

Femoral neck fractures  
Total hip replacement

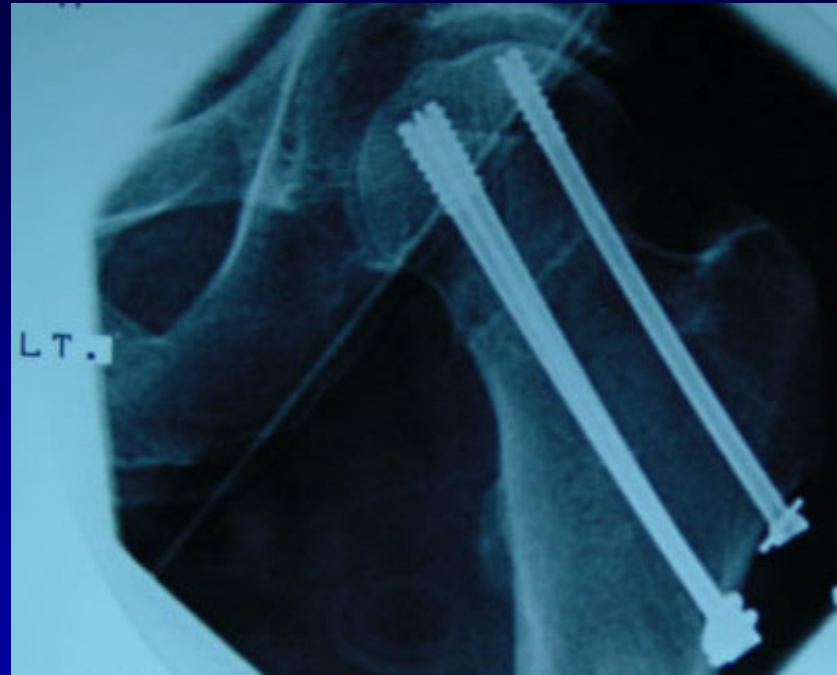
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# Subcapital hip fractures

## The use of THR

- Historical data
- RCT outcomes
- 3 groups of patients

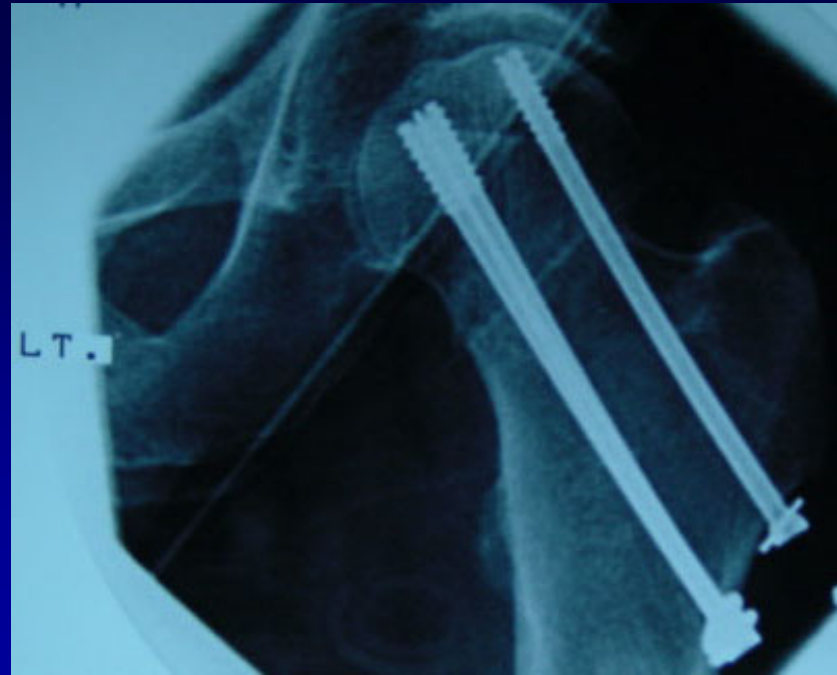




## Displaced subcapital fractures

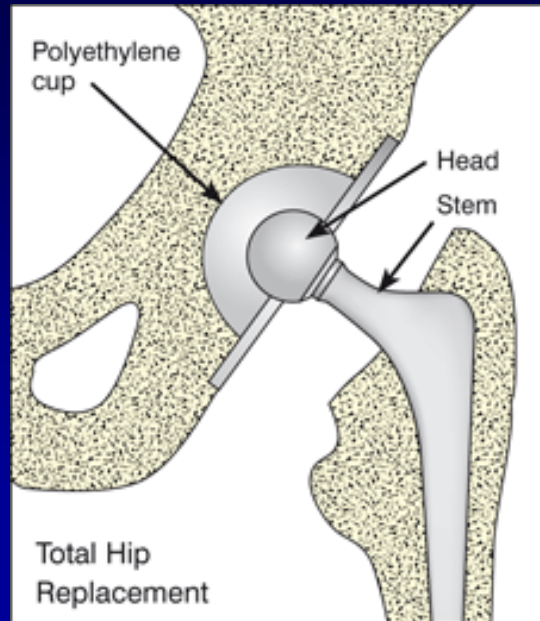
Which method is best?

Arthroplasty or Fixation?



## Displaced subcapital fractures

The choice of implant depends on the patient



## Displaced subcapital fractures

Who is suitable for a hip replacement?

