



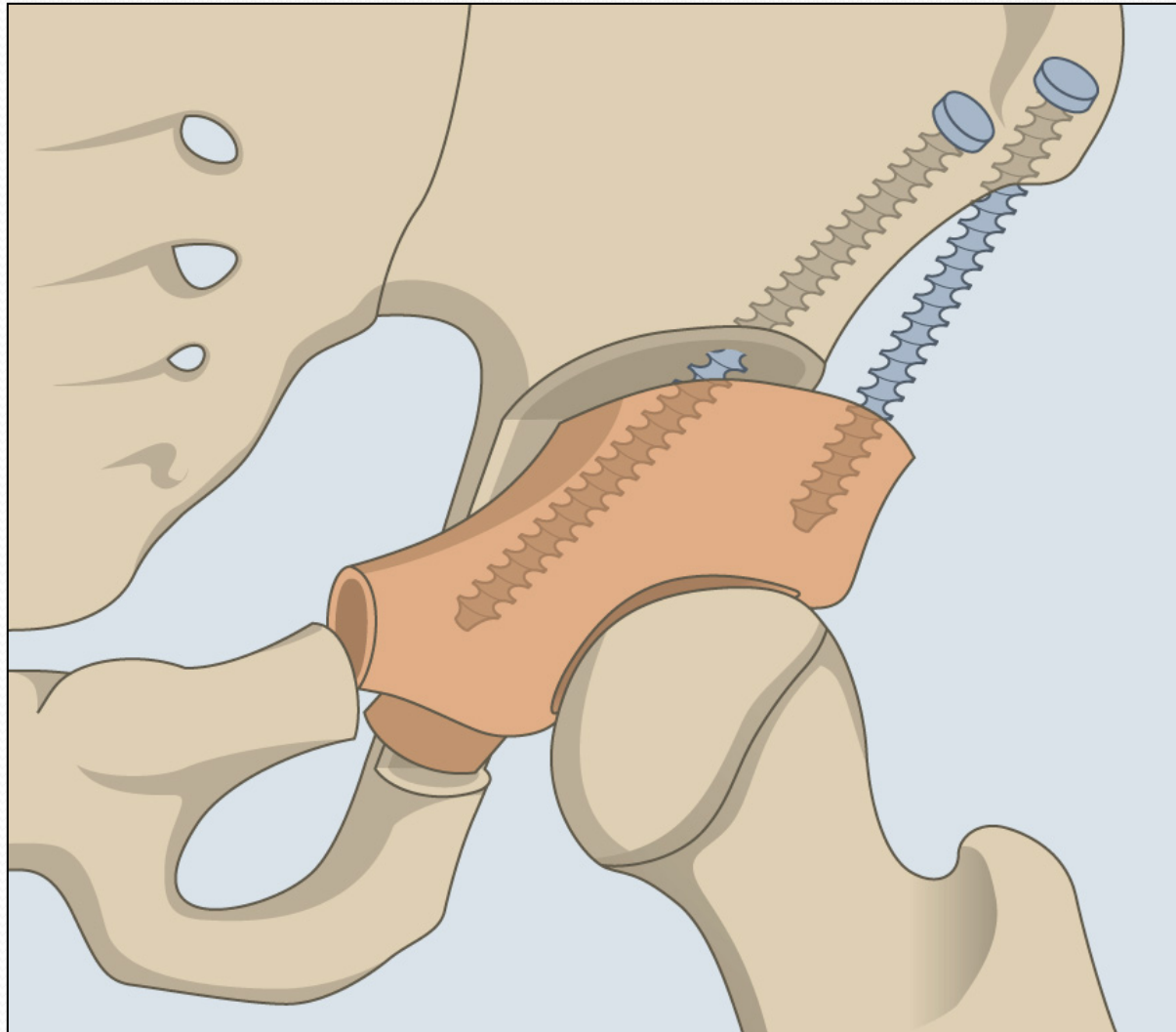
The Lundbeck Foundation Center for Fast Track Hip and Knee Surgery

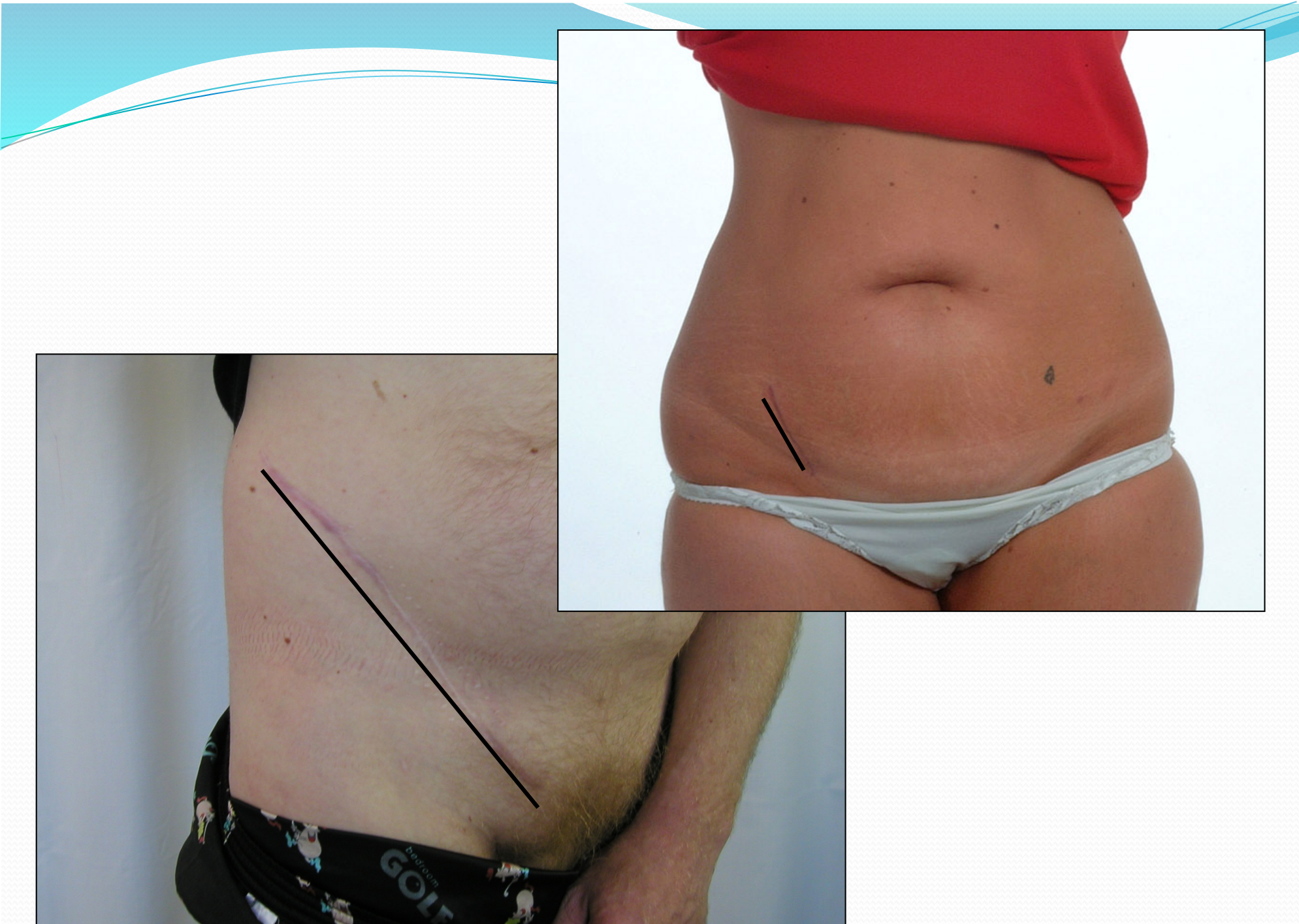
Principal investigators

**Kjeld Søballe
Henrik Kehlet**

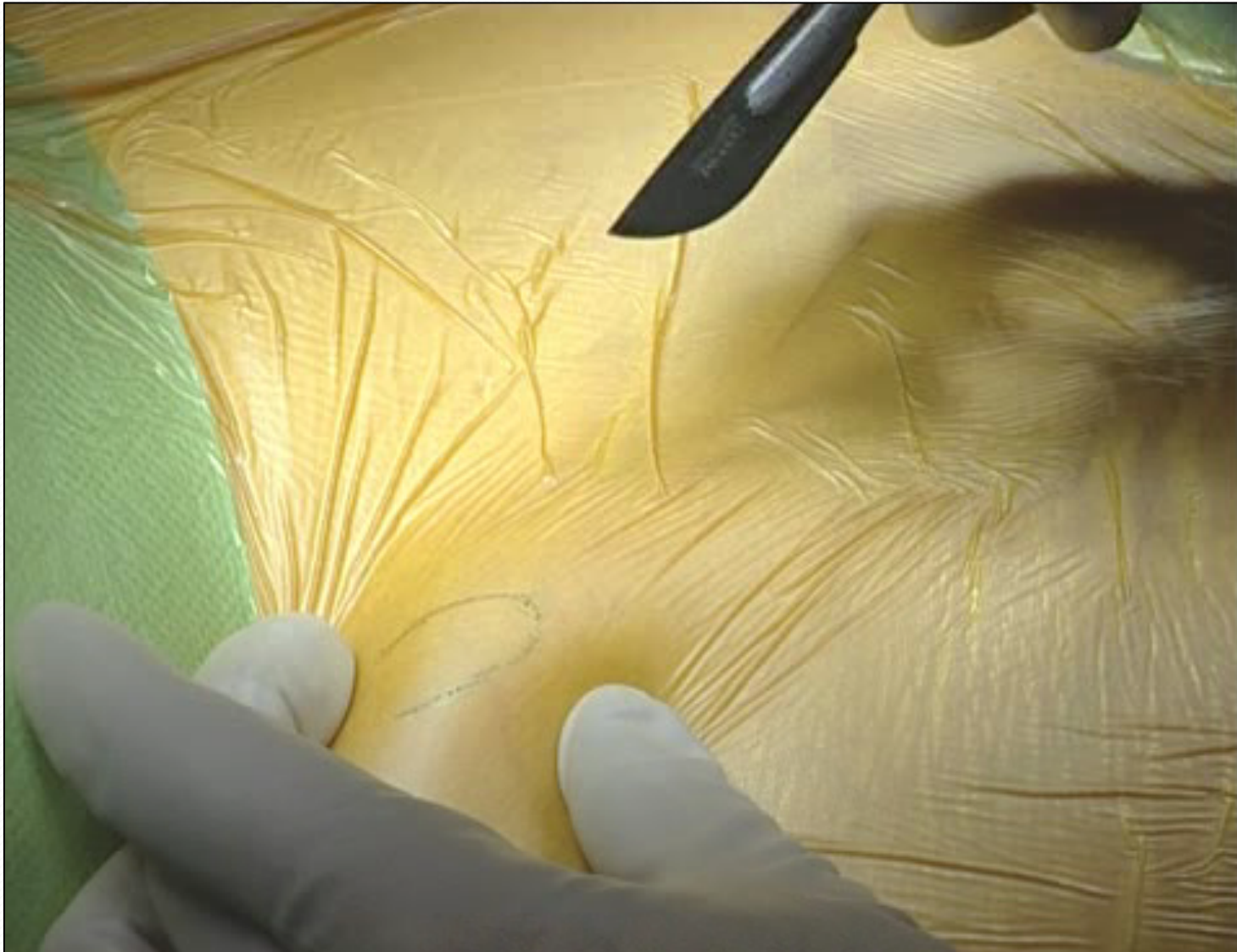
PAO







Prof. K. Soballe

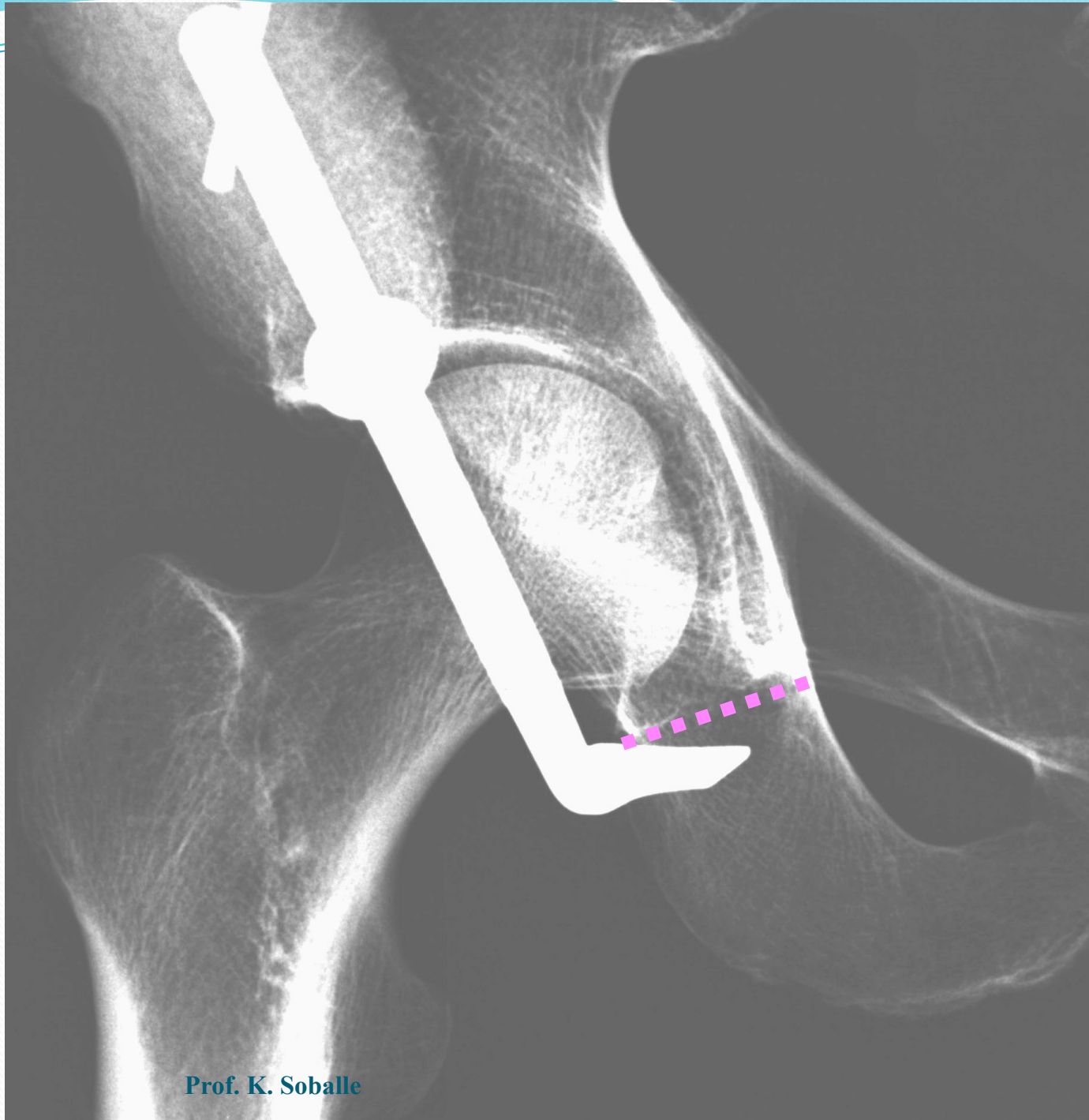


Prof. K. Soballe

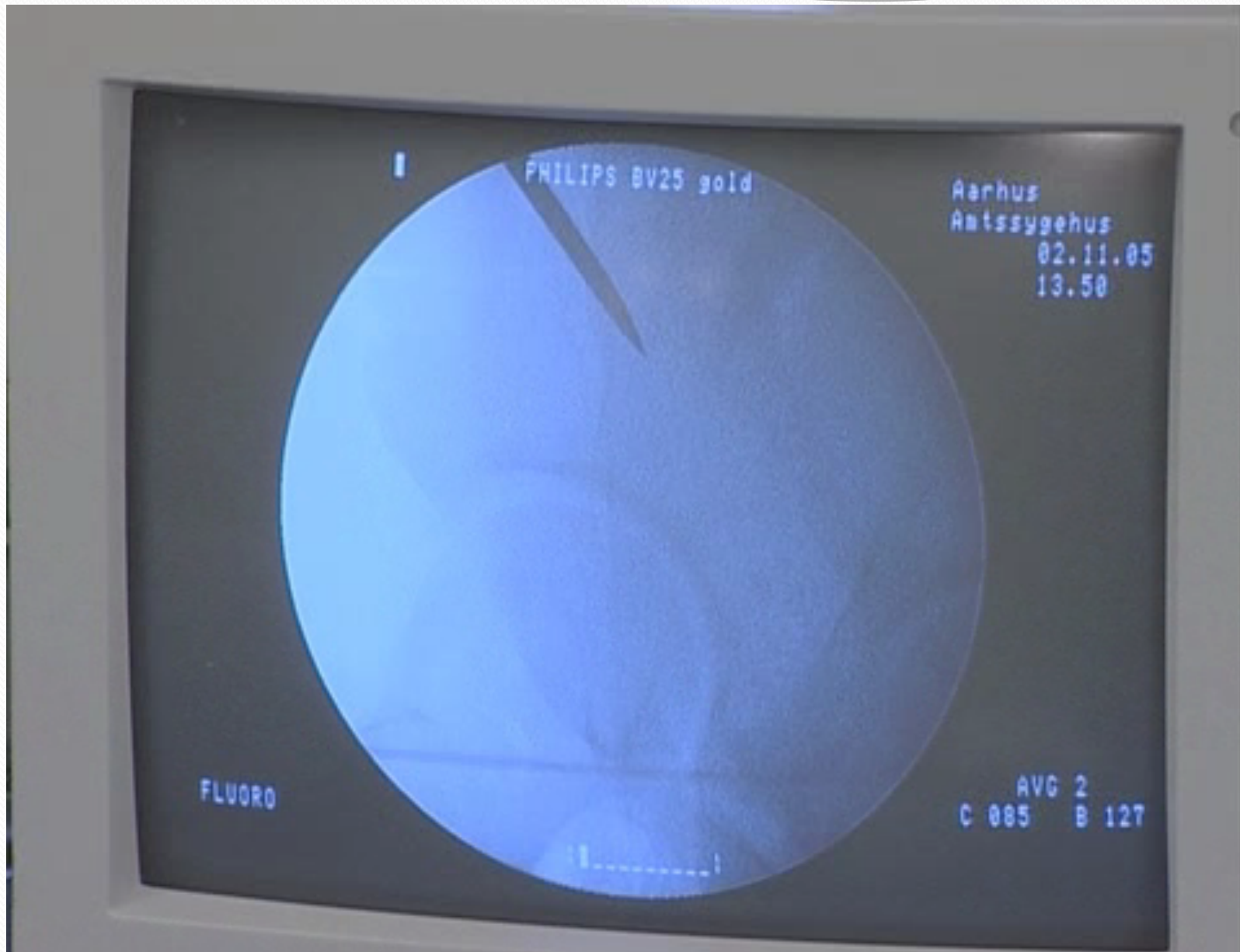




Prof. K. Soballe



Prof. K. Soballe



Prof. K.

