Orthogeriatric Units: Utility in hip fractures

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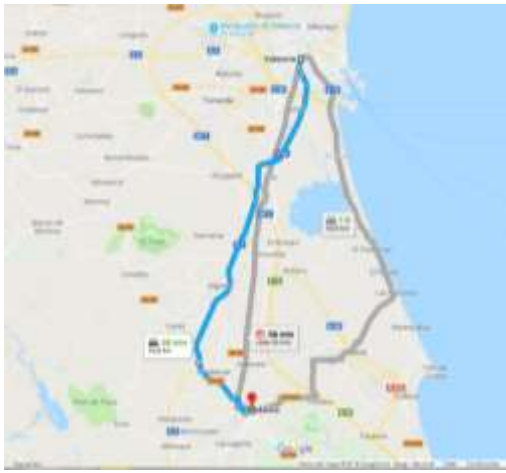


OUTLINE

- ✓ **INTRODUCTION**
- ✓ **HISTORY**
- ✓ **MEDICINE BASED EVIDENCE**
- ✓ **CLINICAL MANAGEMENT**
- ✓ **COSTS**
- ✓ **OUR RESULTS**

INTRODUCTION

Clinical Interventions in Aging

Dovepress
open access to scientific and medical research

Open Access Full Text Article

Clin Interv Aging. 2014;10:13-27 REVIEW

Sunghye Kim[1]
Amber K Brooks[2]
Leanne Groban[2]

Preoperative assessment of the older surgical patient: honing in on geriatric syndromes

>**50%** North Americans will undergo an intervention to:

Age> 65 years.

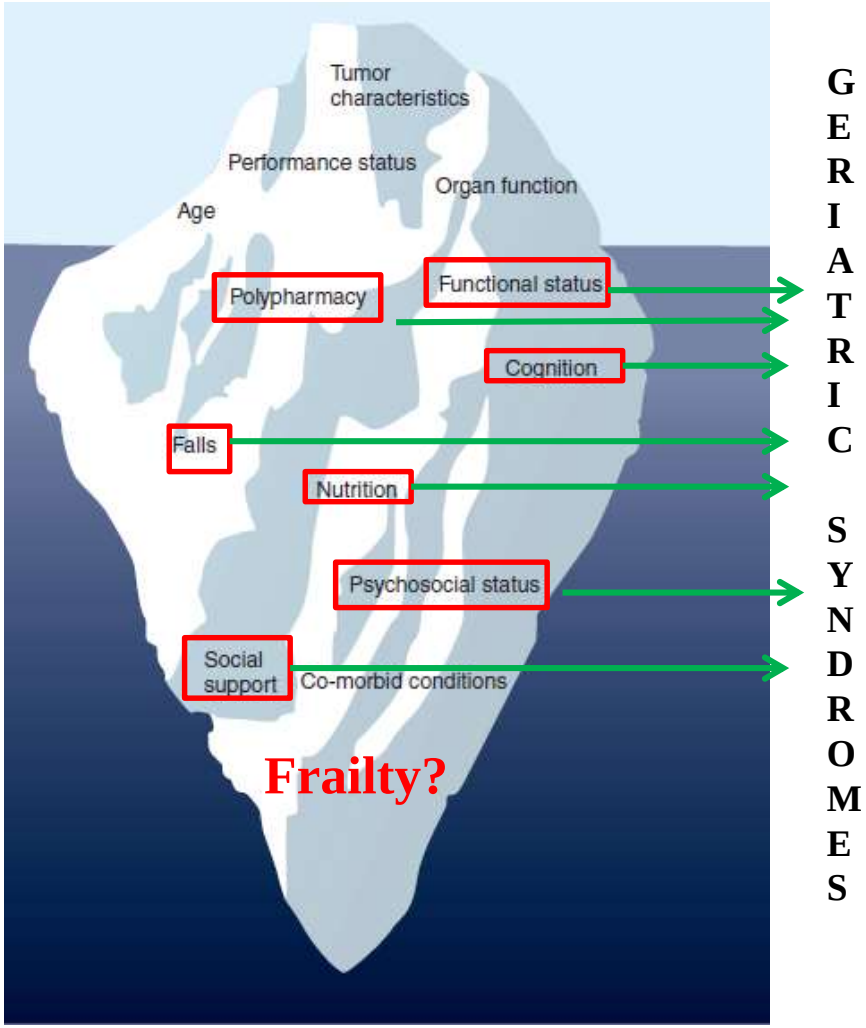
Specific risk measures in the geriatric area:

Good risk predictors

Screening of the physiological / cognitive reserve in older adults allows:

- Identifying vulnerable elders
- Proactive strategies for peri-operative management
- Reducing adverse postoperative outcomes and readmissions

Decision making in surgical geriatric patients.
Patient profile?



DIAGNOSIS
Specific tools

TREATMENT
Specific
Complementary

Fig. The Geriatric Oncology Iceberg: Unrecognized deficits in older adults with cancer.

Joly TA, Williams GR, Bushan S, Pergolotti M, Nyrop KA, Jones EL, Muss HB. Adjuvant treatment for older women with invasive breast cancer. Women Health (Lond). 2016;12(1):129-45.

The Association of Geriatric Syndromes with Hospital Outcomes

Roman Romero-Ortuno, PhD[1,3*], Duncan R. Forsyth, MA[1], Kathryn Jane Wilson, MBBS[1], Ewen Cameron, MD[2], Stephen Wallis, MB BChir[1], Richard Biram, MBBS[1], Victoria Keevil, PhD[1,3]

Journal of Hospital Medicine 2017;12:83-89.

8202 inpatients > 75 y

Non-elective hospitalization

LOS was predicted by

CFS ≥6: OR =1.55; 95%CI, 1.36-1.77; *P* < 0.001
Dementia: OR = 2.16; 95% CI, 1.79-2.61; P < 0.001
Delirium: OR = 3.31; 95% CI, 2.64- 4.15; P < 0.001.

Mortality was predicted by

CFS ≥6: OR = 2.29; 95% CI, 1.79-2.94; *P* < 0.001.

Delayed discharge was predicted by

CFS ≥6: OR = 1.46; 95% CI, 1.27-1.67; *P* < 0.001
Dementia : OR = 2.17; 95% CI, 1.80-2.62; *P* < 0.001
Delirium: OR = 2.29; 95% CI: 1.83-2.85; *P* < 0.001.

Institutionalization was predicted by

CFS ≥6: OR = 2.56; 95% CI, 2.09-3.14; *P* < 0.001
Dementia : OR = 2.51; 95% CI, 2.0-3.14; *P* < 0.001
Delirium: OR 1.93; 95% CI, 1.46-2.56; *P* < 0.001.

Readmission was predicted by

Delirium: OR = 1.36; 95% CI, 1.09-1.71; *P* = 0.006.

Original Article | Journal of INTERNAL MEDICINE

doi: 10.1111/joim.12586

Excess mortality after hip fracture in elderly persons from Europe and the USA: the CHANCES project

M. Katsoulis[1,*], V. Benetou[2,*], T. Karapetyan[1], D. Feskanich[3], F. Grodstein[3], U. Pettersson-Kymmer[4], S. Eriksson[5], T. Wilsgaard[6], L. Jørgensen[7], L. A. Ahmed[7,8], B. Schöttker[9], H. Brenner[9], A. Bellavia[10], A. Wolk[10], R. Kubinova[11], B. Stegeman[12], M. Bobak[12], P. Boffetta[1,13] & A. Trichopoulou[1]

J Intern Med. 2017 Mar;281(3):300-310.

Table 3 *Hazard ratio (HR) for mortality (95% confidence interval) after hip fracture amongst participants in three models*

	Number of cohorts	HR from model 1[a]	HR from model 2[b]	HR from model 3[c]	I^2 for model 3 (*P*-value)
Total population	8	2.39 (1.95–2.92)	2.21 (1.82–2.68)	2.12 (1.76–2.57)	90% (<0.001)
Men	6	2.87 (1.90–4.35)	2.54 (1.78–3.62)	2.39 (1.72–3.31)	78% (<0.001)
Women	7	2.07 (1.67–2.56)	1.97 (1.59–2.44)	1.92 (1.54–2.39)	84% (<0.001)
Elderly (≥70 years at baseline)	5	1.91 (1.49–2.45)	1.88 (1.49–2.38)	1.84 (1.46–2.33)	90% (<0.001)

[a]Model 1: adjusted for age (in years; continuous) and sex (male/female).
[b]Model 2: adjusted for the same variables as in model 1 and additionally for the continuous variables body mass index (in kg m^{-2}), height (in m), daily energy intake (in kcal day^{-1}) and alcohol intake (in g day^{-1}), and the categorical variables vigorous physical activity (yes/no), educational level (none/less than primary/vocational or technical secondary/secondary, not vocational and not technical/college or university), living alone (yes/no), employment status (full-time or part-time employment and not of pensionable age/self-employment/housewife and not of pensionable age/pensionable age and still working/pensionable age and not working/stopped working before retirement age due to poor health/unemployed and not of pensionable age) and smoking status (never/former/current smoker).
[c]Model 3: adjusted for the same variables as in model 2 and additionally hypertension (yes/no) and chronic diseases (cardiovascular disease, diabetes or cancer; yes/no).

HISTORY

Dr. Bobby Irving
Geriatra (1920-2002)

Dr. Michael Devas
Cir. Ortopédico (1920-1999)

Medicine in Old Age

Geriatric Orthopaedics

M. B. DEVAS

British Medical Journal, 1974, 1, 190–192

Orthogeriatrics in the management of frail older patients with a fragility fracture

S. Sabharwal[1] · H. Wilson[2]

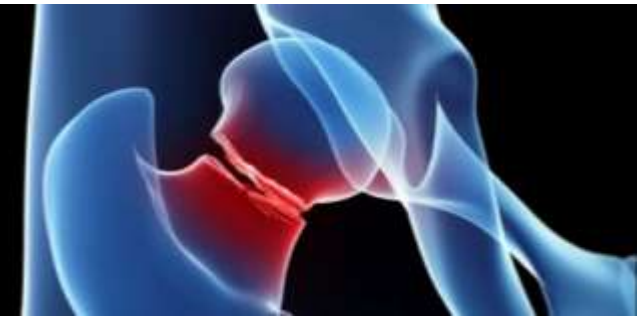
Osteoporos Int. 2015;26(10):2387-99.

Table 1 Types of orthogeriatric models of care and their impact on clinical outcomes

Model of orthogeriatric care	Characteristics of the model	Impact on mortality rate	Impact on length of stay	Other reported outcomes of the model
1. Reactive or usual model of care.	Patient admitted under orthopaedic surgeons with geriatrician review when requested.	Compared to an orthogeriatric liaison model and a joint care model: -Higher inpatient mortality rates [20, 46]	Compared to an orthogeriatric liaison and joint model of care: -Increased length of stay [47, 48]	No significant findings reported
2. Orthogeriatric liaison model of care	Patients admitted under orthopaedic team, Regular geriatrician review on the orthopaedic ward with multidisciplinary input on patient care.	Compared to a usual model of care: -Reduced inpatient mortality rates [46]	Compared to a usual model of care: -Reduced length of stay [48]	Compared to a usual model of care: -Reduced incidence of delirium in patients [49] -Reduced time to surgery [48] -Improved post-operative patient self-care, mobility and depressive symptoms [50]
3. Post-operative geriatric rehabilitation unit	Peri-operative care is provided by the orthopaedic surgeons on their ward with early post-operative discharge to a geriatric rehabilitation unit.	No significant findings reported	Compared to a usual model of care: -Reduced length of stay [51]	Compared to a usual model of care: -Enhancement of activities of daily living and mobility [51]
4. Joint model of care	Admission to a dedicated orthopaedic ward with shared responsibility for the patient by the orthopaedic surgeon and geriatrician.	Compared to a usual model of care: -Reduced inpatient mortality rates [20]	Compared to a usual model of care: -Reduced length of stay [47]	Compared to a usual model of care: -Reduced time to surgery [47] -Fewer post-operative infection and overall complication rates [47]

Box 1 Quality standard for hip fracture (adapted from NICE QS16) [6]

Statement 1 Hip fracture patients are offered a hip fracture programme from admission.
Statement 2 The hip fracture programme team retains leadership for all stages of the pathway of care.
Statement 3 Patients with hip fracture have cognitive assessment.
Statement 4 Patients with hip fracture should receive prompt and effective pain management throughout their hospital stay.
Statement 5 Hip fracture patients should have their surgery on the day of admission, or the day after.
Statement 6 Surgery should be on a planned trauma list, with senior supervision.
Statement 7 Those with displaced intracapsular fracture should receive cemented arthroplasty, or total hip replacement if eligible.
Statement 8 Those with trochanteric fractures above and including the lesser trochanter should receive extramedullary implants in preference to an intramedullary nail.
Statement 9 Physiotherapy assessment should be offered on the day after surgery, with mobilisation at least once a day unless contraindicated.
Statement 10 Patients with hip fracture should be offered early supported discharge.
Statement 11 Patients should be offered a multifactorial falls risk assessment, and offered individualised intervention if appropriate
Statement 12 Patients should be offered a bone health assessment, and commenced on pharmacological treatment as needed prior to discharge from hospital.