# Displaced subcapital fractures

3 patient groups

- Cognitive/mobility impairment (70%)
- Fit older patient (25%)
- Younger patient (< 5%)
- Approx 30% suitable for THR



# Displaced subcapital fractures

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## Displaced subcapital fractures

1. What is the best choice of treatment in the older patient with impaired mobility and/or cognitive function?



# Meta-analysis, Sept 2003

Bhandari et al, JBJS

- 14 randomised trials
- Compared IF with arthroplasty
- Mortality, revision, function, surgical data

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# Meta-analysis, Sept 2003

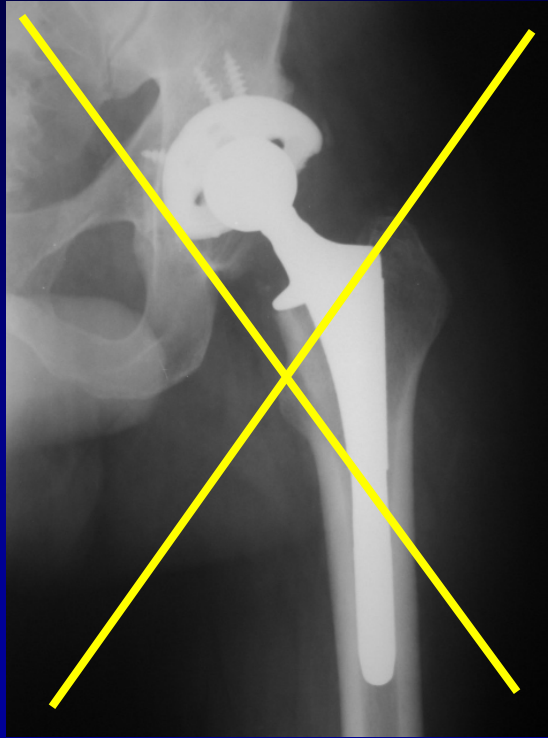
## Findings

- IF shorter operation, less blood loss
- Mortality slightly greater with arthroplasty
- Revision 4 times higher with IF
- Pain and function not different



## Conclusion

In older patients with poor mobility or cognitive impairment, an arthroplasty is probably the best treatment



## Conclusion

In older patients with poor mobility or cognitive impairment, an arthroplasty is probably the best treatment

## 2. Which option is the best for the fit older patient?





## Total hip replacement

Not a popular treatment for subcapital fractures

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# Taine and Armour 1985

## Findings

- 57 patients at 42 months
- 12% rate of dislocation
- 12% rate of revision
- Indications were loosening/dislocation

# Greenhough and Jones 1988

## Findings

- 37 patients at 56 months
- 18 (49%) rate of revision
- 22% radiologically loose
- Recommended against THR



# Meta-analysis Lu-Yao 1994

Findings for 746 cases of THR

- Dislocation rate 11%
- Deep infection 1%
- Pulmonary embolism 3%
- No pain at 2 years 81%

# THR for subcapital fractures

Changes in last 10 years

- More randomised trials
- Larger numbers of patients
- Better follow-up and documentation
- Better evidence to base decisions

# RCTs of displaced intracapsular hip fractures

Author	Year	Total no of pts	Fixation	Hemiarthroplasty	THR
Ravikumar	2000	290	91	91	89
Rogmark	2002	450	217	192	
Parker	2002	455	226	229	
Tidermark	2003	110	55		55
Keating	2006	298	118	111	69
Frihagen	2006	222	112	110	
Baker	2006	81		41	40
Blomfeldt	2007	120		60	60
<b><u>Total</u></b>			<b><u>819</u></b>	<b><u>738</u></b>	<b><u>409</u></b>

