

Joint replacement and snowsport

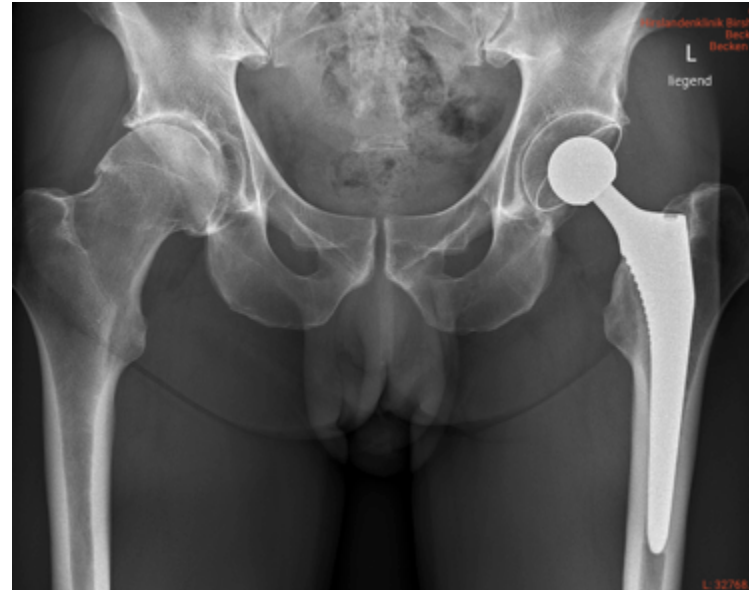
—

a no-go?

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F.T.m 53 yrs
skiing instructor, mountain guide



- Habit
 - Addiction
 - Profession
- > Expectation

no go - points of concern



- Wear
- Shorter implant survival



- Periprosthetic fracture
- Dislocation
- Ligament injuries

Peak loads

in % (100% = bodyweight)

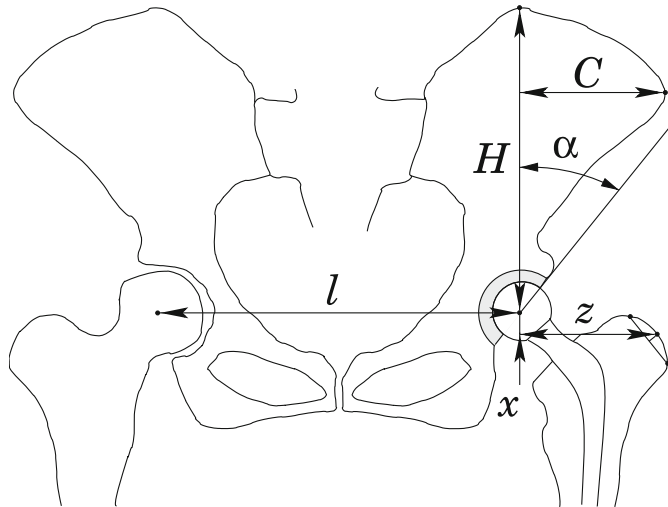
		Bergmann 2001 ¹⁴	Bergmann 2004 ¹⁵	Van den Bogert 1999 ¹⁸	Cleather 2016 ¹⁹
		<i>In vivo</i>		Calculated (gait lab or accelerometer)	
Walking	Slow	240%			
	Normal, operated	240%			
	Normal, not operated			250%	
	Fast	250%			
Running			520%		
Stairs	Up	250%			
	Down	260%			
Standing up		190%			
Sitting down		160%			
Knee bend		140%			
Stumbling			870%		
Weight Lifting	Jumping				550%
	Landing				600%
	Push Jerking				780%
	Jerk Catching				840%
Alpine skiing	Short steep			520%	
	Short flat			400%	
	Long steep			390%	
	Long flat			290%	
Cross country skiing	Classical			320%	
	Skating			360%	

Wear

forces

*

number of cycles



The John Charnley Award

Wear Is a Function of Use, Not Time

Wear

what is the optimal bearing surface?