Geriatricians in perioperative medicine: developing subspecialty training

British Journal of Anaesthesia 116 (1): 4–6 (2016)

P. Braude[1,*], J. S. L. Partridge[1], J. Hardwick[1], D. J. H. Shipway[2] and J. K. Dhesi[1,3]

Table 1 British Geriatric Society's curriculum for Perioperatve Medicine for Older People

Perioperative Medicine for Older People

To know how to risk assess, optimise and manage the older elective and emergency surgical patient throughout the surgical pathway

Knowledge

Demographics and political landscape relevant to the older surgical patient
National reports and policy drivers relevant to the older surgical patient
Models and pathways of care for older surgical patients
Risk assessment of perioperative morbidity and mortality (including use of tools e.g. PPOSSUM and investigations e.g. Cardiopulmonary exercise testing)
Modification of risk including the use of organ specific national and international guidelines (e.g. European Society Cardiology)
Use of inter-disciplinary and cross-speciality interventions to improve postoperative outcome (e.g. therapy delivered pre-habilitation)

Skills

Clinical assessment with appropriate use of investigations and tools to preoperatively risk assess for perioperative morbidity and mortality
Communication of risk with health professionals and patients/relatives
Timely medical optimisation of comorbidity and geriatric syndromes
Appropriate allocation of postoperative resources (e.g. use of level 2 and 3 care)
Decision making regards rehabilitation, and timely and effective discharge pertinent to the surgical patient
Liaison with patients, anaesthetists and surgeons to ensure shared decision making
Application of ethical and biomedical approaches to ensure appropriate ceilings for escalation of care

Behaviours

Objectively assess the risk-benefit ratio of surgery for older patients without value-laden judgement
Develop confidence in the added value of the geriatrician's role in shared decision making
Appreciate the importance of collaboration between geriatricians, anaesthetists and surgeons in promoting high quality care

Specific learning methods

Attend clinics where comprehensive geriatric assessment methodology is used to improve outcomes
Participate in routine nurse led preassessment and high risk anaesthetic led preassessment of older surgical patients
Liaison work on surgical wards
Attend surgical ward multidisciplinary team meetings
Attend training days and conferences relevant to the older surgical patient (e.g. POPS training day, AAGBI training day, Age Anaesthesia Association meetings)

Falls

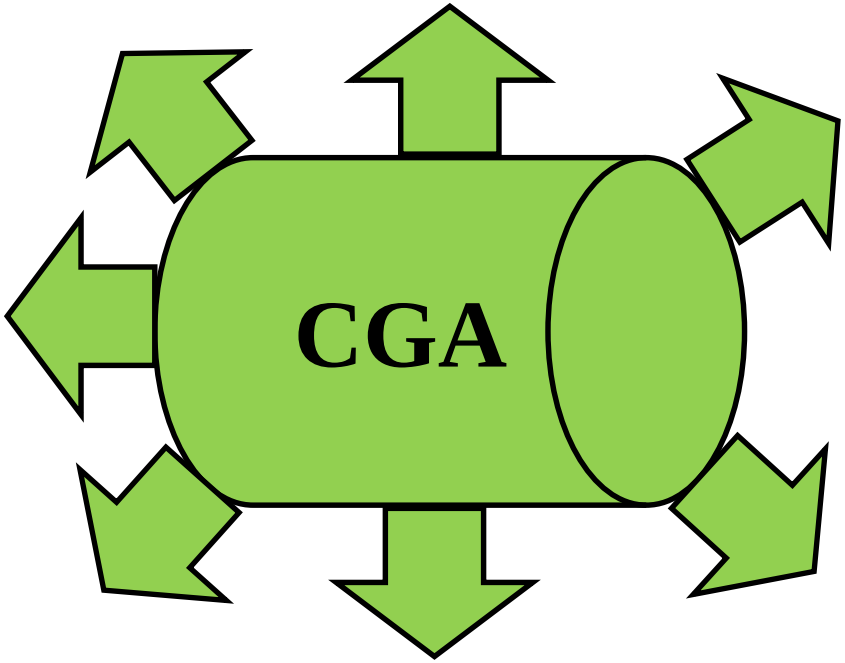
Delirium

Polypharmacy
Start/Stopp

Pressure
sores

Nutrition
Hydration

Sleep
disturbance



Continencia
Urinaria/fecal

Hearing
or visual
Impairment

Pain
Function

Removal of
intravenous
catheters

Social issues

Anemia

Thromboprophylaxis

Mood
disorders

Cognitive
Impairment

Infections

MEDICINE BASED EVIDENCE

Orthogeriatric Units:
Utility in hip fractures.

Published in final edited form as:
J Orthop Trauma. 2014 March ; 28(3): e49–e55. doi:10.1097/BOT.0b013e3182a5a045.

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

Konstantin V. Grigoryan, MS[*], **Houman Javedan, MD**[†], and **James L. Rudolph, MD, SM**[†,‡]
[*]University of Cincinnati College of Medicine

MORTALITY:
In-hospital (RR 0,6 IC95% 0,43-0,84)
1-year mortality (RR 0,83 IC95% 0,74-0,94)
LOS: (SMD -0,25 IC95% -0,44-0,05)

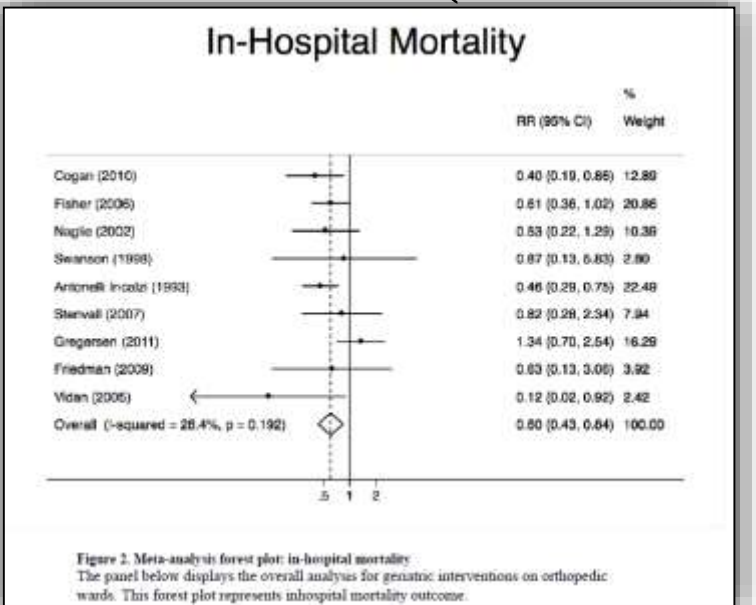


Figure 2. Meta-analysis forest plot: in-hospital mortality
The panel below displays the overall analysis for geriatric interventions on orthopedic wards. This forest plot represents inhospital mortality outcome.

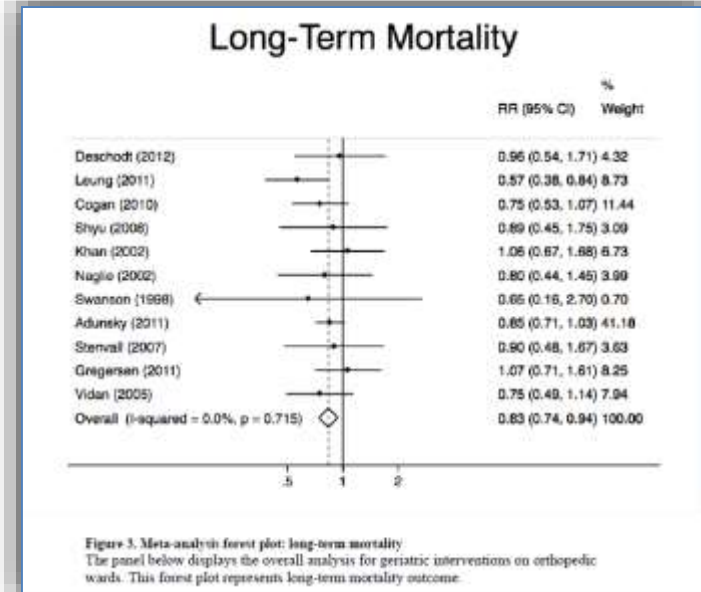


Figure 3. Meta-analysis forest plot: long-term mortality
The panel below displays the overall analysis for geriatric interventions on orthopedic wards. This forest plot represents long-term mortality outcome.

Articles

THE LANCET

Comprehensive geriatric care for patients with hip fractures: a prospective, randomised, controlled trial

Volume 385, No. 9978, p1623–1633, 25 April 2015

Anders Prestmo, MD†, Gunhild Hagen, MPhil†, Olav Sletvold, PhD, Prof Jorunn L Helbostad, PhD, Pernille Thingstad, MSc, Kristin Taraldsen, PhD, Prof Stian Lydersen, PhD, Vidar Halsteinli, PhD, Turi Saltnes, MSc, Prof Sarah E Lamb, PhD, Lars G Johnsen, PhD, Dr Ingvild Saltvedt, PhD

	Comprehensive geriatric care		Orthopaedic care		Difference	
	N	Mean (SE)	N	Mean (SE)	Estimate (95% CI)	p value
Hospital	198		199			
Mobility						
Short Performance Physical Battery	183	1·61 (0·19)	161	1·04 (0·20)	0·56 (0·20 to 1·10)	0·042
1 month	187		183			
Mobility						
Short Performance Physical Battery	173	3·59 (0·19)	160	3·09 (0·20)	0·50 (−0·05 to 1·05)	0·08
Timed Up and Go	140	31·32 (1·53)	120	32·80 (1·66)	−1·48 (−5·92 to 2·95)	0·51
Cognition						
Mini Mental Status Examination	168	23·43 (0·44)	152	22·40 (0·46)	1·03 (−0·22 to 2·27)	0·11
Activities of daily living						
Barthel Index	179	14·53 (0·28)	169	14·21 (0·29)	0·32 (−0·47 to 1·11)	0·43
Nottingham Extended ADL Scale	179	17·05 (1·25)	169	14·87 (1·29)	2·19 (−1·33 to 5·71)	0·22
Depressive symptoms						
Geriatric Depression Scale	169	4·81 (0·25)	154	4·84 (0·26)	0·03 (−0·74 to 0·68)	0·94
Fear of falling						
Falls Efficacy Scale International-short form	158	12·73 (0·35)	139	13·97 (0·37)	−1·24 (−2·24 to −0·24)	0·015
Quality of life						
EQ-5D-3L	176	0·46 (0·26)	165	0·40 (0·26)	0·05 (−0·02 to 0·12)	0·16
4 months	174		170			
Mobility						
Short Physical Performance Battery	165	5·12 (0·20)	160	4·38 (0·20)	0·74 (0·18 to 1·30)	0·010
Timed Up and Go	153	24·05 (1·47)	136	25·94 (1·56)	−1·90 (−6·09 to 2·31)	0·38
Cognition						
Clinical Dementia Rating scale	159	3·59 (0·35)	145	4·38 (0·36)	−0·79 (−1·70 to 0·20)	0·12
Mini Mental Status Examination	165	23·92 (0·44)	156	22·83 (0·46)	1·10 (−0·15 to 2·34)	0·08
Activities of daily living						
Barthel index	168	16·31 (0·29)	165	15·30 (0·29)	1·01 (0·21 to 1·81)	0·013
Nottingham Extended ADL Scale	168	33·59 (1·29)	164	27·42 (1·31)	6·17 (2·57 to 9·78)	0·001
Depressive symptoms						
Geriatric Depression Scale	165	4·32 (0·25)	155	4·75 (0·26)	−0·42 (−1·14 to 2·90)	0·24
Fear of falling						
Falls Efficacy Scale International—short form	154	11·31 (0·35)	144	12·57 (0·37)	−1·27 (−2·27 to −0·27)	0·013
Quality of life						
EQ-5D-3L	177	0·54 (0·26)	170	0·46 (0·26)	0·08 (0·01 to 0·15)	0·033

(Table 3 continues on next page)

1077 pacientes≥ 70 años

Distancia mínima deambulación previa: 10 m.

