

MULTITRAUME PATIENTER

STRATEGI OG METODIK

15 MIN.

AO TRAUMA COURSE – BASIC PRINCIPLES OF FRACTURE MANAGEMENT

FREDERICIA 24-27/4-2023

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Aarhus Universitetshospital





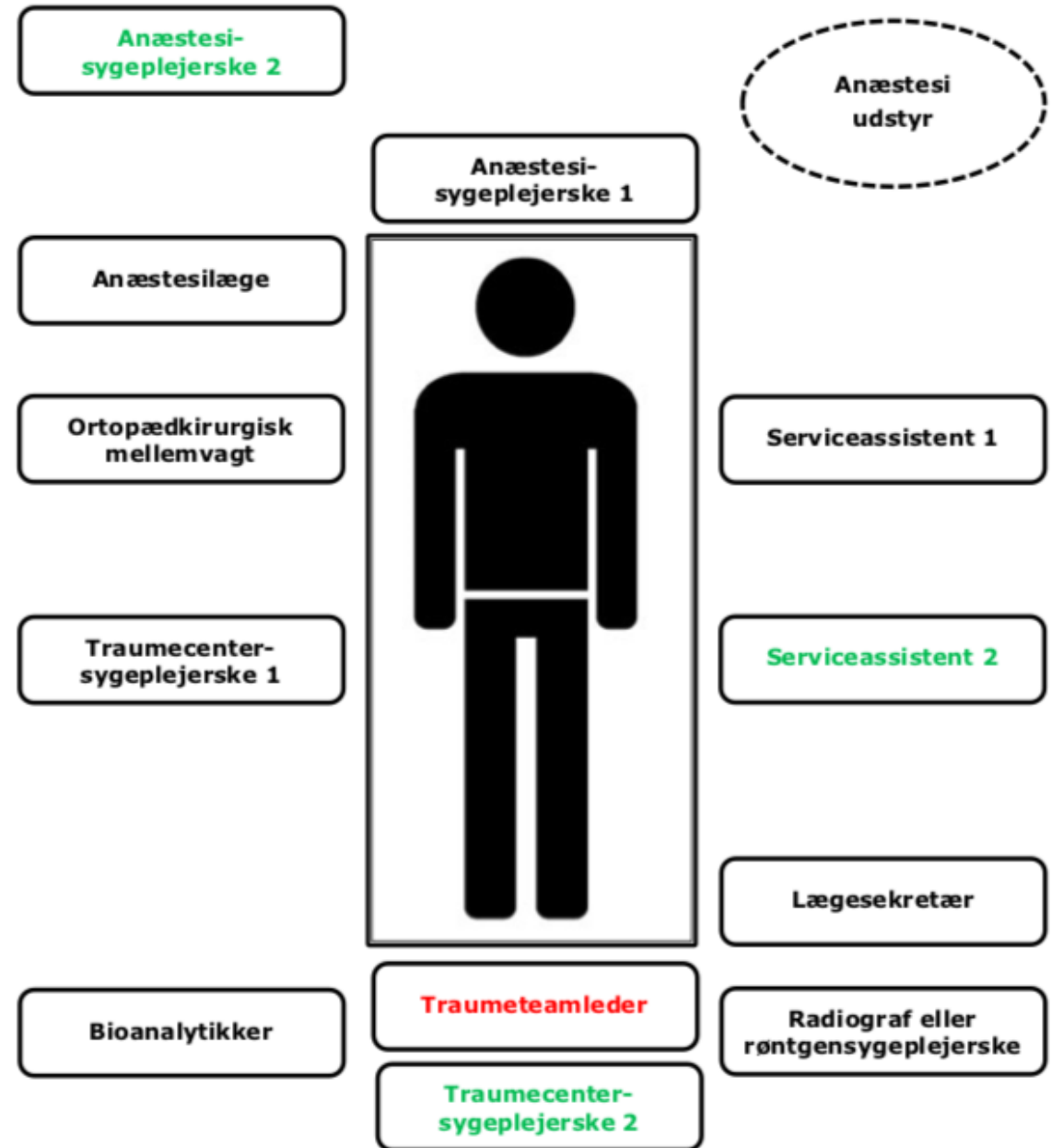
MODTAGELSE AF MULTITRAUME PATIENT



TRAUME TEAM

- Traumeleder
 - Orto/anæstesi
- Undersøgende læge
- Sygeplejerske
- Portør
- Radiograf/radiolog
- Thorax/abdominal/neuro