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# Clinical Results

# Hospital stay

Differences not significant

	Duration	% discharge home
• Fixation	10.6	77%
• Bipolar	11.5	71%
• THR	12.3	72%

# General complications

Differences not significant

	PE	CVA	MI
Fixation	0%	1%	0%
Bipolar	6%	3%	4%
THR	1%	3%	3%

## Mortality at 2 years

Differences not significant

- Reduction and fixation 13%
- Bipolar 13%
- THR 9%



# Dislocation

Differences not significant

- Reduction and fixation 4%
- Bipolar 3%
- THR 3%



# Infection

Differences not significant

- Reduction and fixation 6%
- Bipolar 4%
- THR 4%



## Further surgery

- Reduction and fixation 39%
- Hemiarthroplasty 7%
- THR 9%

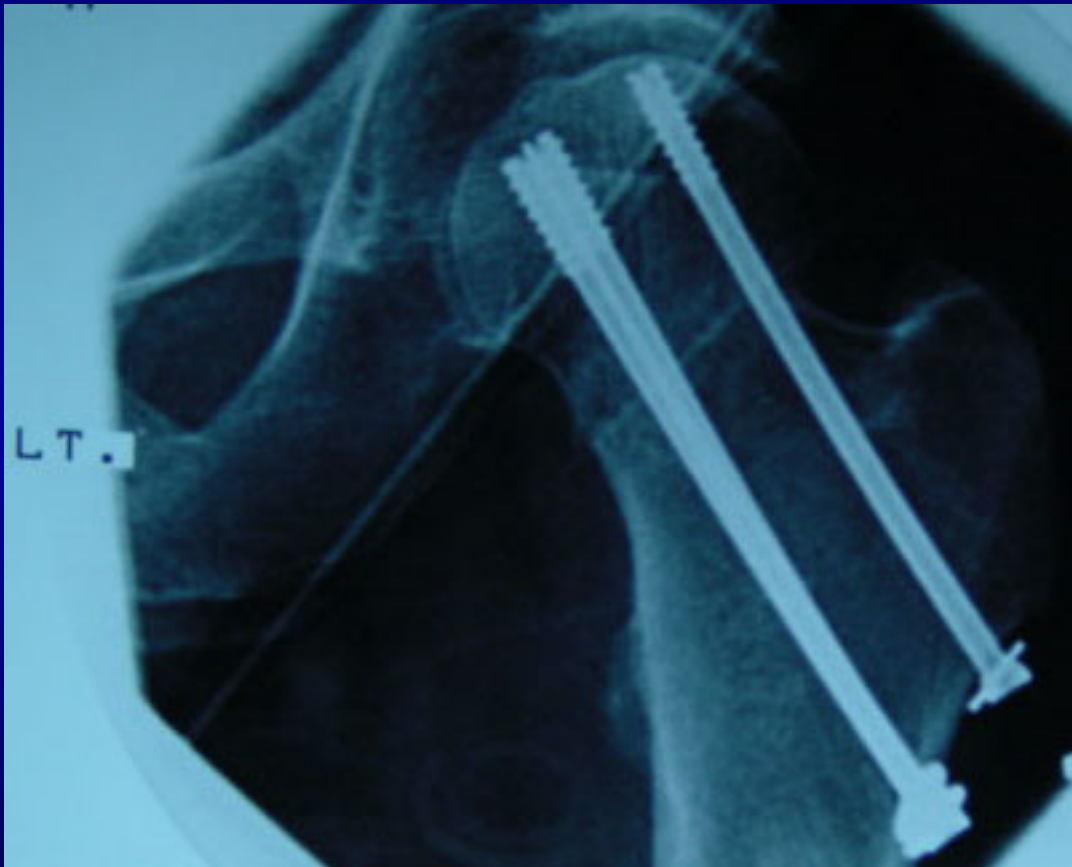
# Displaced subcapital fracture

61 yr old male



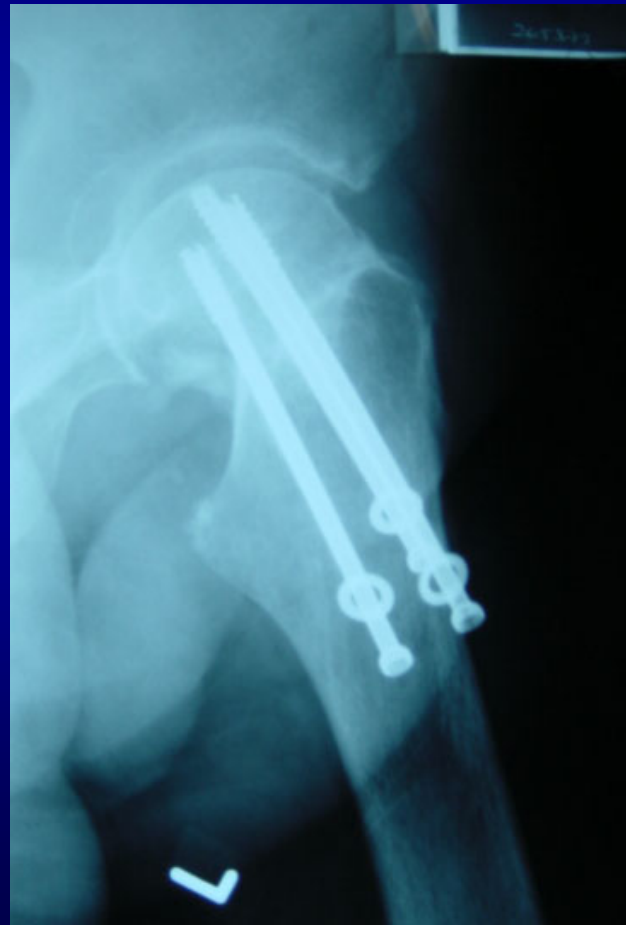
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## Mortality at 1 year

- Fixation 164/819 (20%)
- Hemiarthroplasty 157/738 (21%)
- THR 47/409 (11%)



## Dislocation rates

- Fixation 11/230 (5%)
- Hemiarthroplasty 17/738 (2%)
- THR 29/409 (7%)

