



# **Orthogeriatric Care**

**BIUCGM** course

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Go to www.menti.com and use the code 76 25 03

# Describe in 2 words what orthogeriatric care means to you

Mentimeter

Go to www.menti.com and use the code 40 34 58

Do you have personal expierence with orthogeriatric care?





## Introduction - Fragility fractures







## Impact of osteoporosis







## Impact of osteoporosis



Fig. 1. Incidence rates of hip, vertebra, humerus, proximal tibia/fibula, distal forearm, and ankle fractures in women (A) and in men (B).

### **UZ LEUVEN** Increased mortality risk after fragility fracture



	N deaths observed	N deaths expected	SMR (95% CI)
Overall*	11217	3561	3.15 (3.09 - 3.21)
By sex **			
Male	4078	943	4.32 (4.19 - 4.46)
Female	7139	2618	2.73 (2.66 - 2.79)

## One-year mortality risk is more than 3-fold higher after fracture as compared to the general population

### **Z EUVEN** Increased mortality risk after fragility fracture



Forest plot of multivariable-adjusted mortality hazard ratios for women and men.

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## Outcome after hip fracture – some facts

- 6-months mortality: around 23%
- 6-months re-admission rate: up to 46%
- Decrease in quality of life
- Decline in functional status
- Increased institutionalisation







# Hip fracture in nursing home residents

- Very frequent: 23-51/1000 patient years
- Bad prognosis
  - 36,2% has died within 6 months
  - Another 17% has become totally dependent
  - Risk factors: age >90y, premorbid physical or cognitive impairments





## Fragility fracture patients are special

### Figure 2 Common Comorbidities in Patients With Hip Fracture



Source: Adapted from: Nikkel LE, et al. J Bone Joint Surg Am. 2012; 94:9-17





## Fragility fracture patients are special

- Would we usually operate on frail elderly with these problems?
- Falls are often result of medical illness and/or frailty
- Poor starting point for surgery





# Treatment of fragility fractures

Main goals:

1. Managing pain

2. Restoring mobility where possible





## Treatment of fragility fractures

Proximal femur fracture  $\rightarrow$  Surgical

Proximal humeral fracture  $\rightarrow$  Surgical / Non-operative 'conservative'

Vertebral fracture → Almost always conservative; except if >6w pain consider vertebro/kyphoplasty except if instable

Pelvic fracture  $\rightarrow$  almost always conservative





## Advanced dementia and hip fracture

- Surgery or conservative treatment
  - Survival of 65% after 6 months, but better with surgery
  - Only 10% is mobile afterwards (more with surgery)









## A Proximal femur fracture







## Intra-capsular fractures: 50% of all hip fractures Garden classification



Stable fractures (Garden I-II)

Instable fractures (Garden III- IV)





## Intra-capsular fractures: 50% of all hip fractures Garden classification

**Stable fractures (Garden I-II):** internal fixation with parallel implants

#### Instable fractures (Garden III- IV):

- Pre fracture mobile patient: Total Hip arthroplasty
- Pre fracture immobile patient: Hemi-arthroplasty









## Extra-capsular fractures – other half of hip fractures Trochanteric and subtrochanteric

Stable fracture: dynamic hip screw or PFNa



Not stable fracture: intramedullary nail (PFNa)







# Strategies for treating hip fractures

• Arthroplasty

 $\Rightarrow$  Removing fracture-site and replacing the femoral head (+/- acetabulum cup)

- Osteosynthesis internal fixation
  - ⇒ Reducing bone fragments to an acceptable position and retaining them until healing





# B Proximal Humeral Fracture AO/OTA classification

#### Types:

Humerus, proximal end segment, extraarticular, unifocal, 2-part fracture 11A



Humerus, proximal end segment, extraarticular, bifocal, 3-part fracture 11B



Humerus, proximal end segment, articular or 4-part fracture 11C







## B Proximal Humeral Fracture *Treatment*

No guidelines exist!

- **Type A:** Non-operative treatment can be considered
- **Type B:** No significant difference in clinical outcomes between surgery and nonoperative treatment in patients 60 years of age or older
- Type C: Surgical; open reduction and internal fixation or prosthesis





## Post Operative care



# **UZ LEUVEN** Complications are important



⊡ 50-64 y ■ 65-79 y ■ ≥ 80 y

	3oday mortality		1 year m	ortality	5year mortality	
	with	without	with	without	with	without
Any complication	13.3%	0.8%	28.1%	6.9%	57.6%	39.5%

# Why are aged patients at risk?

### **Patient factors**



### Service factors







## What is the solution?

# 



## Implementation of (only) care pathway in hip fracture patients has minimal impact on outcomes

Unadjusted and adjusted patient outcomes and adherence to guidelines (intervention and control group).