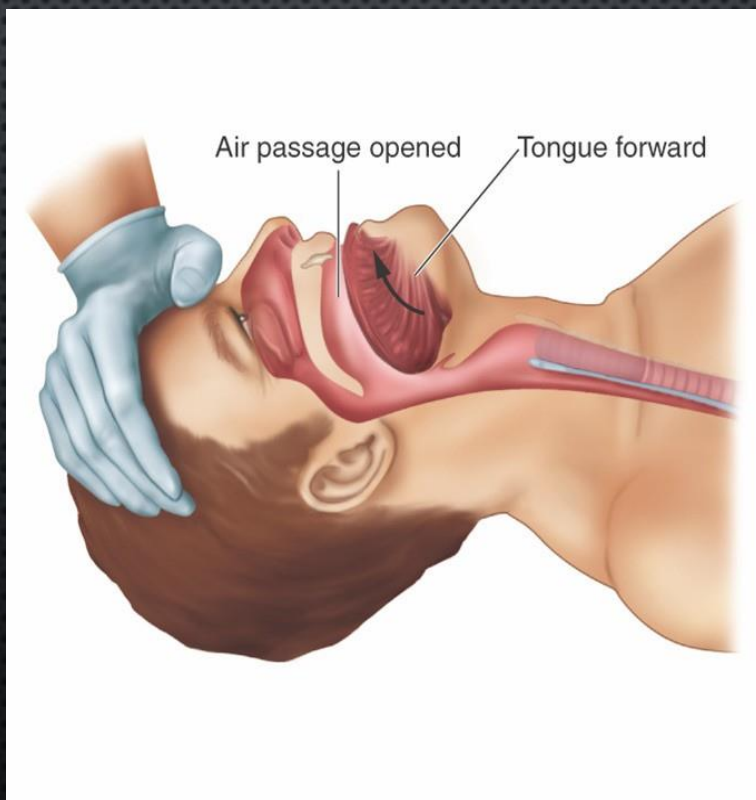
TRAUMETEAMMEDLEMMERNES PLACERING PÅ TRAUMESTUEN



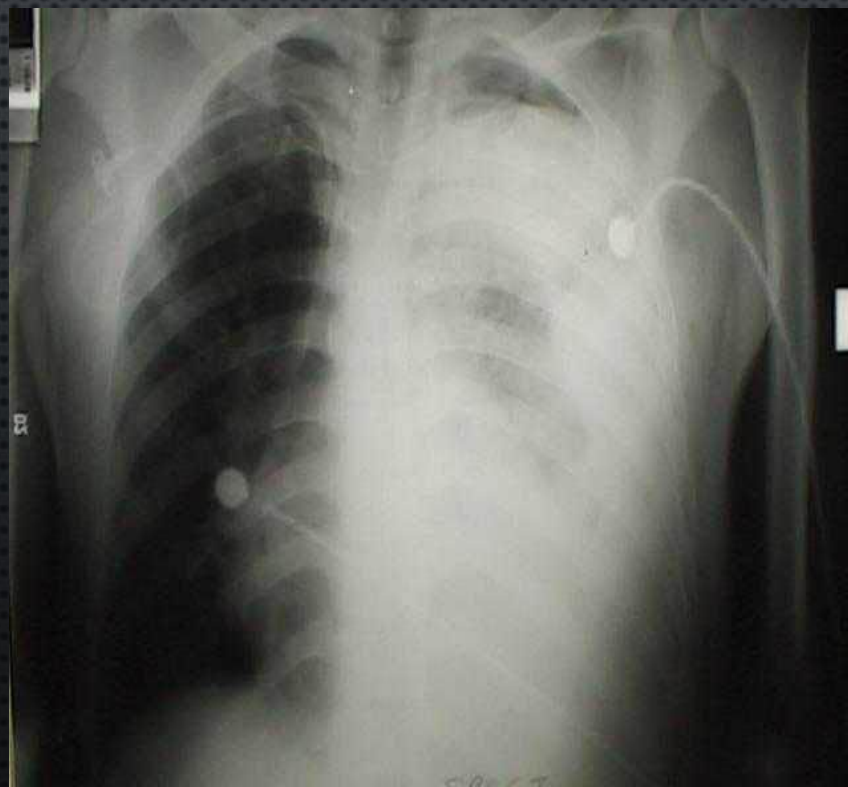
A B C C D D E



A B C D E



A B C D E



A B C D E

	Klasse 1 15%	Klasse 2 15-30%	Klasse 3 30-40%	Klasse 4 >40%
Blodtab (ml)	0-750	750-1500	1500-2000	> 2000
BT	Normal	Normal	Nedsat	Nedsat
Puls	< 100	100-120	120-140	> 140
Pulstryk	Normal	Nedsat	Nedsat	Nedsat

A B C D E

Brud (isoleret)	Blødning (ml)
Et ribben	
Distal radius	
Humerus	
Tibia	
Femur	
Bækken	

	Klasse 3 30-40%	Klasse 4 >40%
Blodtab (ml)	1500-2000	> 2000
BT	Nedsat	Nedsat
Puls	120-140	> 140
Pulstryk	Nedsat	Nedsat

A B C D E

Brud (isoleret)	Blødning (ml)
Et ribben	125
Distal radius	250-500
Humerus	750
Tibia	500-1000
Femur	1000-2000
Bækken	Massiv

	Klasse 3 30-40%	Klasse 4 >40%
Blodtab (ml)	1500-2000	> 2000
BT	Nedsat	Nedsat
Puls	120-140	> 140
Pulstryk	Nedsat	Nedsat

A B C D E



- Glasgow Coma Scale
- Pupiller
- Bevægelse af ekstremiteter
- Faldgruber
 - Hypoxi, hypovolemi
 - Alkohol, narkotika
- IKKE forklare nedsat bevidsthed med alkoholpåvirkning

A B C D E

- OBS forurening
- Us. patienten foran og bagpå
- Log-roll
- Undgå varmetab
 - Varme væsker, Varme tæpper, rumvarme

MODTAGELSE

A: Intuberet

B: ia. SAT 100%.
Pleuradræn sin.

C: Transfunderet,
bækkenpakket nu C stabil.

D: GCS 3. Dilaterede let
reagerende pupiller.

E: Bækken fraktur + flere
ekstremitetsfrakturer

Hvad nu?