CLINICAL PRACTICE

Management of Acute Hip Fracture

N Engl J Med 2017;377:2053-62.

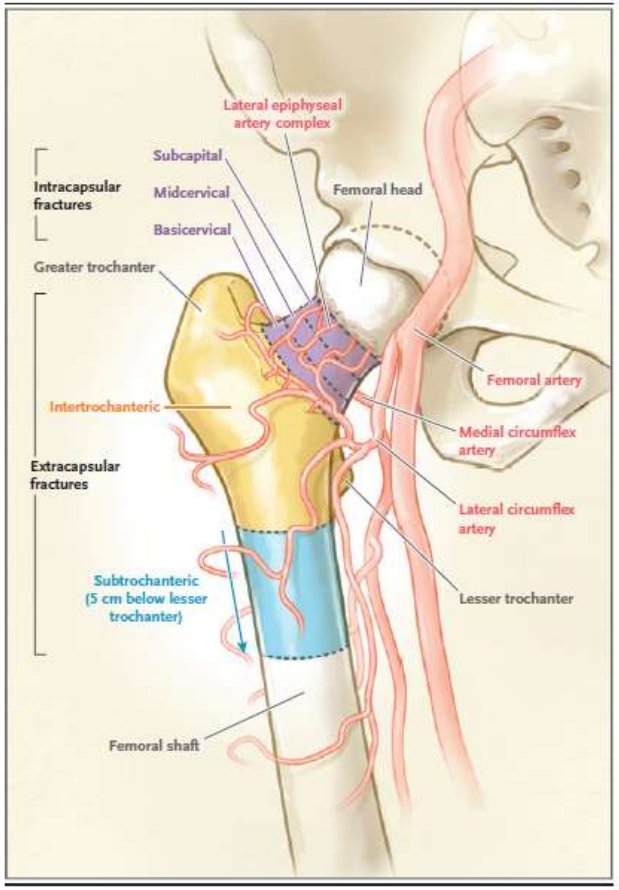
Mohit Bhandari, M.D., Ph.D., and Marc Swiontkowski, M.D.

Comprehensive, interdisciplinary care shown significantly improve:

- Mobility
- Activities of daily living
- Quality of life

Care also includes:

- Provision of venous thromboprophylaxis
- Antibiotic prophylaxis
- Evaluation for and treatment of osteoporosis.



Dedicated Perioperative Hip Fracture Comanagement Programs are Cost-effective in High-volume Centers: An Economic Analysis

Eric Swart MD, Eshan Vasudeva BS, Eric C. Makhni MD, MBA, William Macaulay MD, Kevin J. Bozic MD, MBA

Clin Orthop Relat Res (2016) 474:222–233
DOI 10.1007/s11999-015-4494-4

Orthogeriatric comanagement:

Better outcomes compared totraditional management.

More cost effective than traditional care:

If case volume was more than 54 patients annually (range 41-68)

Cost savings: More than 318 patients annually (range 238-390)

If staff partially dedicated to a comanagement:

More cost effective than risk-stratified comanagement
(incremental cost effectiveness of USD 2300 per QUALY)

Table 3. Reductions in complication rates with comanagement

Complication	Incidence (%)	Relative risk	References
Delirium	5.9–32	0.5–0.64	[22, 46, 70]
Sepsis	6.7	0.54	[22]
Venous thromboembolism	1.3	0.28	[22]
Pneumonia	0.5	0.13	[22]
Intensive care unit admission rate	23	0.48	[17]
Readmission	7.6	0.27–0.97	[22, 61]
Venous thromboembolism prophylaxis	94	1.49	[22]
Osteoporosis treatment	69	5.75	[22, 39]

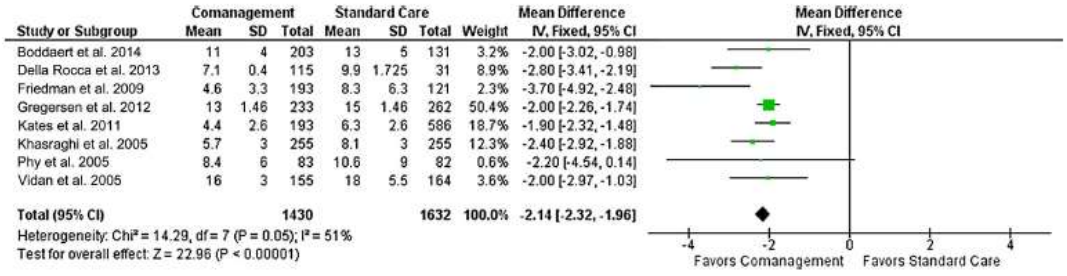


Fig. 1 A forest plot and meta-analysis of the literature shows the reduction in length of stay after implementation of a comanagement protocol, with an average reduction in length of stay of 2.28 days (95% CI, 1.96–2.32). IV = interval value.

Age and Ageing 2016; **45:** 236–242
doi: 10.1093/ageing/afv204
Published electronically 21 January 2016

Clinical effectiveness of orthogeriatric and fracture liaison service models of care for hip fracture patients: population-based longitudinal study

Samuel Hawley[1], M. Kassim Javaid[1,2], Daniel Prieto-Alhambra[1,2,3,4], Janet Lippett[5], Sally Sheard[1], Nigel K. Arden[1,2], Cyrus Cooper[1,2], Andrew Judge[1,2], The REFReSH study group

33,152 primary hip fracture patients (PHF)
1,288 sustained a second hip fracture within 2 years
(age and sex standardised proportion of 4.2%)

Orthogeriatric Units Impact
30-day mortality HR = 0.73 (95% CI: 0.65-0.82)
1-year mortality HR = 0.81 (CI: 0.75-0.87)
No significant impact on time to second hip fracture (**FLS**).

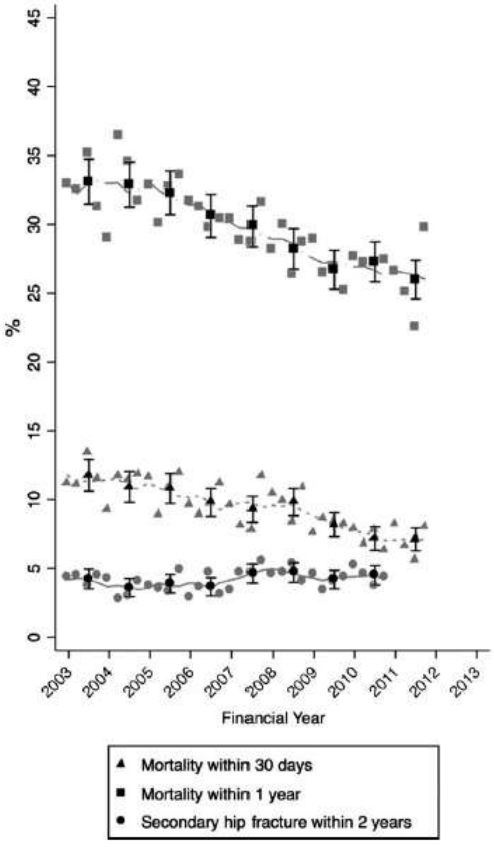


Figure 1. Annual and quarterly regional trends in mortality (30-day and 1-year) and second hip fracture (2-year) after primary hip fracture during the study period.

Orthogeriatrics in the management of frail older patients with a fragility fracture

S. Sabharwal[1] · H. Wilson[2]

Osteoporos Int. 2015 Oct;26(10):2387-99.

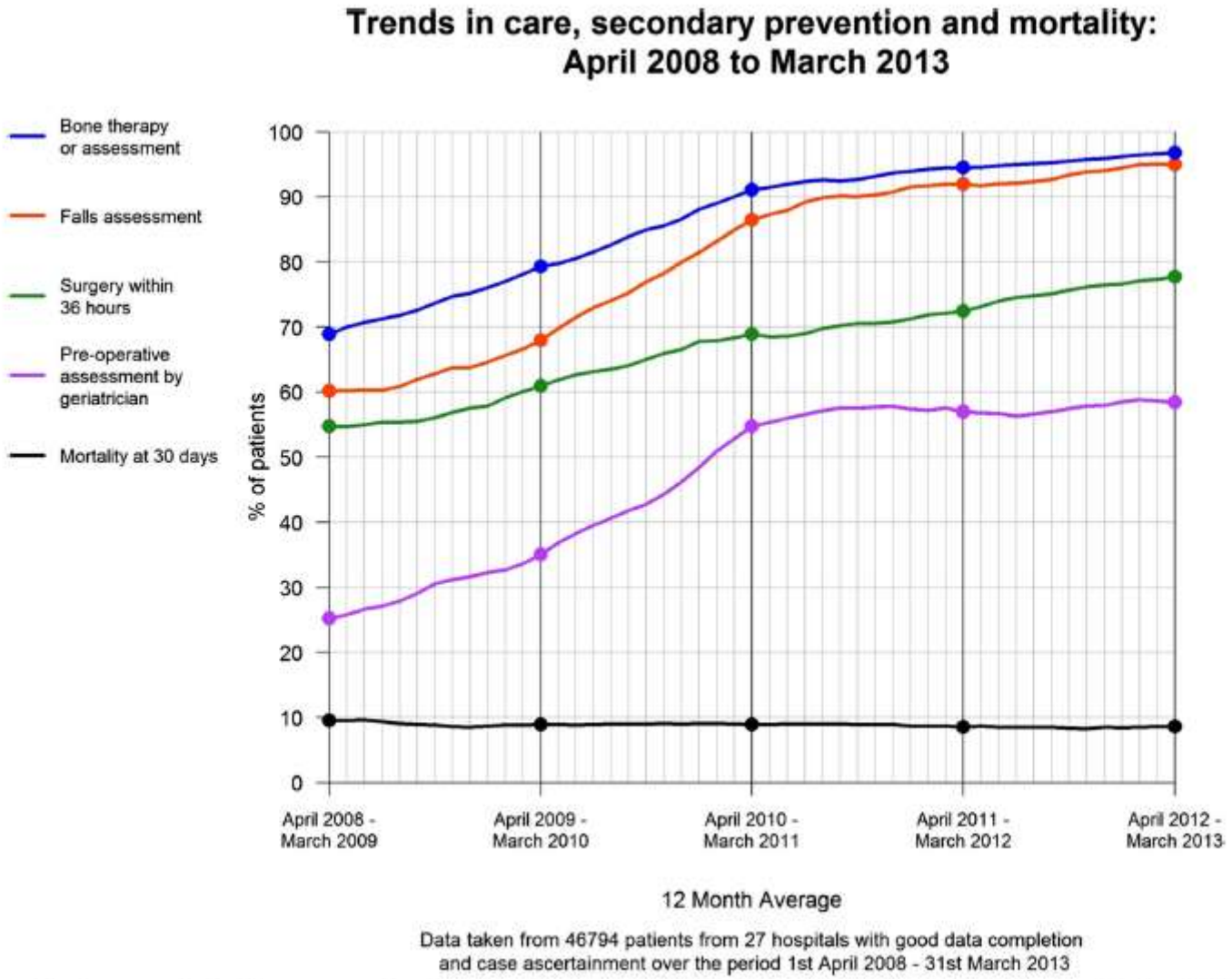


Fig. 1 Trends in the care and clinical outcomes of patients with a hip fracture in the UK (Copyright © National Hip Fracture Database 2013)

OPEN ACCESS Freely available online

PLOS | ONE

PloS One. 2012;7(10):e46175.

