

Den geriatriske patient med den osteoporotiske fraktur.

Optimering og valg af implantater

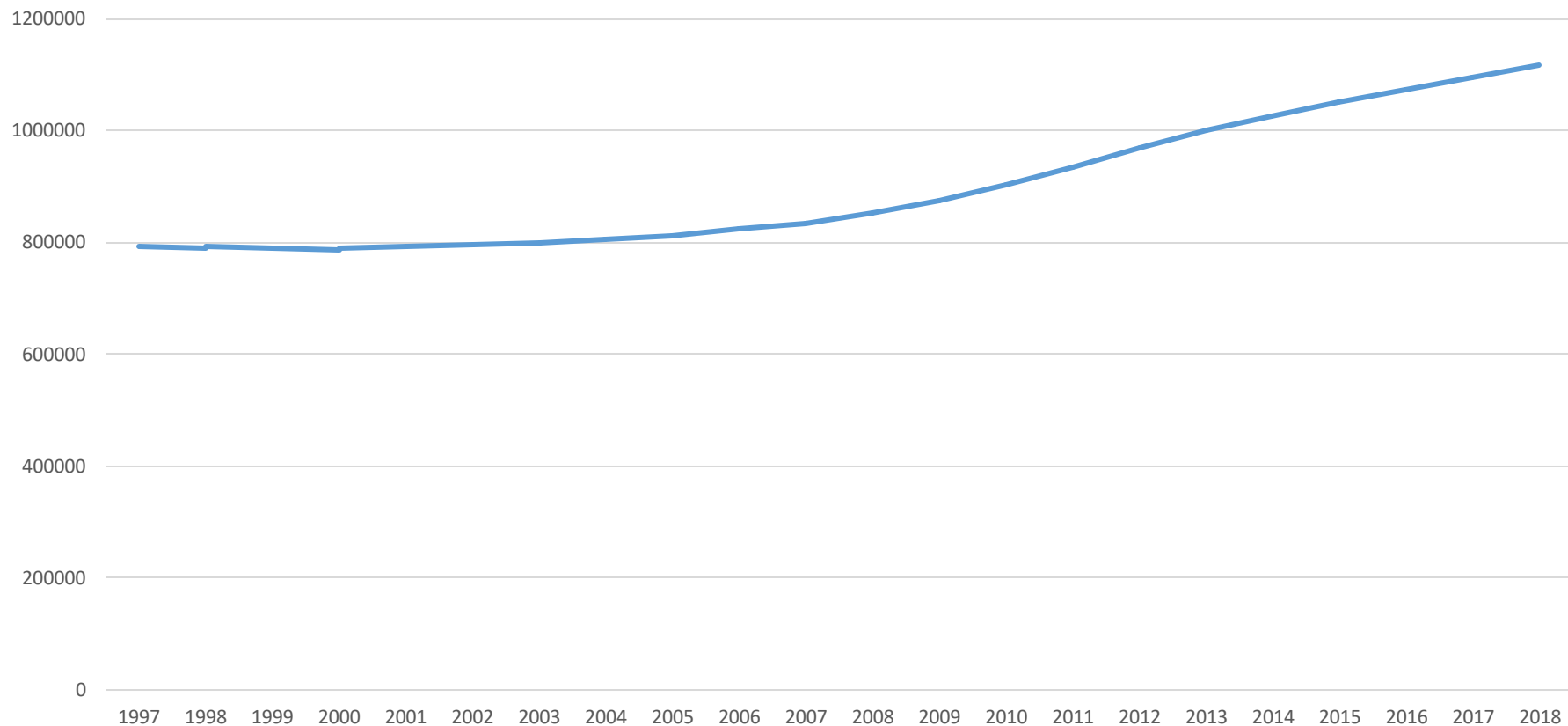
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Den geriatriske patient

1,6 mio. i 2060 (>35%)

+65 årige i DK



Udgangspunkt for hoftefraktur

- 7000 årligt i Danmark
 - 10% døde efter 1 måned
 - 25% døde efter 1 år
 - 50% oplever funktionstab