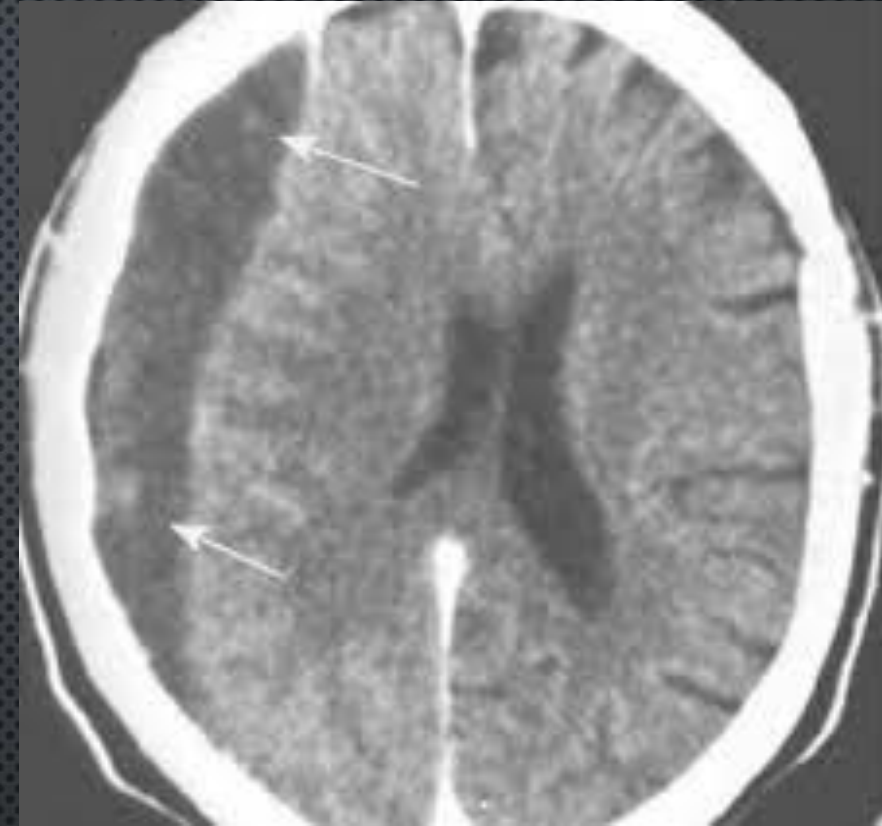


TRAUME CT/RTG

BEHANDLING

PRIORITET

- Circulation C
- Brain D
- Bones E

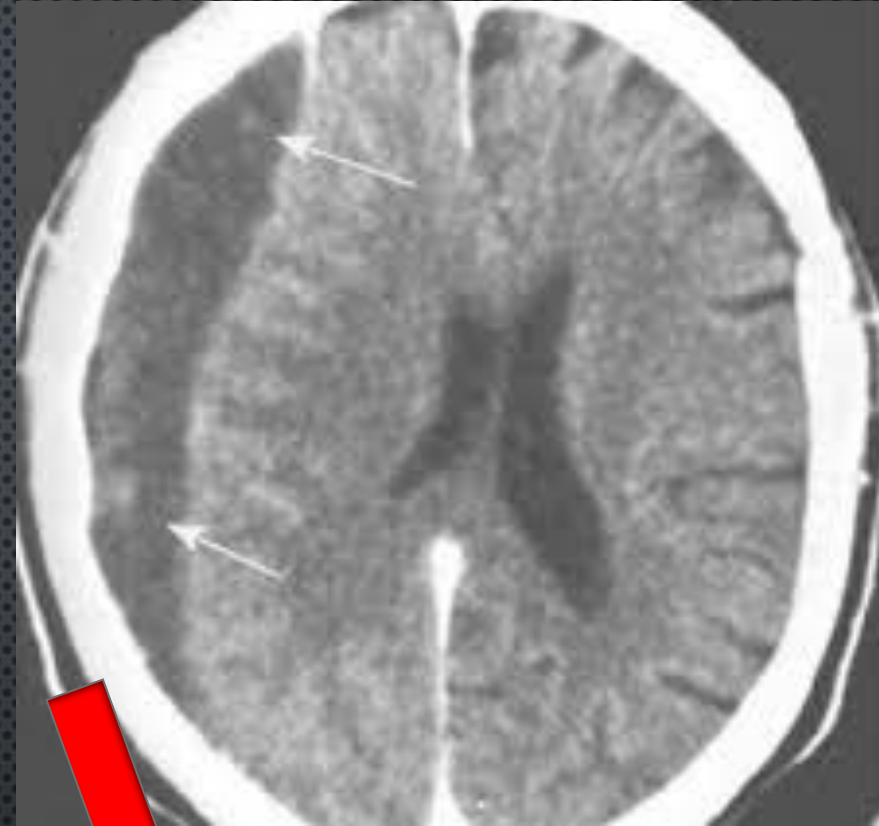


TRAUME CT/RTG

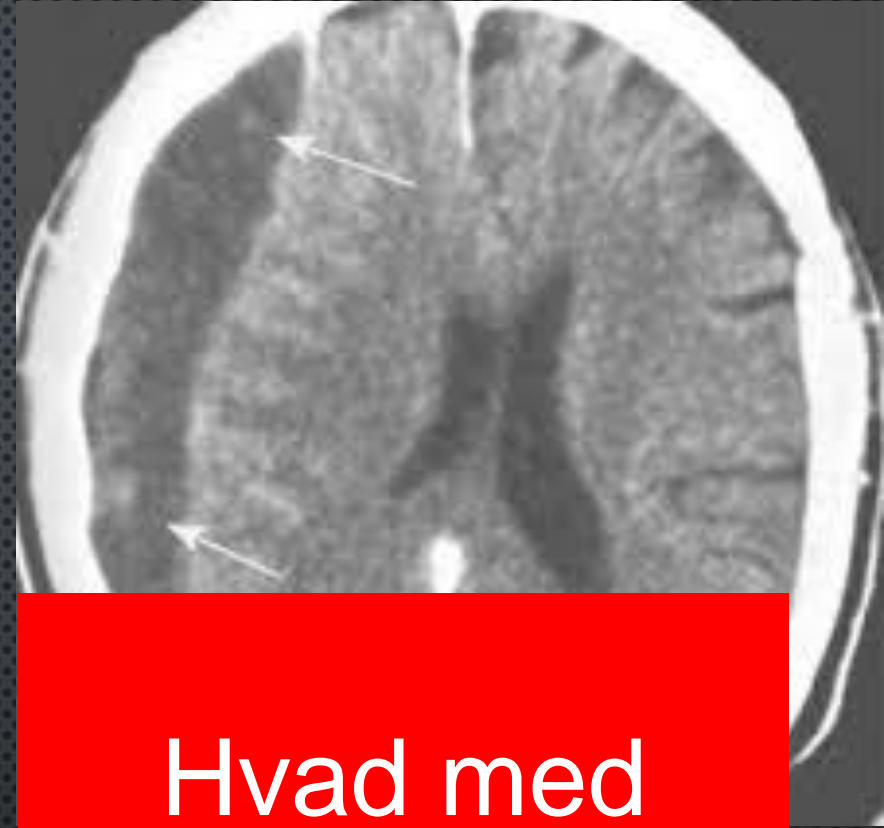