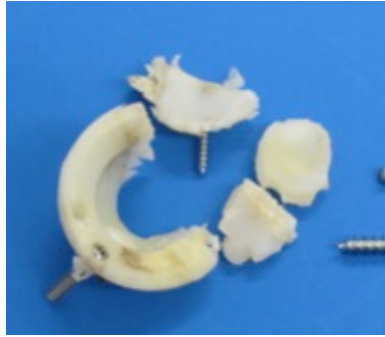
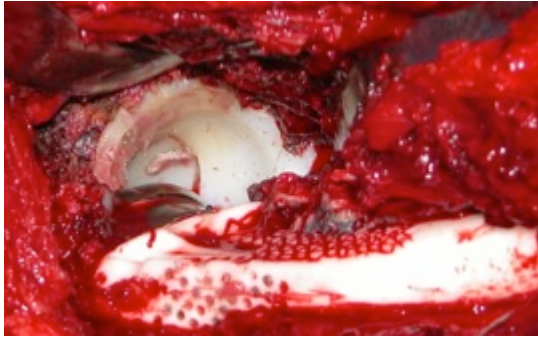
$$\text{friction: } Fr = \mu * Fn$$

μ : friction coefficient

Soft
polyethylene

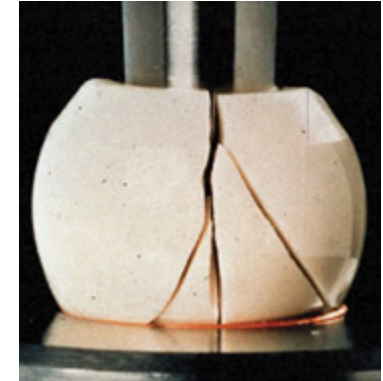


hard
ceramic
metal



Wear

Polyethylene:
Osteolysis and wearing through



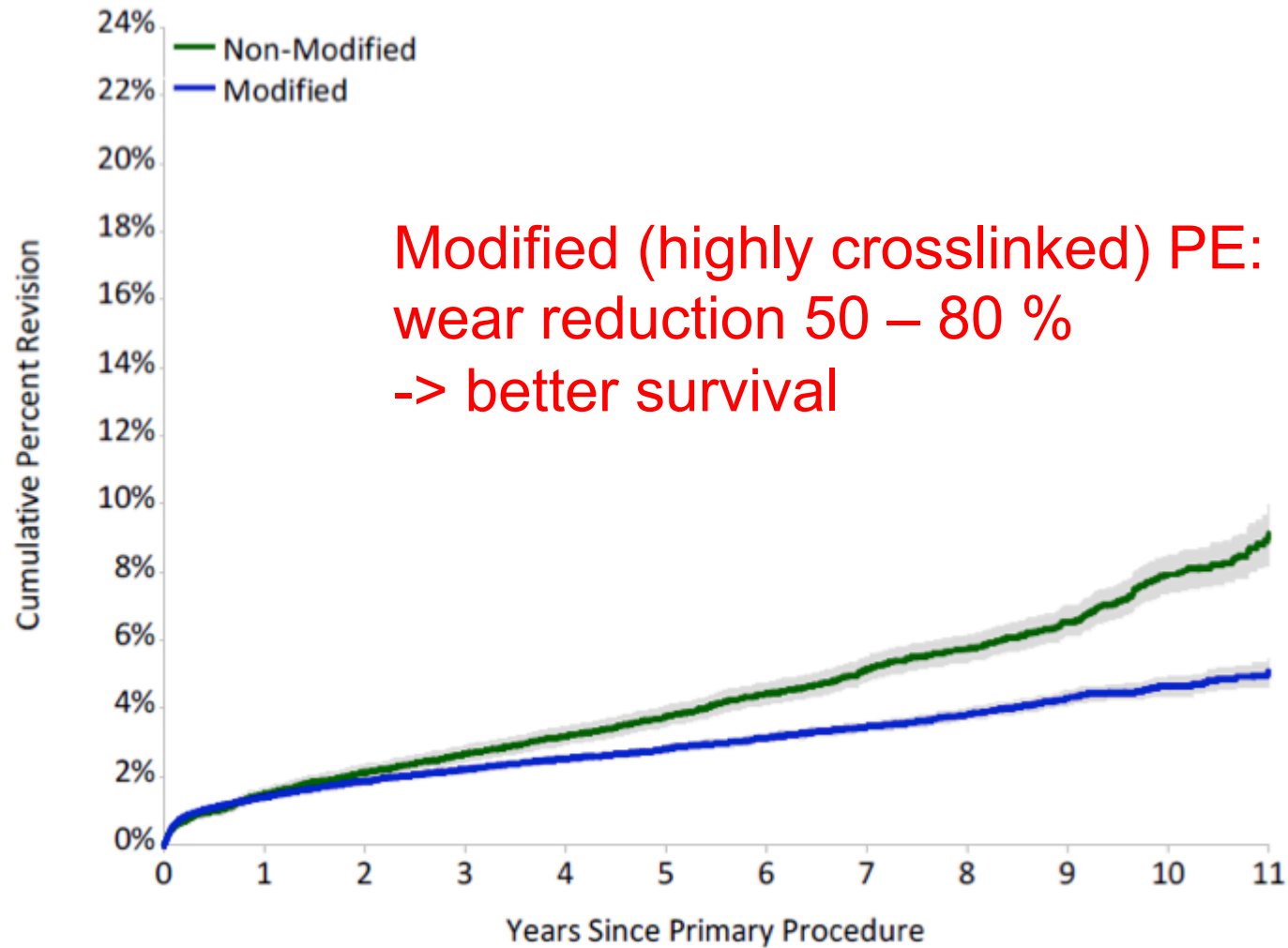
Ceramic:
Fractures and squeaking



Metal:
pseudotumors, osteolysis

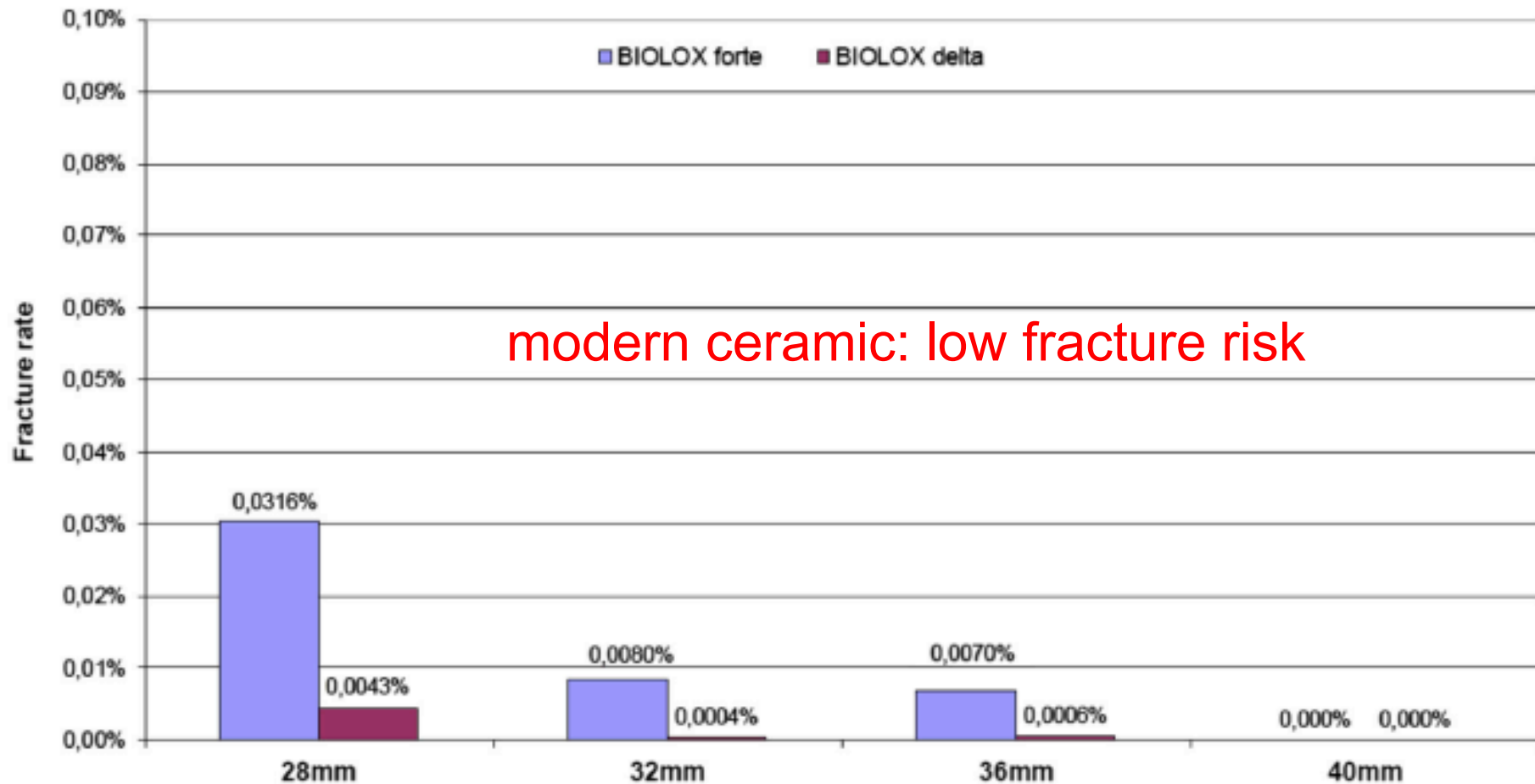


Wear



Wear

Fracture rate BIOLOX heads per diameter



modern ceramic: low fracture risk



Wear

DePuy ASR™ Hip Recall Guide

In August 2010, DePuy Orthopaedics issued a voluntary recall of its ASR™ XL Acetabular Shell. See the list below to learn more. Find information about possible symptoms, testing, treatment, and how to return your hip for recall. The DePuy Orthopaedics ASR Hip System first became available in July 2003.

recall.