Parameters

Age

>85

Sex

female

AMTS

>=7

Hb on admission

>=100 g/l

Residence

other

Comorbidities

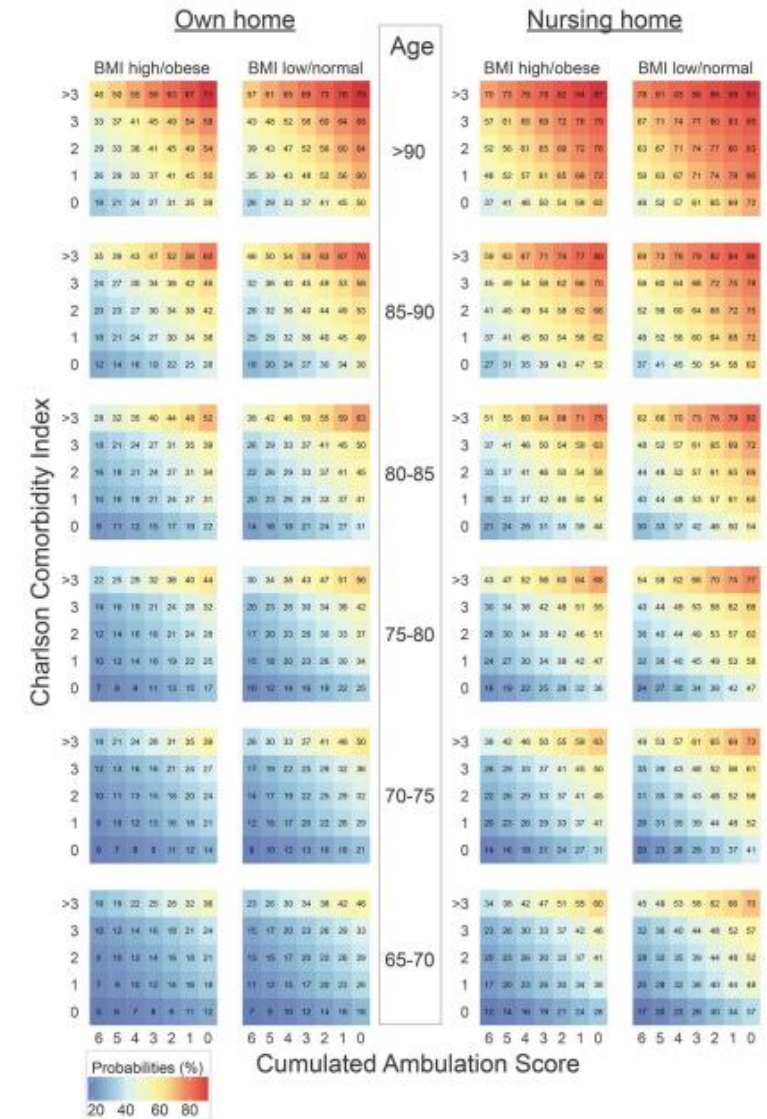
<2

Active malignancy in the last 20yrs (not SCC/BCC)

no

Calculate Risk

Reset Form



1. Marufu TC et al. Prediction of 30-day mortality after hip fracture surgery by the Nottingham Hip Fracture Score and the Surgical Outcome Risk Tool. *Anaesthesia* 2016, 71, 515–521
2. Hjelholt TJ et al. Development and validation of a model for predicting mortality in patients with hip fracture. *Age Ageing*. 2022 Jan 6;51(1)

Præoperativ optimering?

Open Access

Research

BMJ Open Resuscitation in hip fractures: a systematic review

Brett Rocos,¹ Michael R Whitehouse,² Michael B Kelly³

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► Prepublication history and additional material are available. To view these files please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2017-015906>).

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ABSTRACT

OBJECTIVES

To evaluate the evidence for the resuscitation of patients with hip fracture in the preoperative or perioperative phase of their treatment and its impact on mortality.

Design We searched MEDLINE, EMBASE, CENTRAL and PROSPERO databases using a systematic search strategy for randomised trials and observational studies investigating the fluid resuscitation of any patient with hip fracture. No language limits were applied to the search, which was complemented by manually screening the reference lists of appropriate studies.

Outcome measures Mortality at 1 week, 30 days and 1 year following surgery.

Results Two hundred and ninety-eight citations were identified, and 12 full manuscripts were reviewed; no studies satisfied the inclusion criteria. The background literature showed that the mortality for these patients at 30 days is approximately 8.5% and that bone cement implantation syndrome is insufficient to explain this. The literature was explored to define the need for an interventional investigation into the preoperative resuscitation of patients with hip fracture.

Conclusions Patients with hip fracture show similar physiological disturbance to major trauma patients. Nineteen per cent of patients presenting with hip fracture are hypoperfused and 50% show preoperative anaemia suggesting that under resuscitation is a common problem that has not been investigated. A properly conducted interventional trial could improve the outcome of these vulnerable patients.

Strengths and limitations of this study

- This review addresses a significant public health disease with a very poor prognosis.
- Thorough literature search revealed no relevant articles.
- Current practice has no evidence base and requires a clinical trial to inform it.
- A small improvement in mortality would lead to a large real number of patients surviving.

year) and a 1-year mortality of approximately 20%.³⁻⁴

The care pathway of these patients is complicated. Patients are typically frail and generally have multiple comorbidities, polypharmacy and are often living dependently at the time of injury.⁵⁻⁸ Forty per cent shows cognitive impairment and 20% will present with an acute delirium. Despite these data suggesting that a hip fracture is a potentially devastating event with multiple factors influencing overall outcome and survival, this population continues to be managed as if the hip fracture was an isolated, skeletal injury.

In contrast, patients who sustain major trauma or multiple fractures, where multiple pathologies influence outcomes, are routinely managed in a secondary and tertiary trauma

Conclusion

Patients with hip fracture show similar physiological disturbance to major trauma patients.