Timing Matters in Hip Fracture Surgery: Patients Operated within 48 Hours Have Better Outcomes. A Meta-Analysis and Meta-Regression of over 190,000 Patients

Lorenzo Moja[1,3]*, Alessandra Piatti[4], Valentina Pecoraro[2], Cristian Ricci[3], Gianni Virgili[5], Georgia Salanti[6], Luca Germagnoli[3], Alessandro Liberati[7], Giuseppe Banfi[2,3]

35 studies
191.873 patients/34.448 died.

Surgical Delay

Death: OR 0,74; (95%CI 0,67 - 0,81; p<0.001)
Pressure sores: OR 0.48; 95%CI 0,38 to 0.60; p<0.001)

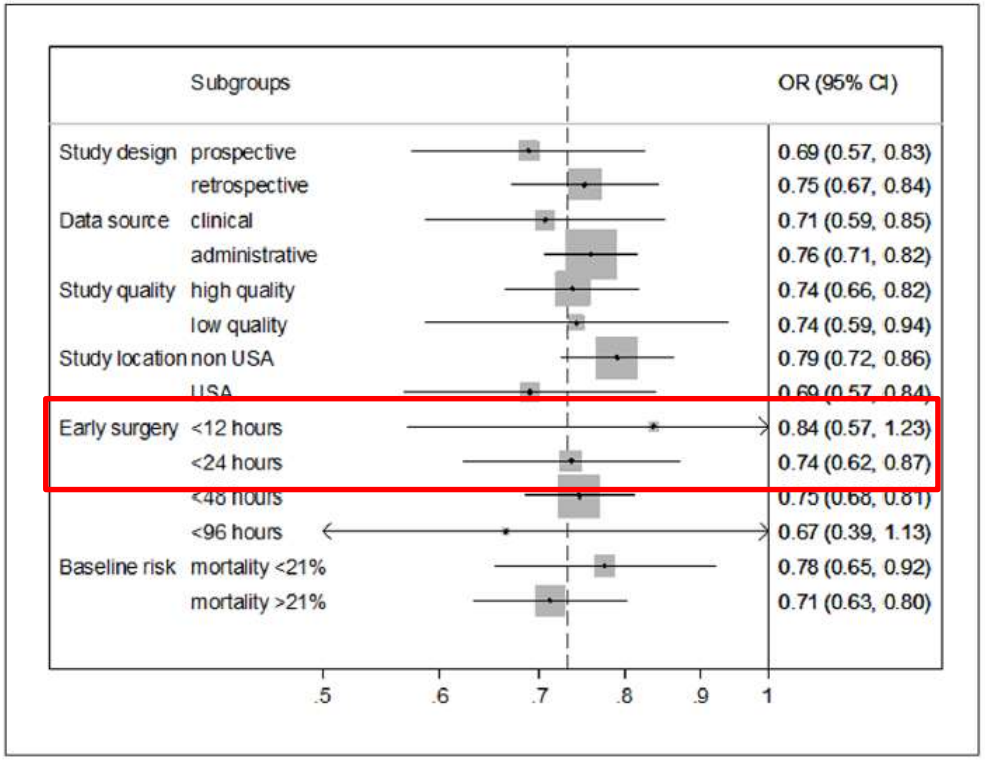
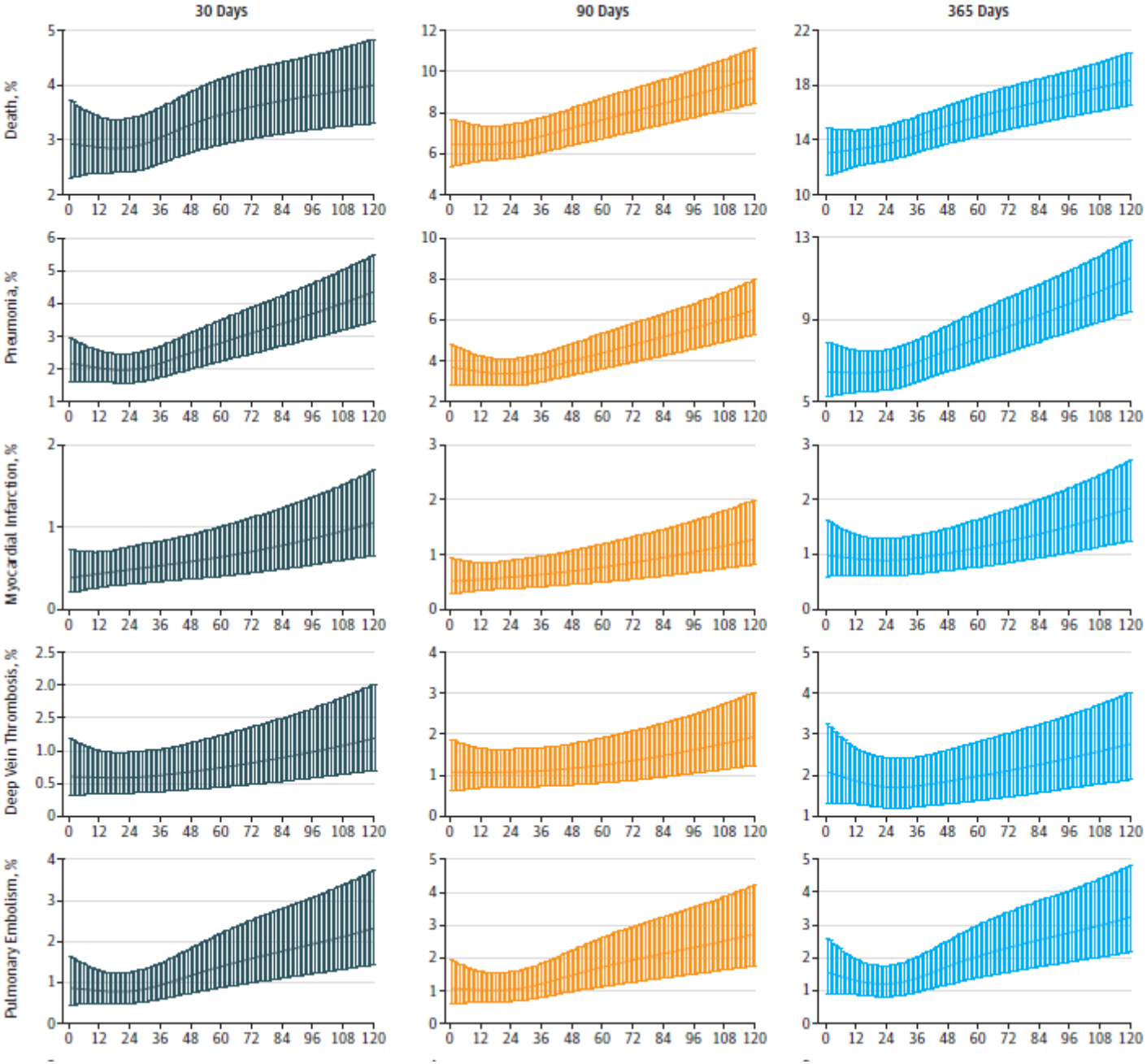


Figure 2. Probability of the Primary, Secondary, and Negative Tracer Outcomes (Involving Hardware Removal and Hip Dislocation)



CLINICAL MANAGEMENT

Orthogeriatric Units:
Utility in hip fractures.

Arch Orthop Trauma Surg (2014) 134:597–604
DOI 10.1007/s00402-014-1959-y

ORTHOPAEDIC SURGERY

Risk factors for complications and in-hospital mortality following hip fractures: a study using the National Trauma Data Bank

Philip J. Belmont Jr. · E'Stephan J. Garcia · David Romano · Julia O. Bader · Kenneth J. Nelson · Andrew J. Schoenfeld

To describe the impact of patient **demographics, injury-specific factors, and medical co-morbidities** on **outcomes after hip fracture**
Using the National Sample Program (NSP) of the National Trauma Data Bank (NTDB).

44,419 incidents of hip fracture. The average age was 72.7.
Sixty-two percent of the population was female and 80 % was white.
The mortality rate was 4.5 % and 12.5 % sustained at least one complication.
Seventeen percent of patients who sustained at least one complication died.

Predictors of mortality
Dialysis
Presenting in shock
Cardiac disease
Male sex
ISS

Predictors of Complications
Dialysis
Obesity
Cardiac disease,
Diabetes
Procedure delay of ≥2 days

Comprehensive Geriatric Assessment for Prevention of Delirium After Hip Fracture: A Systematic Review of Randomized Controlled Trials

Lynn Shields, MBChB, Victoria Henderson, MBChB, and Robert Caslake, MBChB, PhD

J Am Geriatr Soc. 2017;65(7):1559-1565.

4 RCT: 973 patients.

Orthogeriatric Units: Reduction Delirium incidence **RR = 0.81, 95%CI= 0.69–0.94**.

Post hoc analysis: Effect preserved in the team-based intervention but not the ward-based **RR = 0.77, 95% CI = 0.61–0.98.**

Study or Subgroup	CGA Events	CGA Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
1.1.1 Visiting team						
Marcantonio 2001	20	62	32	64	11.0%	0.65 [0.42, 1.00]
Vidan 2005	53	155	67	164	22.1%	0.84 [0.63, 1.11]
Subtotal (95% CI)		**217**		**228**	**33.0%**	**0.77 [0.61, 0.98]**
Total events	73		99			
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.96$, df = 1 (P = 0.33); $I^2 = 0\%$						
Test for overall effect: Z = 2.10 (P = 0.04)						
1.1.2 Ward based intervention						
Lundstrom 2006	56	102	73	97	34.0%	0.73 [0.59, 0.90]
Watne 2014	80	163	86	166	33.0%	0.95 [0.76, 1.17]
Subtotal (95% CI)		**265**		**263**	**67.0%**	**0.83 [0.64, 1.08]**
Total events	136		159			
Heterogeneity: $Tau^2 = 0.02$; $Chi^2 = 2.98$, df = 1 (P = 0.08); $I^2 = 66\%$						
Test for overall effect: Z = 1.41 (P = 0.16)						
Total (95% CI)		**482**		**491**	**100.0%**	**0.81 [0.69, 0.94]**
Total events	209		258			
Heterogeneity: $Tau^2 = 0.01$; $Chi^2 = 4.11$, df = 3 (P = 0.25); $I^2 = 27\%$						
Test for overall effect: Z = 2.70 (P = 0.007)						
Test for subgroup differences: $Chi^2 = 0.15$, df = 1 (P = 0.70), $I^2 = 0\%$						

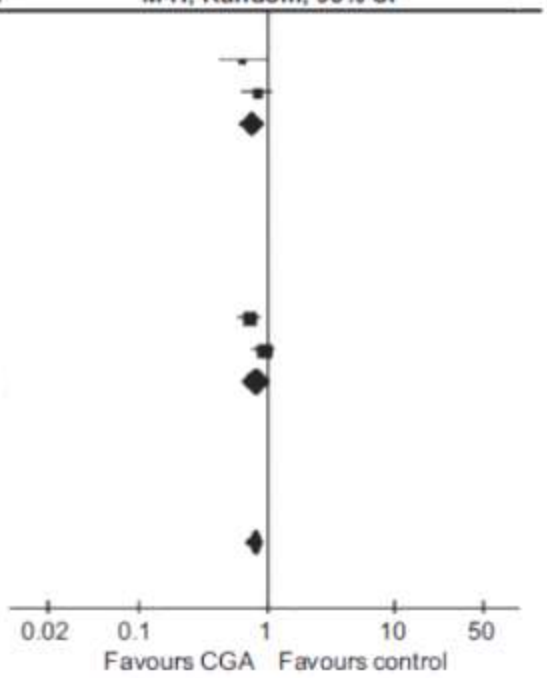


Figure 2. Incidence of delirium metaanalysis. Includes subgroup analysis of ward-based and team-based comprehensive geriatric assessment interventions. Data displayed as risk ratios with 95% confidence intervals calculated using a random-effects model.