S. J. II

18 hours postop



Prof. K. Soballe

20 hours postop



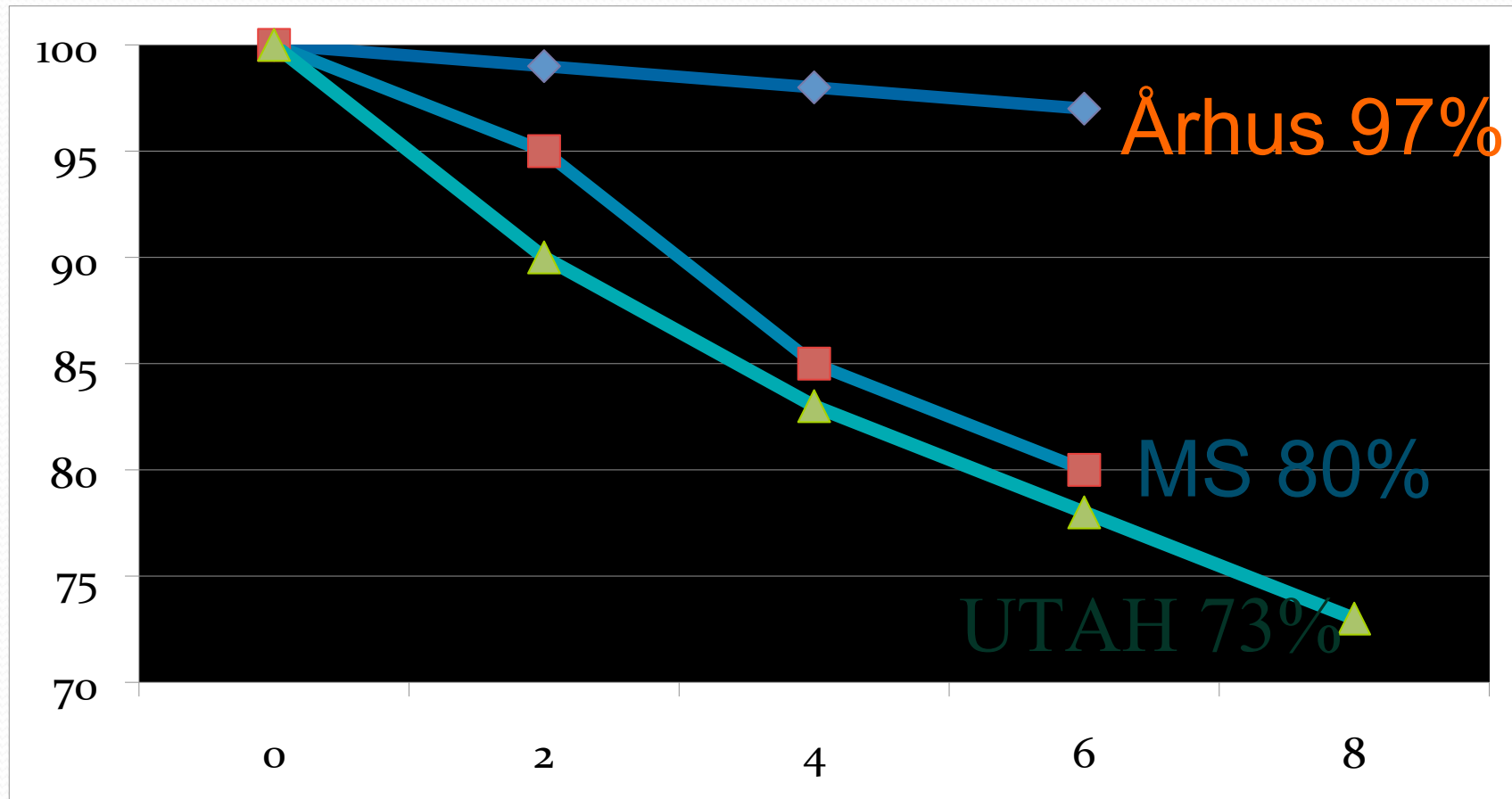
Prof. K. Soballe

24 hours postop



Prof. K. Soballe

“OVERLEVELSE”



YEARS



Fast-track surgery – hip and knee arthroplasty

Principal investigators

**Kjeld Søballe
Henrik Kehlet**

34 mill DKK (5 mill Euro)





fast-track surgery

- fast-track surgery is a concept where unimodal evidence-based interventions are combined in a multimodal effort to reduce pain and organ dysfunctions, and subsequently morbidity, hospital stay and convalescence



Fast-track surgical programmes

- to reduce morbidity
- subsequently, to reduce hospital stay and costs



Optimised fast track Surgery

Organization

Pain management

Rehabilitation

Transfusion strategy

Thromboprophylaxis

Cognitive dysfunction

Deep infection

Safety aspects

Telemedicine

Collaborative Centre for Fast-track Hip and Knee Surgery

Steering Committee

Professor Henrik Kehlet (Rigshospitalet)
Professor Kjeld Søballe (Aarhus)

Daily project secretary NN (Rigshospitalet)
Daily project secretary NN (Aarhus)

Western Danish partner

Management group:

Professor Kjeld Søballe (Aarhus)
Ass. Professor, dr,med,sci, Lone Nikolajsen (Aarhus)

Satellites:

Chief orthopaedic surgeon Torben Bæk Hansen (Holstebro)
Chief orthopaedic surgeon Malene Laursen (Silkeborg)

Eastern Danish partner

Management group:

Professor Henrik Kehlet (Rigshospitalet)
Chief physician, The Blood Bank, Pär Johansson (Rigshospitalet)
Chief anaesthesiologist Lars Rasmussen (Rigshospitalet)
Chief orthopaedic surgeon Michael Rud-Lassen (Hørsholm)
Chief orthopaedic surgeon Henrik Husted (Hvidovre)

> 3000 THA & TKA procedures per year

Multicenter studies

- > 3500 THA and TKA procedures per year

improvement of perioperative outcome?

- every operation can be ambulatory ?
- why is the patient in hospital today ?
- what is it that we cannot control ?

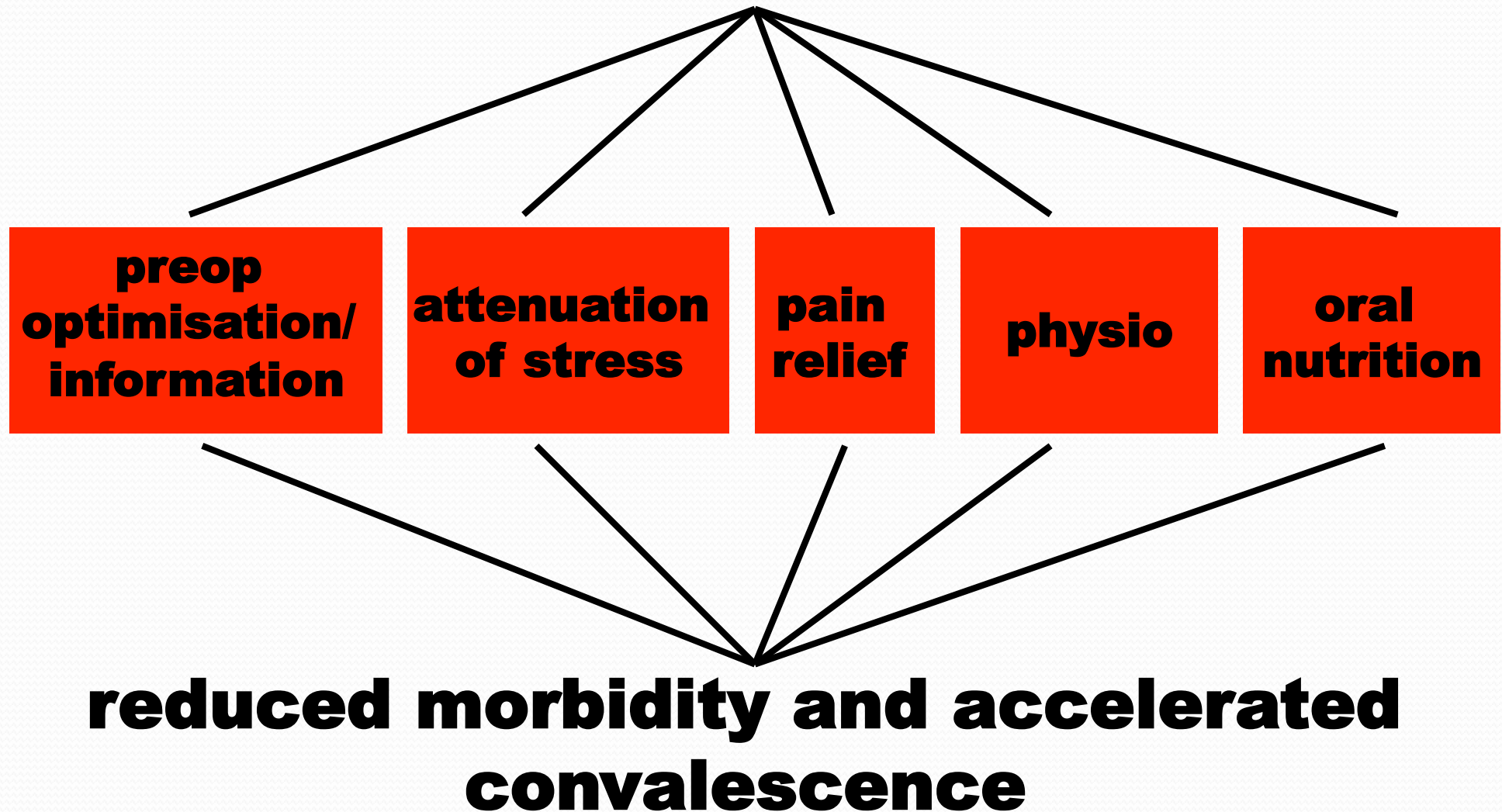
why is the patient in hospital today ?

- organ dysfunction (“surgical stress”)
- hypothermia-induced morbidity
- pain
- PONV / ileus
- fluid excess/ hypovolaemia
- cognitive dysfunction/sleep disturbances
- immobilisation
- semi-starvation
- fatigue (early/late)
- traditions (tubes, drains, restrictions, etc.)

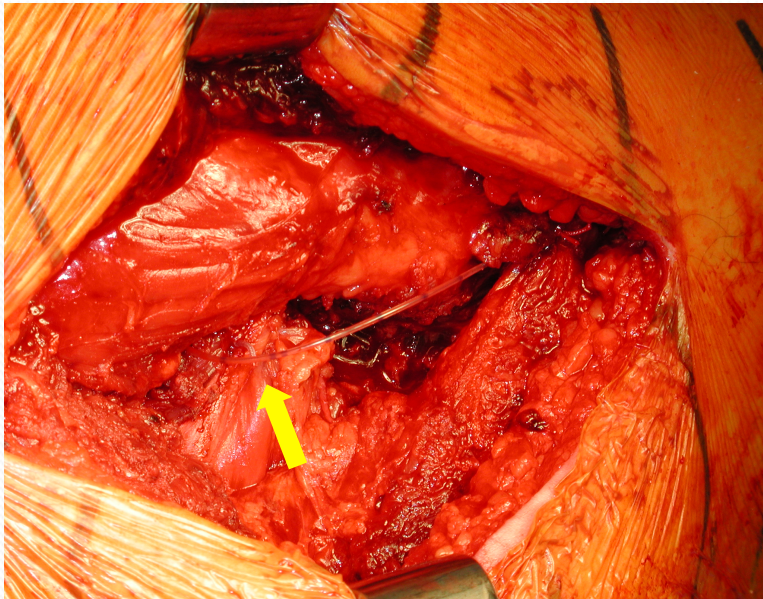
Lancet 2003; 363: 192

Anesth Analg 2007;104:138

controlling postoperative physiology - fast-track surgery

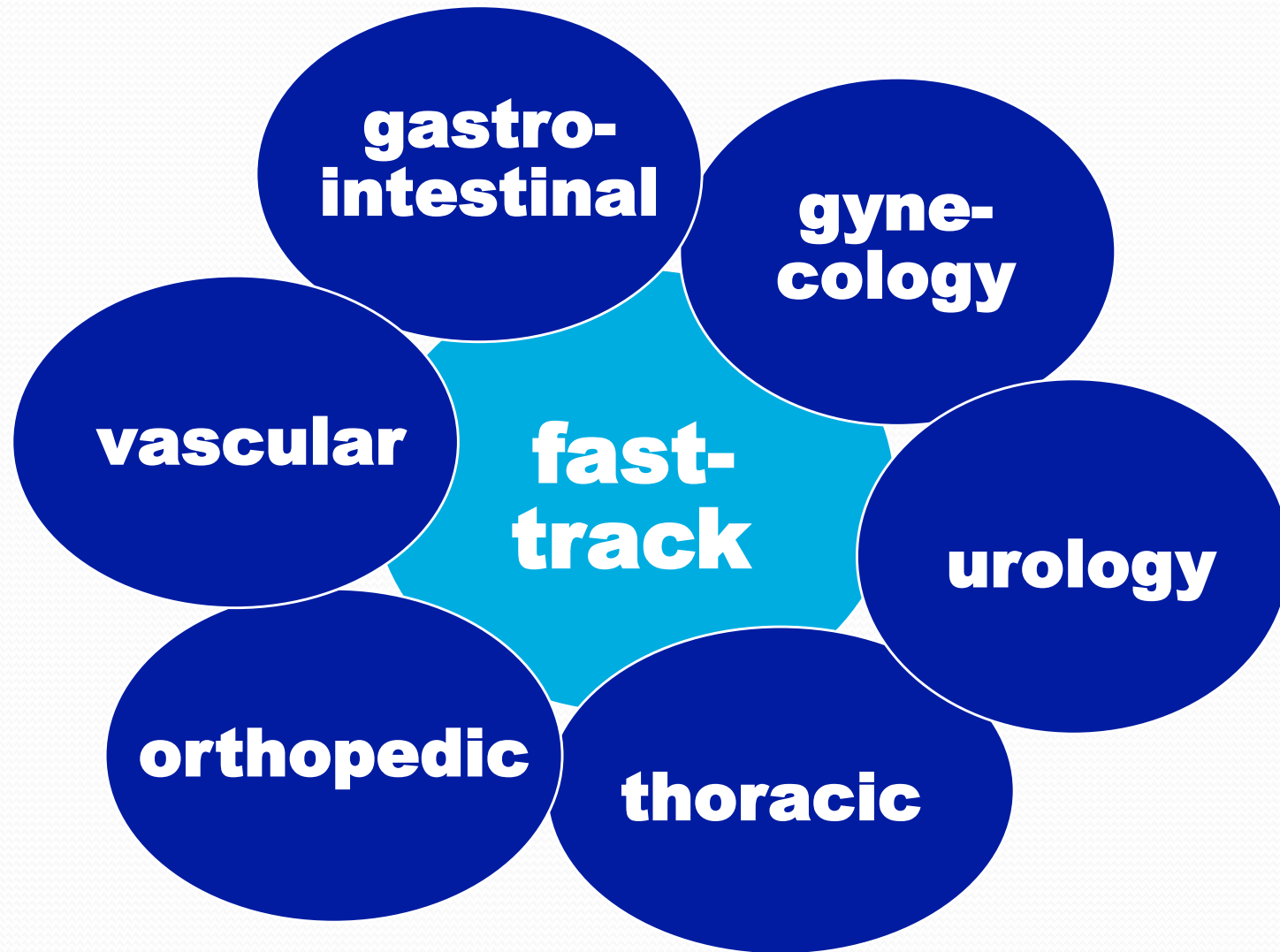


high-dose wound infiltration in hip and knee replacement (LIA)



- **100 ml ropivacaine**
- **30 mg ketorolac**
- **1 mg adrenaline**

fast-track surgery



Lancet 2008;371:791
Ann Surg 2008;248:189



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Local infiltration analgesia