19% are hypoperfused
50% show preoperative anaemia

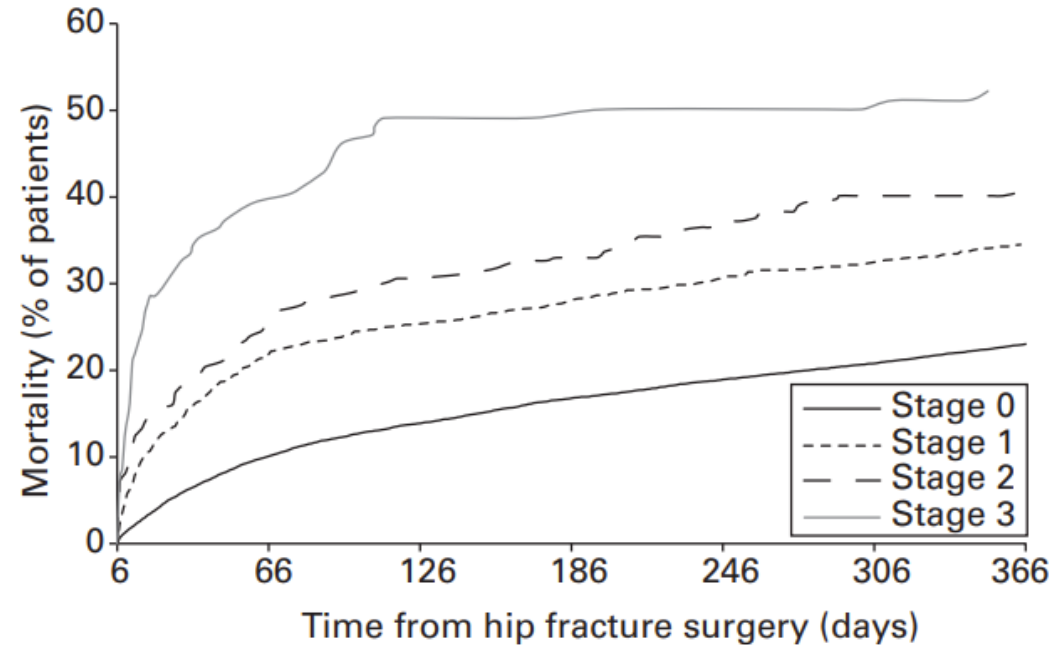
Andre typiske medicinske problemstillinger

Hyperkaliæmi
Hypokaliæmi
Hyponatriæmi
Nyrefunktion
CRP

Volumen problem

Volumen i blodbanen

- Akut nyrepåvirkning, ca. 13 %



1. Risk of acute renal failure and mortality after surgery for a fracture of the hip: a population-based cohort study. Pedersen AB, Christiansen CF, Gammelager H, Kahlert J, Sørensen HT. Bone Joint J. 2016 Aug;98-B(8):1112-8.

Volumen problem

Volumen i blodbanen

- Væske iv. præoperativt
- Blodtrykssænkende medicin

Anæmi

- Præoperativ grænse for transfusion er højere end efter operation
- Postoperativt på 2.-3. dagen følges NKR

Blødning

- Nedsæt blødning med Tranexamsyre
- Blodfortyndende: Pauser kun NOAK og Marevan

Præoperativ optimering

Nationale krav

Gennemført indenfor 4 timer

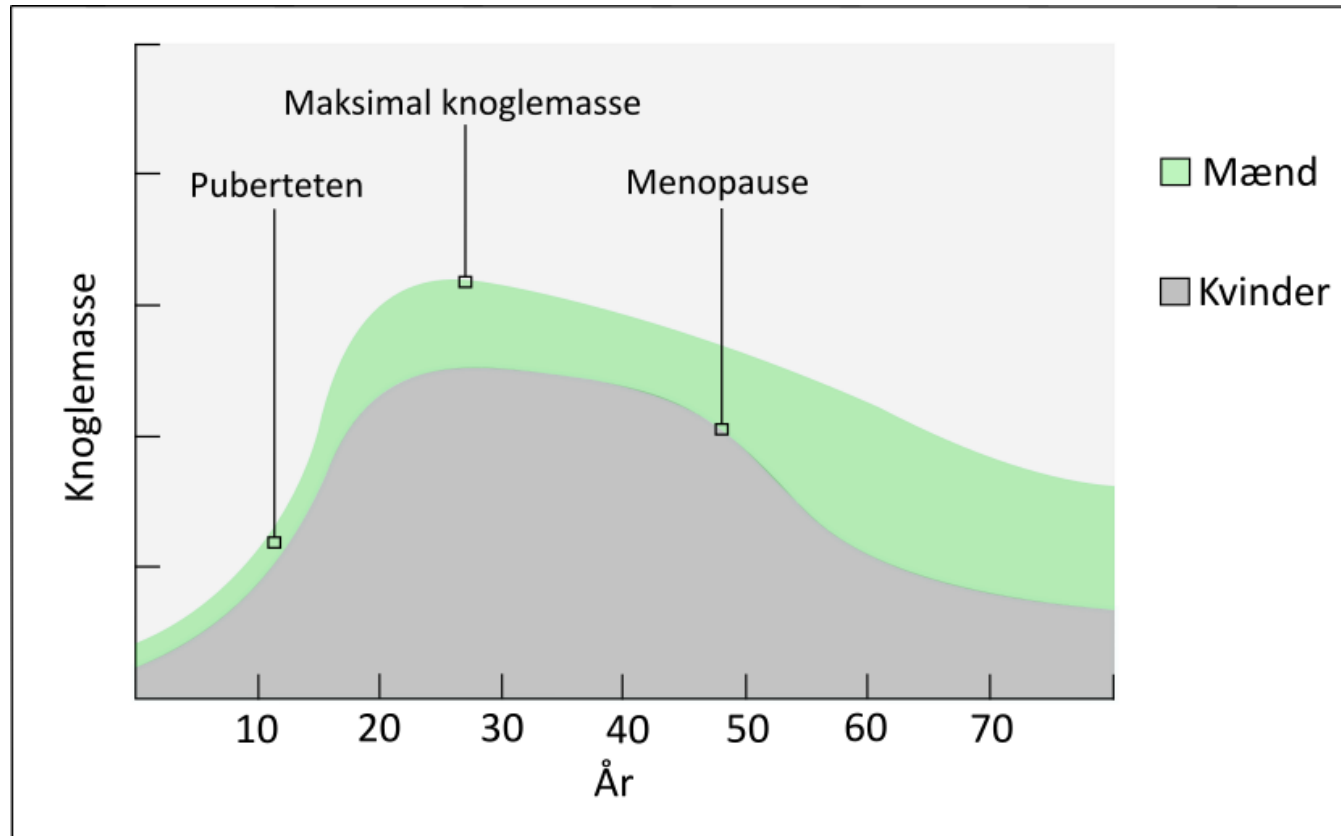
Bør være samarbejde med anæstesien, evt. mediciner