Systematic Review and Meta-Analysis

Medicine®

OPEN

Comprehensive geriatric care reduces acute perioperative delirium in elderly patients with hip fractures

A meta-analysis

Medicine (Baltimore). 2017 ;96(26):e7361.

Yiyang Wang, BN, Jun Tang, MM, Feiya Zhou, MM, Lei Yang, MD, Jianbin Wu, MM*

6 RCTs & 1 quasi-RCT = 1840 patients

CGA: Reduction perioperative delirium incidence:

OR=0.71; 95% CI= 0.57–0.89; P=.003

No differences in delirium duration neither intensity

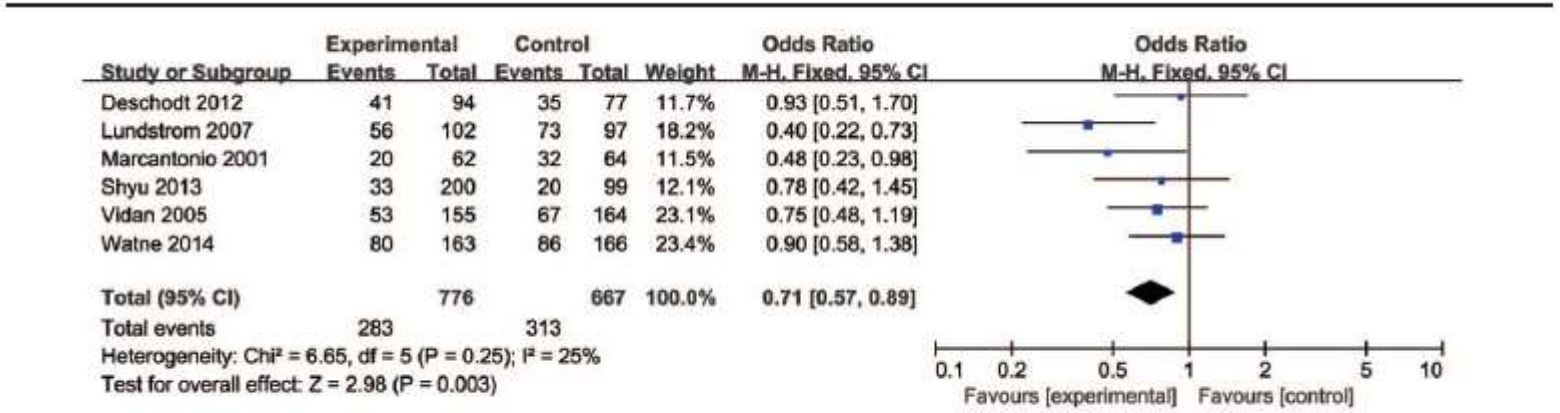


Figure 4. Forest plot of odds ratios and associated confidence intervals for the incidence of perioperative delirium during hospitalization or 1 month postoperatively.

Aging Clinical and Experimental Research

Risk factors for postoperative delirium following hip fracture repair in elderly patients: a systematic review and meta-analysis

Yanjiang Yang[1] · Xin Zhao[3] · Tianhua Dong[1] · Zongyou Yang[1] · Qi Zhang[1] · Yingze Zhang[1,2]

Aging Clin Exp Res. 2017;29(2):115-126.

24 stu
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Risk
Cogni
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Nursi
Heart
Total
Comc

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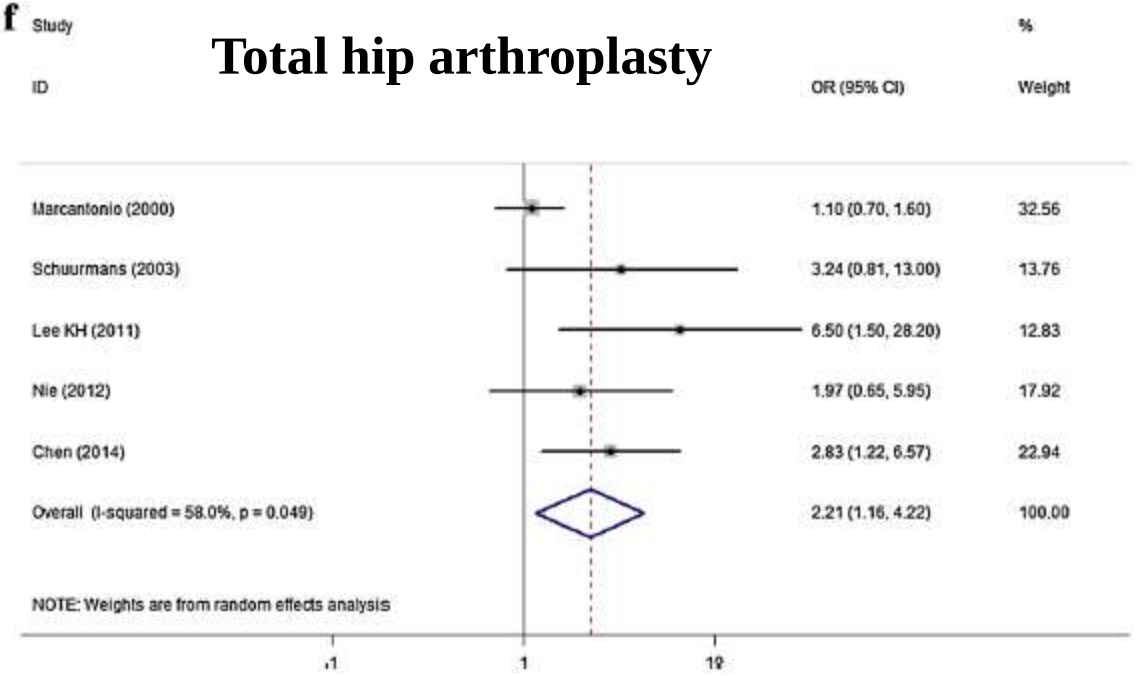


2,26–4,56
,30–6,94
1,65–5,23
1,72–3,53
,16–4,22
,12–1,68

Contents lists available at ScienceDirect

Geriatric Nursing

Geriatr Nurs. 2017; 4572(17)30172-6.

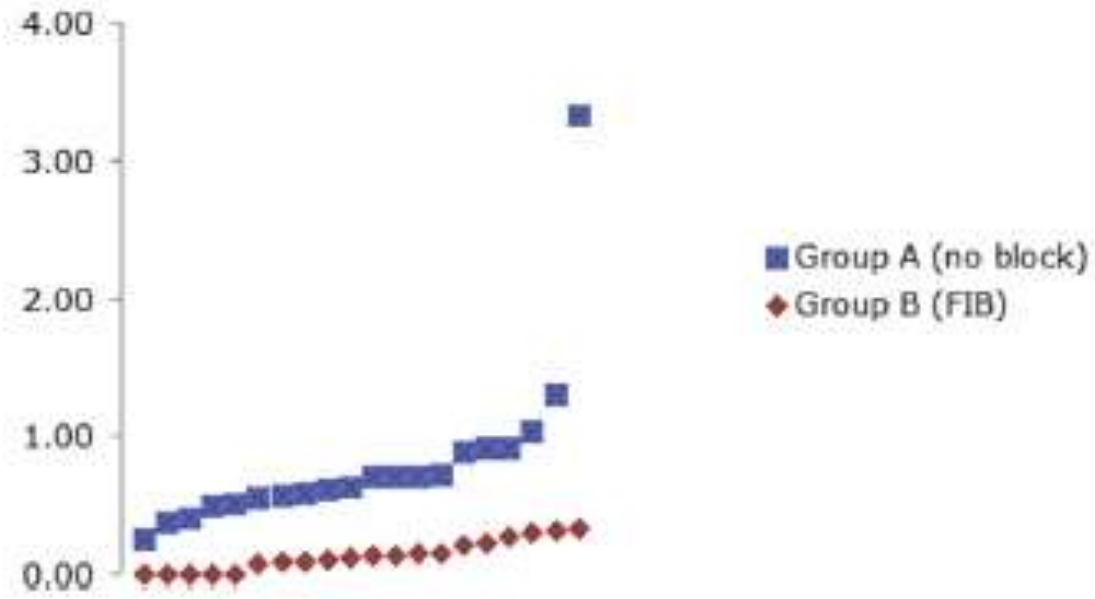
journal homepage: www.gnjournal.com

Can we reduce morphine use in elderly, proximal femoral fracture patients using a fascia iliac block?

Al-Amin M. Kassam, MBBS, BSc (Hons), FRCS (Tr and Orth) [a,*], Anthony T. Gough, MBBS, MSc, MRCS [a], Joanna Davies, FRCP [b], Rathan Yarlagadda, MBBS, FRCS (Tr and Orth) [a]

Table 2
Average pain scor
ferences between

Time post admi
At admission/pr
At 1 h
At 6 h
At 12 h



on in patients' total

Fig. 4. Standardised morphine use for renal function (morphine used/admission creatinine level) showing significantly lower ratio in patients receiving a FIB ($p < 0.05$).