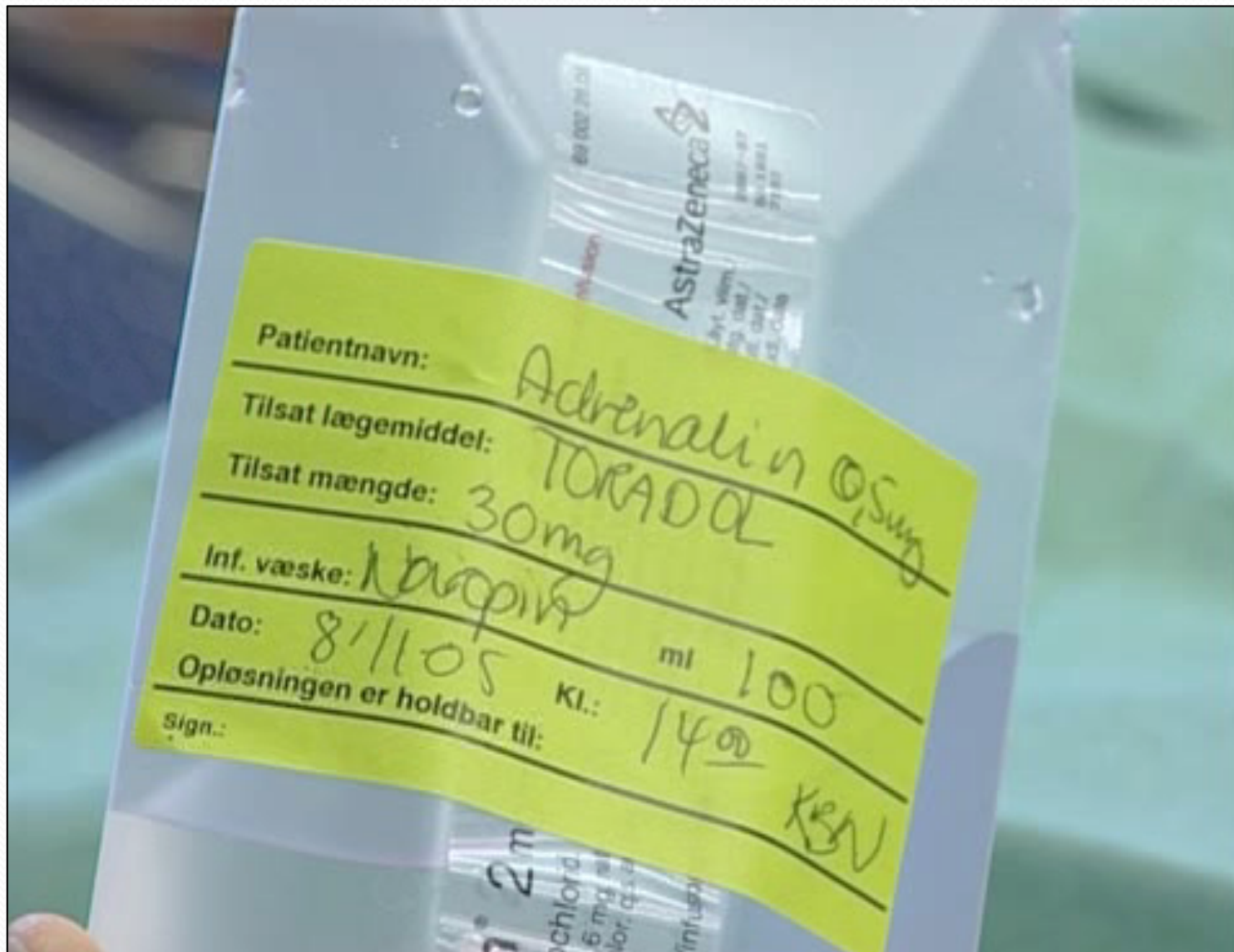
LIA

Karen Andersen

Mixture

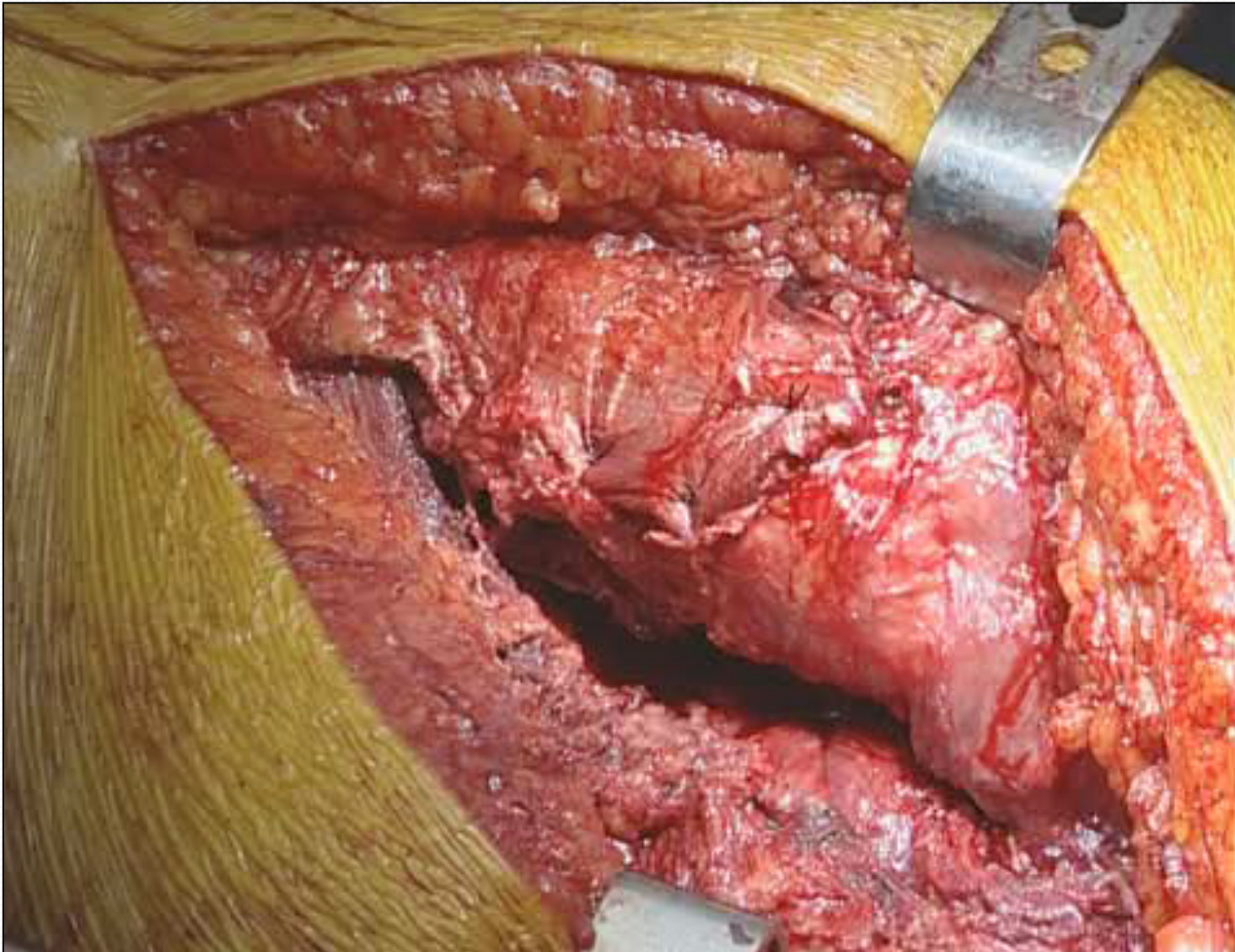
- 100 ml ropivacaine 2 mg/ml,
- 1 ml ketorolac 30 mg/ml,
- 1 ml epinephrine 0.5 mg/ml

Local infiltration



Ropivacaine, ketorolac, epinephrine

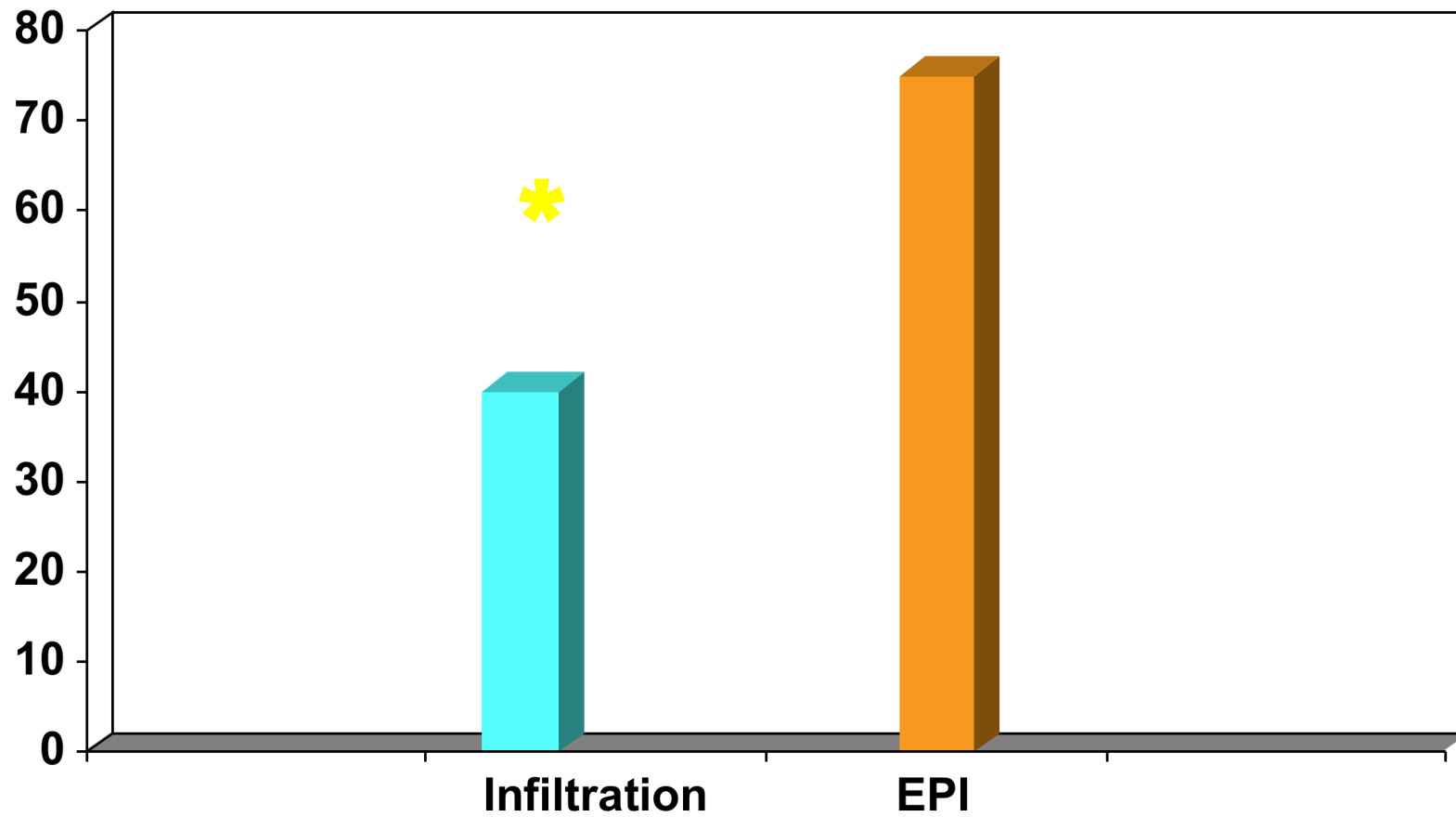
local infiltration analgesia



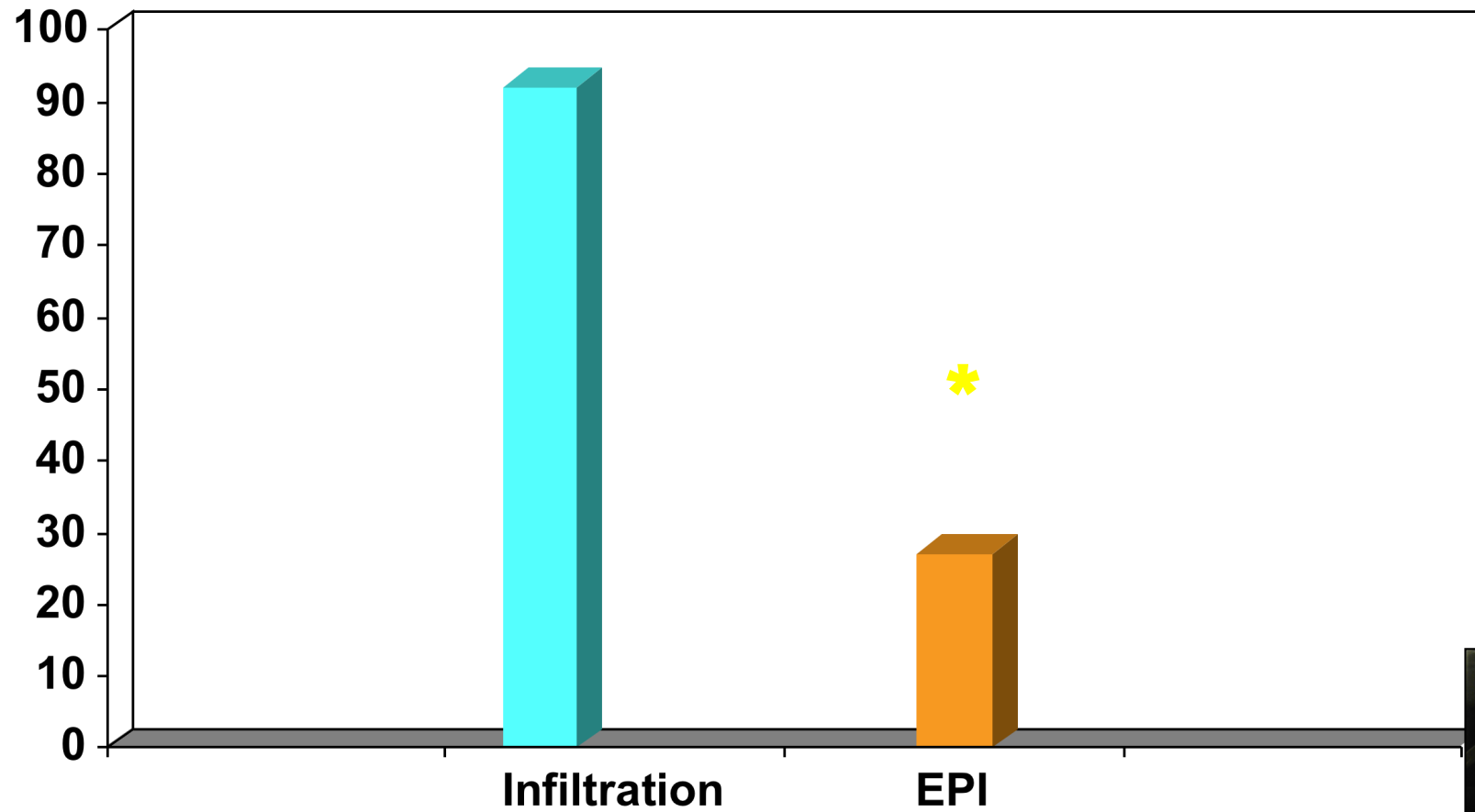
Three randomized studies

- Andersen K et al: Acta Orthop: 78: 180-86; 2007
- Andersen K et al: Acta Orthop: 78: 172-79; 2007
- Andersen K et al: Acta Orthop: in press

p.n. medication the first 96 h

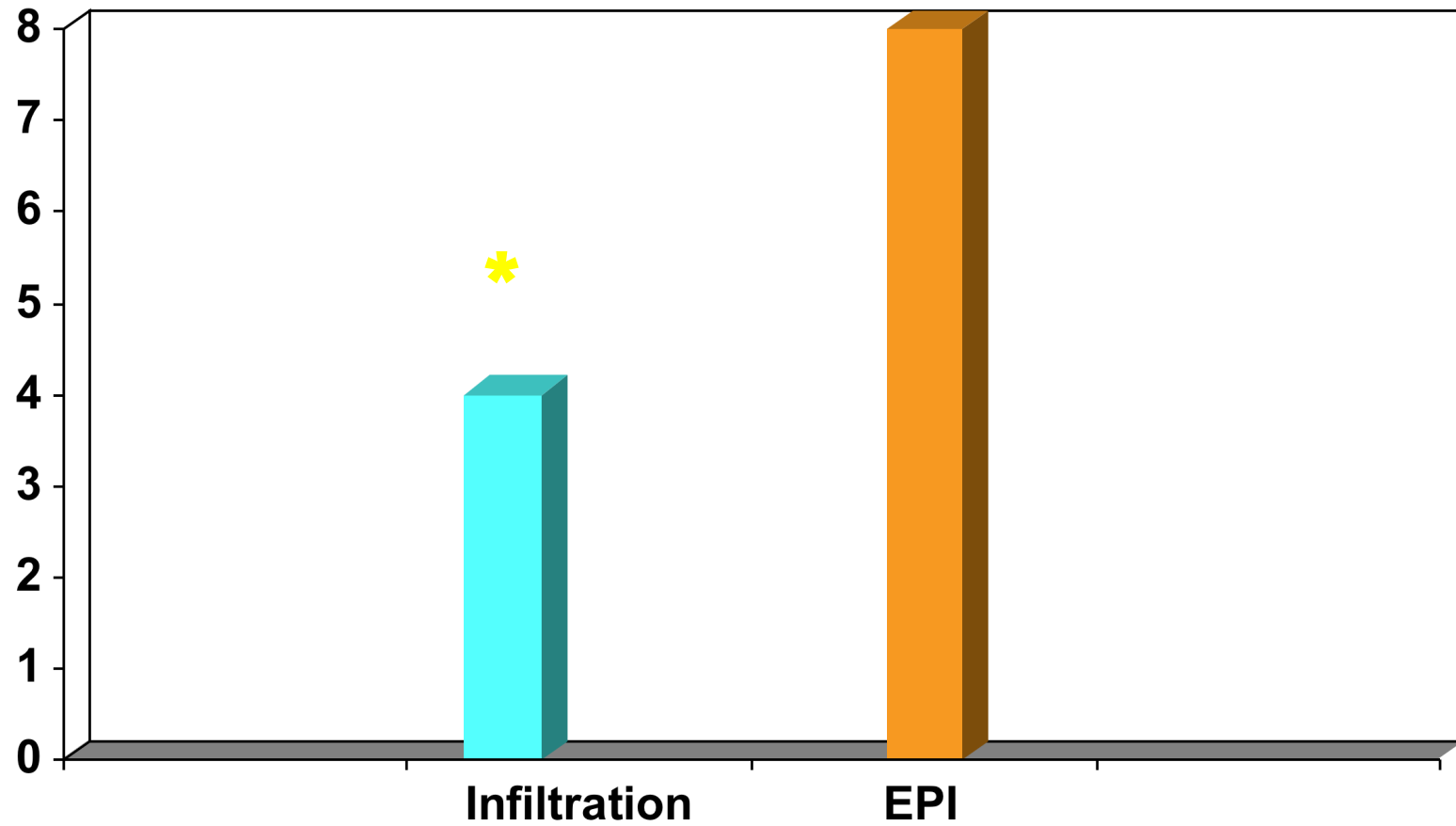


Ability to walk 8 h postop



Length of stay

Days



Adverse Effects

	Infiltration (n=38)	EPI (n=37)	P-value
Urinary retention	3	35	<0,0001 ¹
Urinary Tract infections	2	6	0,09 ¹
Nausea<24 h post	11	24	<0,01 ²
Nausea>24 h post	13	17	0,30 ²
Vomiting	2	8	0,04 ¹
Itching	0	13	<0,0001 ¹
Constipation	5	24	<0,0001 ¹



¹Fisher's Exact test ²Chi² square test



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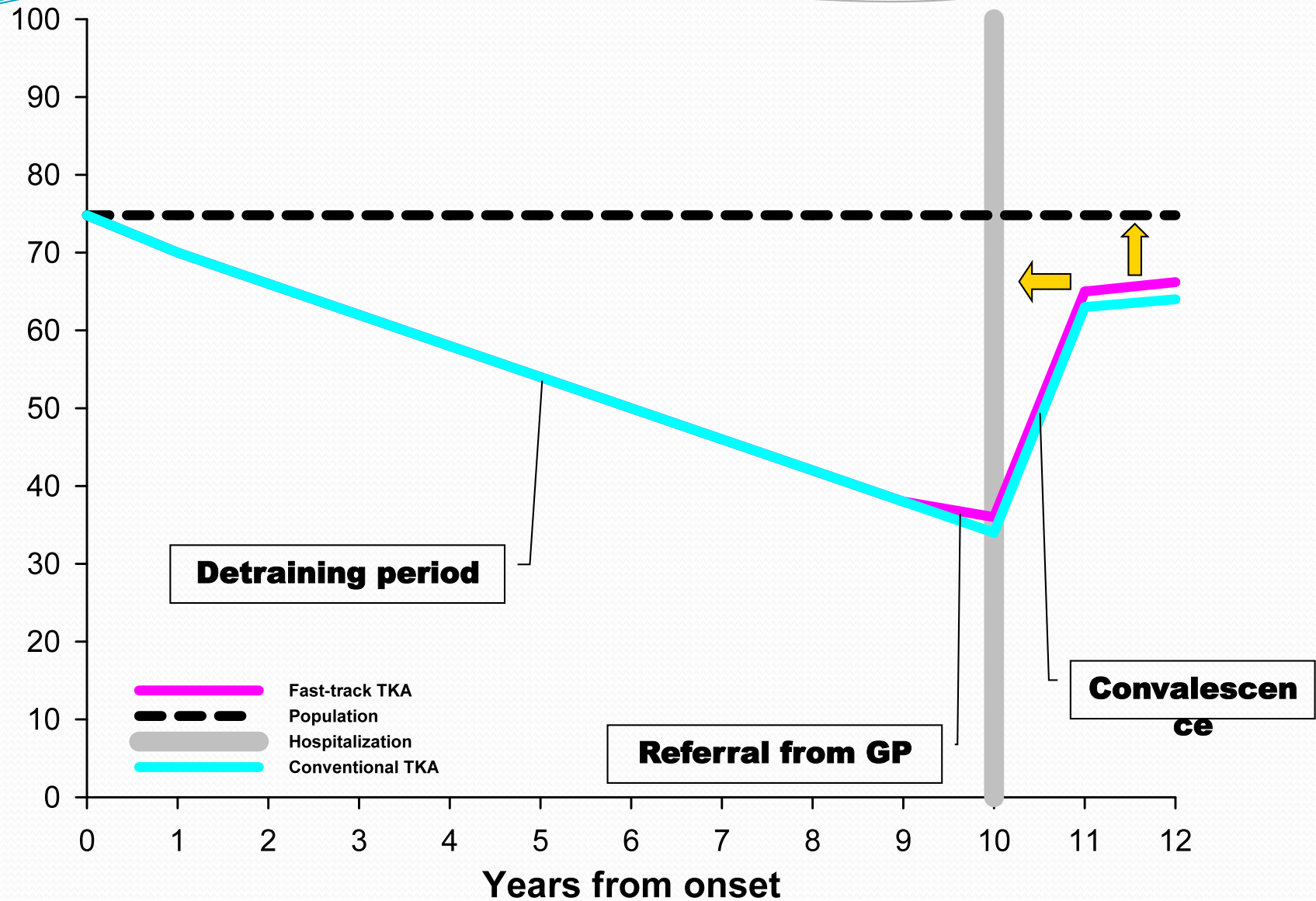
Cognitive dysfunction