Akutte tilstande, som bør behandles akut, er f.eks.

- Anæmi
- Tromboseprofylakse/INR kontrol
- Ukontrollerbar diabetes (reduktion af insulin dosis, GIK-drop)
- Væske- og elektrolyt forstyrrelser
- Akut hjerteinsufficiens, hjerteiskæmi, arytmi
- Lungebetændelse
- Akut forværring af KOL

Osteoporose

Den osteoporotiske knogle = ↓ knoglemineraltæthed (BMD)



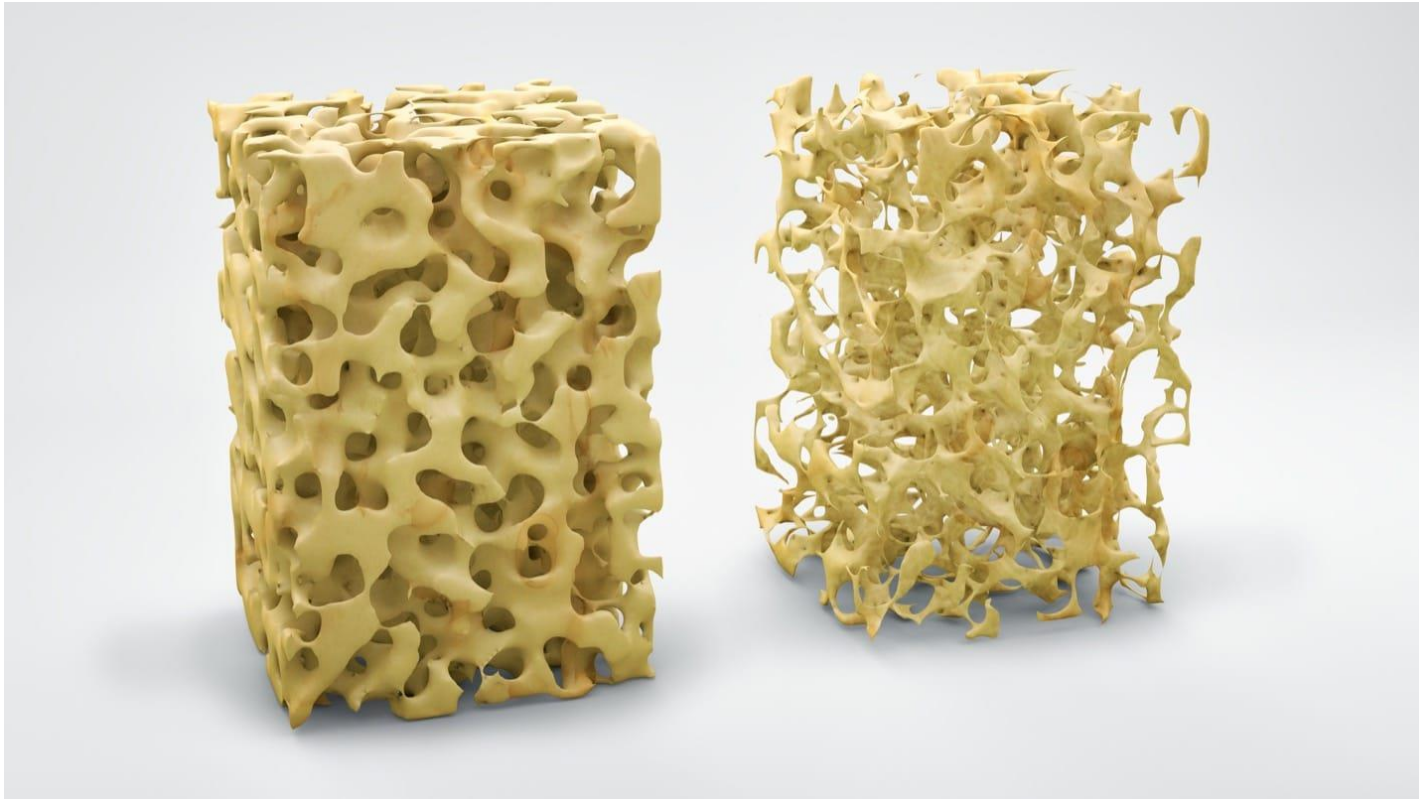
3% af dansker har osteoporose

>2-3 x udiagnosticeret

Årsager

- Arv
- Medicin (steroider)
- Diabetes
- Tobak, alkohol
- Kost, vægt
- Motion

Osteoporose - trabekulær knogle



- Færre og tyndere trabekler
- Færre trabekulære forbindelser
- Mikrostrukturen er nedbrudt