	Intervention Control		Difference unadjusted		Difference adjusted*	
	group	gloup	OR (95% CI)	P- value	OR (95% CI)	P-value
6-month mortality	27/229 (11.8%)	9/133 (6.8%)	1.842 (0.838 - 4.045)	0.128	1.819 (0.811 – 4.081)	0.146
30-day mortality	16/234 (6.8%)	3/145 (2.1%)	3.488 (3.446 – 3.530)	<0.001	3.519 (0.983 – 12.592)	0.053
30-day readmission	13/206 (6.3%)	4/139 (2.9%)	1.807 (0.232 – 14.059)	0.572	1.676 (0.214 – 13.145)	0.623
6-month readmission	21/178 (11.8%)	5/118 (4.2%)	2.351 (0.411 – 13.449)	0.337	2.271 (0.404 – 12.775)	0.352
Length of stay	$12.35\pm7.82$	$14.65\pm 6.94$	0.140 (0.009 - 2.141)	0.158	0.122 (0.008 – 1.861)	0.131
Functional status (ADL-score) 30-day after discharge same as before fracture	70/90 (77.8%)	60/73 (82.2%)	0.734 (0.223 – 2.347)	0.602	0.688 (0.198 – 2.394)	0.556
Functional status (ADL-score) 6-month after discharge same as before fracture	72/83 (86.7%)	64/77 (83.1%)	1.330 (0.557 – 3.176)	0.521	1.413 (0.577 – 3.463)	0.450
Mobility status 30-day after discharge same as before fracture	61/132 (46.2%)	37/107 (34.6%)	1.625 (0.962 – 2.748)	0.070	1.600 (0.943 – 2.717)	0.082
Mobility status 6-month after discharge same as before fracture	62/121 (51.2%)	54/99 (54.5%)	0.876 (0.514 – 1.492)	0.625	0.866 (0.506 - 1.482)	0.599
Proportion of patients returning to previous residential status 30-day after discharge	119/160 (74.4%)	98/126 (77.8%)	0.780 (0.317 - 1.919)	0.589	0.900 (0.299 - 2.709)	0.851
Proportion of patients returning to previous residential status 6-month after discharge	122/150 (81.3%)	95/117 (81.2%)	1.009 (0.543 – 1.875)	0.977	1.065 (0.543 – 2.091)	0.854
EQ5D (measured 30-day after discharge)	$\textbf{0.425} \pm \textbf{0.321}$	$\textbf{0.409} \pm \textbf{0.306}$	1.006 (0.910 – 1.111)	0.911	1.000 (0.907 – 1.104)	0.993
SF36 (measured 30-day after discharge)						
Physical functioning	$\textbf{20.61} \pm \textbf{23.91}$	$19.06 \pm 24.97$	1.528 (3.299) +	0.644	$-0.977(2.895)^{+}$	0.938
Social functioning	$41.69 \pm 26.56$	$41.51 \pm 27.22$	-4.893 (5.552) *	0.379	-4.390 (4.265) +	0.619
Role physical	$10.74 \pm 25.26$	$15.36\pm30.86$	0.398 (4.424) +	0.928	2.167 (4.884) *	0.781
Role emotional	$37.09 \pm 47.49$	$\textbf{34.88} \pm \textbf{45.99}$	0.708 (3.373) +	0.834	-0.625 (3.357) *	0.720
Mental health	$60.92 \pm 22.36$	$59.62 \pm 18.70$	2.596 (4.103) +	0.527	2.805 (4.760) *	0.594
Vitality	$49.24 \pm 24.26$	$46.05\pm20.63$	-0.298 (3.670) *	0.936	-0.586 (3.631) *	0.982
Bodily pain	$48.96 \pm 23.41$	$46.98\pm26.08$	1.795 (10.216) *	0.860	6.694 (10.637) +	0.506
General health	$49.21 \pm 22.07$	$49.11 \pm 19.34$	1.209 (3.702) +	0.744	0.316 (4.170) *	0.998
Health change	$30.23 \pm 21.26$	$30.97 \pm 21.28$	–0.315 (2.997) *	0.916	-0.051 (3.188) *	0.989

\*Adjusted for age, gender, type of fracture and Charlson comorbidity index.

n/N (%) or mean  $\pm$  SD, <sup>+</sup> Beta-coefficient (Standard error), bold: significant P < 0.05.