Pain Management Interventions for Elderly Patients With Hip Fracture

Clinical Bottom Line

Effectiveness of Pain Management Interventions

Systemic Analgesics and Multimodal Approaches:
Studies comparing specific regimens of systemic analgesics or comparing multimodal approaches with standard care were limited, and evidence is insufficient to permit conclusions. ○○○

Spinal and Epidural Anesthesia:

The evidence is insufficient to understand the effectiveness, benefits, or adverse events from differing doses, modes of administration, and the addition of opioids to the anesthetic injection. ○○○

Continuous versus single-dose modes of spinal anesthesia do not differ for either 30-day mortality rates or changes in mental status. ●○○

Nerve Blocks:
Reduce the intensity of acute pain (3-in-1, fascia iliaca, femoral, psoas compartment, and combined obturator+femoral blocks). ●●○

Can be as effective as spinal anesthesia for relief of acute pain (psoas compartment, posterior lumbar plexus, and combined lumbar and sacral plexus blocks). ●○○

Reduce the incidence of delirium (NNT = 9).* ●●○

Do not affect mortality rates (pre- and postoperative use). ●○○

Skin Traction:
Does not reduce intensity of acute pain. ●○○

Rehabilitation,† Acupressure, Relaxation Therapy, and TENS‡:
The current evidence indicates that these modalities show some promise for pain relief, but the data are too limited to draw conclusions about the benefits or harms. ○○○

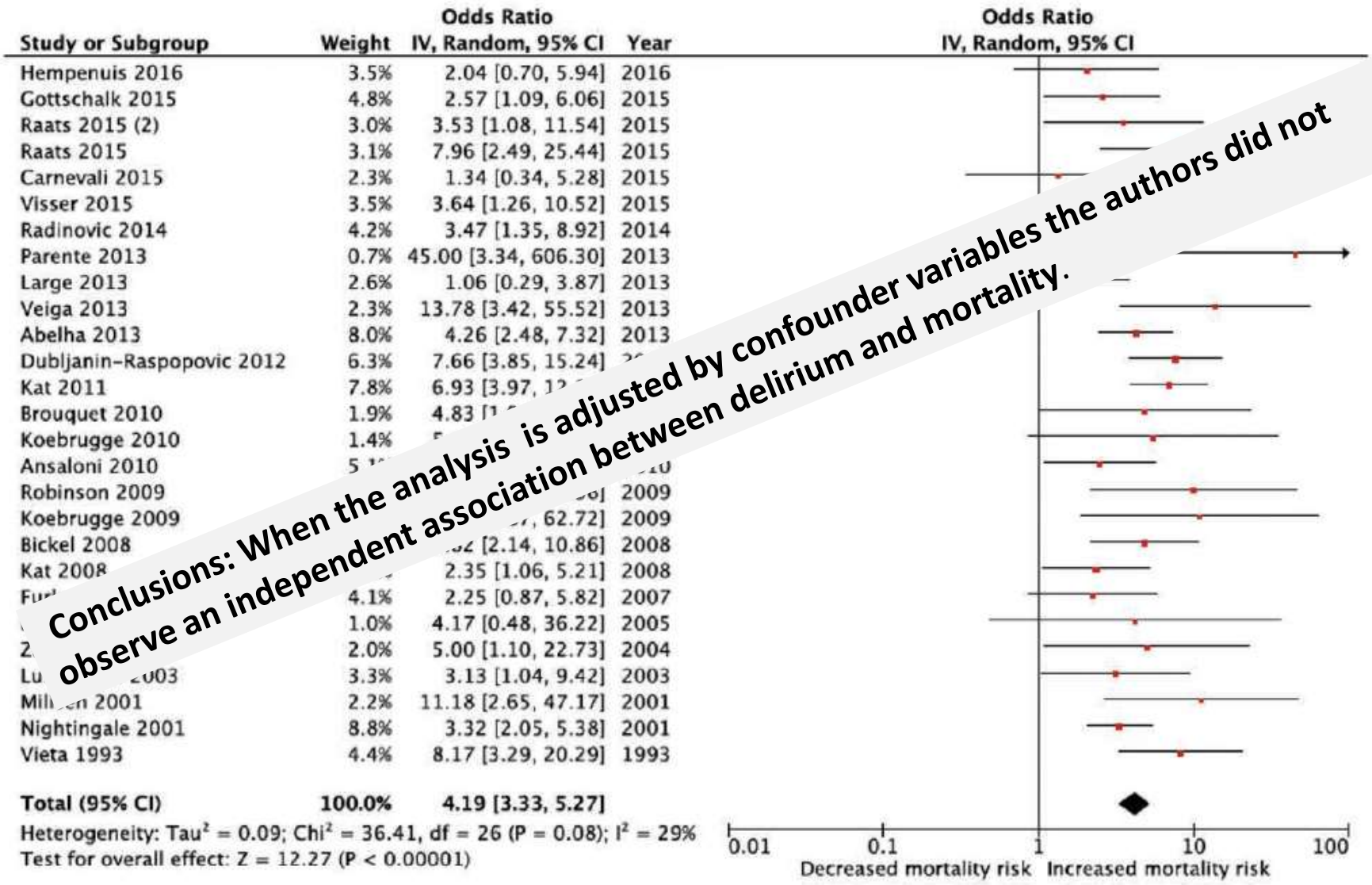
Adverse Events

Overall, adverse event rates were similar in both treated and control groups, but studies were not powered to identify statistically significant differences. Serious adverse events such as myocardial infarction, stroke, and renal failure were either rarely reported or no significant differences were found between groups.

*NNT = number needed to treat; †strengthening and stretching exercises; ‡TENS = transcutaneous electrical nerve stimulation

Strength of Evidence

High:	●●●	There are consistent results from good-quality studies. Further research is very unlikely to change the conclusions.
Moderate:	●●○	Findings are supported, but further research could change the conclusions.
Low:	●○○	There are very few studies, or existing studies are flawed.
Insufficient:	○○○	Research is either unavailable or does not permit estimation of a treatment effect.



Conclusions: When the analysis is adjusted by confounder variables the authors did not observe an independent association between delirium and mortality.

Fig. 4. Tertiary analysis: forest plot of unadjusted event rates available for pooled analysis. Note THAT The point estimates and lower CI values shown in this figure are identical to values found in the articles. Given the variation in statistical techniques used to obtain adjusted odds ratios, the upper CI value in this figure may not be identical to reported values found in the individual studies (see Supplemental Digital Content 2, http://links.lww.com/ALN/B435, which lists all of the studies that met our primary, secondary, and tertiary analyses). df = degrees of freedom.

Effect of the Overlap Syndrome of Depressive Symptoms and Delirium on Outcomes in Elderly Adults with Hip Fracture: A Prospective Cohort Study

J Am Geriatr Soc. 2014;62(9):1640-8.

Kristina S. Radinovic, MD, Ljiljana Markovic-Denic, MD, PhD,†§ Emilija Dubljanin-Raspopovic, MD, PhD,†§ Jelena Marinkovic, PhD,‖¶ Lepa B. Jovanovic, MD, MSc,** and Vesna Bumbasirevic, MD, PhD*§*

Prospective cohort study. 227 patients 78.0(SD 8.2) yo.
Geriatric Depression Scale
Short Portable Mental Status Questionnaire
Confusion Assessment Method.
30 (10.8%) depressive symptoms alone
88 (31.8%) delirium alone
60 (21.7%) overlap syndrome →
99 (35.7%) neither condition.

Higher incidence of:
Vision impairment (P = .02)
Longer time-to-surgery (P = .03),
Lower cognitive function (P < .001)

Table 4. Univariate and Multivariate Linear Regression Analysis of Predictors for Outcomes

	Length of Hospital Stay	Complication Severity Score (Burvill Scale)
Overlap Syndrome	B (95% Confidence Interval) *P*-Value	
Categorical variable (1 = overlap syndrome, 0 = others)		
Unadjusted	6.86 (3.72–10.00) <.001	0.43 (−0.38–1.24) .29
Adjusted[a]	5.17 (1.75–8.59) .003	0.23 (−0.78–0.98) .27
Ordinal scale (0 = none, 1 = depressive symptoms, 2 = delirium, 3 = overlap syndrome)		
Unadjusted	2.69 (1.60–3.78) <.001	0.40 (0.12–0.68) .006
Adjusted[a]	2.20 (0.80–3.61) .002	0.22 (−0.15–0.58) .24

[a] Adjusted for sex, age, education, Charlson Comorbidity Index, history of depression, vision impairment, number of drugs used, Short Portable Mental Status Questionnaire score, American Society of Anesthesiologists score, type of surgery, and type of anesthesia.

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OBSERVATIONAL STUDY
Medicine (Baltimore). 2016;95(5):e2469.

Anemia on Admission Is an Independent Predictor of Long-Term Mortality in Hip Fracture Population

A Prospective Study With 2-Year Follow-Up

Licheng Zhang, PhD, Pengbin Yin, MD, Houchen Lv, MD, Anhua Long, PhD, Yuan Gao, MD, Lihai Zhang, PhD, and Peifu Tang, PhD

Prospective cohort study1330 hip fracture patients

Anemia at 3 different time points: Admission
Postoperation
Discharge, were collected

Age, female sex, ASA score, and intertrochanteric fx associated with admission anemia.

Surgical procedure, surgical duration, blood transfusion, blood loss during the operation, and drainage volume were major risk factors for postoperation anemia.

Risk all-cause mortality **higher** anemia on admission (1.7, 95%CI: 1.2–2.4, P<0.01)

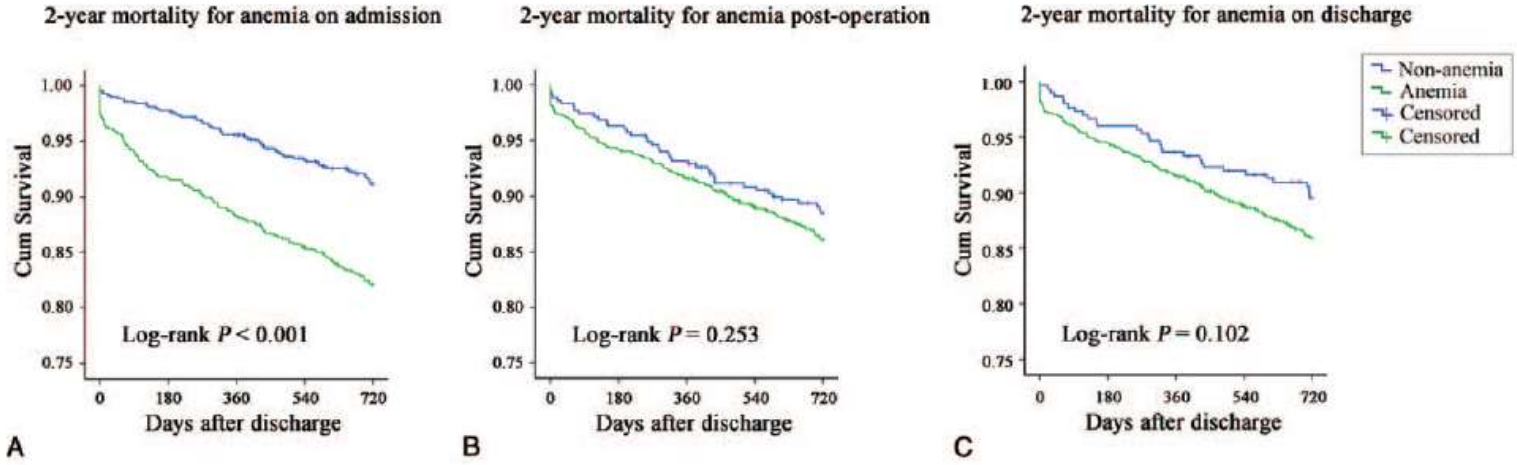


FIGURE 2. The survival curve for 2-year mortality of patients with hip fracture. (A) 2-year mortality for anemia on admission. All-cause 2-year mortality in anemic patients was significantly higher than nonanemic patients by Log-rank test. (B) 2-year mortality for anemia on postoperation. No significant difference was found between anemic and nonanemic patients. (C) 2-year mortality for anemia on discharge. No significant difference was found between anemic and nonanemic patients.

Age and Ageing 2008; **37:** 173–178
doi:10.1093/ageing/afm161

Anaemia impedes functional mobility after hip fracture surgery

NICOLAI B. FOSS[1,2], MORTEN TANGE KRISTENSEN[3], HENRIK KEHLET[4]

487 hip fracture patients consecutive hip fracture patients
Well-defined multimodal rehabilitation programme
Uniform, liberal transfusion threshold.
Hb was measured on each of the first three post-operative days

Anaemia defined as Hb *<100 g/l.*
Functional mobility measured with Cumulated Ambulation Score (CAS).

A significant association between anaemia and the ability to walk independently before the correction of anaemia was present on each of the 3 days separately (*p<0.05). A significant correlation was also found on* each day between the functional score and the Hb level. Multivariate analysis showed that anaemia at the time of the physiotherapy session was an independent risk factor for not being able to walk on the third post-operative day [OR 0.41 (0.14–0.73) *P = 0.002]*.