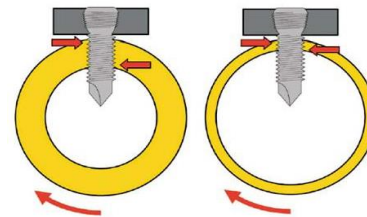
Porøs knogle = ↓↓↓Knoglestyrke

Osteoporose - kortikal knogle

Normal versus osteoporotic bone



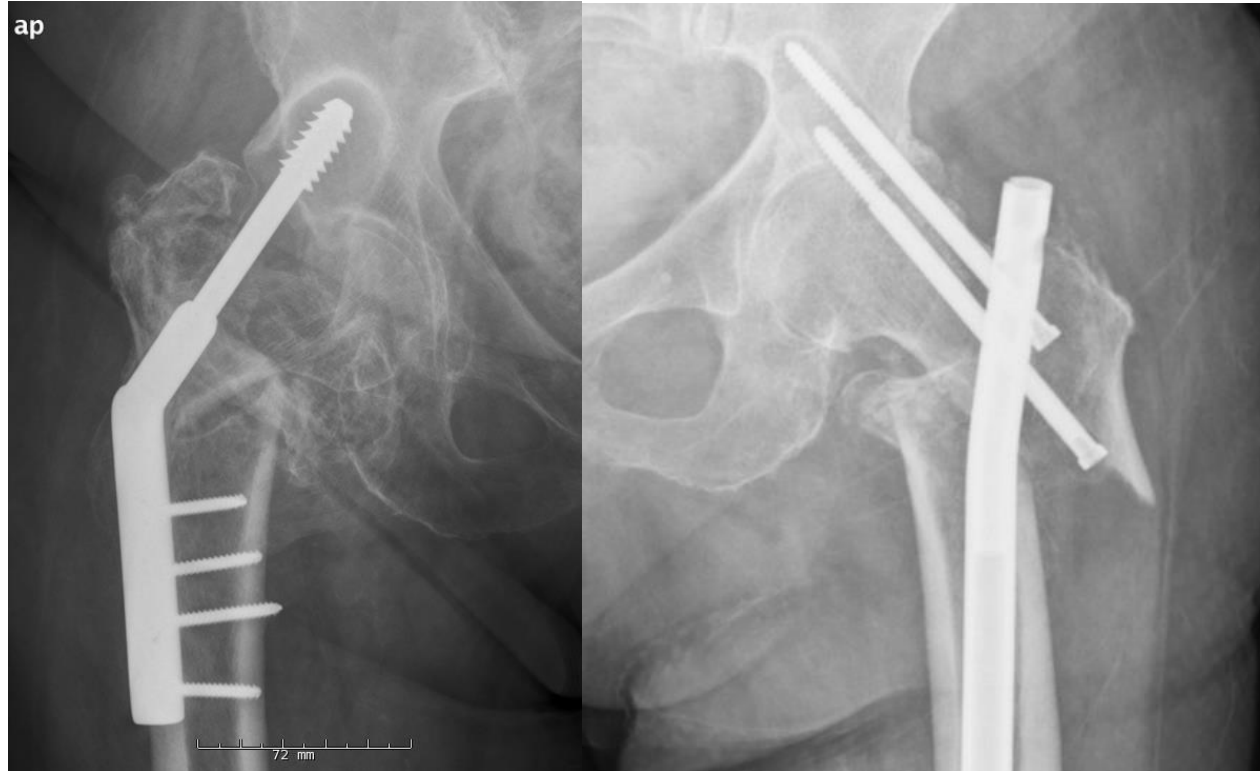
- Tynd og skrøbelig
 - Svært/umuligt at opnå absolut stabilitet
 - Kortikalis skruer: *pull-out* styrken ↓↓↓
- Rørknogler
 - Større intramedullær og ekstramedulær diameter
 - ↓↓↓ kontaktflade med skruer og søm
 - ↓↓↓ kompressions- og rotationsstyrke