Click Here for the latest information

The Americas



Asia & the Pacific



metal on metal: almost out of use

implant survival

higher lifetime risk for revision for the young

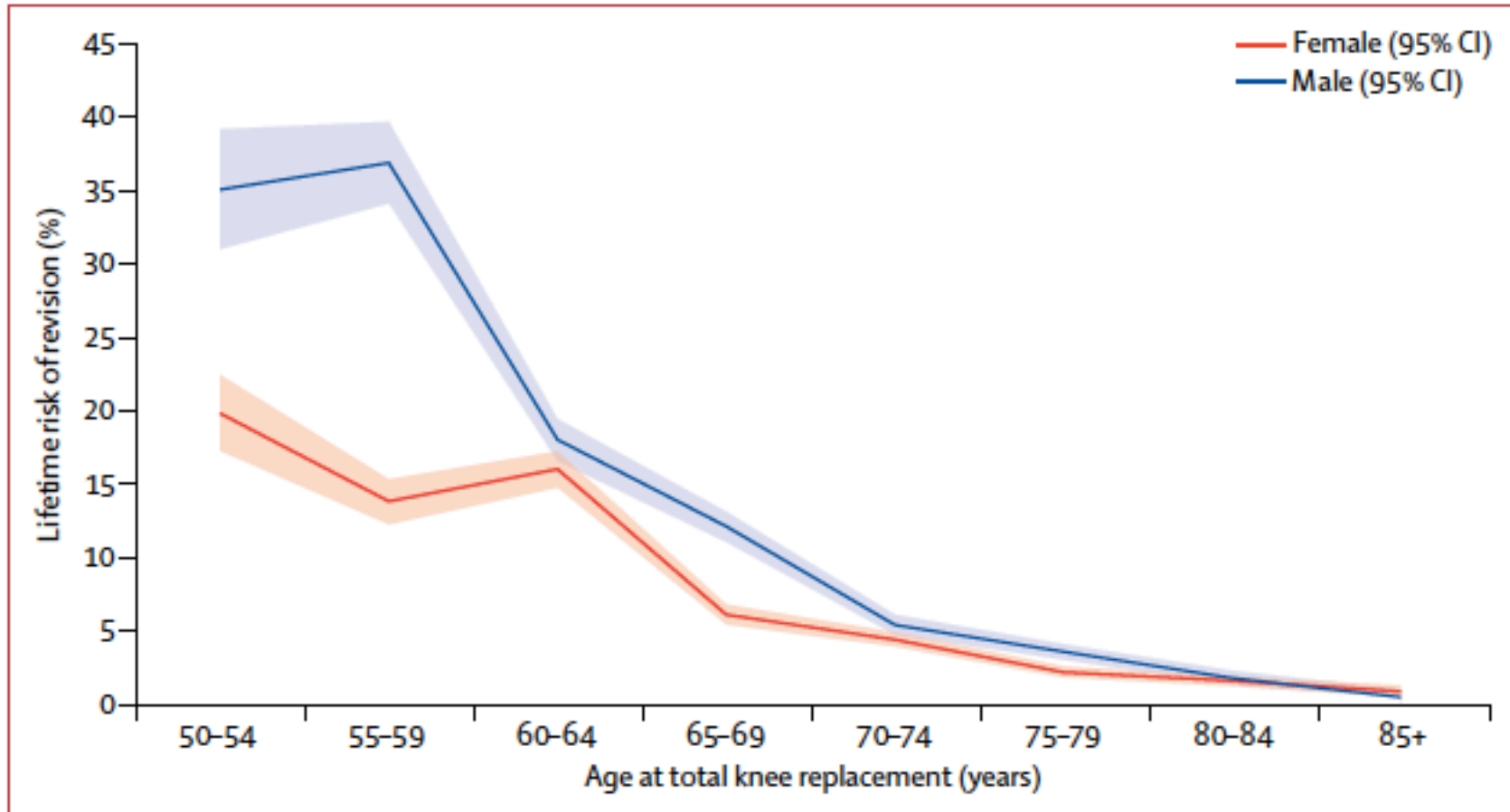