BEHANDLING

PRIORITET

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TRAUME CT/RTG



Hvad med
ekstremitets
frakturerne?



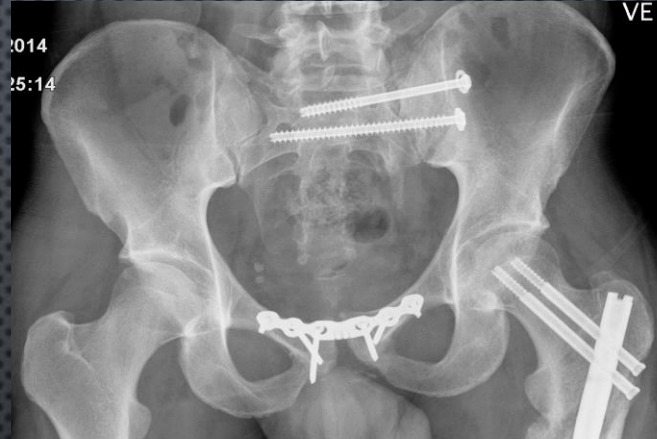
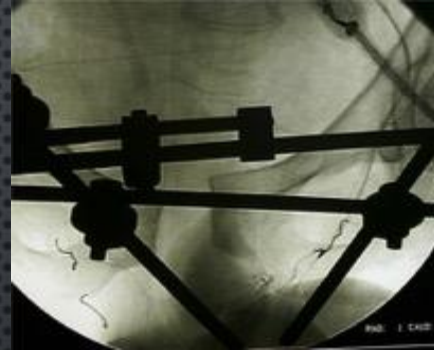
BEHANDLINGS