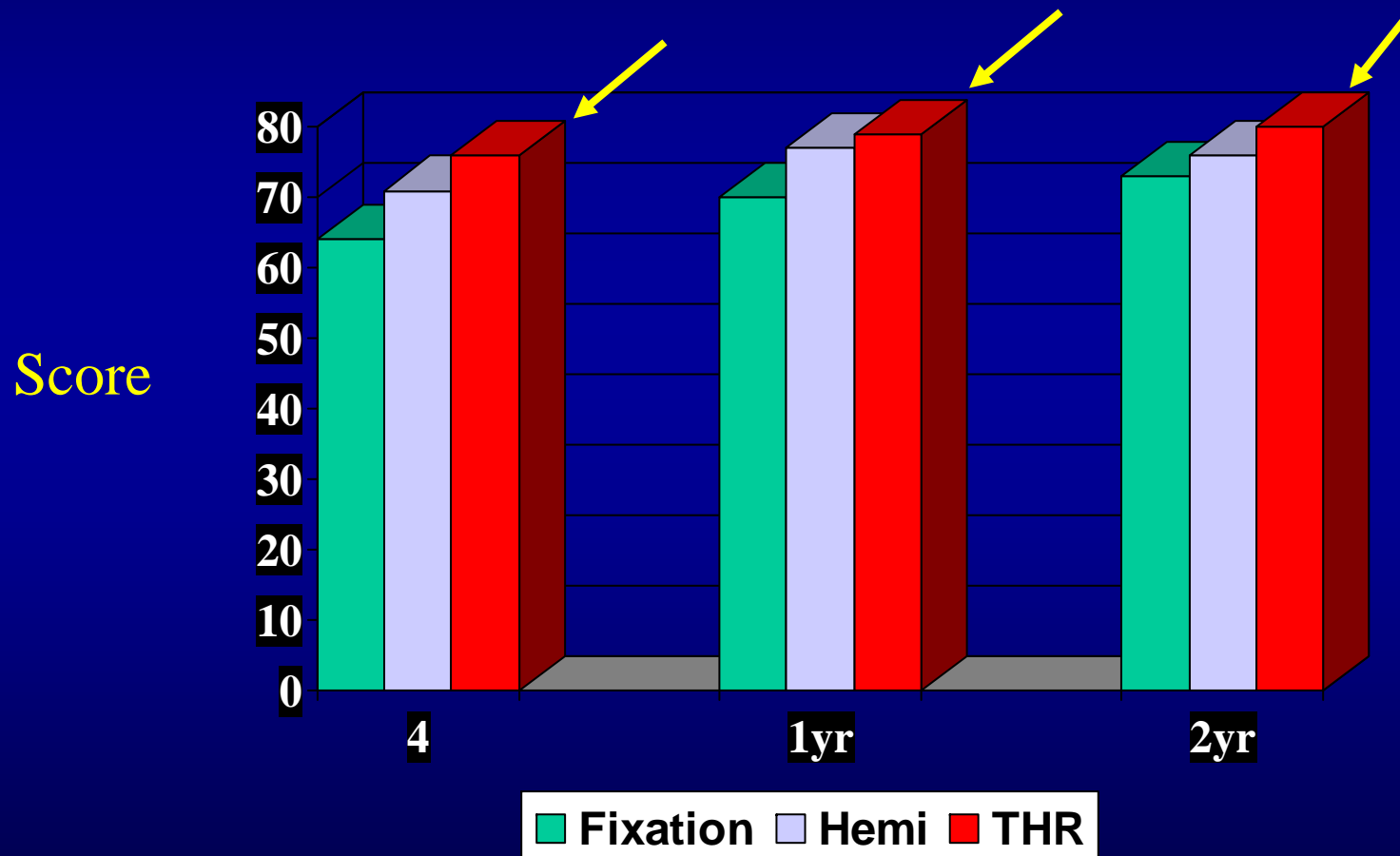
## Revision surgery rates

- Fixation 337/817 (41%)
- Hemiarthroplasty 68/738 (9%)
- THR 23/403 (6%)