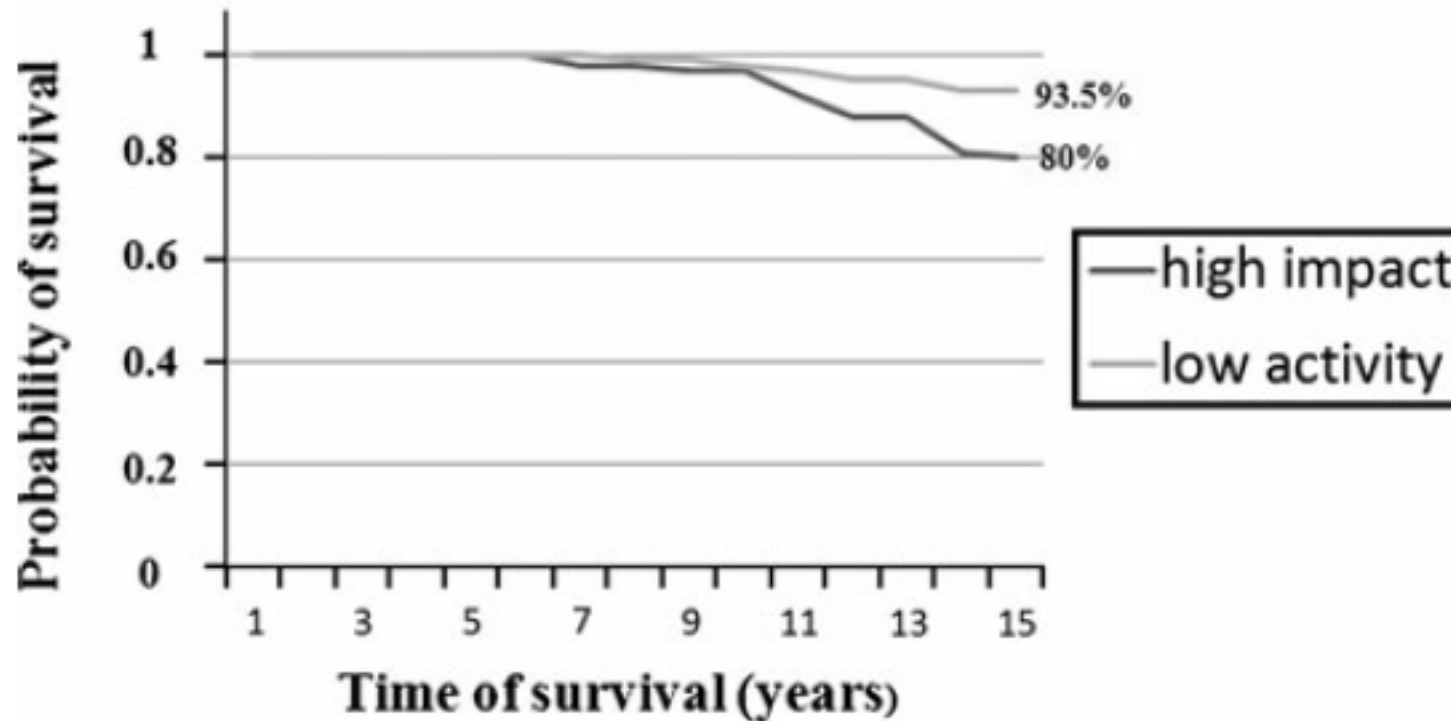


Figure 3: Lifetime risk of revision after total knee replacement

implant survival

THA 15 years: 80 % survival for high impact group



implant survival

What Host Factors Affect Aseptic Loosening After THA and TKA?