Deep infection

Safety aspects

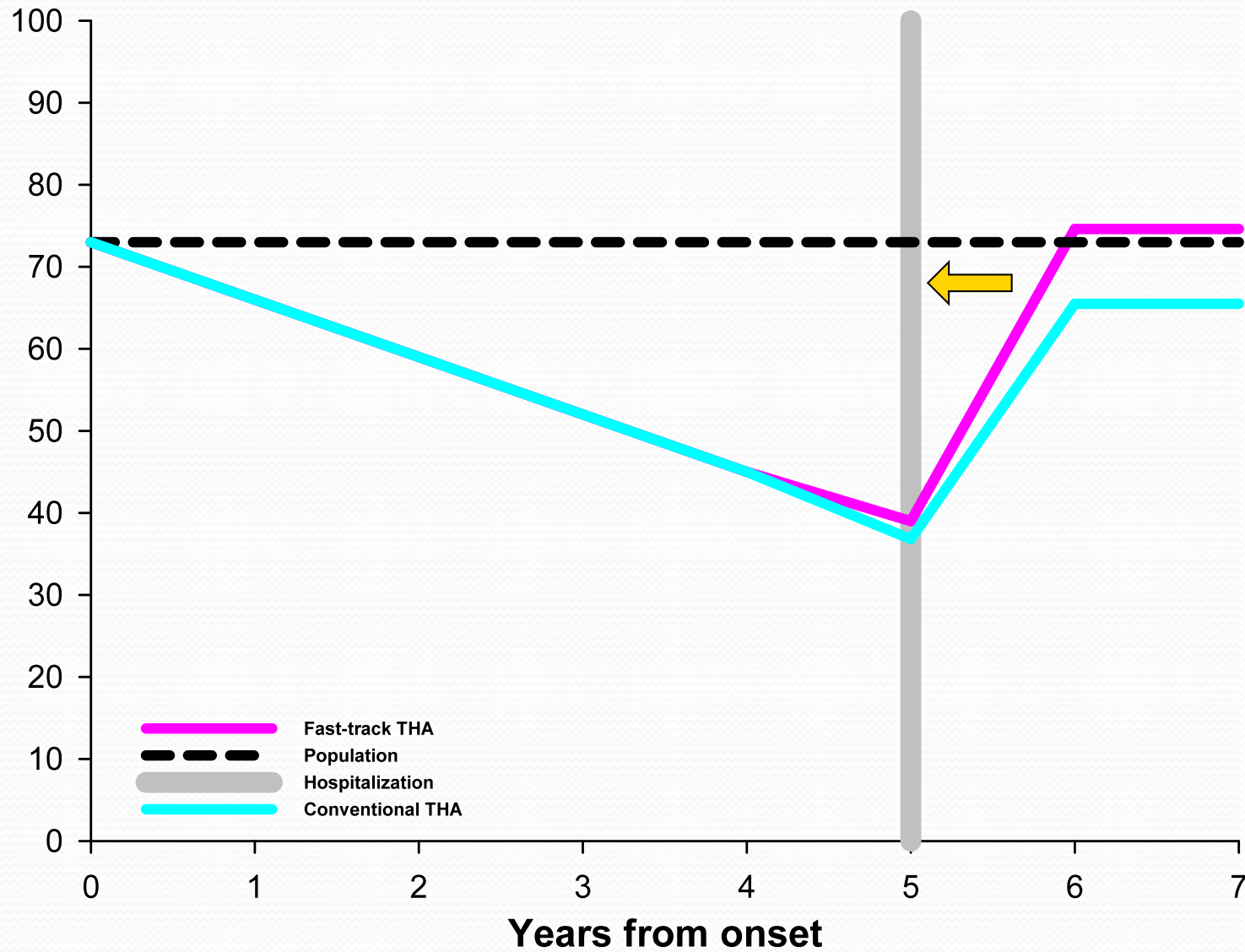
Telemedicine

Outcome after fast-track TKA*



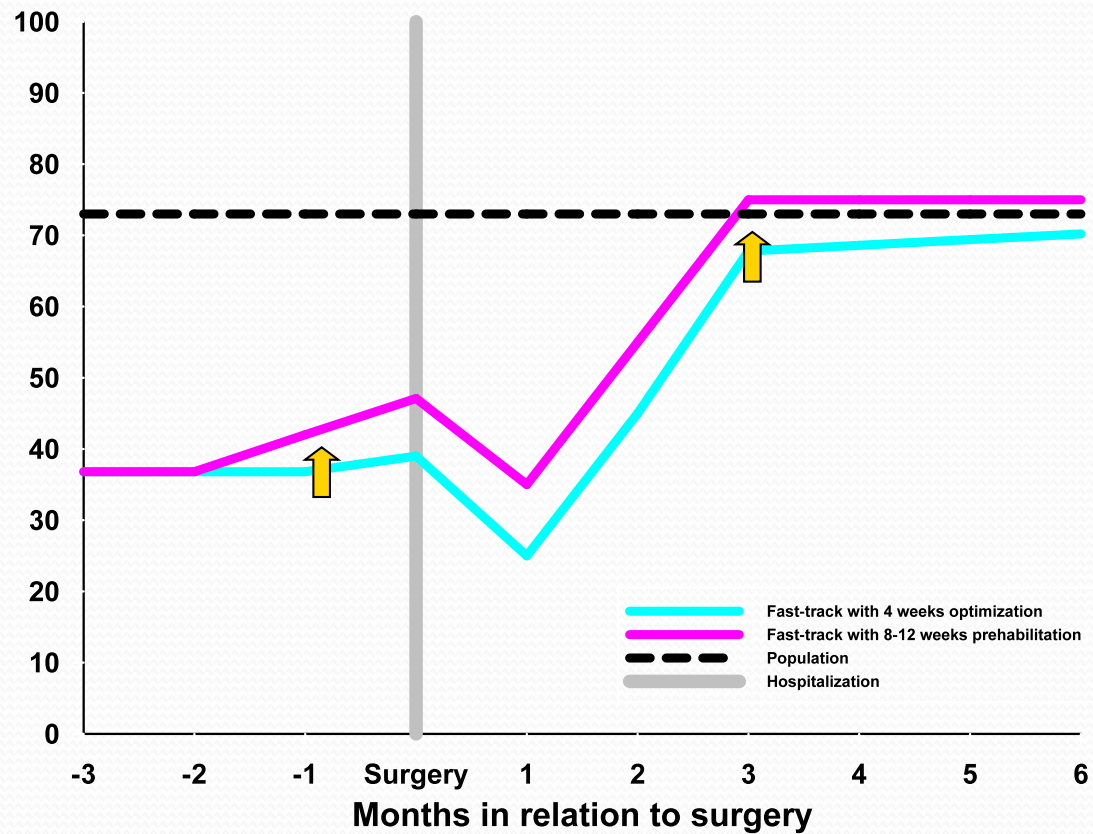
* Larsen et al. BMC 2010 submitted; Gunther et al. Ann Rheum Dis 1998, Ethgen et al. JBJS 2004

Outcome after fast-track THA *



* Larsen et al. BMC 2010 submitted; Gunther et al. Ann Rheum Dis 1998, Ethgen et al. JBJS 2004

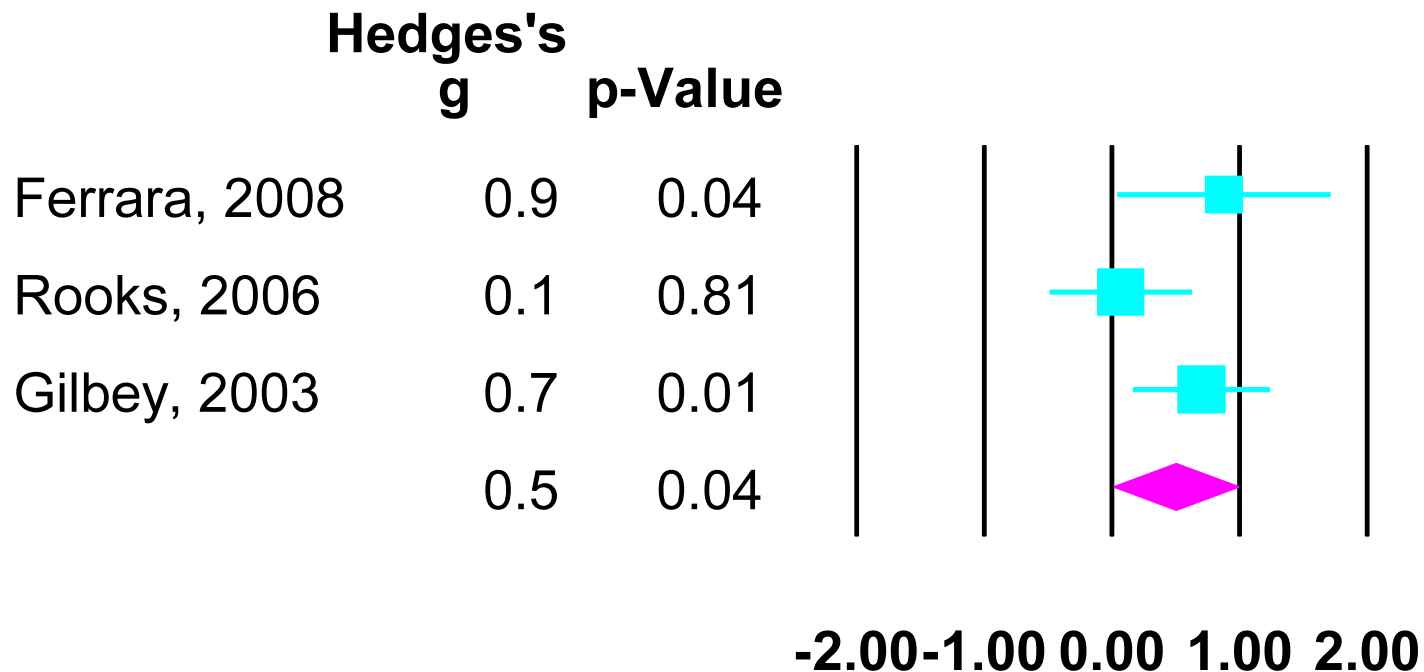
Prehabilitation*† before fast-track THA and TKA



Evidence for prehabilitation before THA*

Study name

Hedges's g and 95% CI

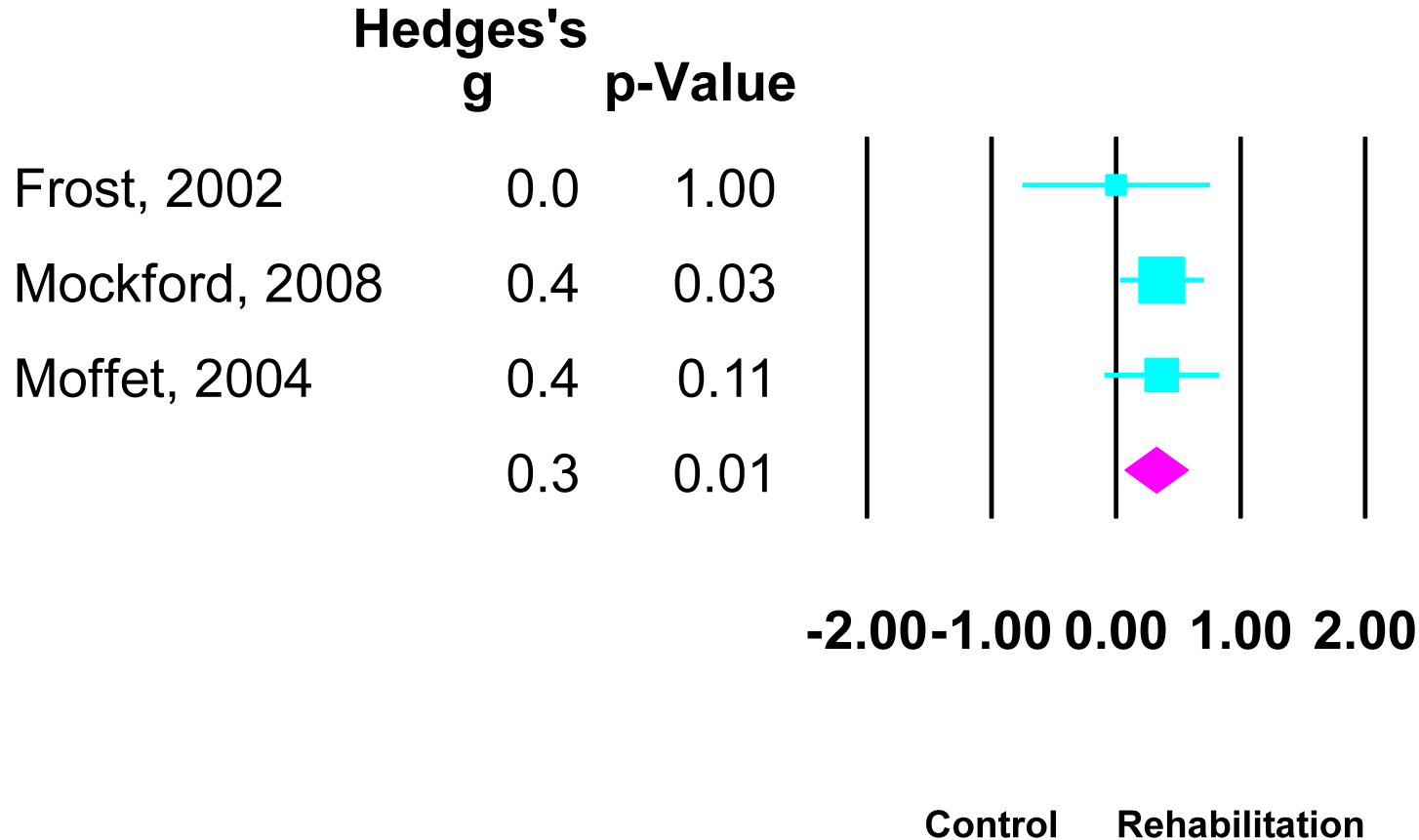


No intervention Prehabilitation

Outcome is hip specific activity level until 3 months postoperatively

Evidence for rehabilitation after TKA

Study name Hedges's g and 95% CI



Outcome is knee specific activity level 3 and 12 months postoperatively



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why fast-track hip and knee replacement ?

- ~ 12 000 op/yr in DK
- mean hospital stay ~ 6 days (2007)
- post-discharge pain / rehabilitation
- post-discharge cognitive dysfunction
- prolonged thromboprophylaxis / risk thromboembolism
- anaemia/ transfusion requirement
- cost



Optimised transfusion strategy

Øivind Jans

Optimising transfusion strategy

- 30% of THA receive blood transfusion
- Restrictive transfusion policy recommended
< 4.5 mmol/l
- Anemia results in ↑ risk of death
- Anaemia ↓ mobility

Optimising transfusion strategy

First RCT to investigate the role of a liberal transfusion trigger to improve functional outcome and morbidity in THA

Design

900 patients > 70 yrs randomised to RBC transfusion trigger < 6 mmol or < 4.5 mmol

Functional outcomes

6 min walking test, Timed Up & Go test and general morbidity/mortality

Conclusion

Transfusion:

Restricted (<4.5) or Liberal (6.0)



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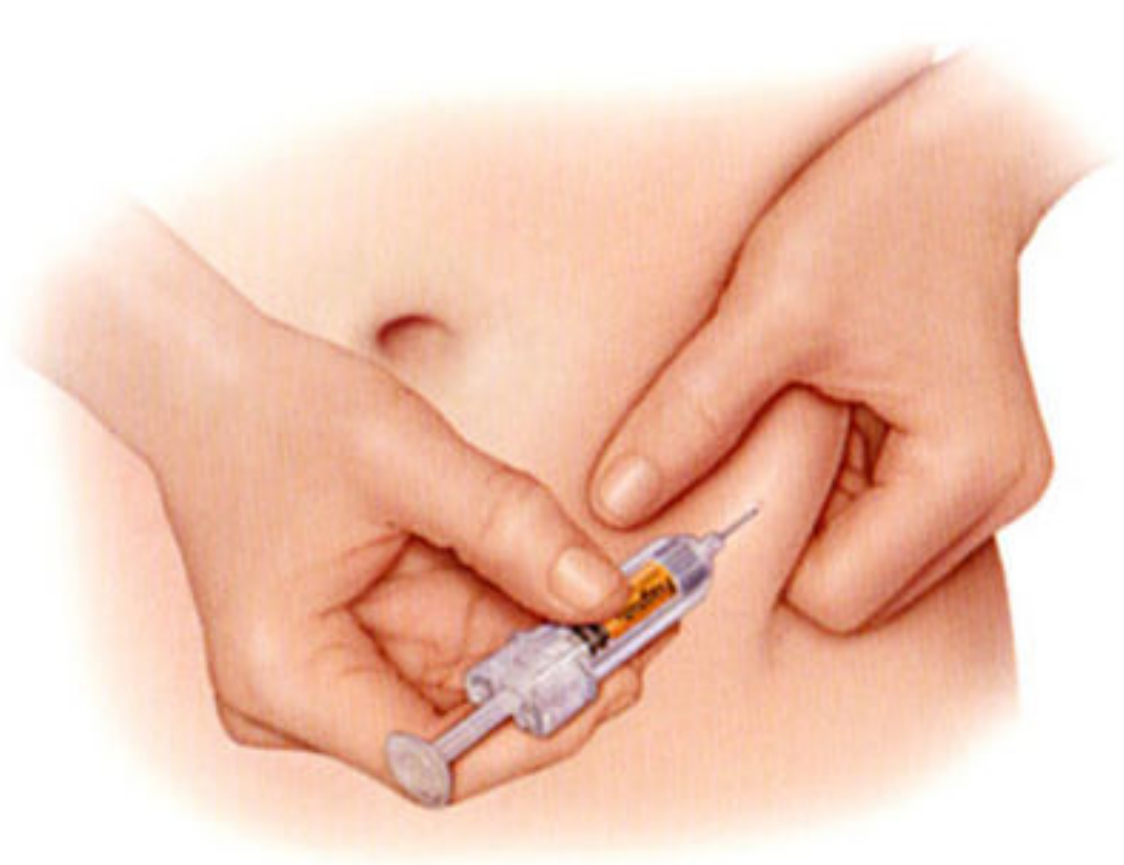