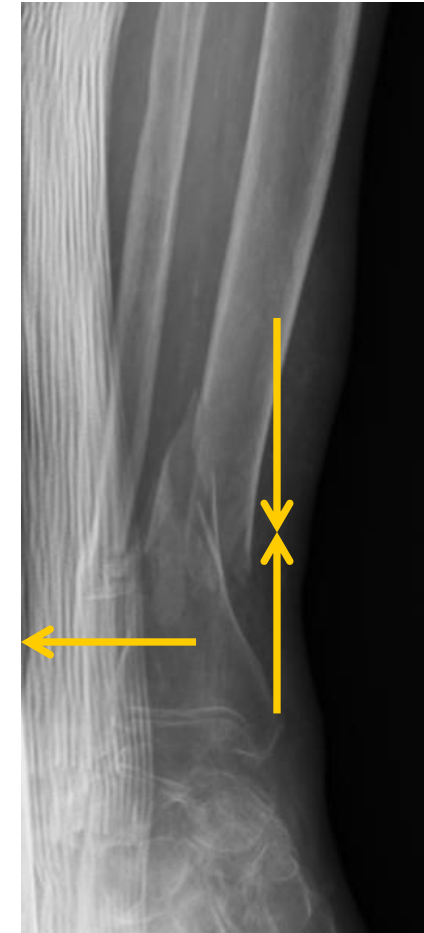
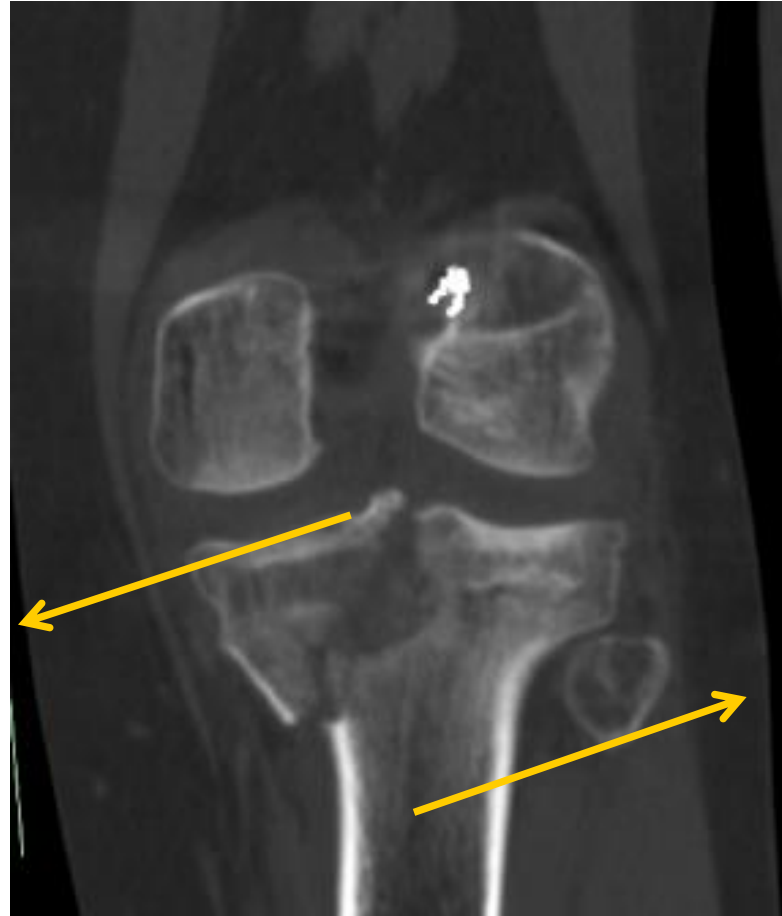
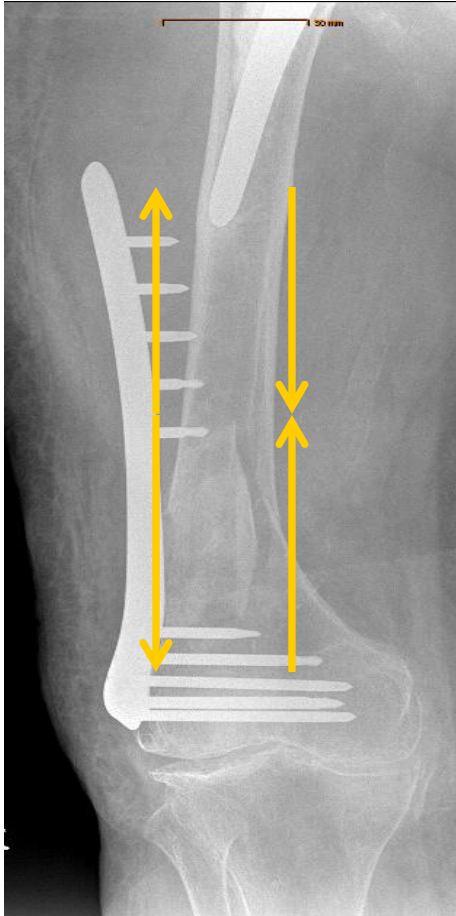
Osteoporose – komplikationer