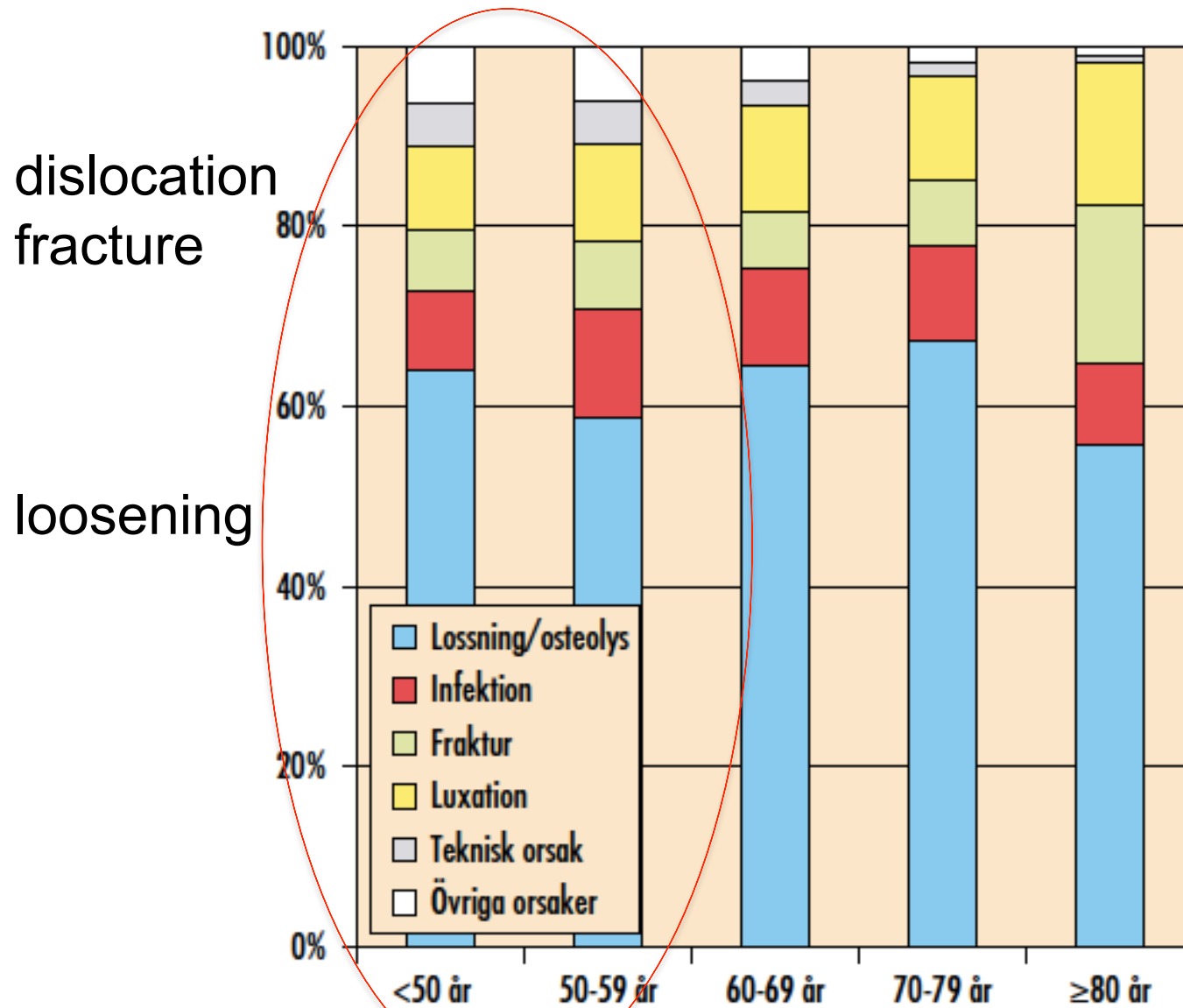
THA

male sex ($p = 0.001$),
high activity level ($p = 0.001$)

TKA

no host factors associated with loosening!