FETA-study

The Frequency of vascular events using short term tromboprophylaxis in hip and knee-arthroplasty in fast-track surgery



Michael Kjær Jacobsen





Background DVT

- American College of Chest Physicians (ACCP) recommend
- TKA: 10 days prophylaxis
- THA: 35 days prophylaxis



The frequency of vascular events using short term tromboprophylaxis

Michael Kjær Jacobsen

Study design in Fast-Track

- A prospective kohorte study (n=5000) in THA and TKA using tromboprophylaxis only during hospitalization (avg 2.4 days)

Conclusion

- Is short term (2 days) DVT prophylaxis sufficient



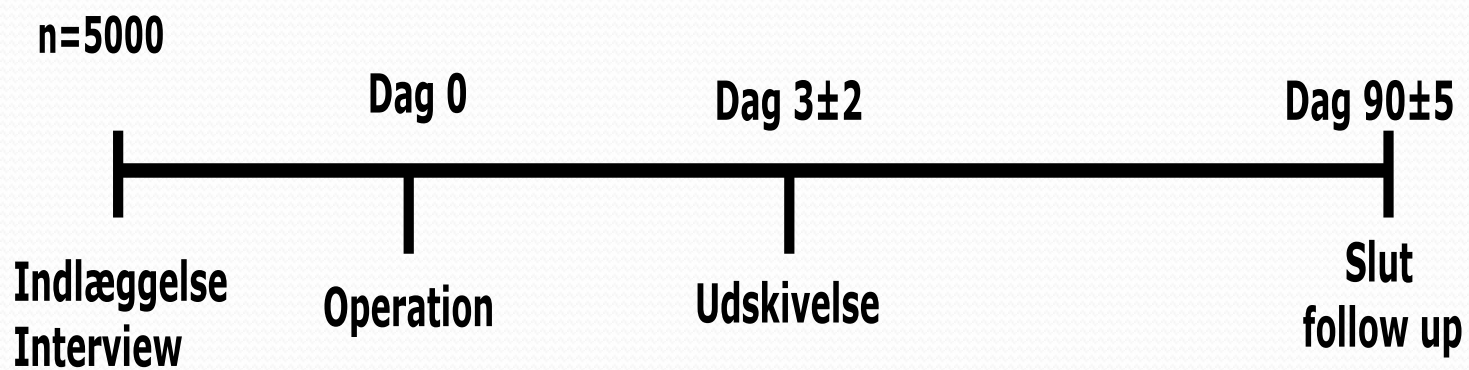
Ethics

- Approved by the regional ethics committee



Inklusion

- Inkludere afdelinger med fast-track principper
 - I. Tidlig mobilisering (< 24 timer)
 - II. Optimal smertedækning
 - III. Grundig information
 - IV. Hurtig udskrivelse (< 5 dage)





Optimised fast track Surgery

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CORIHA

Cementless One-stage Revision in fast-track setting of
the chronic Infected Hip Arthroplasty

Jepppe Lange



Background

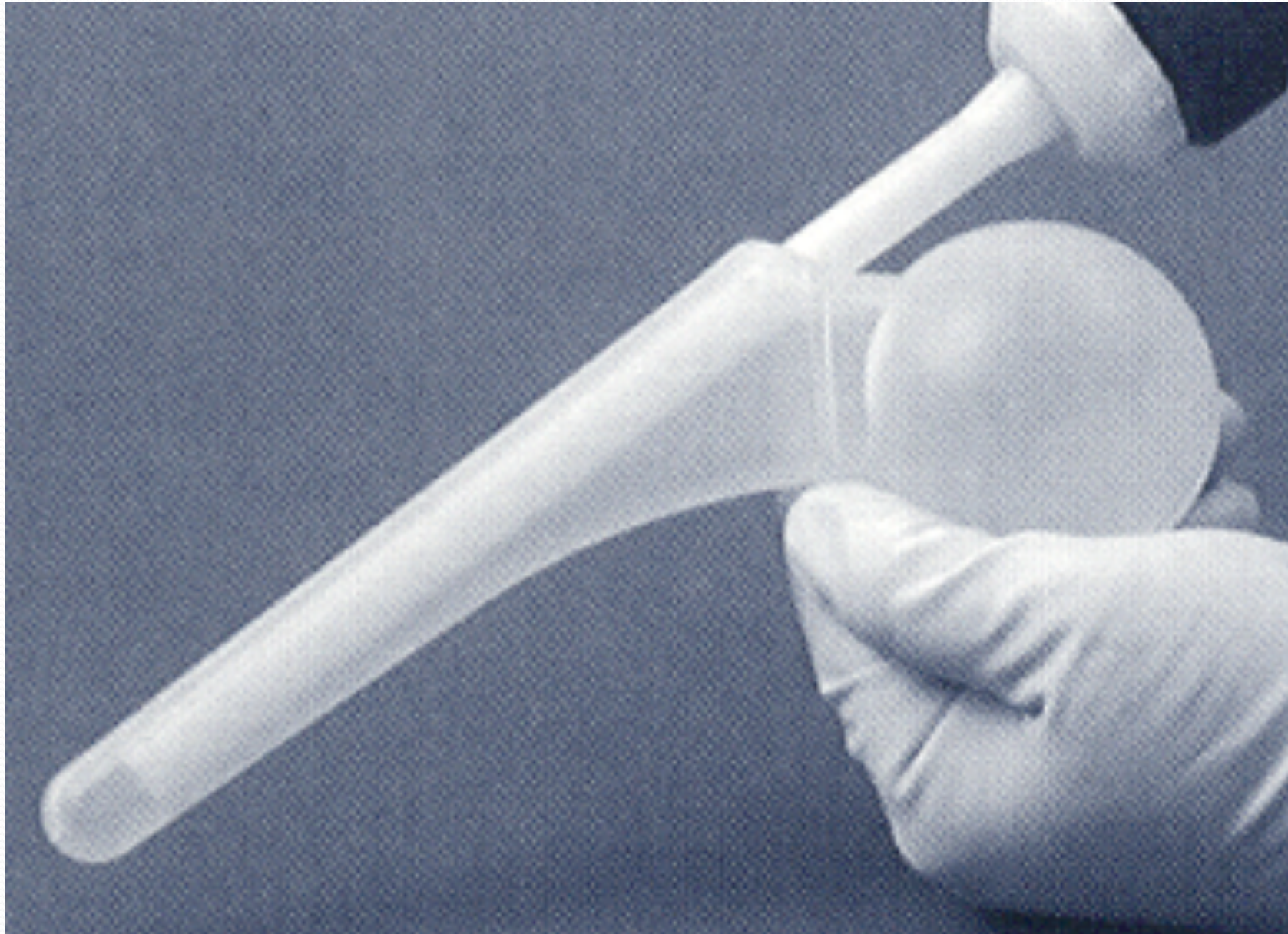
- Infection is a feared complication
- The course is associated with poor outcome
- The treatment is a burden to the patient and the surgeon



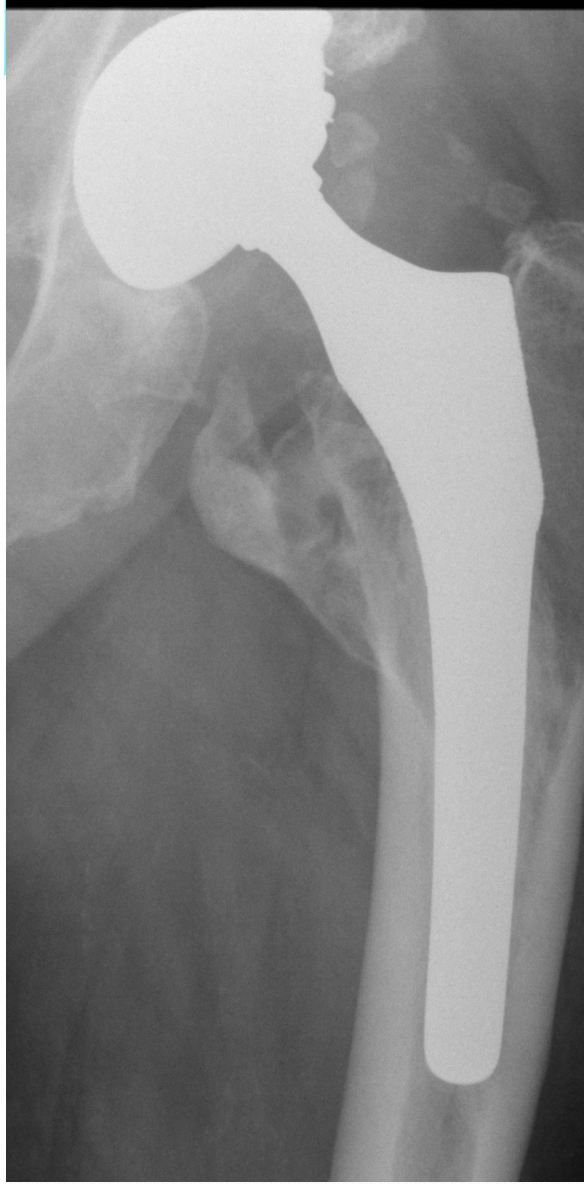


Two stage revision

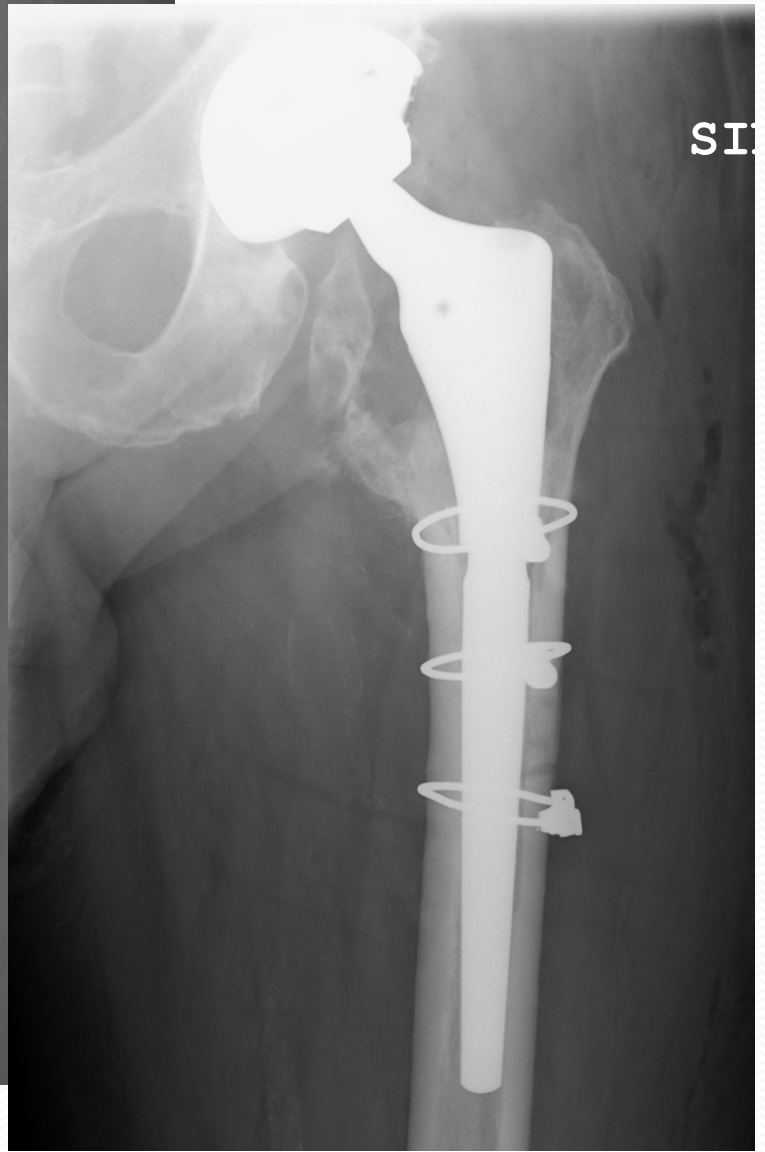
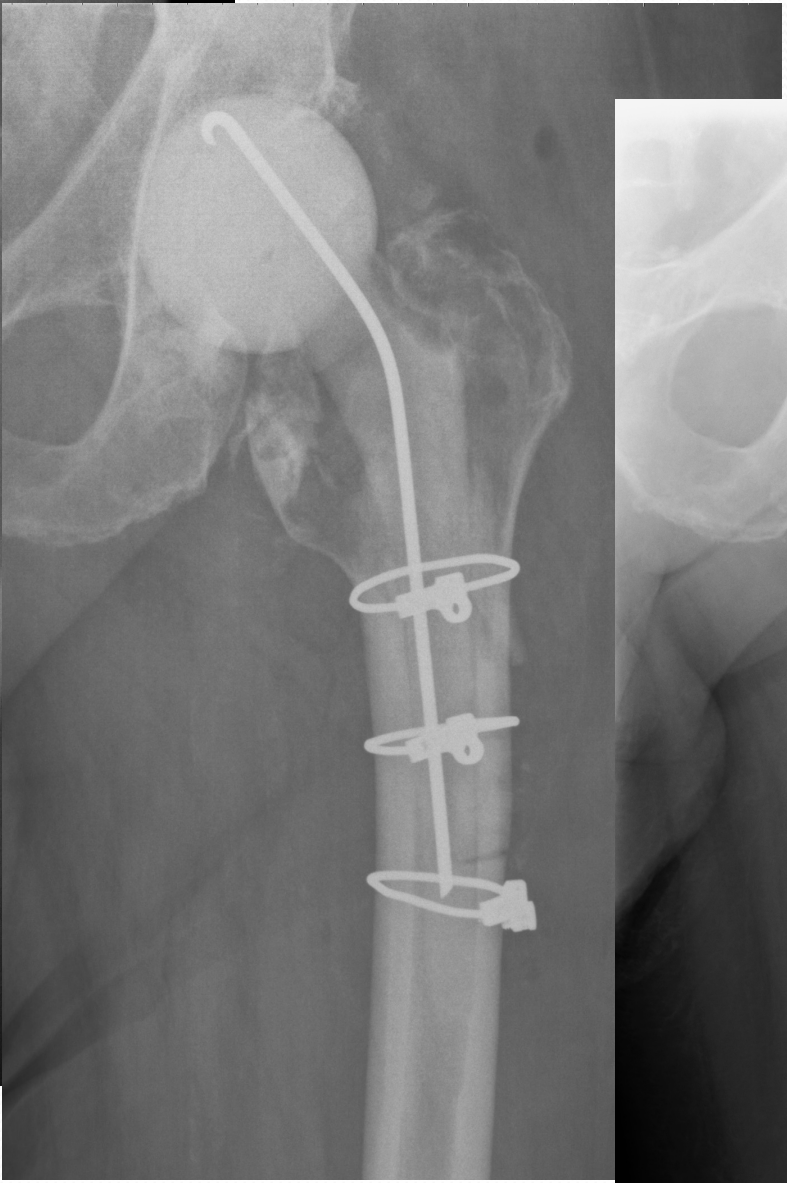
Cement spacer