Table 2. Associations between anaemia, functional mobility and mobilization on the first three post-operative days in 487 hip fracture patients

		Walking independently	Walking with human assistance	Not able to walk	*P*	Mobilisation (hours out of bed)	
1st post-operative day	No anaemia $n = 317$	52 (16%)	160 (51%)	105 (33%)	0.049	3 (1–5)	0.011
	Anaemia $n = 170$	9 (5%)	103 (61%)	58 (34%)		2 (0.5–4.5)	
2nd post-operative day	No anaemia $n = 330$	82 (25%)	175 (53%)	73 (22%)	0.007	4 (2–6)	0.024
	Anaemia $n = 132$	24 (18%)	62 (47%)	46 (35%)		3 (1–5.5)	
3rd post-operative day	No anaemia $n = 314$	124 (40%)	130 (41%)	60 (19%)	0.001	5 (3–7)	0.129
	Anaemia $n = 116$	30 (26%)	47 (41%)	39 (34%)		4 (2.5–6)	

Anaemia defined to be present in any patient who on that given day had a hb measurement of <100 g/l. Data are presented as number of patients (%) for categorical variables and as median (25–75% quartiles) for continuous data. Test for statistical significance performed with chi-square corrected for linear-by-linear association for categorical data.

Key points

- Anaemia is prevalent after hip fracture surgery.
- Anaemia is associated with impaired post-operative ambulation.
- Post-operative anaemia is an independent risk factor for the inability to walk independently.
- Post-operative anaemia is associated with increased mortality and hospitalisation

Table 3. Multivariate analysis of factors impeding functional mobility and the ability to walk independently or with human assistance on the third post-operative day ($n = 430$)

	Ability to walk on the third post-operative day			
	Univariate analysis		Multivariate analysis	
	Odds ratio (95% CI)	*P*	Odds ratio (95% CI)	*P*
>75 years	0.16 (0.07–0.35)	<0.001	0.28 (0.12–0.67)	0.004
Prefracture NMS 0–5	0.19 (0.12–0.32)	<0.001	0.35 (0.20–0.63)	<0.001
Dementia	0.21 (0.13–0.34)	<0.001	0.36 (0.20–0.64)	<0.001
ASA 3–4	0.37 (0.23–0.60)	<0.001	0.69 (0.39–1.22)	0.20
Post-operative medical complication	0.28 (0.17–0.44)	<0.001	0.39 (0.23–0.67)	0.001
Operation is arthroplasty[a]	0.92 (0.57–1.49)	0.73	0.53 (0.17–1.60)	0.26
Operation is sliding hip screw[a]	0.78 (0.50–1.23)	0.29	0.37 (0.13–1.09)	0.07
Operation is intramedullary hip screw[a]	0.52 (0.25–1.09)	0.08	0.25 (0.07–0.91)	0.04
Hb <100 g/l 1st post-operative day	0.47 (0.29–0.75)	0.002	0.41 (0.23–0.73)	0.002

ASA, American Society of Anaesthesiologists Score; NMS, New Mobility Score.

[a] Dummy parameters, standard set as two parallel screws.

Red blood cell transfusion for people undergoing hip fracture surgery (Review)

Cochrane Database Syst Rev. 2015 ;(4):CD009699.

Brunskill SJ, Millette SL, Shokoohi A, Pulford EC, Doree C, Murphy MF, Stanworth S

Seis ensayos clínicos (2722 participantes)
Edad: Rango 81 - 87 años
24% hombres

No evidence of a difference in:

Mortality, at 30 days post hip fracture surgery (RR 0.92, 95%CI 0.67 to 1.26)

Mortality at 60 days post surgery (RR 1.08, 95% CI 0.80 to 1.44)

Low quality evidence of no difference in postoperative morbidity

Very low quality evidence of a lower risk of myocardial infarction in liberal group (RR 0.59, 95% CI 0.36 to 0.96).

Revista Española de Anestesiología y Reanimación

Rev Esp Anestesiol Reanim. 2015;62(Supl 1):57-62

www.elsevier.es/redar

MANEJO PRÁCTICO DE LA OPTIMIZACIÓN PREOPERATORIA Y DEL TRATAMIENTO PERIQUIRÚRGICO DE LA ANEMIA EN DIFERENTES ESCENARIOS CLÍNICOS

Tratamiento de la anemia en cirugía de fractura de cadera

E. García Pascual

Kateros et al[25], 2010	Perioperatorio de fractura de cadera	Controlado, prospectivo, aleatorizado (n = 279)	Grupo 1 (n = 41). Hierro sacarosa 100 mg/24 h i.v. + placebo, 10 días consecutivos desde el ingreso Grupo 2 (n = 38). Hierro sacarosa 100 mg/24 h i.v. + rHuEPOP 20.000 UI, 10 días consecutivos desde el ingreso	La Hb al 7.° día del postoperatorio fue más alta (10,1 frente a 9,1 g/dl; p = 0,019) y los requerimientos transfusionales más bajos (1,5 unidades/paciente frente a 2,5 unidades/paciente; p = 0,034) en el grupo que recibió hierro i.v. + rHuEPO

Tabla 1 Estudios de tratamiento con hierro en la cirugía de fractura de cadera. Programa «Patient Blood Management» *(Continuación)*

Referencia	Escenario	Estudio	Grupos	Resultados
Muñoz et al, 2014	Preoperatorio de fractura subcapital de cadera (hemiartroplastia)	Prospectivo (n = 255)	Grupo 1 (n = 138). Hierro sacarosa 200 mg/48 h i.v. (dosis total 600 mg) + rHuEPO 40.000 UI si Hb < 13 g/dl + transfusión restrictiva, si Hb < 8 g/dl y/o síntomas Grupo 2 (n = 117). Igual que grupo 1 + drenaje de bajo vacío (BelloVac™ ABT)	Reducción en el porcentaje de pacientes transfundidos y en el número de concentrados requeridos en el subgrupo de pacientes con Hb < 13 g/dl (el 16 frente al 46%; p < 0,001)

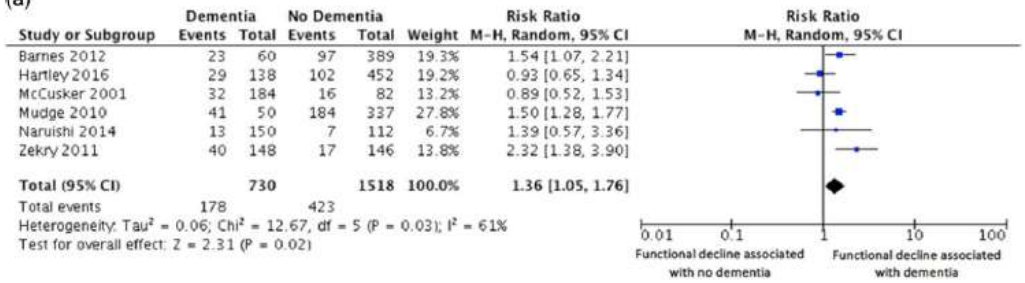
EPO: eritropoyetina; Hb: hemoglobina; i.v.: intravenoso; PAS: programa de ahorro de sangre; rHuEPO: eritropoyetina humana recombinante; s.c.: subcutáneo; v.o.: vía oral.

The association between cognitive impairment and functional outcome in hospitalised older patients: a systematic review and meta-analysis

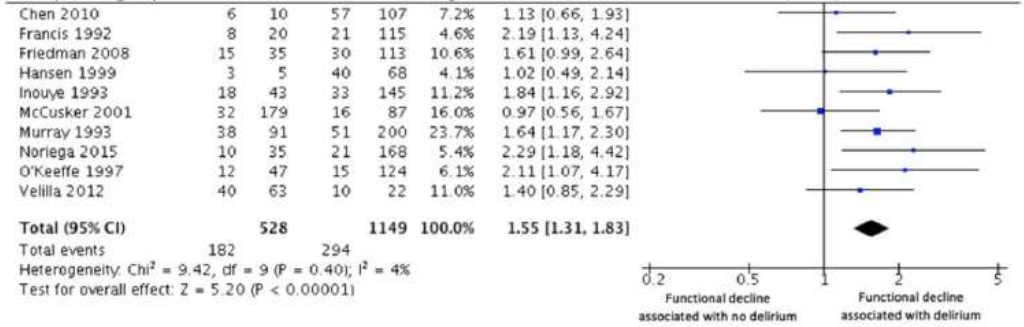
Age and Ageing 2017; **0:** 1–9
doi: 10.1093/ageing/afx007

Peter Hartley[1], Nathalie Gibbins[1], Amanda Saunders[1], Kerry Alexander[1], Eimear Conroy[1], Rebecca Dixon[1], Joseph Lang[1], Jasmine Luckett[1], Tim Luddington[1], Roman Romero-Ortuno[2,3]

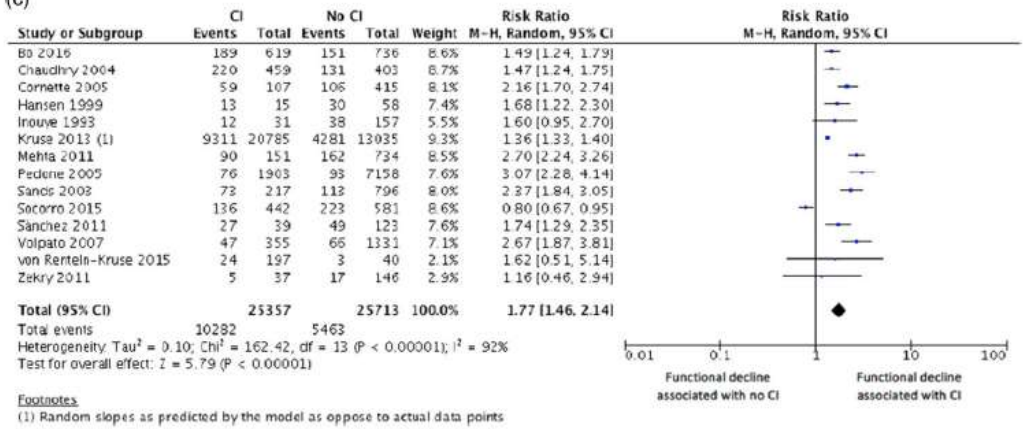
(a)



(b)



(c)



Footnotes
(1) Random slopes as predicted by the model as oppose to actual data points

Figure 2 Meta-analysis comparing the relative risk of functional decline between subgroups with and without cognitive impairments.

Enhanced rehabilitation and care models for adults with dementia following hip fracture surgery (Review)

Cochrane Database Syst Rev. 2015 15;(6):CD010569.

Smith TO, Hameed YA, Cross JL, Henderson C, Sahota O, Fox C

5 RCT= 316 patients.
Low quality evidence on rehabilitation efficacy after hip fracture in these patients

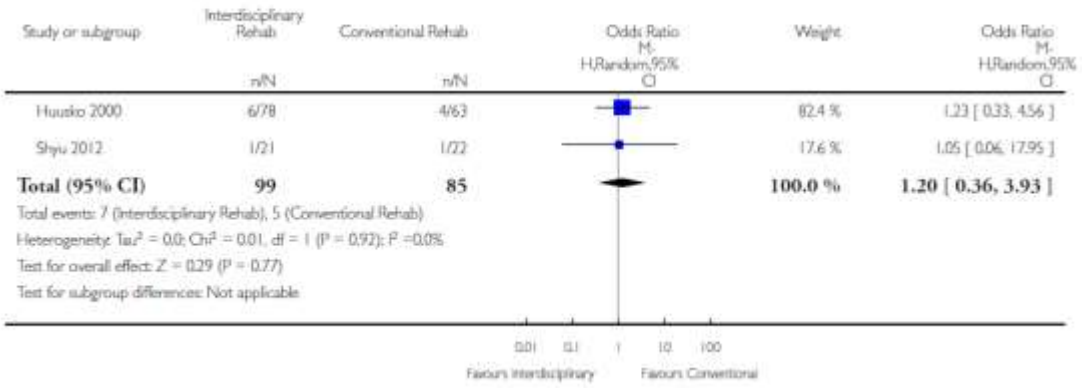
Results
Nursing home after discharge:
3-months : OR= 0,46 95%IC= 0,22-0,95
1-years: OR= 0,90, 95%IC =: 0,40 - 2,03
Delirium incidence: OR=0,73, 95%IC = 0,22- 2,38

Analysis 1.1. Comparison 1 Interdisciplinary geriatric rehabilitation (inpatient and community rehabilitation) versus conventional rehabilitation, Outcome 1 Mortality at 3 months post-hip fracture.