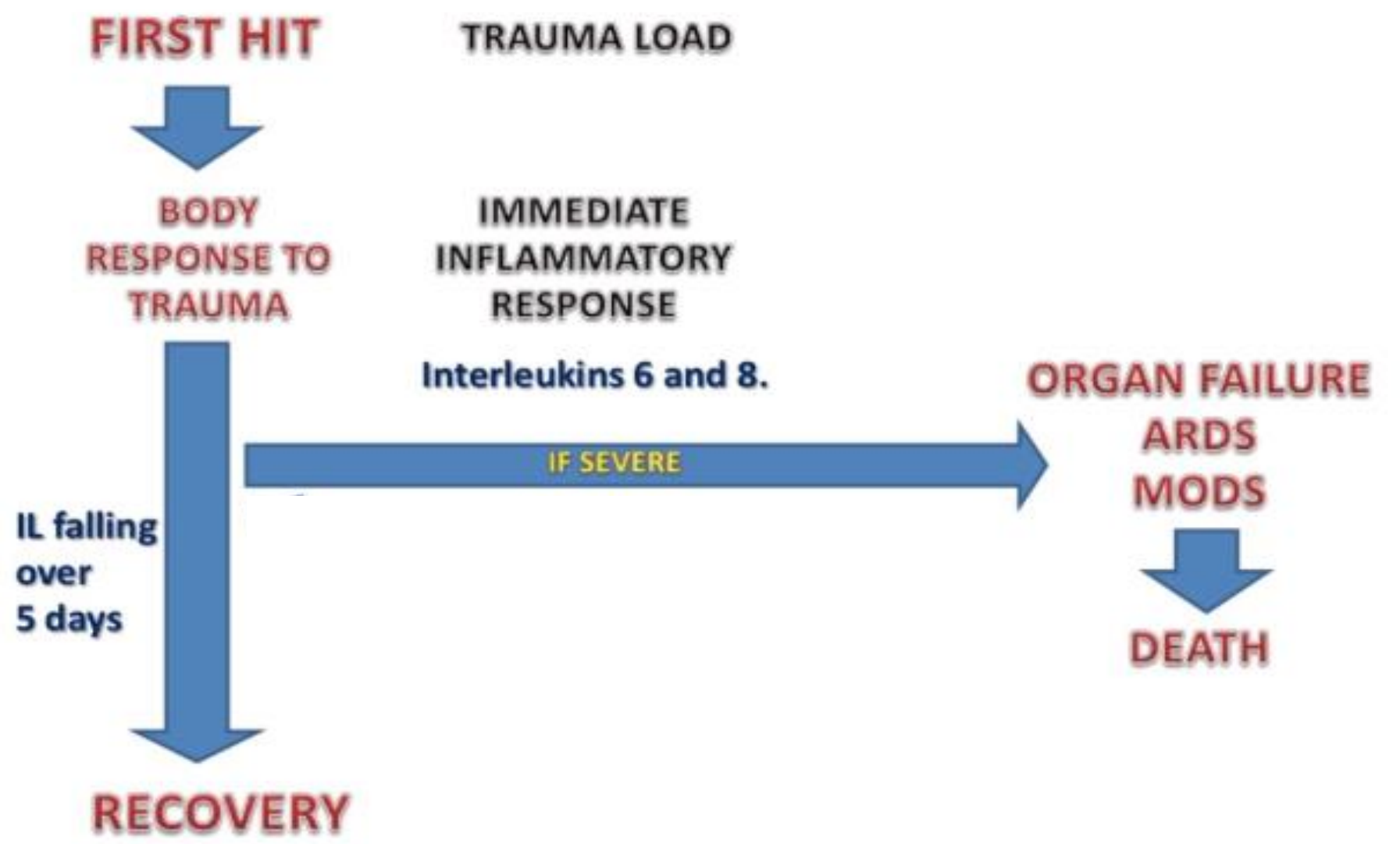
PRIORITET

- Circulation C
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DAMAGE CONTROL ORTHOPEADICS VS. EARLY TOTAL CARE





FIRST HIT

TRAUMA LOAD

**BODY
RESPONSE TO
TRAUMA**

**IMMEDIATE
INFLAMMATORY
RESPONSE**

Interleukins 6 and 8.

ORGAN FAILURE

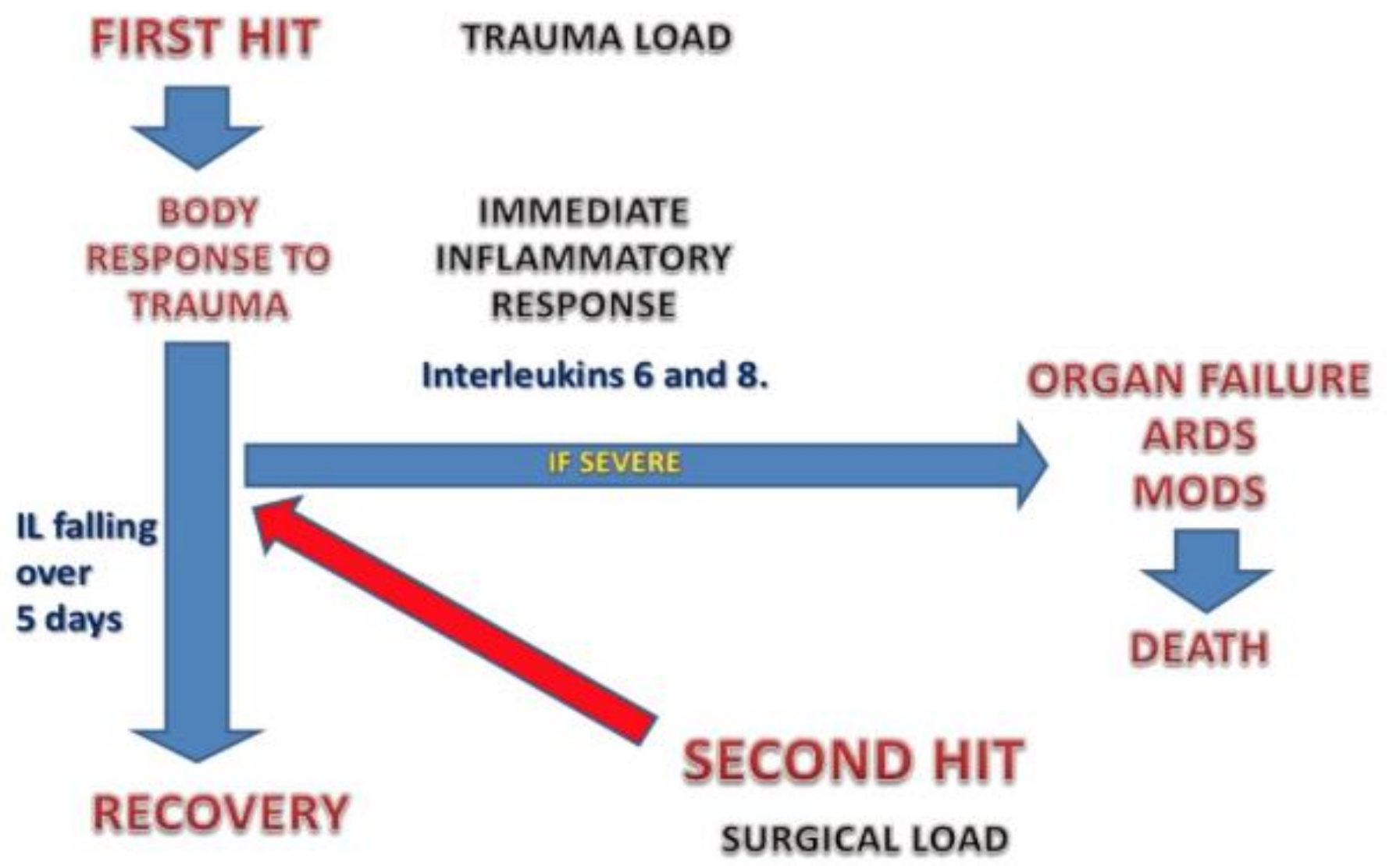
**ARDS
MODS**

DEATH

**IL falling
over
5 days**

RECOVERY

IF SEVERE



HVEM SKAL BEHANDLES MED DCO?