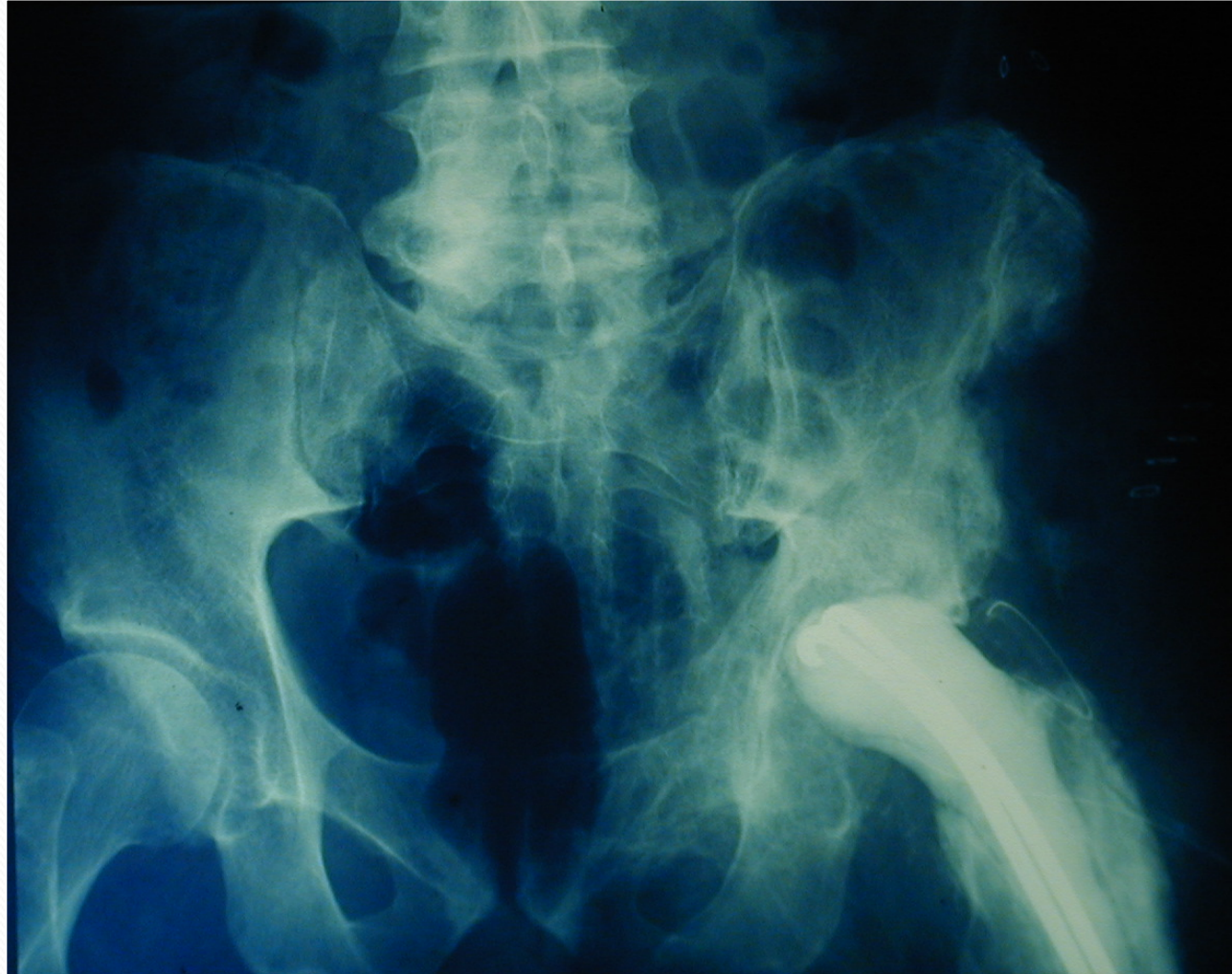
2-STAGE REVISION



VE

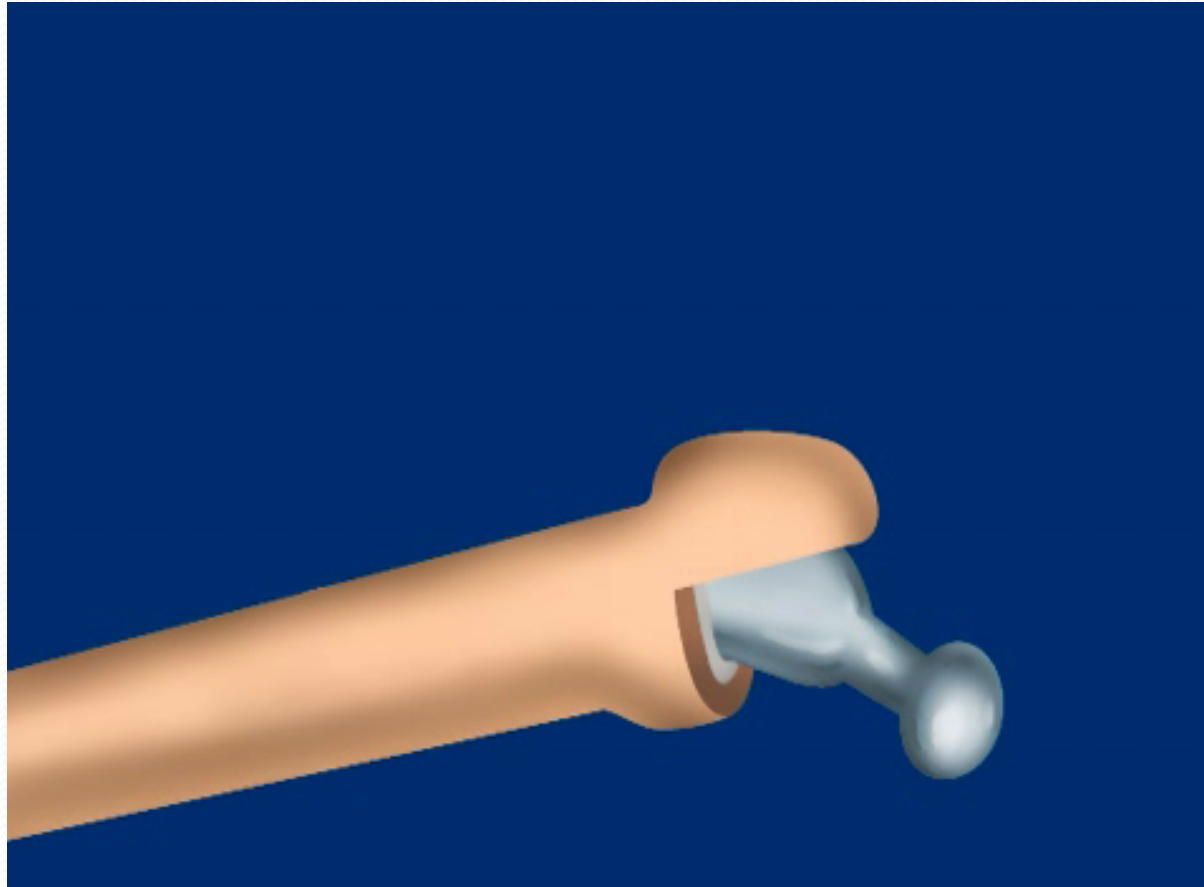


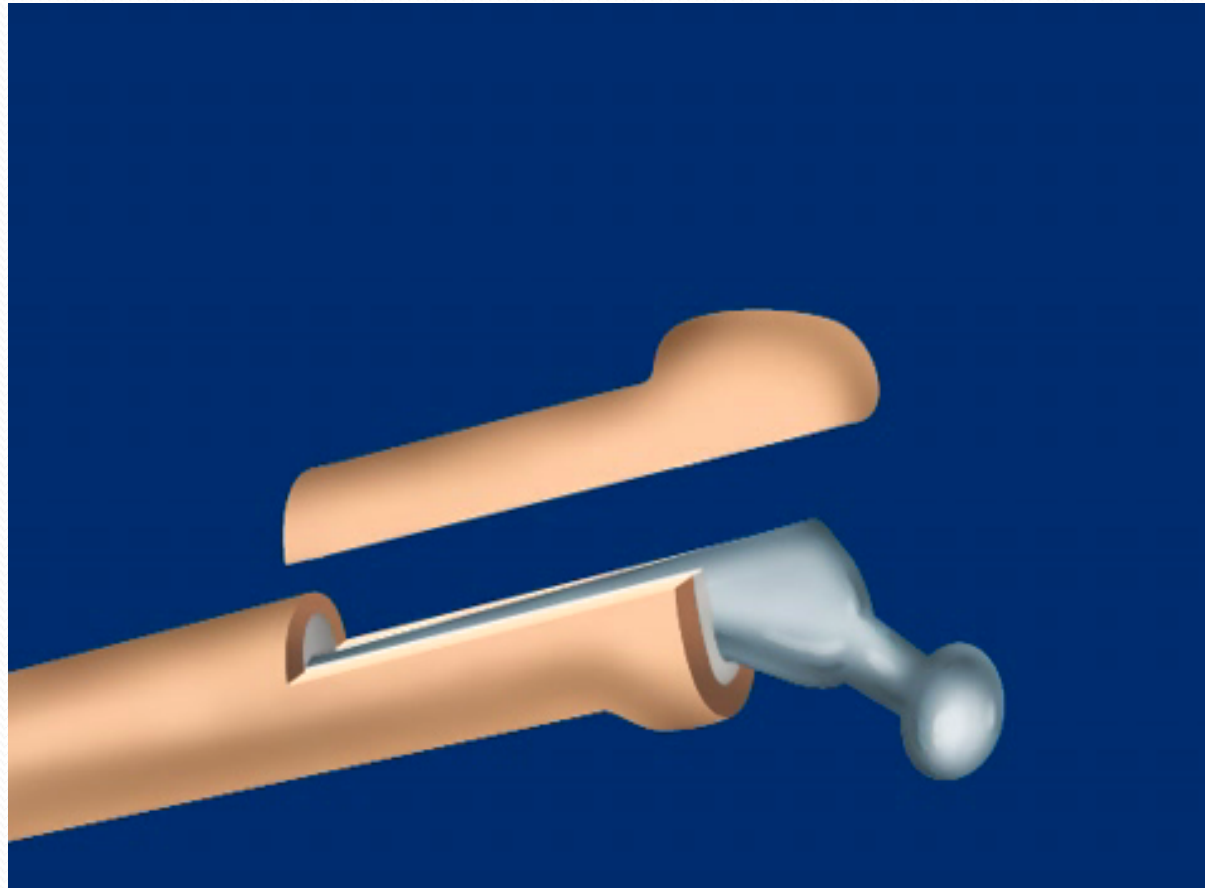
SI

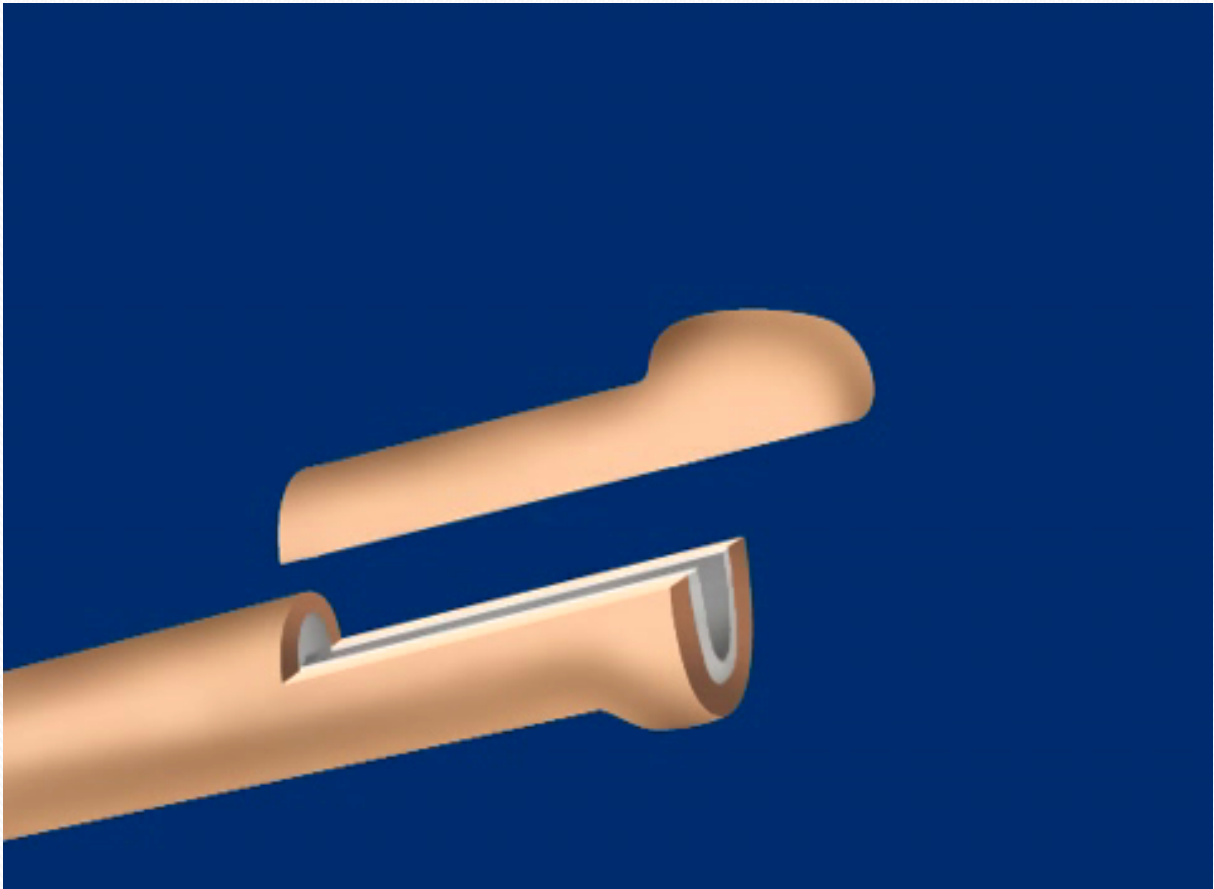


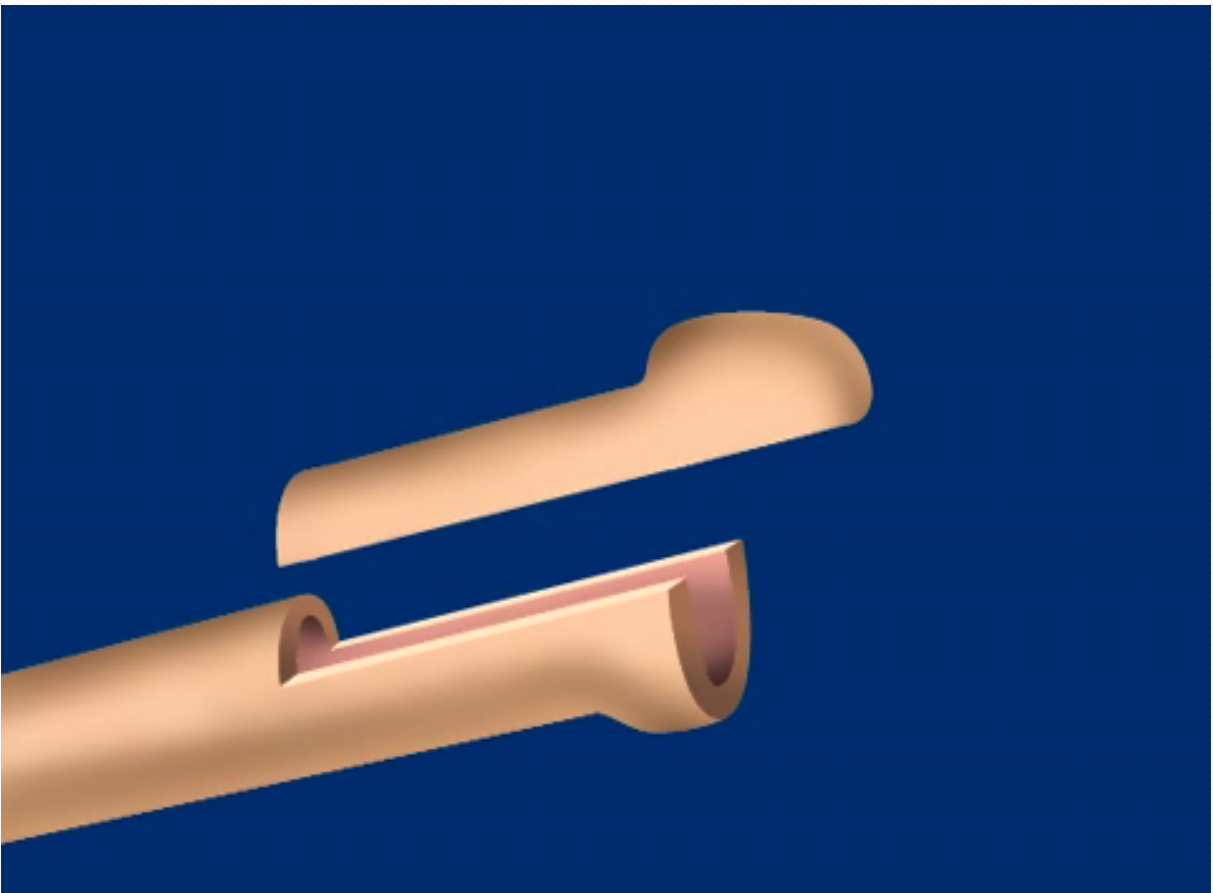


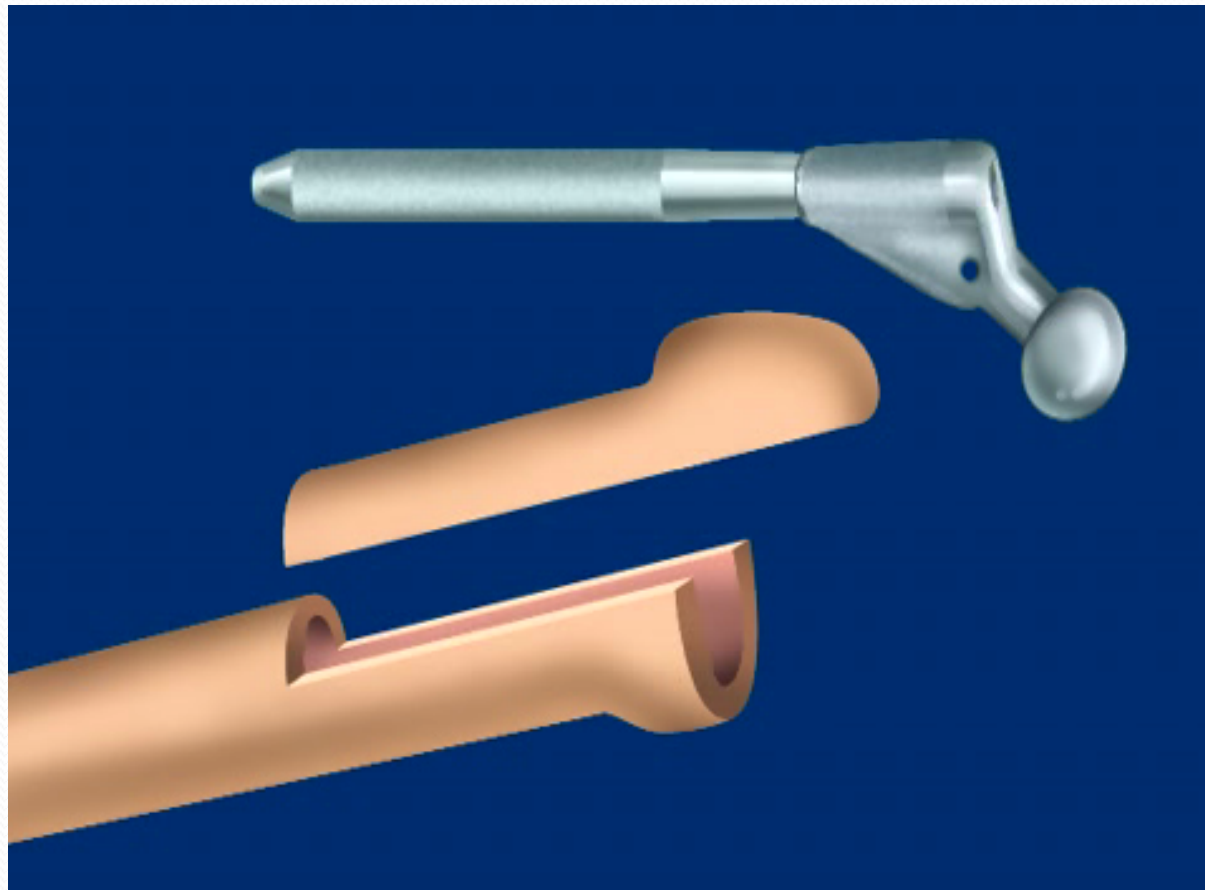
One stage revision

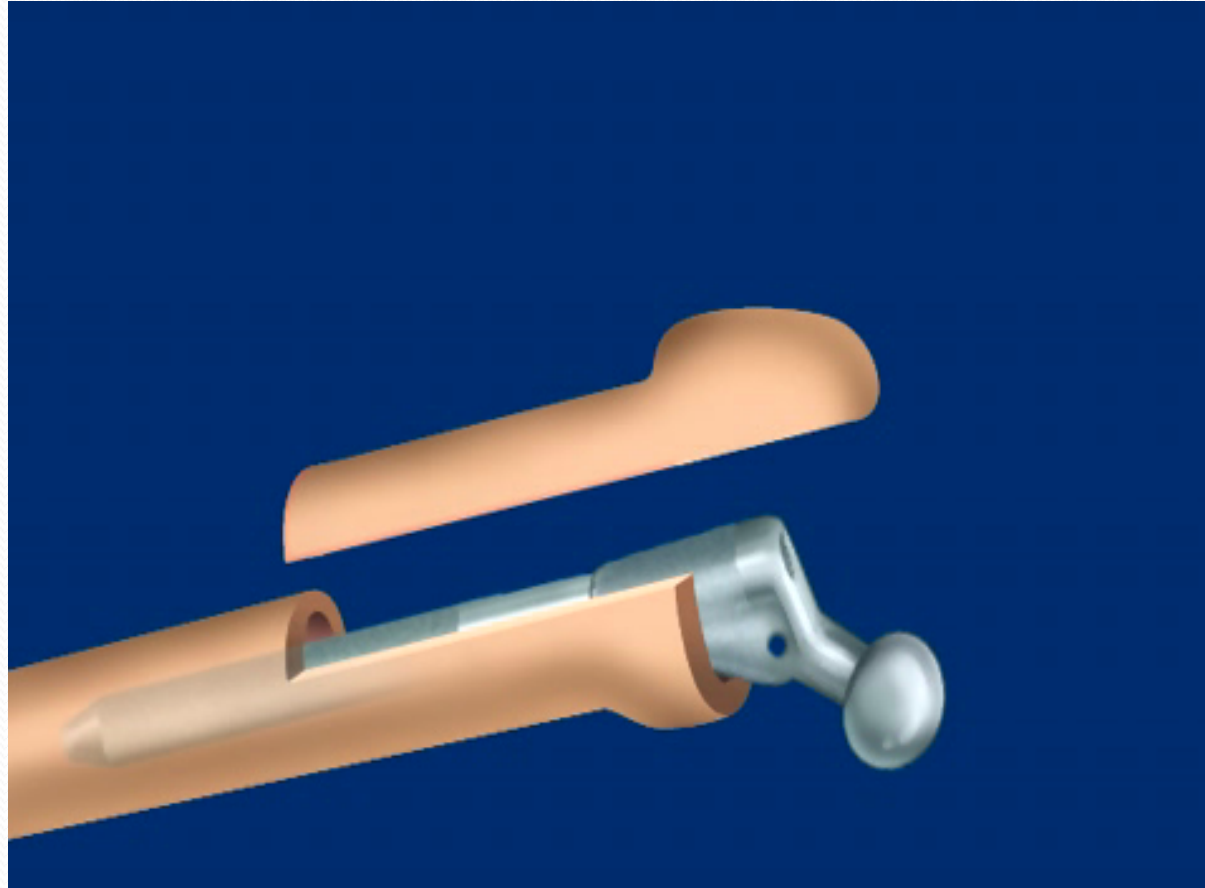






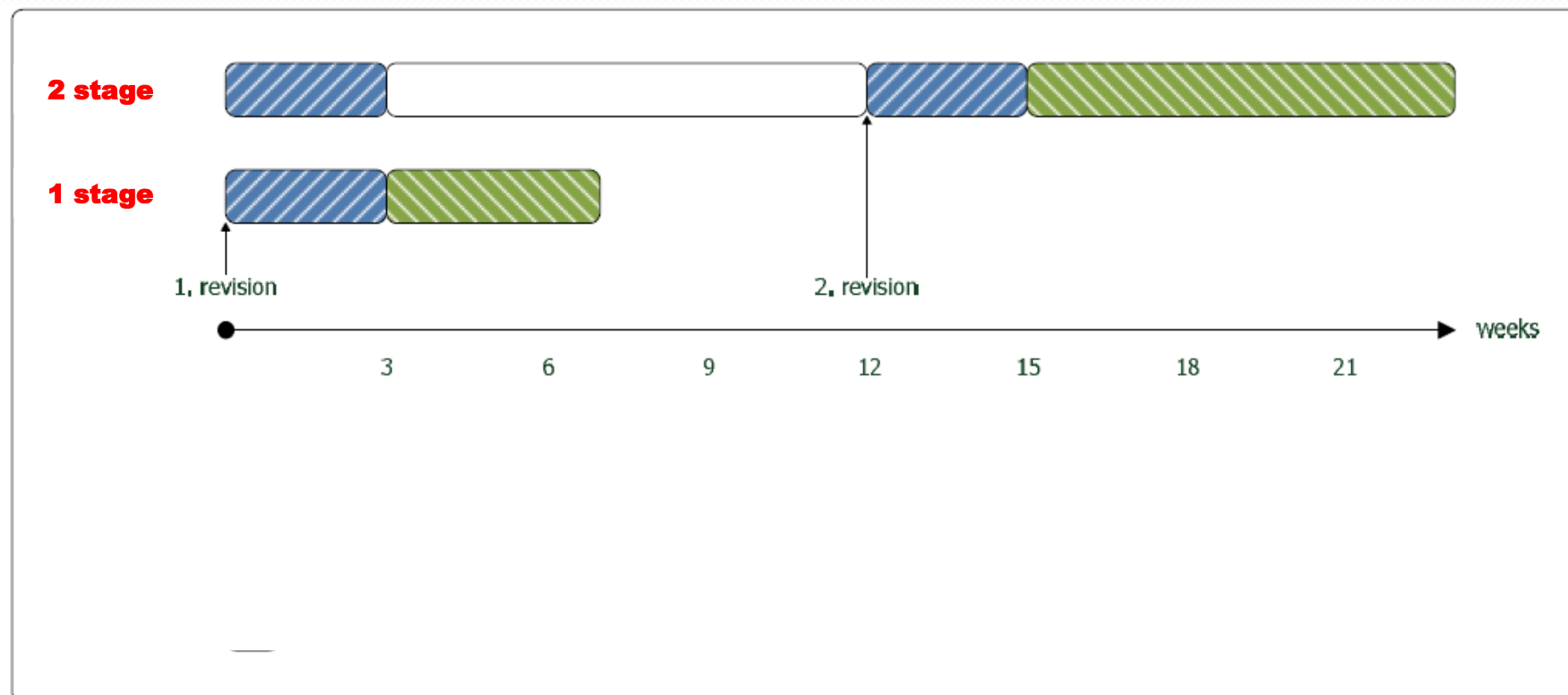






One stage







Study Design

- Prospective multicenter cohort study
- two years follow-up
- n = 100 patients



Conclusion

- Is one stage revision for deep infection safe



Inclusion

- Patient with pain, discomfort or other relevant symptom arising from hip Arthroplasty
- Clinical sign of infection defined as one or more of the following:
 - Positive Indium-111 “white blood cell” bone scan
 - Serological signs of infection
 - Chronic fistula
 - Positive growth in pre-operatively joint fluid aspiration
 - Suspicious conventional radiography
- Informed oral and written consent given



Ethics

