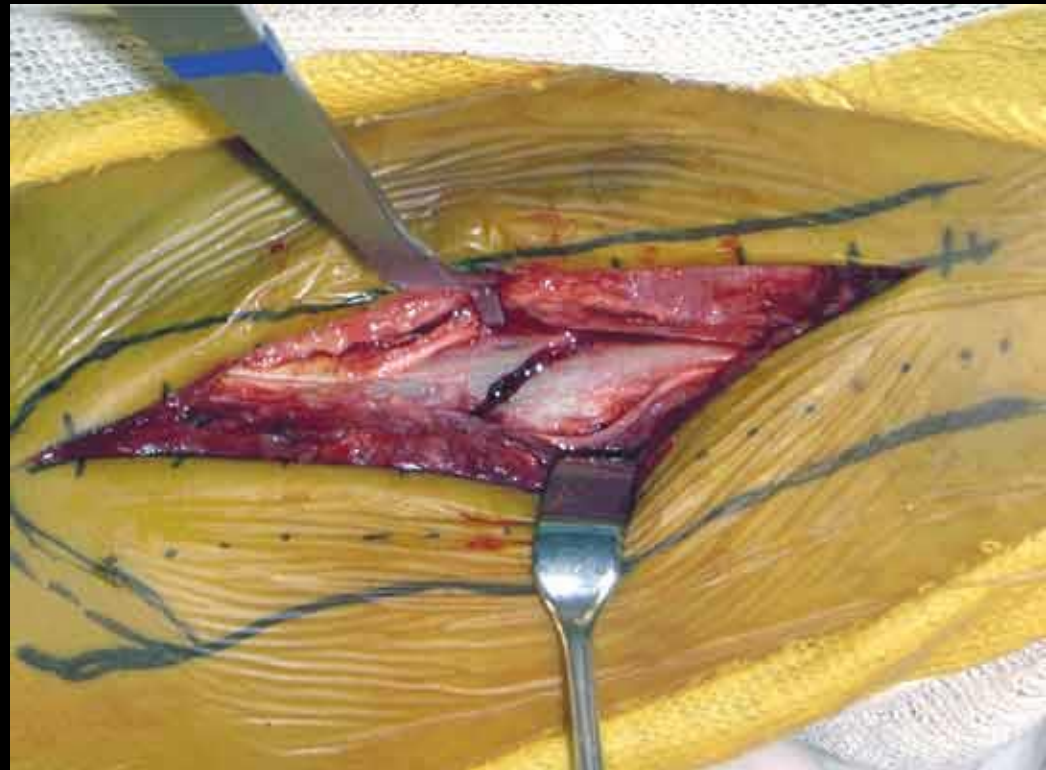
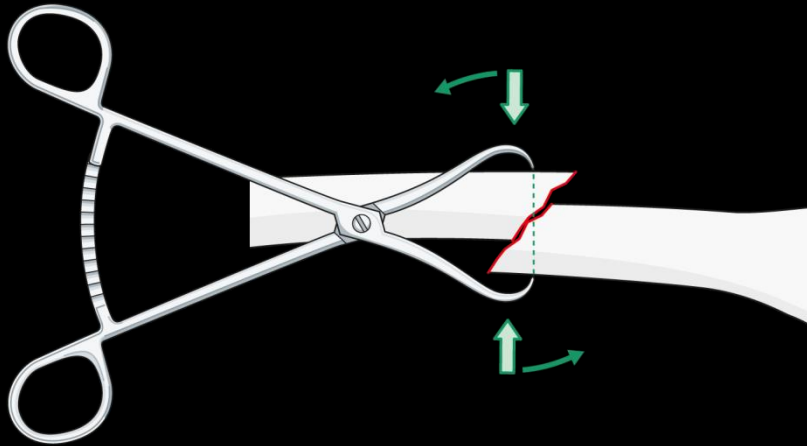
- Kniven er de (er mere tilbøjelige ti

er mere

- Undgå multiple snit eller klip ned gennem vævene

frilægning af knogle

- Bevar periostenen hvor det er muligt
- Brug de mindst aggressive knogletænger / lus
- **Gør dig umage!**



Konklusion



- Evaluér både frakturen og bløddelene
- Analysér skaden på
 - Hud og underhud
 - Muskler og sener
 - Kar og nerver
 - Periost og knogle

Bløddelsforholdene er altafgørende for behandlingsstrategien