Typiske

- Cut-out
- Sekundær displacering af skruer
- Sekundær frakturskred
- Non-union



Biomekanik - de deformerende kræfter

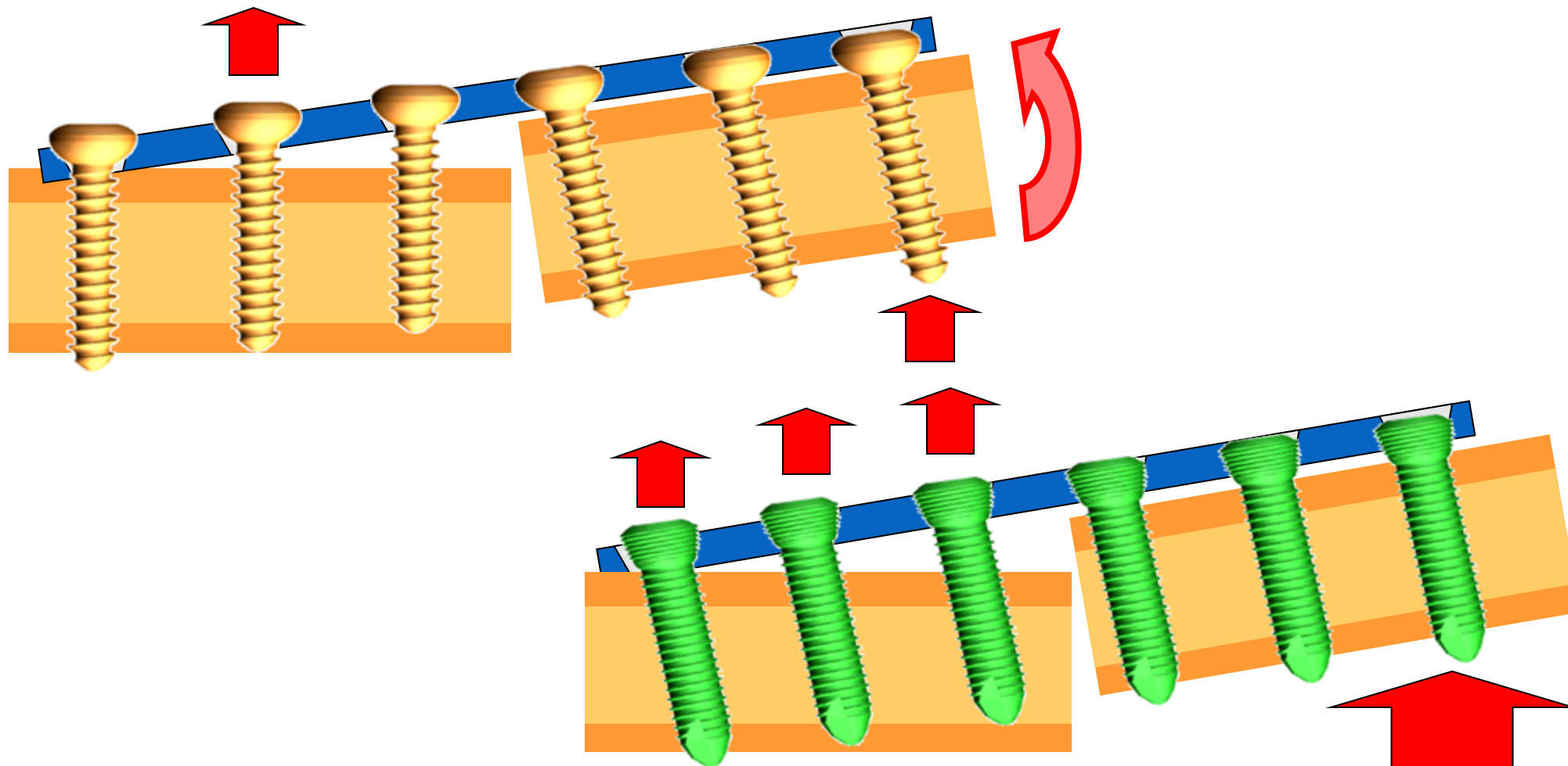


Valg af implantater

- Frakturtype og de deformedede kræfter
- Knoglekvalitet
- Bløddede og vaskularitet

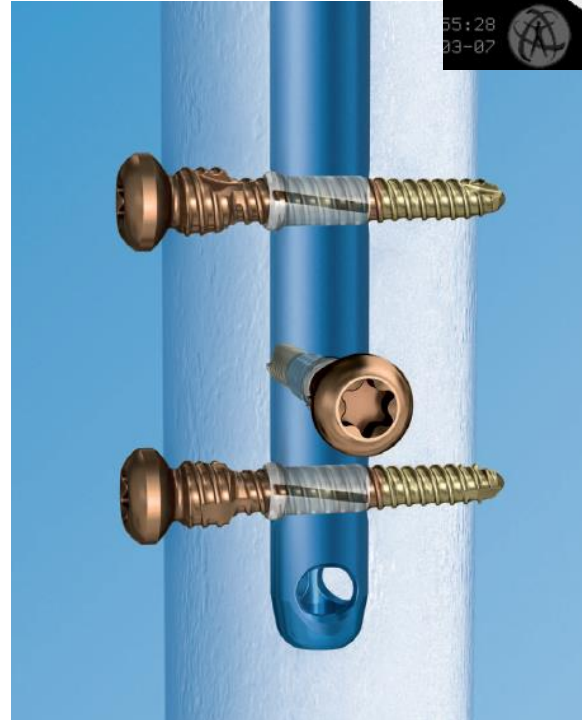
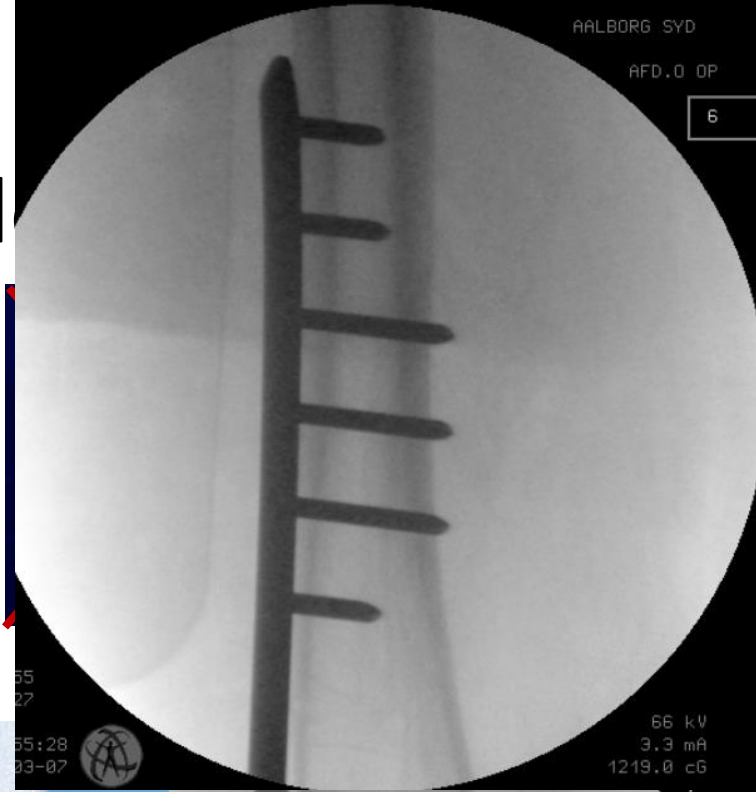