- Approved by the regional ethics committee



Optimised fast track Surgery

Organization

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Safety aspects

Telemedicine



Safety aspects

Adverse effects

- Early mobilization may result in increased strain on the newly operated limb
- Leading to potential adverse effects
 - a) dislocation
 - b) implant loosening
 - c) decreased patient satisfaction

Adverse effects

- a) dislocation
- b) implant loosening
- c) decreased patient satisfaction

a) dislocation





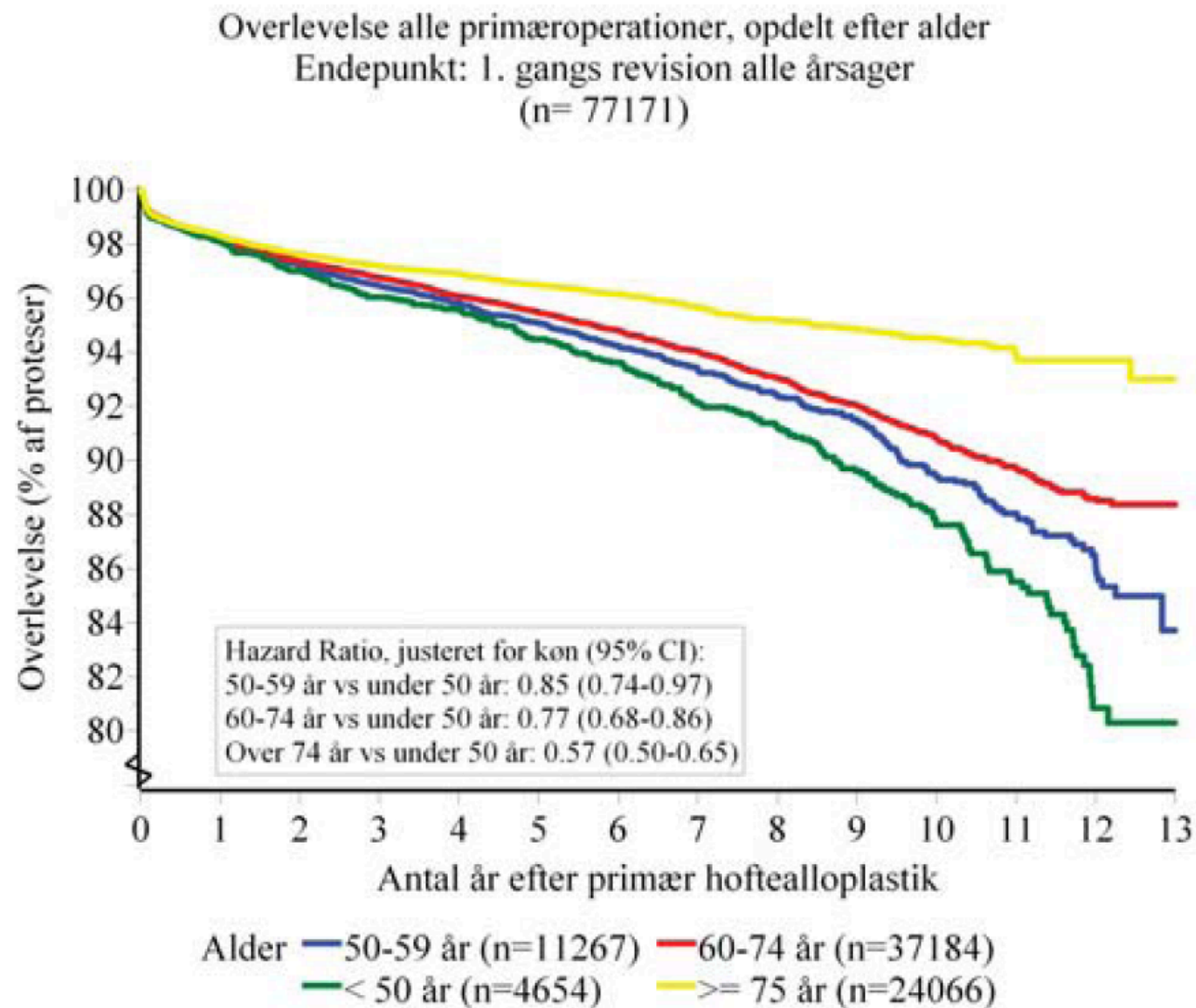
Conclusion

- Is the risk for dislocation increased in fast track surgery

Adverse effects

- a) dislocation
- **b) implant loosening**
- c) decreased patient satisfaction

b) implant loosening



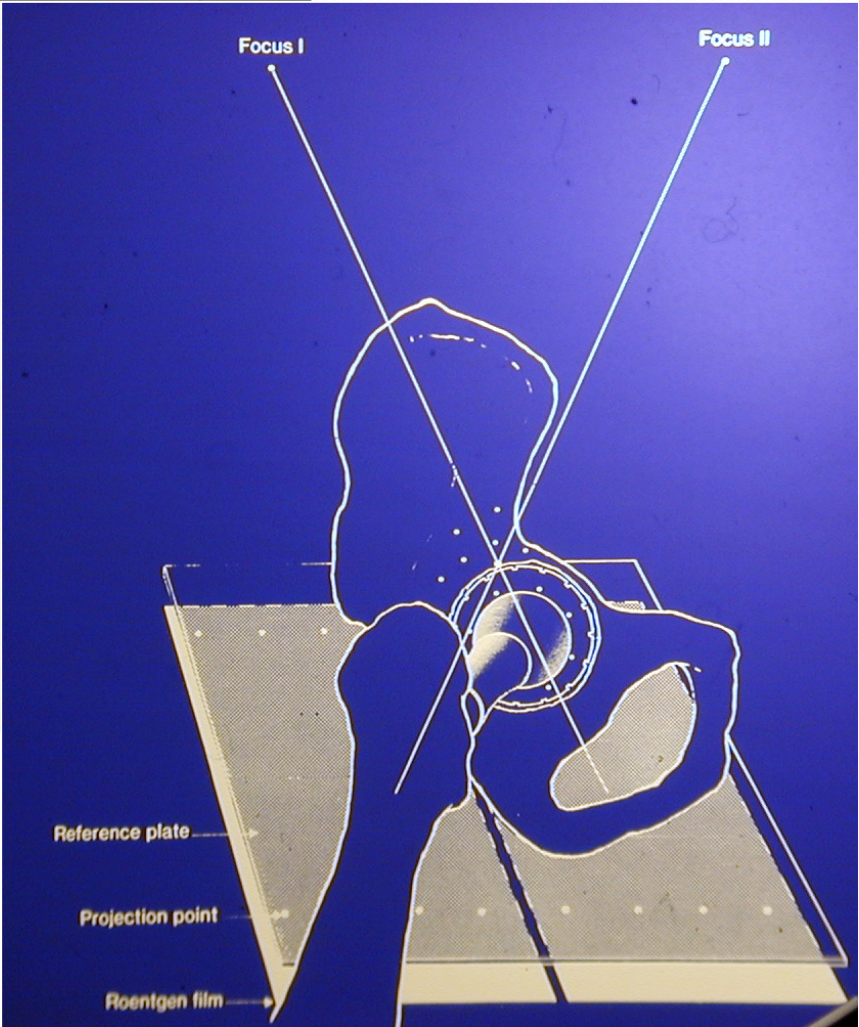
b) implant loosening

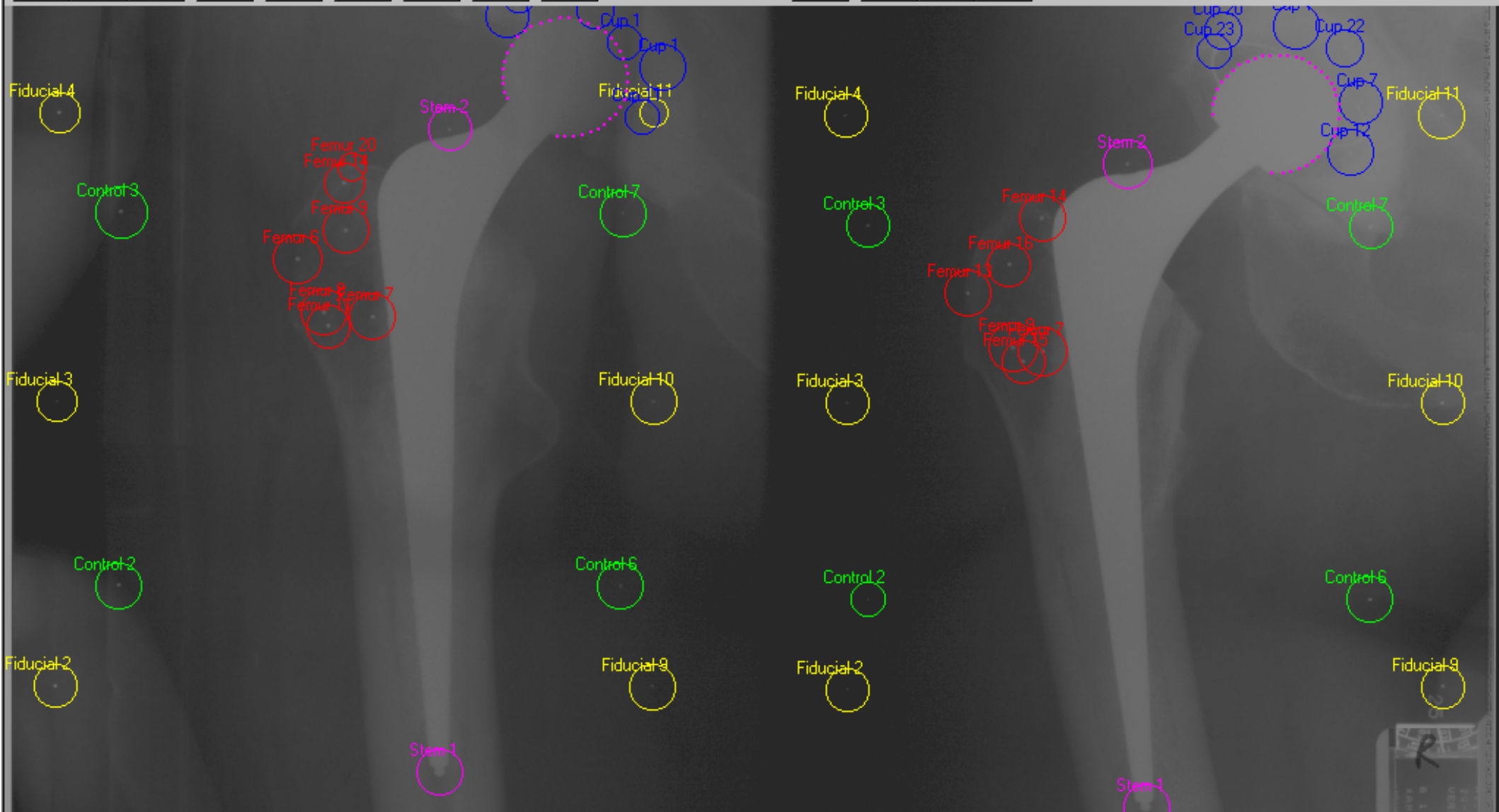
- Overloading a newly inserted uncemented implant may cause mechanical failure.
- Early migration of implants is correlated with later loosening