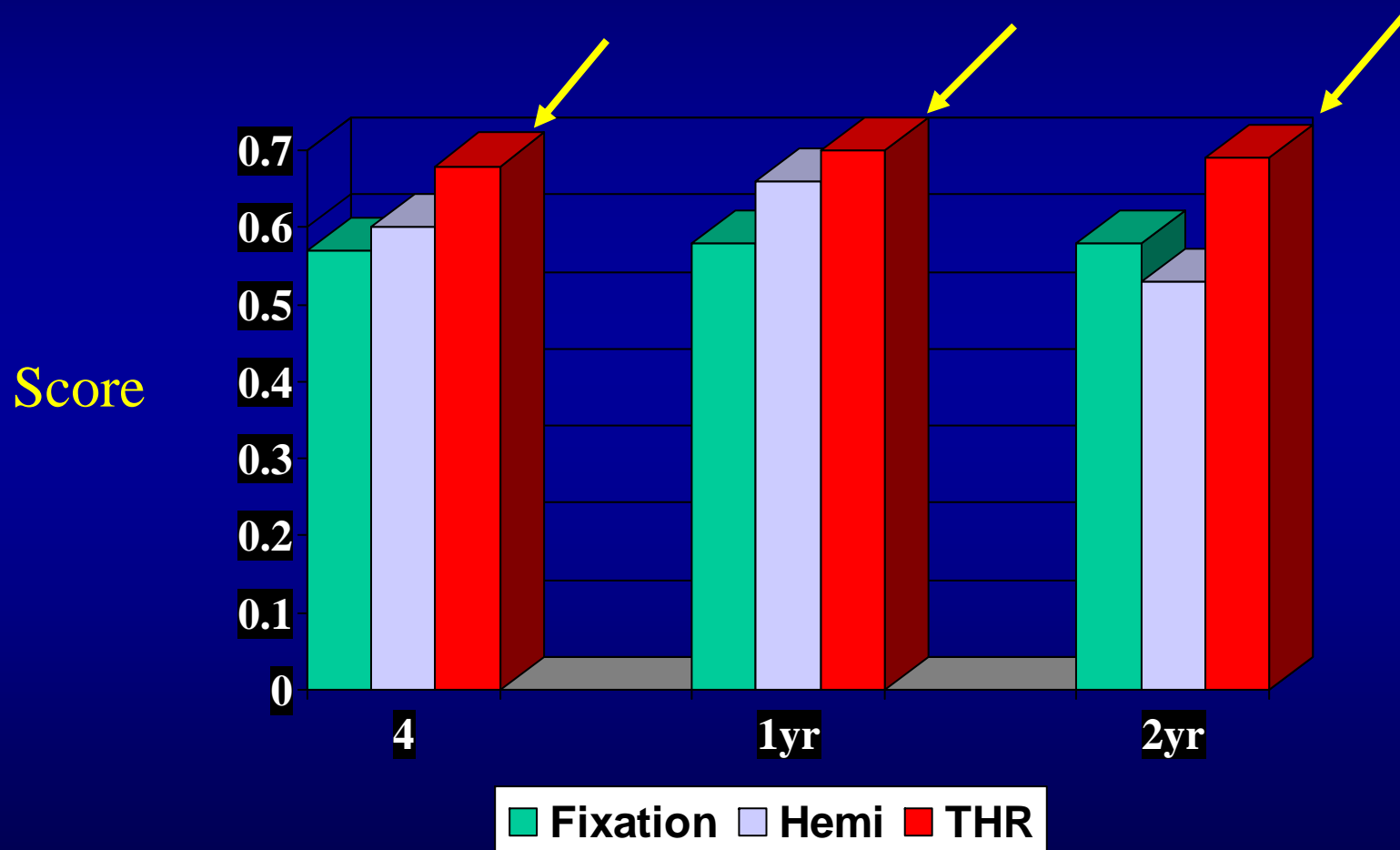
# Functional Outcomes

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# Hip Rating Questionnaire



# Euroqol Utility Score



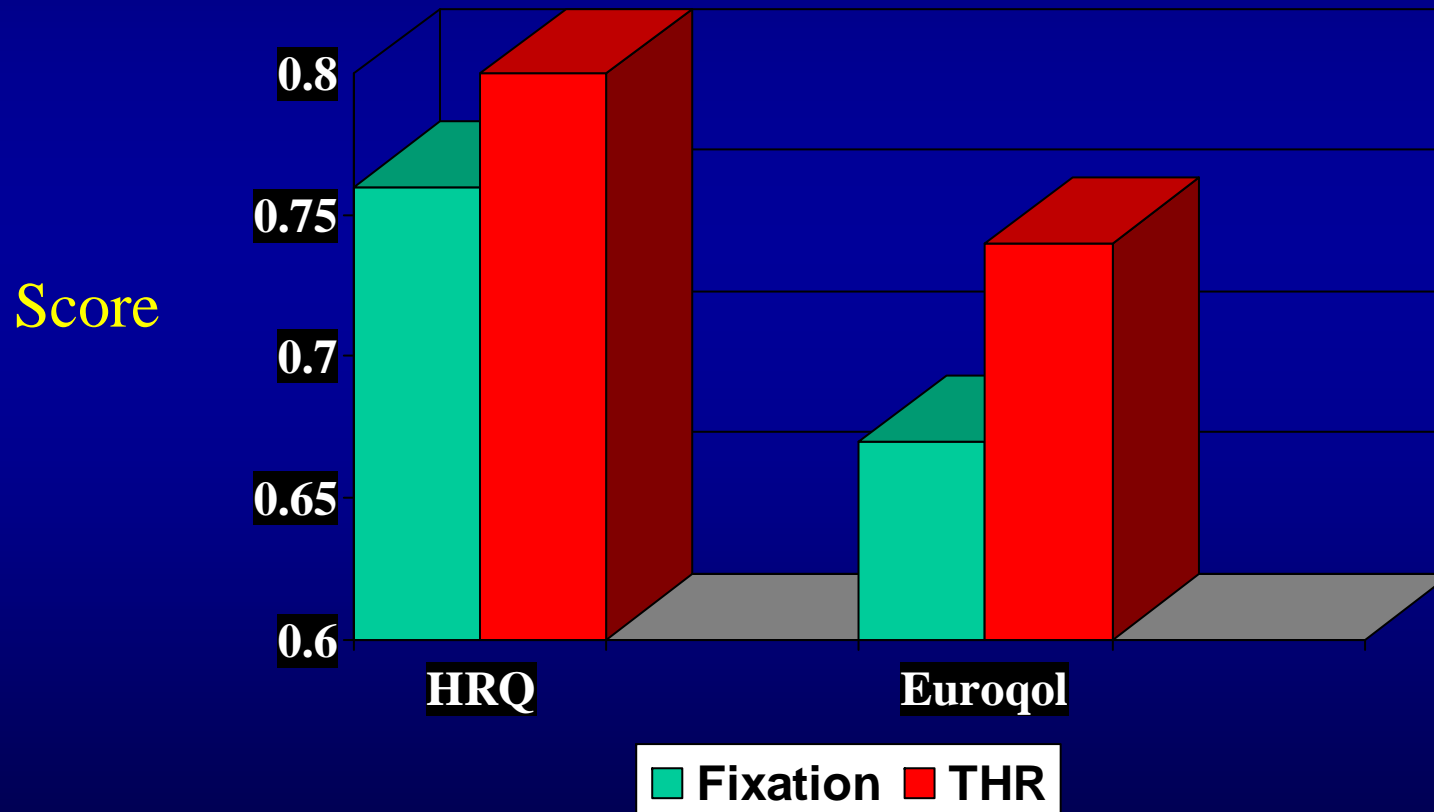
# Summary - Functional outcome

Blomfeldt, 2007

- Bipolar vs THR
- No difference in complication rates
- THR less pain at 1 year
- THR better hip function at 1 year