Reasons for first revision

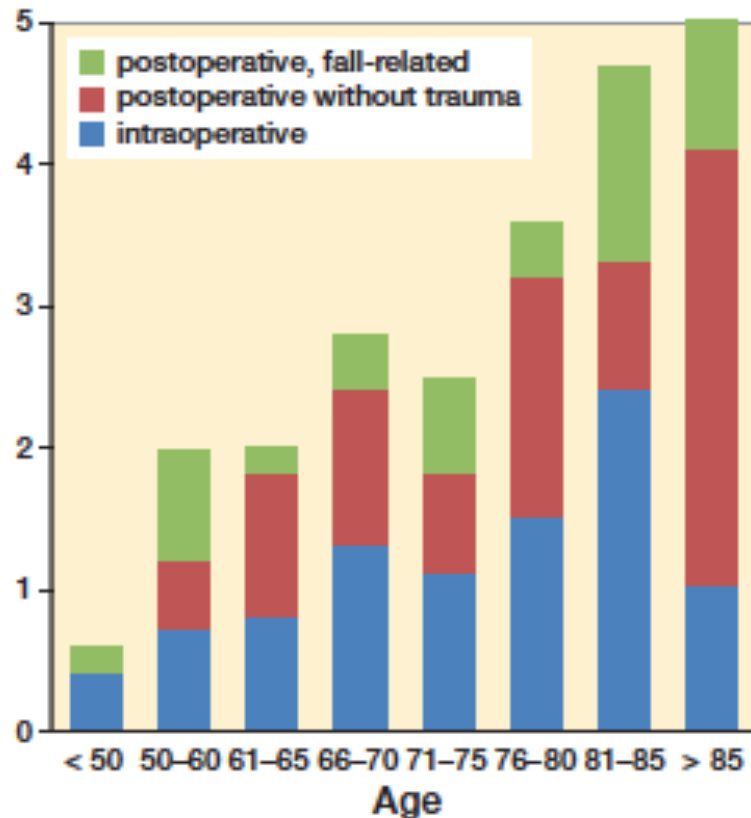


Periprosthetic fractures



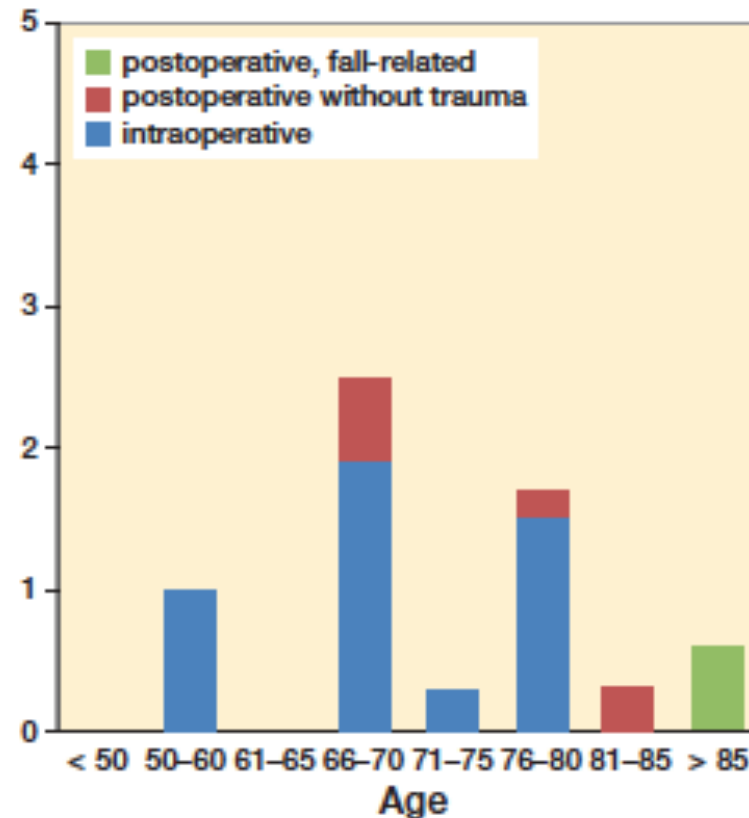
Periprosthetic fractures: higher risk for uncemented stems

Femoral fracture incidence (%)



uncemented

Femoral fracture incidence (%)