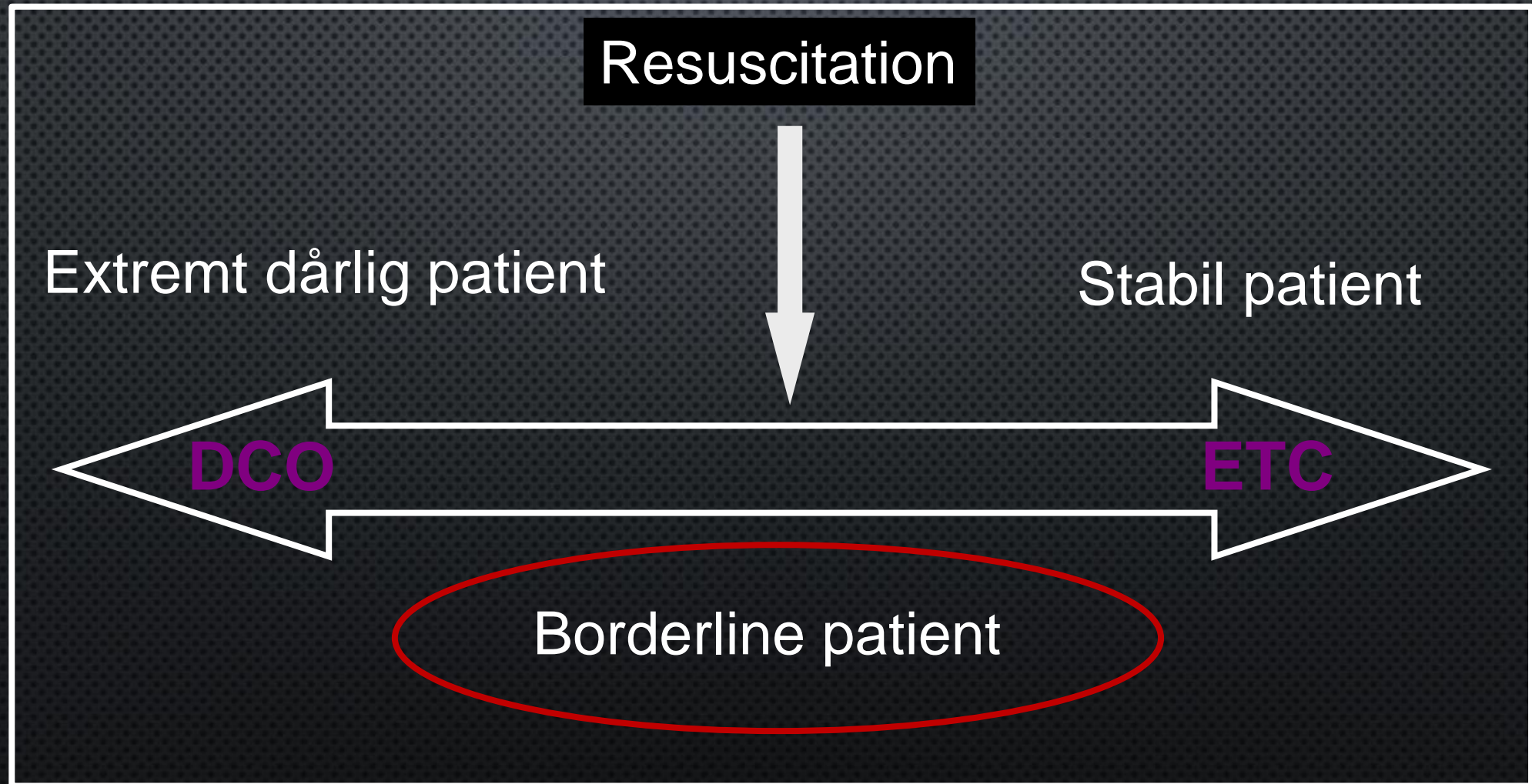


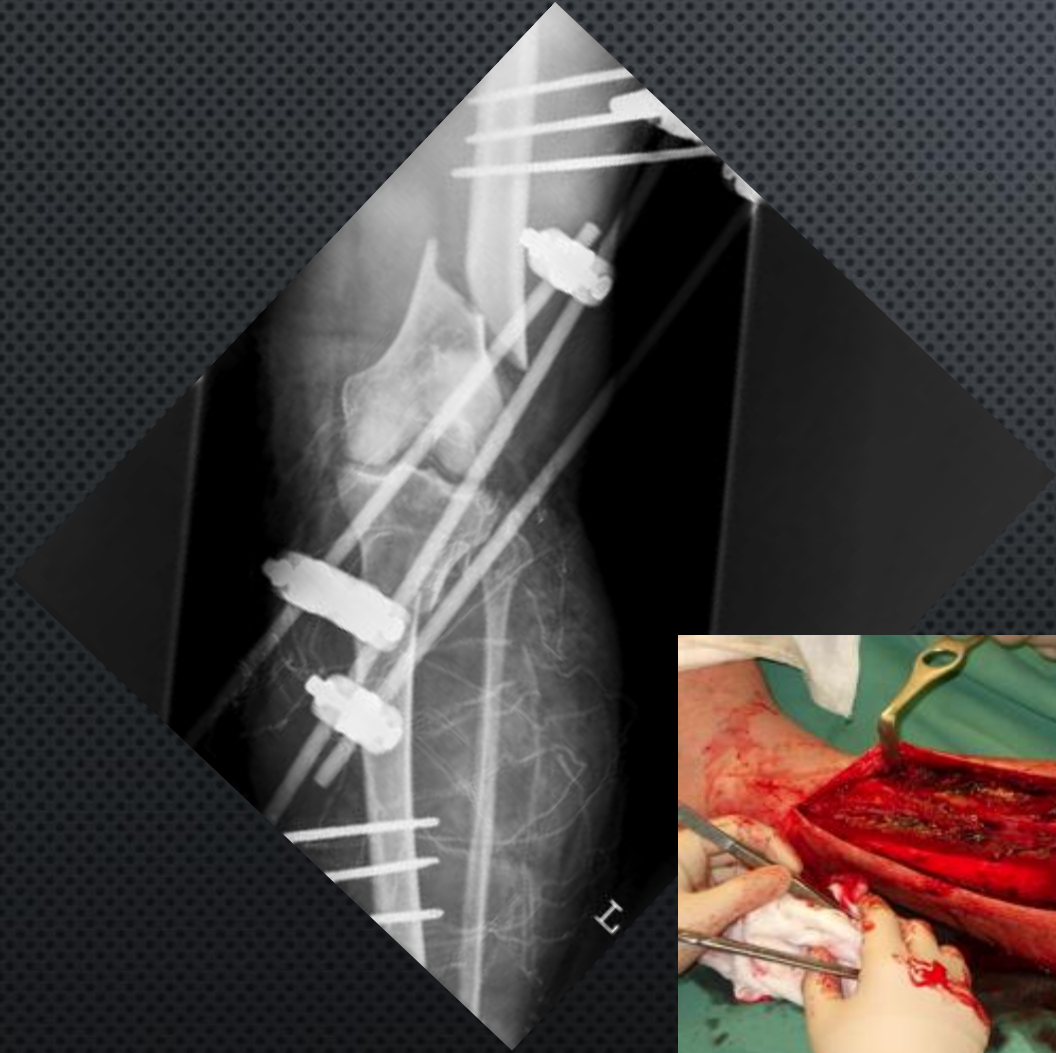
TABLE I: The assessment of the four clinical grades with the corresponding range of clinical parameters (data from [26]).

	Parameter	Stable (grade I)	Borderline (grade II)	Unstable (grade III)	In extremis (grade IV)
Shock	BP (mmHg)	≥100	80–100	60–90	<50–60
	Blood units (2 h)	0–2	2–8	5–15	>15
	Lactate levels	Normal range	Approx 2.5	>2.5	Severe acidosis
	Base deficit (mmol/L)	Normal range	No data	No data	>6–18
	ATLS classification	I	II-III	III-IV	IV
	UO (mL/h)	>150	50–150	<100	<50
Coagulation	Platelet count ($\mu\text{g/mL}$)	>110000	90000–110000	<70000–90000	<70000
	Factor II and V (%)	90–100	70–80	50–70	<50
	Fibrinogen (g/dL)	>1	Approx 1	<1	DIC
	D-Dimer	Normal range	Abnormal	Abnormal	DIC
Temperature	>35°C	33–35°C	30–32°C	30°C or less	
Soft tissue injuries	Lung function, PaO ₂ /FiO ₂	>350	300	200–300	<200
	Chest trauma scores, AIS	AIS I or II	AIS ≥ 2	AIS ≥ 2	AIS ≥ 3
	TSS	0	I-II	II-III	IV