# Successful Fixation vs THR?

THR is significantly better at 2 years

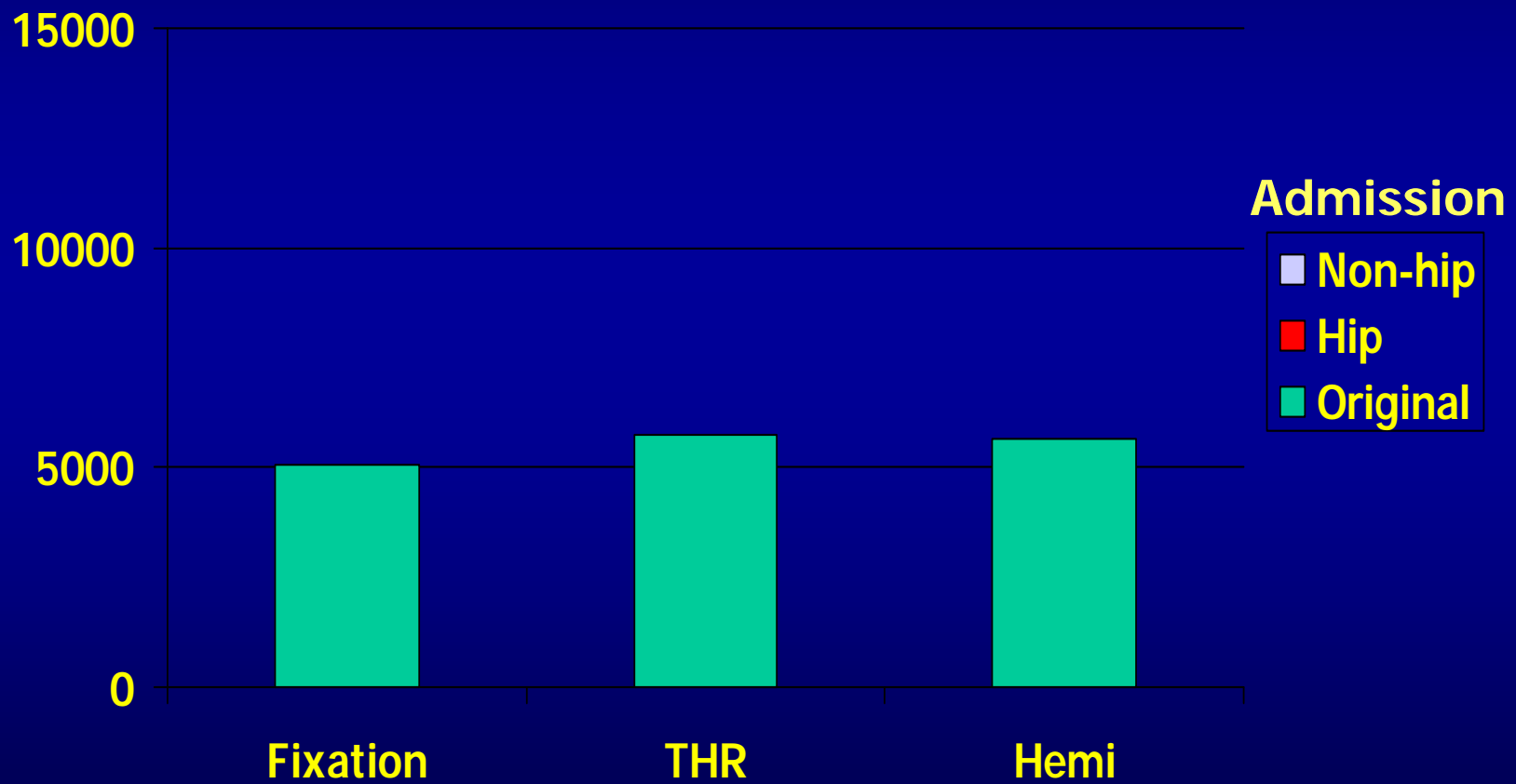


# STARS

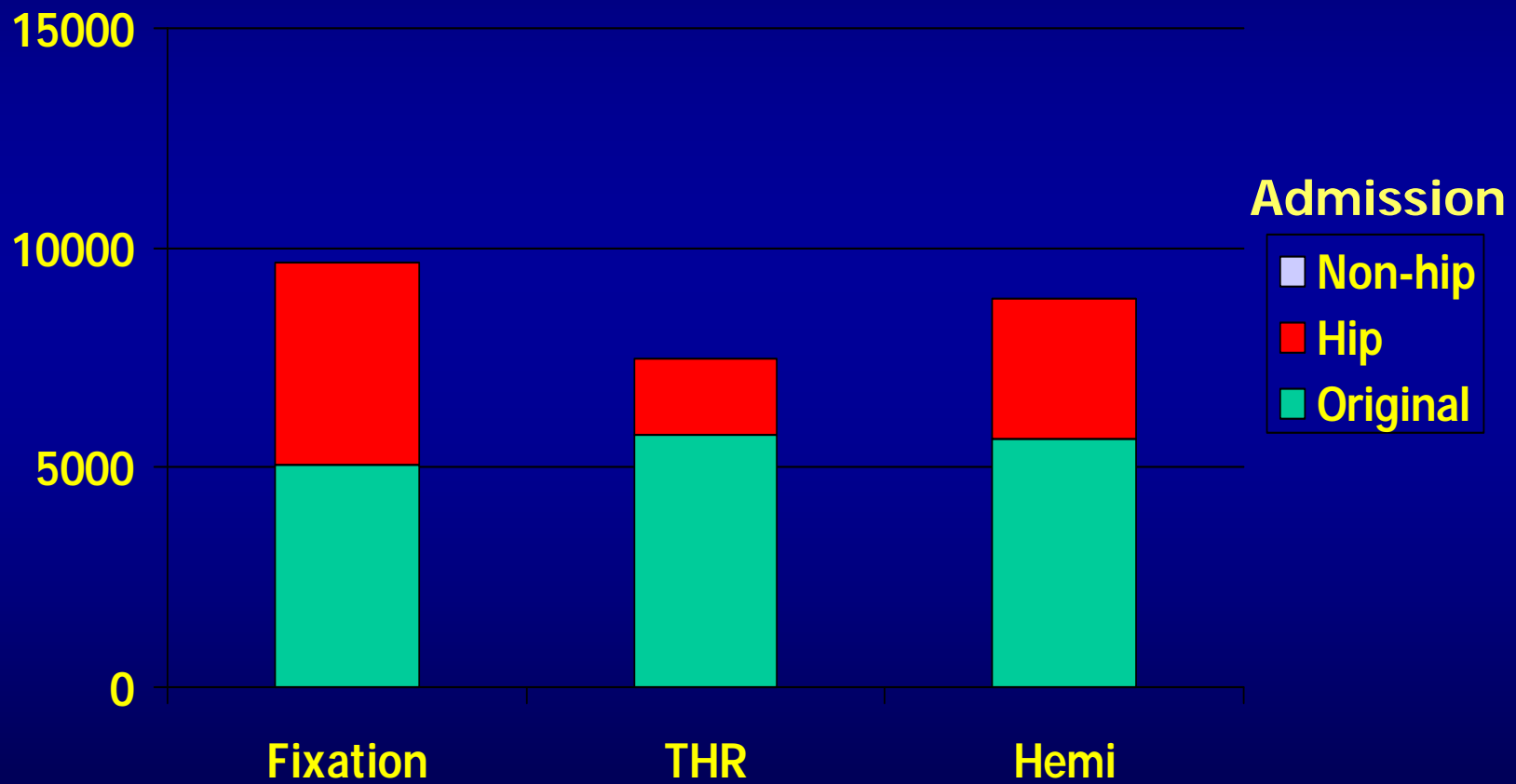
## Economic Outcomes



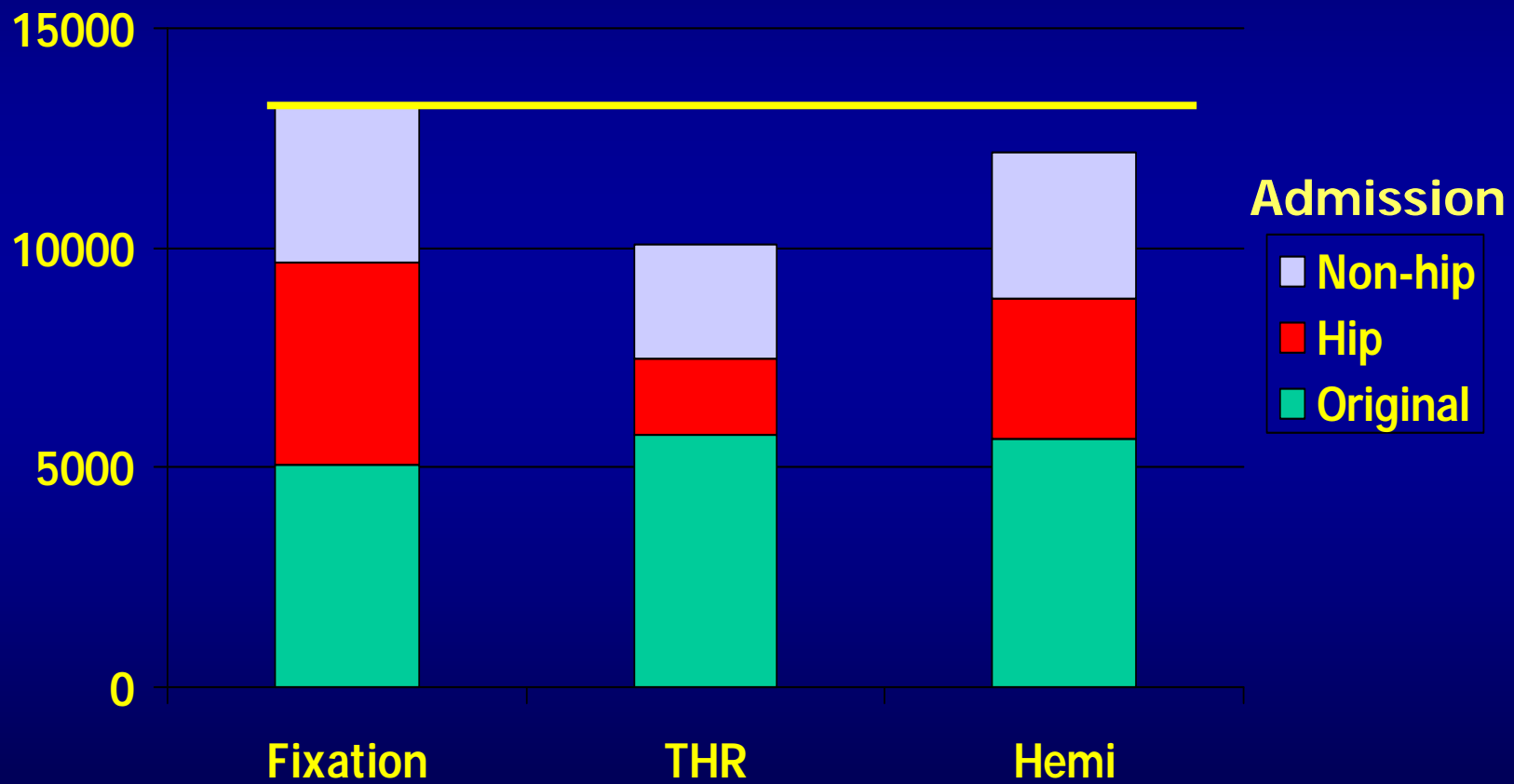
# Average Hospital Costs (£) Over 24 months



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# Average Hospital Costs (£) Over 24 months



## Summary - Clinical results

- Mortality rates                      no difference
- General complications              no difference
- Hospital stay                         no difference
- Infection/dislocation                no difference

# **Main clinical difference**

**Higher reoperation rate after  
reduction and fixation**

**39 - 47%**

## Summary - Functional outcome

- Fixation poorest functional outcome
- THR vs Hemi no different initially
- THR best at 2 years
- THR better than successful fixation

## Summary - Economic outcome

- Fixation most expensive treatment
- THR cheapest treatment





## Total hip replacement

What about survivorship?