Lundbeckfondcenteret

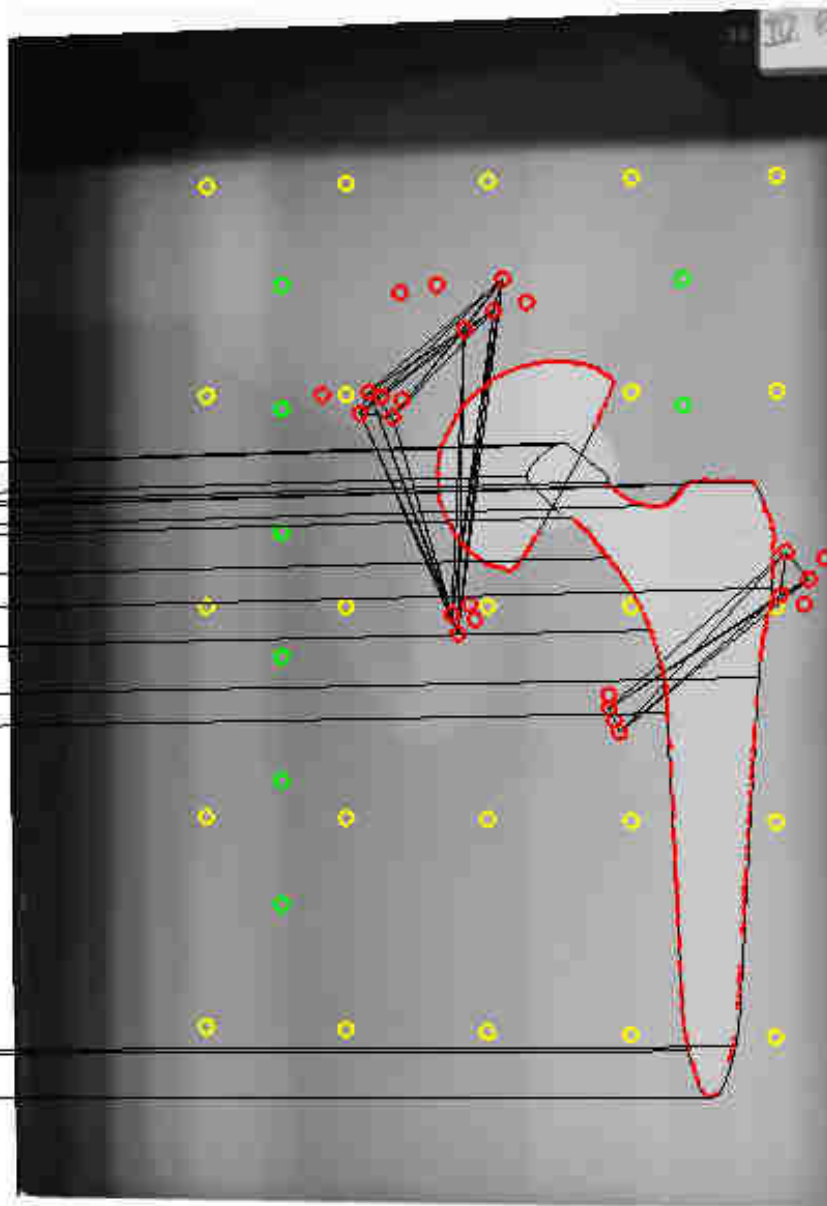
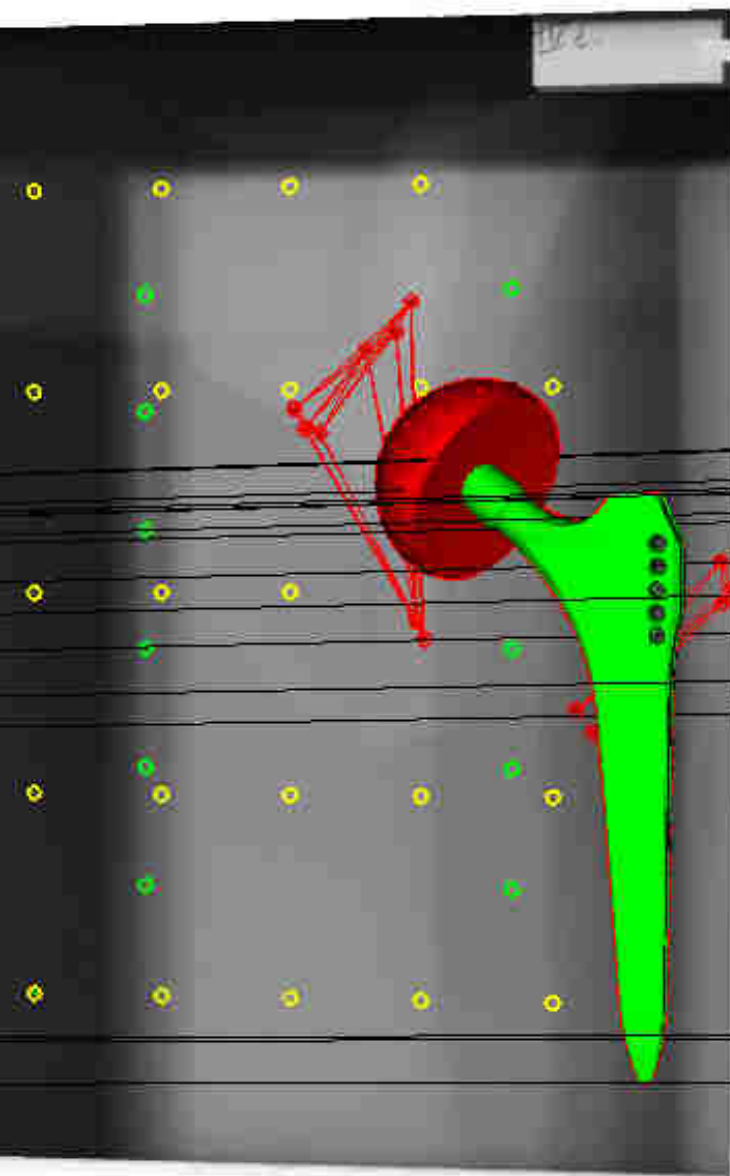
RSA





Trans Error: 0.106 / 0.103

Focus Error: 1.169 / 1.760



Scene: Demo HipX1 New

Patient

Id	Name	BirthD
	Demo Hip	

Scene

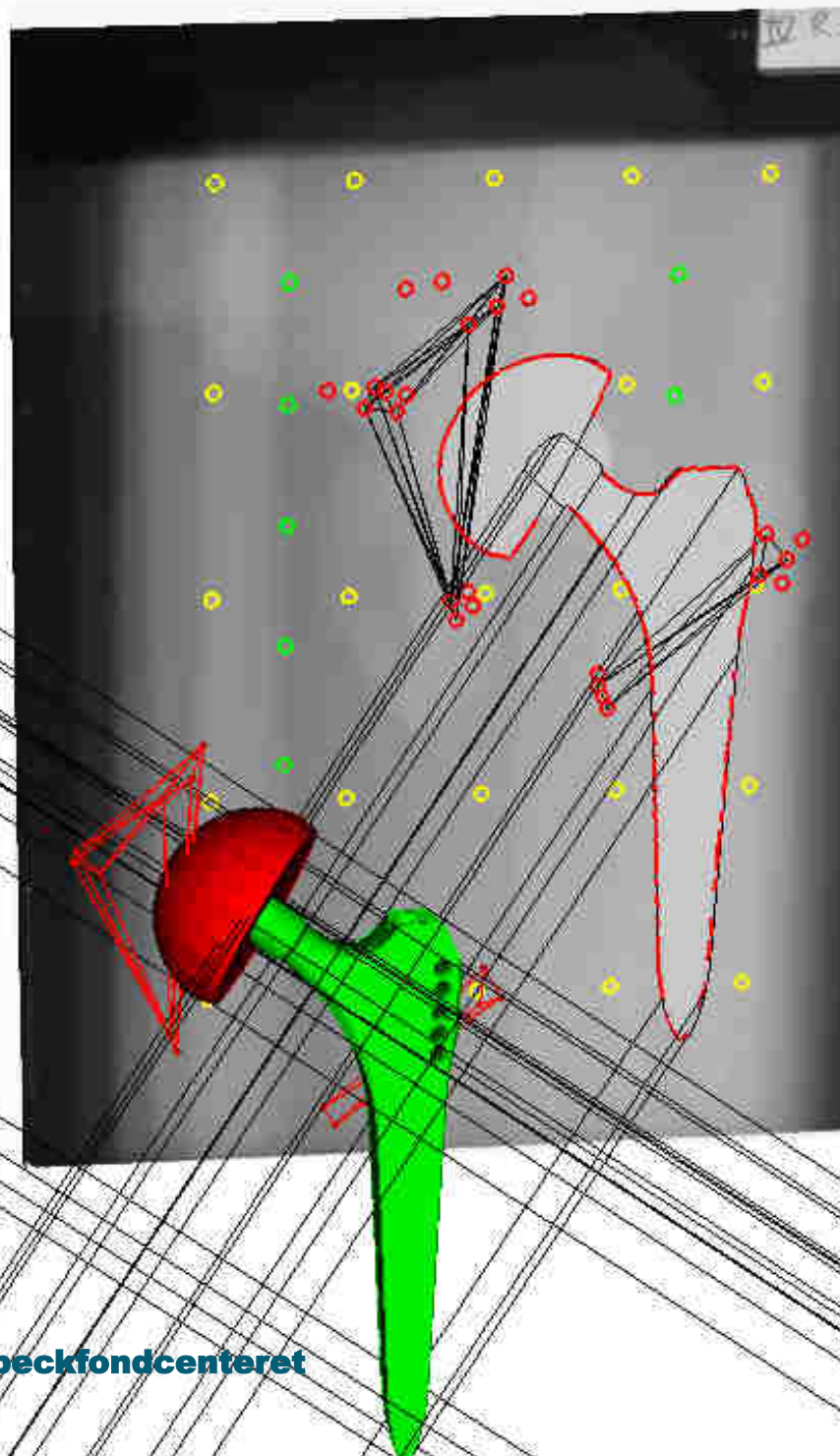
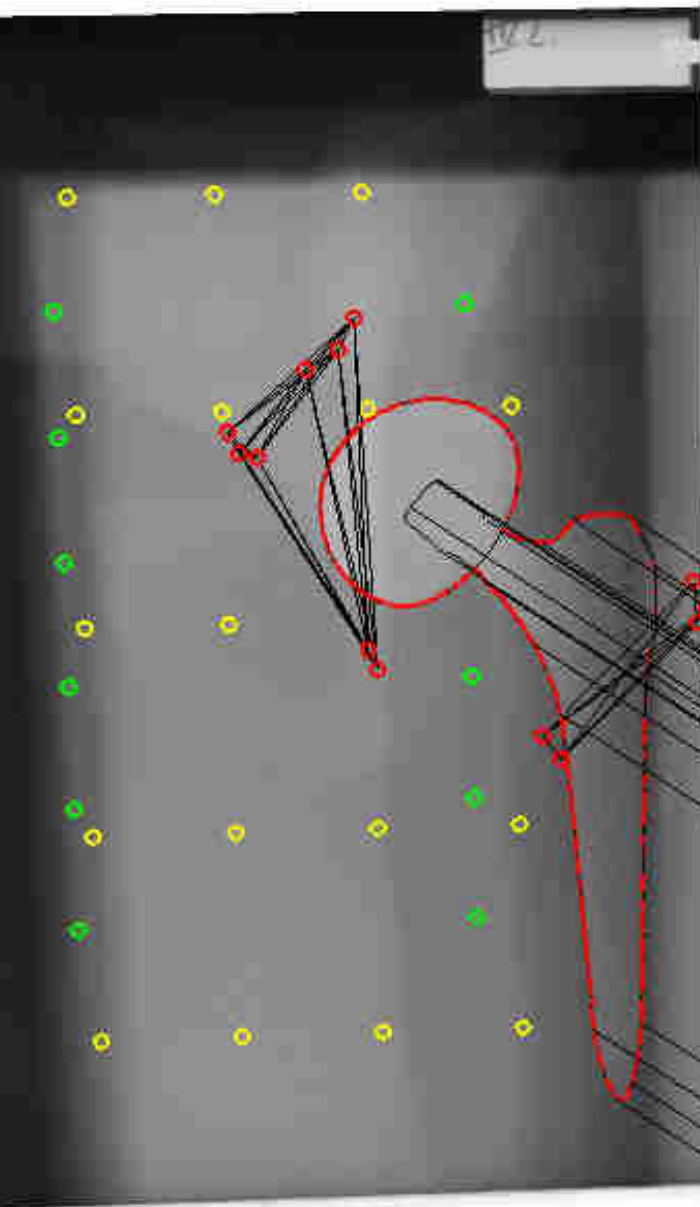
X-nr	Follow-Up	Calibration Box
1	Postoperative	CarbonBox008Leiden

Models

Type	Label	
	Femur	5
	Acetabulum	8
	Cup_52	
	stem_4_5000_centered	

Images

	Label	
	Left	X4l
	Right	X4r



Lundbeckfondcenteret

Scene: Demo HipX1 [New]

Patient

Id	Name	BirthD
	Demo Hip	

Scene

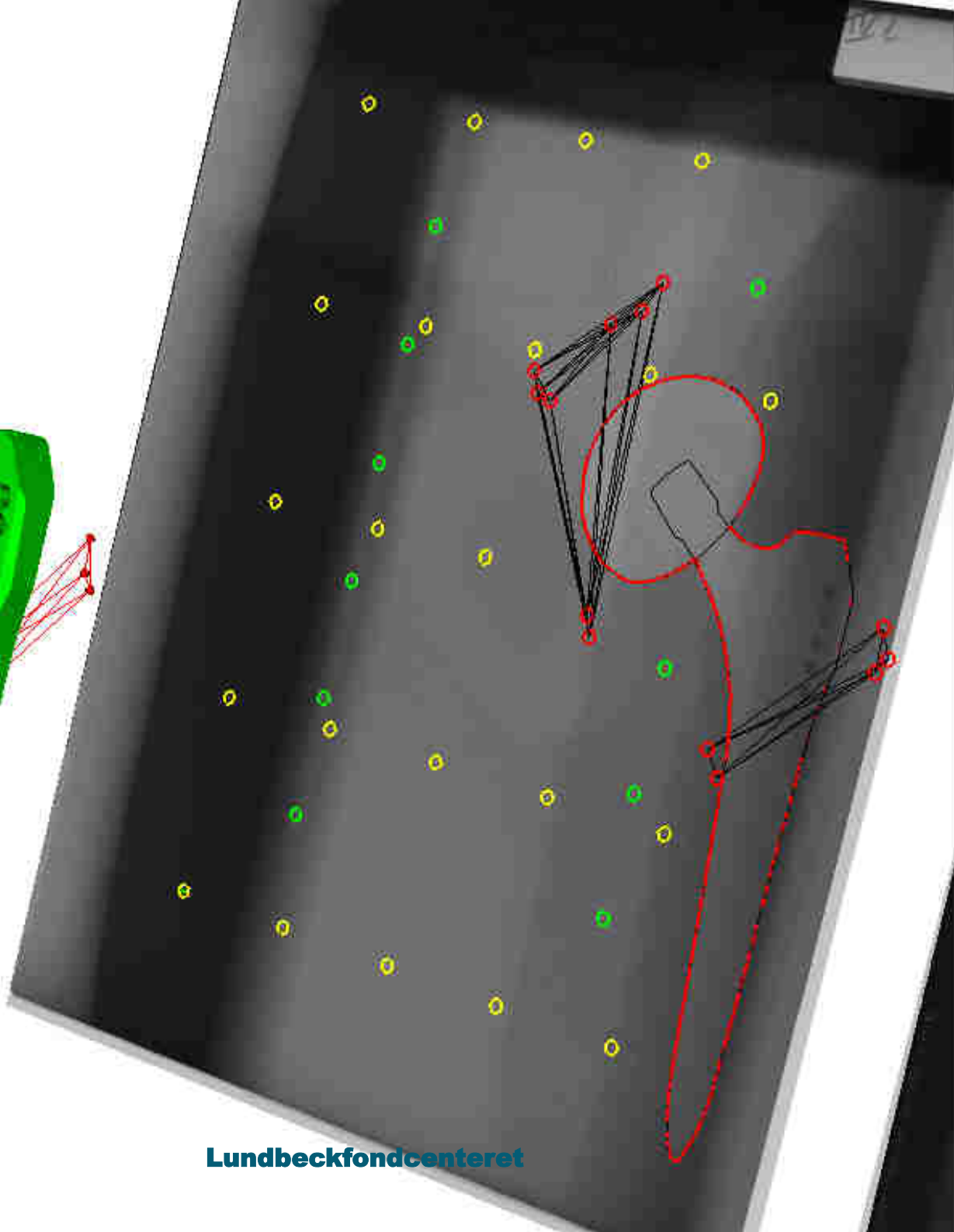
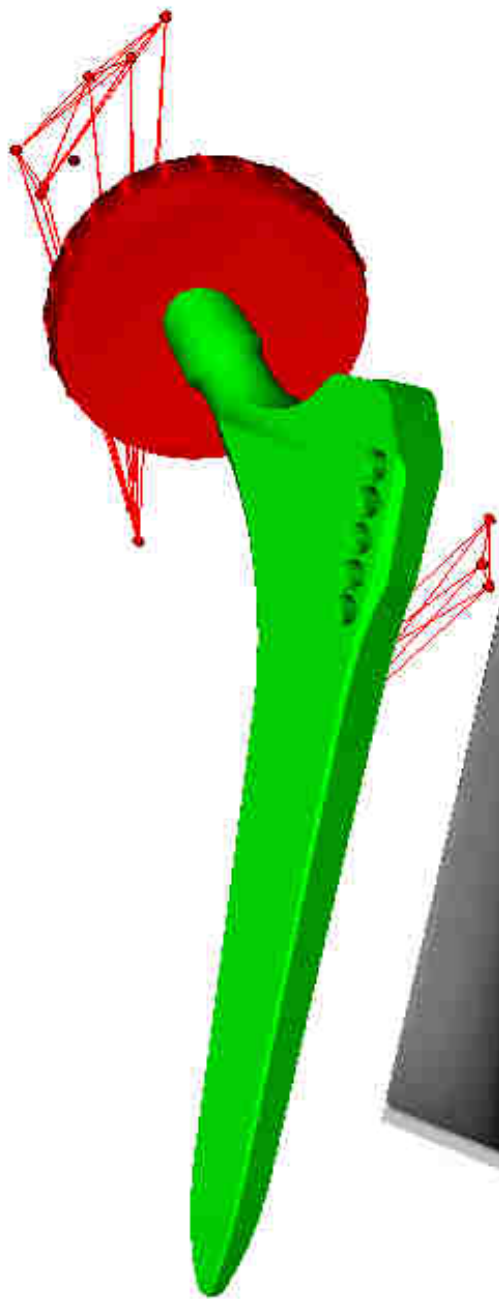
X-nr	Follow-Up	Calibration Box
1	Postoperative	CarbonBox008Leiden

Models

Type	Label	V
	Femur	5
	Acetabulum	8
	Cup_52	
	stem_4_5000_centered	

Images

	Label	V
	Left X4l	
	Right X4r	



Demo HipX1 New

Patient

Id	Name	BirthD
	Demo Hip	

Scene

X-ni	Follow-Up	Calibration Box
1	Postoperative	CarbonBox008Leiden

Models

Type	Label	#
	Femur	5
	Acetabulum	8
	Cup_52	
	stem_4_5000_centered	

Images

	Label	V
	Left X4l	
	Right X4r	







3-D

Study design

- Prospective cohort of fast track THA with cementless implants will be monitored with RSA
- Compared with a group of patients subjected to traditional care



Conclusion

- Is the risk for implant loosening increased in fast track surgery

Adverse effects

- Early mobilization may result in increased strain on the newly operated limb
- Leading to potential adverse effects
 - a) dislocation
 - b) implant loosening
 - **c) decreased patient satisfaction**

c) decreased patient satisfaction

- A potential side effect of early discharge may be decreased patient satisfaction and risk of readmission



Conclusion

- Is patient satisfaction decreased in fast track surgery



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