	Abdominal trauma (moore)	≤II	≤III	III	≥III
	Pelvic trauma (AO classification)	A	B or C	C	C (crush, rollover with abd trauma)
	Extremities	AIS I or II	AIS II-III	AIS III-IV	Crush, rollover, extremities

Abbreviations: BP: blood pressure, ATLS: advanced trauma life support, UO: urine output, TTS: thoracic trauma score, AIS: abbreviated injury scale, DIC: disseminated intravascular coagulation.

H. C. Pape, P. V. Giannoudis, C. Krettek, and O. Trentz, "Timing of fixation of major fractures in blunt polytrauma: role of conventional indicators in clinical decision making," *Journal of Orthopaedic Trauma*, vol. 19, no. 8, pp. 551–562, 2005.

HVAD ER DAMAGE CONTROL ORTHOPEADIC?



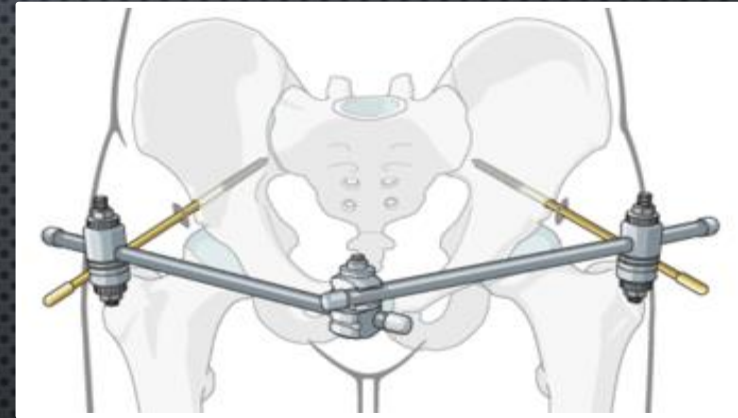
DAMAGE CONTROL ORTHOPAEDIC – ET KONCEPT

- **Stop skaden**
 - Reponere dislocerede led
 - Debridement af sår
 - Compartmet syndrom
 - Stabilisere lange knogler / bækken
- **Stabiliser frakturer**
 - Gips/ex. fix lange rørknogler / bækken