Not much data



## Lee et al, 1998

Findings for patients with femoral neck fractures

- 126 patients at 10 years
- 95% survival at 5 years
- 94% survival at 10 years
- 89% at 15 years
- 84% at 20 years

## Conclusion 2

Displaced subcapital fracture in the  
fit older patient

THR is associated with the best  
clinical, functional and economic  
outcome

## Displaced subcapital fractures

In patients under 60 years, internal fixation is usually considered the treatment of choice

## Displaced subcapital fractures

Young patients with these injuries often have  
conditions predisposing to osteoporosis

# Displaced subcapital fractures

Review of patients < 60 years

- 10,400 hip fractures 1988 – 2001
- 127 displaced subcapital fractures
- 1.2% of all hip fractures
- 3% of all displaced subcapital fractures

# Displaced subcapital fractures

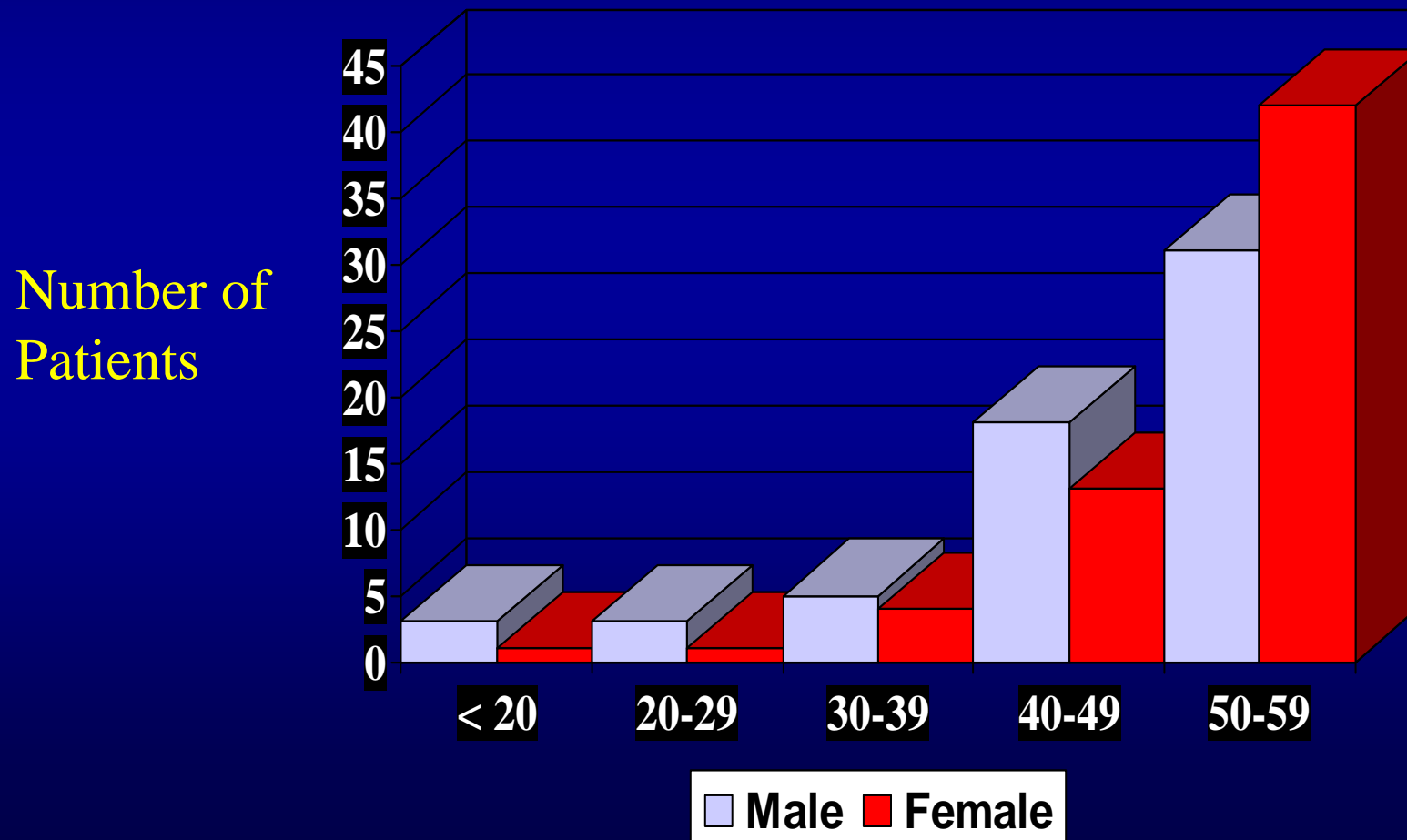
## Predisposing conditions

- Medical co-morbidity
- Alcohol
- Smoking
- Medication esp steroids



# Sex and Age Distribution

Displaced subcapital fractures in patients < 60 years



# Displaced subcapital fractures

## Modes of failure

- Fixation failure
- Nonunion
- Avascular necrosis





# Displaced subcapital fractures

## Risk factors in young patients

- Medical comorbidity 45%
- Alcohol abuse 32%
- Smoking 30%
- Steroids 21%
- Neuromuscular disorder 13%
- Previous low energy fracture 12%
- Rheumatoid arthritis 4%

# Results

# Displaced subcapital fractures

## Modes of failure



# Displaced subcapital fractures

Some risk factors are worse than others

- Chronic renal failure
- Rheumatoid arthritis
- Alcohol abuse

### **Conclusion 3**

**Young patients with displaced subcapital fractures**

Healthy patients with no risk factors  
should have internal fixation, otherwise  
consider arthroplasty

# Summary

## THR in femoral neck fractures

- Frail elderly – modern hemiarthroplasty
- Fit older – THR
- Unfit younger – THR
- Alcohol abuse – ?hemiarthroplasty

# THR for femoral neck fracture

## The future

- Increase use of THR
- Bipolar vs THR
- Modern implants