Låseskinner



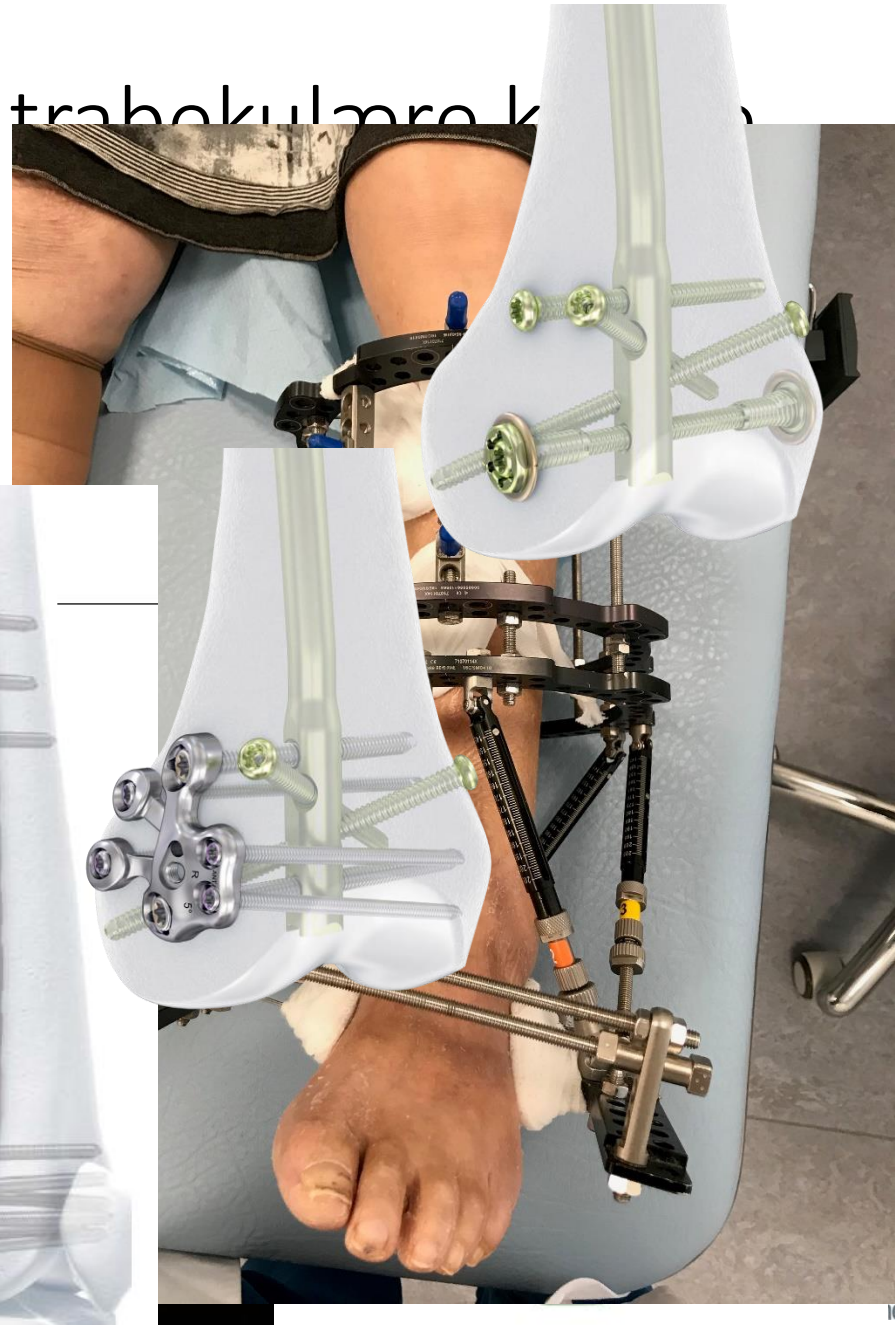
Valg af implantater: kortikal knogl

- Skruer
 - Skruediameter så stor som muligt
 - Bicortikale skruer
 - Låse-skruer
- Skinner
 - Vinkelstabile skinner
 - LISS, LCP
 - Lange skinner
 - Flere skinner?
- Søm
 - Så stort som muligt
 - Så langt som muligt
 - Vinkelstabile skruer



Implantater til frakturer i den trabekulære knogle

- Vinkelstabil osteosyntese med skruer i flere retninger
 - Variabel angle (VA-LCP, VA-Condylar plate)
- Tykt søm med d/b'
- Ekstremitetslaster
 - Cement
 - Alloplast
- Ringfiksation



Take home messages

- Præoperativ optimering er vigtig og kan redde liv!
- Operationsteknik
 - Absolut stabilitet er svært/umuligt at opnå
 - Respekter bløddelene
 - Indirekte reponering med så godt som mulig knoglekontakt
- Implantat valg
 - Bikortikale skruer
 - Lange skinner og søm
 - Vinkelstabil osteosyntese