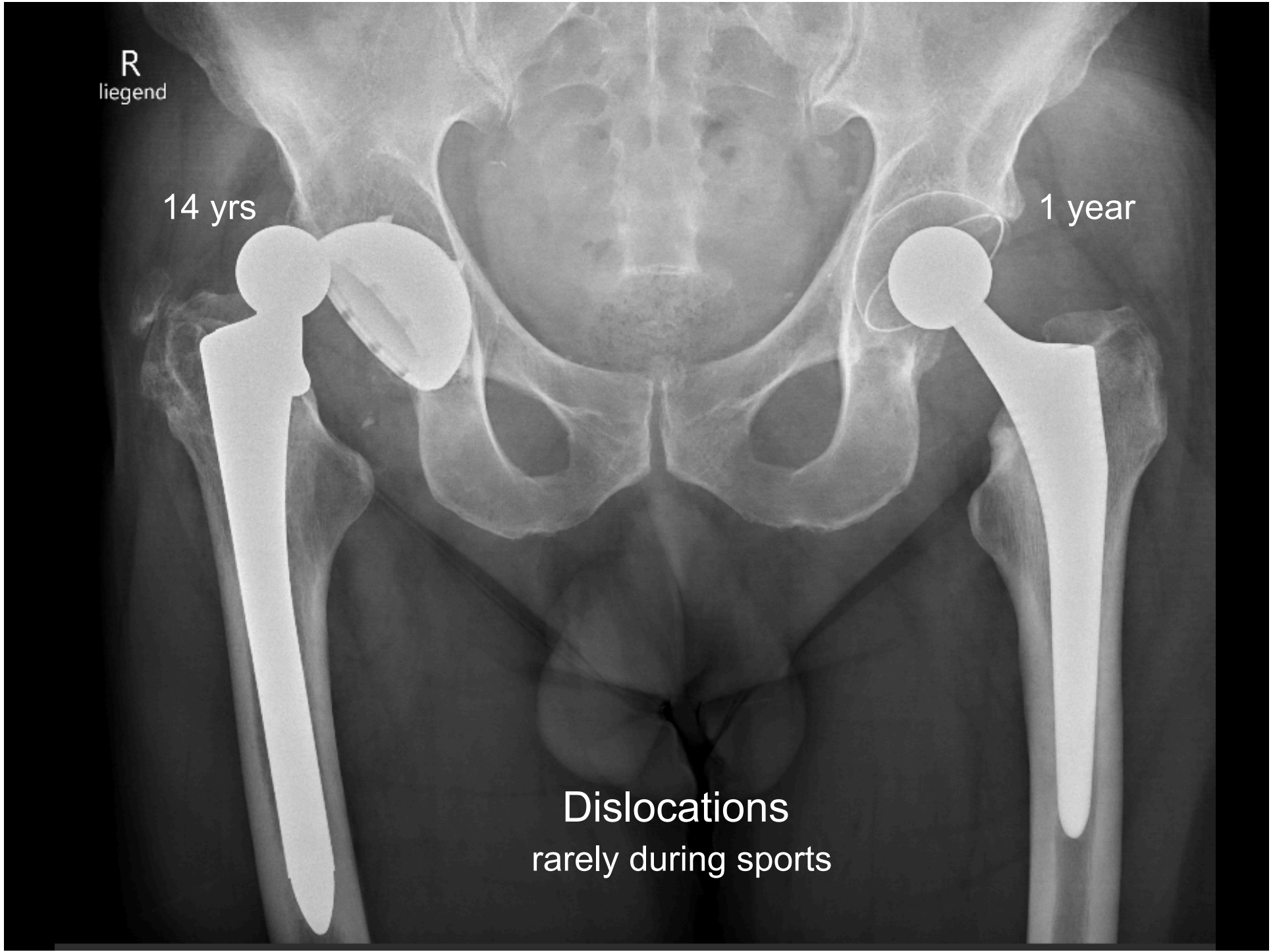
cemented

R
legend

14 yrs

1 year

Dislocations
rarely during sports





stem fracture

ligament injuries
not frequent in skilled persons



Return to sport after joint replacement

- 26.4% unable to return to sport (pain)
- largest decline in high-impact sports
(badminton, tennis and dancing)
- no difference according to type of operation

Alpine and cross-country skiing after total hip replacement

2 cohorts of 50 patients each, one active, the other inactive in skiing, followed for 5–10 years

Active in skiing:

- More active in summer sport too
- more wear
- more femoral osteolysis (n.s.)
- no fractures

High-Impact Sports After Total Knee Arthroplasty

many patients attempt high-impact
jogging, downhill skiing, singles tennis, racquetball, squash, basketball

4 years f-up:

32 of 33 knees successful outcomes

high satisfaction (9.1 of 10 points)

-> some patients participate high-impact sports
and enjoy excellent clinical outcomes

Alpine skiing with total knee arthroplasty

recommended for older persons:
well-being, perceived pain, knee function,
perceived exertion

no additional loosening
no additional wear

Joint replacement and snowsport

no evidence to be very restrictive
gently return to sports earliest 6 months post-op
high impact sports only if well trained

but:

- Higher risk for periprosthetic fractures (hip)
- Trauma not more frequent but more severe sequelae
- Shorter implant survival