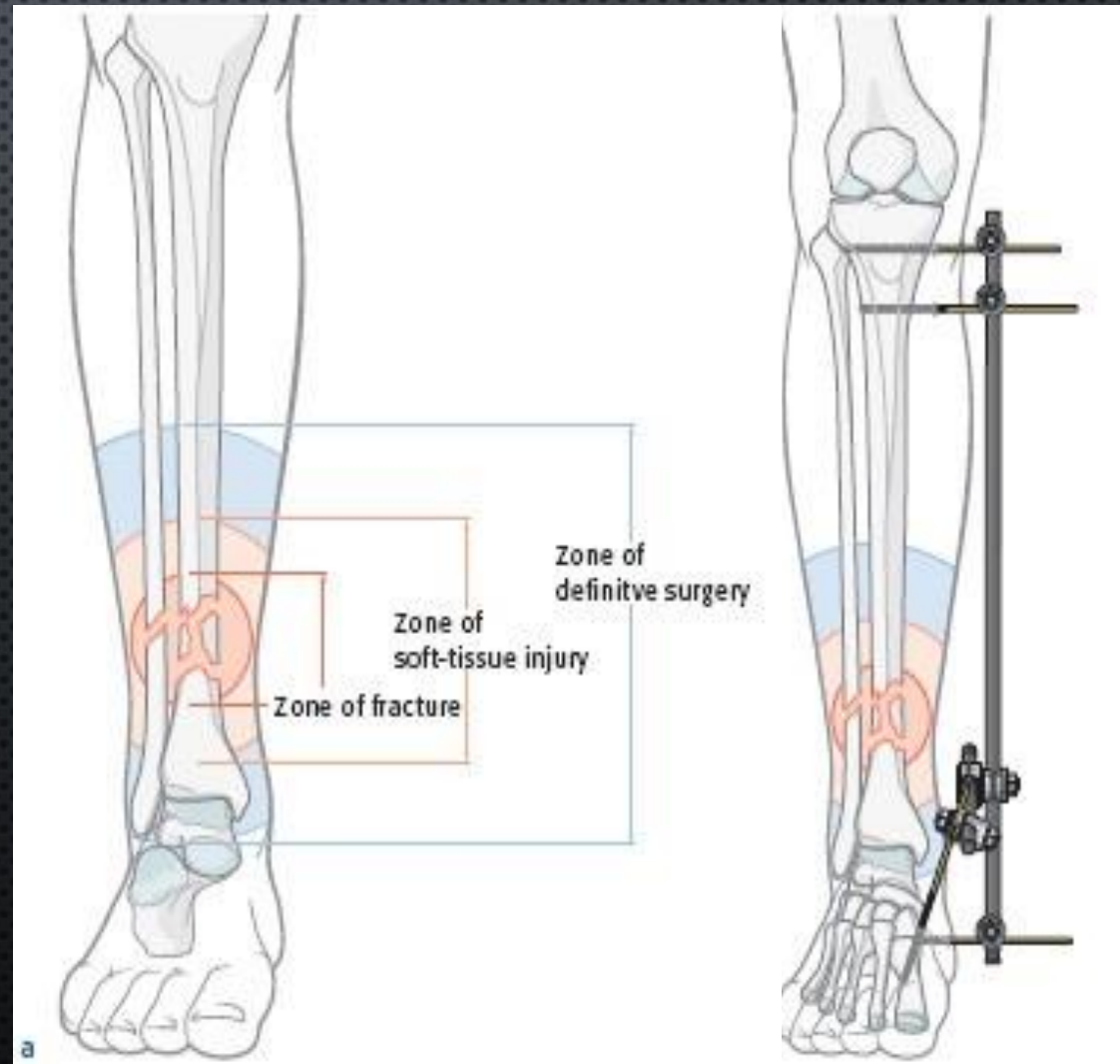
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GRUNDREGLER FOR DCO EKSTERN FIKSATION

- Acceptabel stabilitet
 - 2 pins i hvert fragment
 - Bi cortical fæste
- Akseret reposition
- Trækkes ud i korrekt længde
- Ingen pins zone of injury
- Undgå pins hvor definitivt osteosyntese materiale skal være



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 - Stabilisere lange knogler / bækken
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 - Gips/ex. fix lange rørknogler / bække
- **Stabiliser patienten**
 - Intensiv
- **i**
 - N
 - N



DAMAGE CONTROL ORTHOPAEDIC – ET KONCEPT

- **Stop skaden**
 - Reponere dislocerede led
 - Debridement af sår
 - Compartmet syndrom
 - Stabilisere lange knogler / bækken
- **Stabiliser frakturer**
 - Gips/ex. fix lange rørknogler / bækk
- **Stabiliser patienten**
- **Definitiv kirurgi**
 - Når patienten er klar
 - Den rigtige kirurg





MULTITRAUME PATIENTER TAKE HOME

- Kend dit lokale traume setup
- ABCDE principper (ATLS)
- Strategi for ETC vs DCS
 - ETC
 - Stabil patient
 - Rigtige kirurg
 - DCS
 - Ustabil patient
 - Mange osteosynteser
 - Manglende ekspertise