#### Only 2/15 interventions groups included a geriatrician, 1/11 in control group

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### So what does work



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# Ortho-Geriatric Care Models and Outcomes in Hip Fracture Patients: A Systematic Review and Meta-Analysis

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- Reduction of inpatient mortality (RR 0,60 95%CI 0,43-0,84)
- Reduction in long term mortality (RR 0,83 95%CI 0,74-0,94)
- Reduction in length of stay (SMD -0,25 95%CI -0,440-0,05)

### UZ LEUVEN Orthogeriatric care models









Effect of care pathway and orthogeriatric care on older hip fracture patients in the UK



Care pathway composed of:

- prompt admission to orthopedic care
- surgery within 48 hours
- prevention of pressure ulcers
- access to acute orthogeriatric care
- assessment for bone protection therapy
- falls assessment

→ Orthogeriatric care is currently a requirement to obtain the highest refund in the UK Other countries are following this path

### **UZ LEUVEN** Functional outcome of orthogeriatric care



Trondheim study









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Original Article

Do Surgical Trainees Believe They Are Adequately Trained to Manage the Ageing Population? A UK Survey of Knowledge and Beliefs in Surgical Trainees

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#### Results

Of the trainees, <u>68%</u> (n = 107) reported inadequate training and 89.2% (n = 140) supported the inclusion of geriatric medicine issues in surgical curricula. Of the respondents, <u>77.2%</u> (n = 122) were unable to correctly identify the key features required to demonstrate mental capacity, and <u>only 3 of 157 respondents were</u> familiar with the diagnostic criteria for delirium. Support from geriatric medicine was deemed necessary (84.7%, n = 133) but often inadequate (68.2%, n = 107). Surgical trainees support closer collaboration with geriatric medicine and shared care of complex, older patients (93.6%, n = 147).

### **UZ LEUVEN** Is orthogeriatric care cost-effective?



#### Cost-effectiveness of the differing models of secondary prevention care of hip fractures

Representative male*	Difference in costs	Difference in LYs	Difference in QALYs	ICER (£/LY)	ICER (£/QALY)	Prob that is the most cost- effective at £30,000/ QALY
Usual care	-	-	-	-	-	0%
FLS vs. usual care	£1,975 (1297 to 2620)	0.159 (0.095 to 0.218)	0.099 (0.058 to 0.140)	£12,458	£19,955	31%
OG vs. fracture liaison nurse	£635 (-207 to 1496)	0.043 (-0.031 to 0.116)	0.027 (-0.019 to 0.074)	£14,898	£23,407	69%
Representative female						
Usual care	-	-	-	-	-	0%
FLS vs. usual care	£1,909 (1271 to 2562)	0.149 (0.094 to 0.209)	0.093 (0.057 to 0.133)	£12,837	£20,421	28%
OG vs. fracture liaison nurse	£638 (-207 to 1418)	0.044 (-0.032 to 0.110)	0.028 (-0.020 to 0.071)	£14,618	£22,709	72%





- NICE guidelines (UK)
- AAOS guidelines (American Academy of Orthopaedic Surgeons)



## Pre-operative management Guidelines



- Timing surgery: within 24-48h after admission
- Pain management
  - Iv paracetamol, at admission and every 6h
  - Strong evidence supports regional analgesia to improve pre-operative pain control in patients with hip fracture
- Assessment of comorbidities and prevention of complications established care program
  - Anticoagulant therapy
  - Cardiovascular disease
  - Anaemia
  - Medication reconciliation
  - Antibiotic prophylaxis
- Advanced care planning



## Post-operative management Guidelines



• Offer physiotherapie and mobilisation (unless medically or surgically contraindicated) on the day after surgery

### Prevent complications

- Prevention of delirium
- Caloric supplementation with oral nutritional supplements
- Management of post-surgical anaemia
- Offer multidisciplinary management
  - Orthogeriatric assessment
  - Rehabilitation program
  - Secondary fracture prevention
  - Discharge planning





### **Fall prevention**

 $\rightarrow$  dr. Ellen Vlaeyen

### Fracture liaison service

 $\rightarrow$  prof. Evelien Gielen





## Take home message

- Ageing population with increased falls and fractures
- Conventional surgical pathways are not adapted to complex patient group
- Orthogeriatric care models improve length of stay, quality and mortality