Review: Enhanced rehabilitation and care models for adults with dementia following hip fracture surgery

Comparison: 1 Interdisciplinary geriatric rehabilitation (inpatient and community rehabilitation) versus conventional rehabilitation

Outcome: 1 Mortality at 3 months post-hip fracture



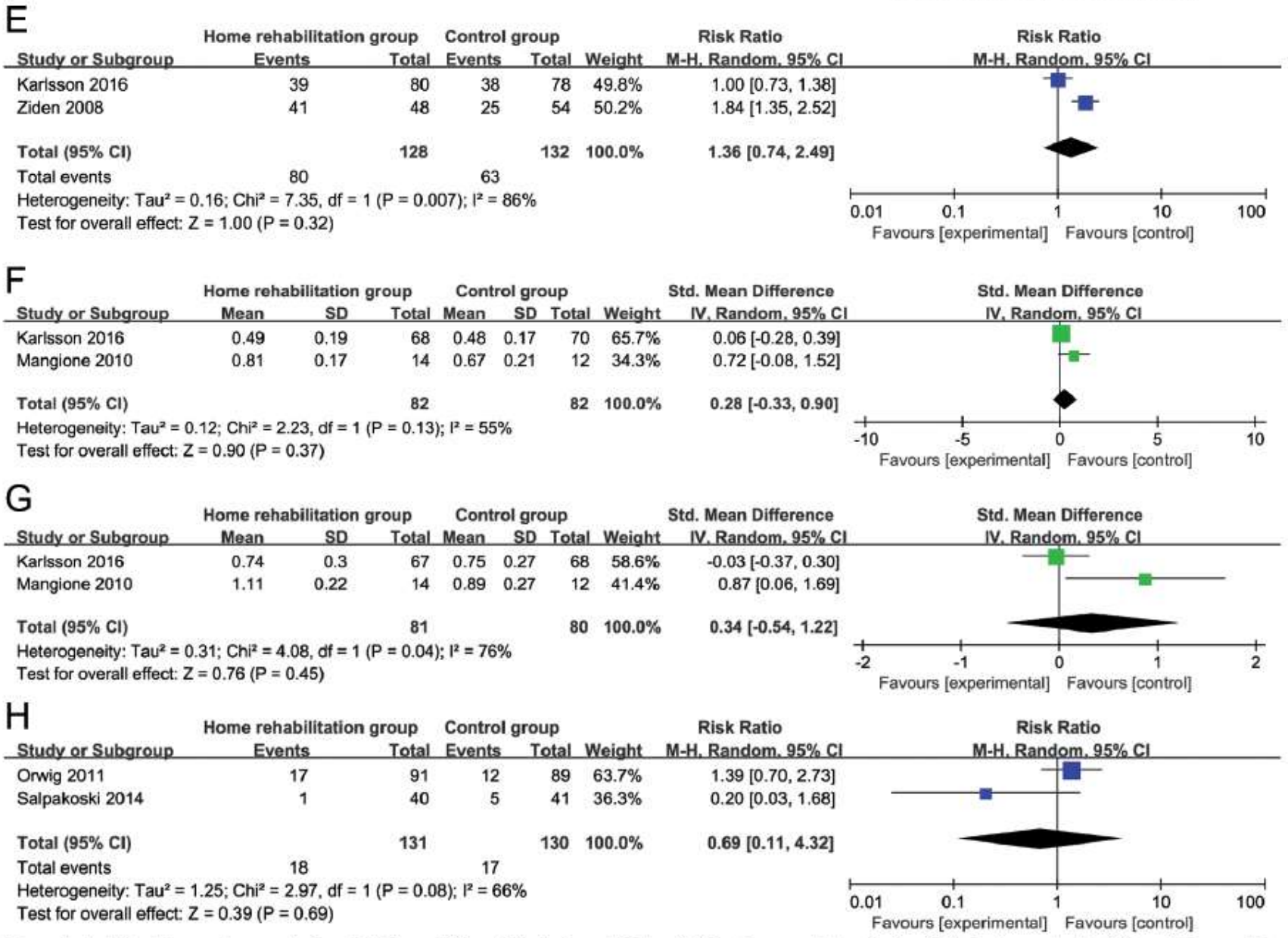


Fig. 2. Forest plot for the meta-analysis of (A) mobility, (B) daily activity, (C) instrumental activity, (D) balance test, (E) walking outdoors, (F) usual gait speed (m/s), (G) fast gait speed (m/s), and (H) emergency department visit.

Prevalence of malnutrition in a cohort of 509 patients with acute hip fracture: the importance of a comprehensive assessment

M Díaz de Bustamante[1], T Alarcón[1,2,3], R Menéndez-Colino[1,2], R Ramírez-Martín[1], Á Otero[2,3,4] and JI González-Montalvo[1,2,3]

European Journal of Clinical Nutrition (2017), 1–5

www.nature.com/ejcn

Table 2. Nutritional parameters in the sample of patients admitted for

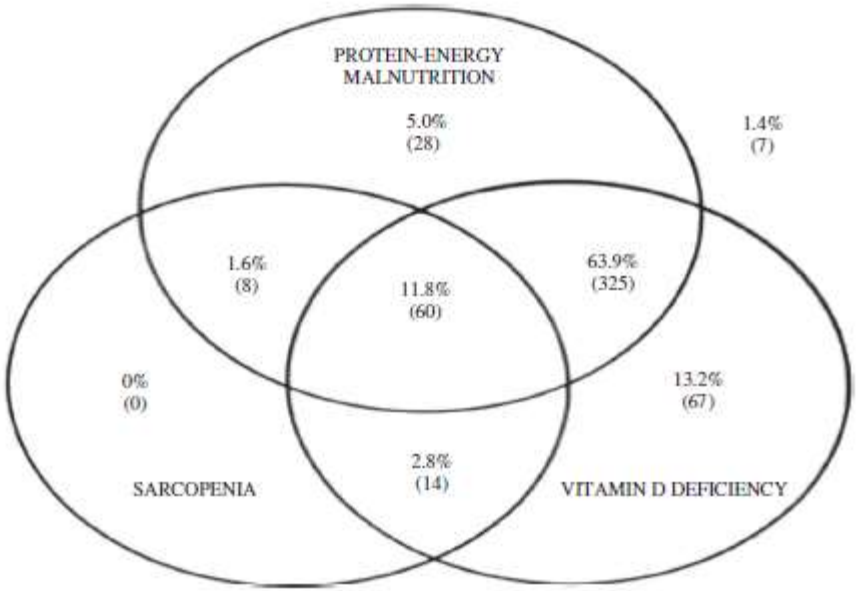


Figure 1. Venn diagram. Association between protein–energy malnutrition, sarcopenia and vitamin D in the 509 patients included. Data shown as % (*n*).

Data shown as mean (s.d.) or *n* (%). [a]Energy malnutrition. [b]Protein malnutrition. Valid cases: number of cases with valid data for each variable.

ORIGINAL ARTICLE

Osteoporos Int (2017) 28:1569–1576
DOI 10.1007/s00198-017-3929-z

The association between sarcopenia and functional outcomes among older patients with hip fracture undergoing in-hospital rehabilitation

F. Landi[1,2] · R. Calvani[1] · E. Ortolani[1] · S. Salini[1] · A. M. Martone[1] · L. Santoro[3] · A. Santoliquido[3] · A. Sisto[1] · A. Picca[1] · E. Marzetti[1]

127 patients, 81.3 (SD 4.8) years, 64.6% females
43 (33.9%) with sarcopenia.

Patients with sarcopenia: Increased risk of incomplete functional recovery
OR 3.07, 95% CI 1.07–8.75

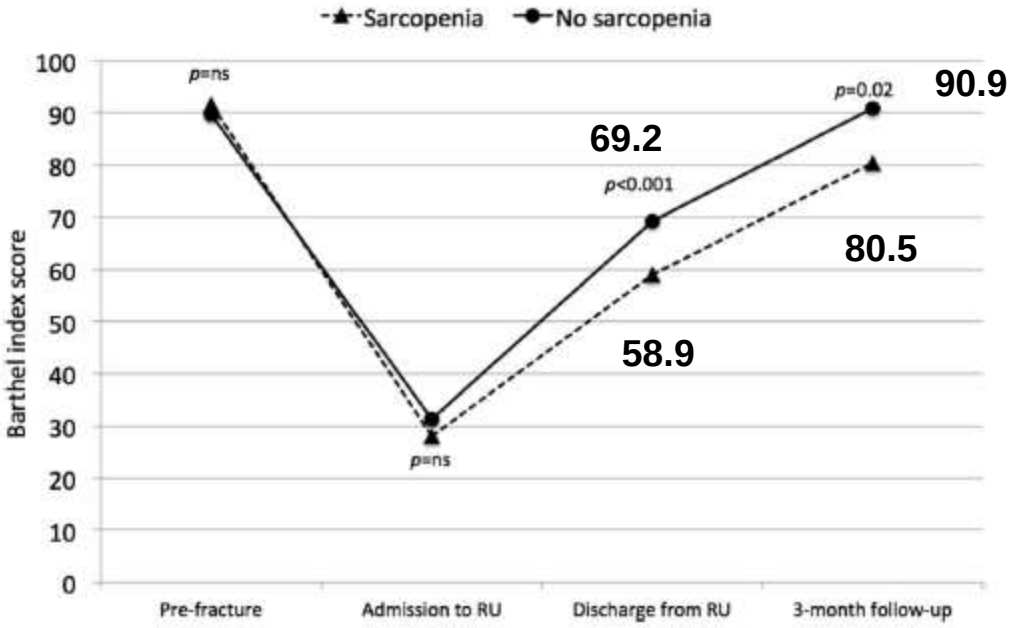


Fig. 1 Trend of Barthel index scores adjusted for age and gender (ANCOVA analysis) from pre-fracture to 3-month follow-up after rehabilitation unit (RU) discharge according to sarcopenia. No significant difference was observed between sarcopenic and non-sarcopenic participants for pre-fracture Barthel index score and at admission to RU. Patients with sarcopenia showed lower scores at discharge from RU and after 3 months compared with those without sarcopenia

Clinical Interventions in Aging Clin Interv Aging. 2015;10:849-58. Dovepress

The role of perioperative oral nutritional supplementation in elderly patients after hip surgery

Liu M, Yang J, Yu X, Huang X, Vaidya S, Huang F, Xiang Z

10 RCTs = 986 patients ≥ 65 a.

No changes in-hospital mortality OR =1.02; 95% CI: 0.62-1.70; *p*=0.93.

Improvements:

Total protein level SMD =1.56;95% CI: 1.06- 2.07; *p*<0.001.

Adverse events OR =0.49; 95% CI: 0.32- 0.73; *p*<0.001.

Wound infection OR =0.17; 95% CI: 0.04- 0.79; *p*=0.02.

Respiratory infection OR =0.26;95% CI: 0.0- 0.94; *p*=0.04

Urinary tract infection OR =0.22;95% CI: 0.05-0.90]; *p*=0.03.

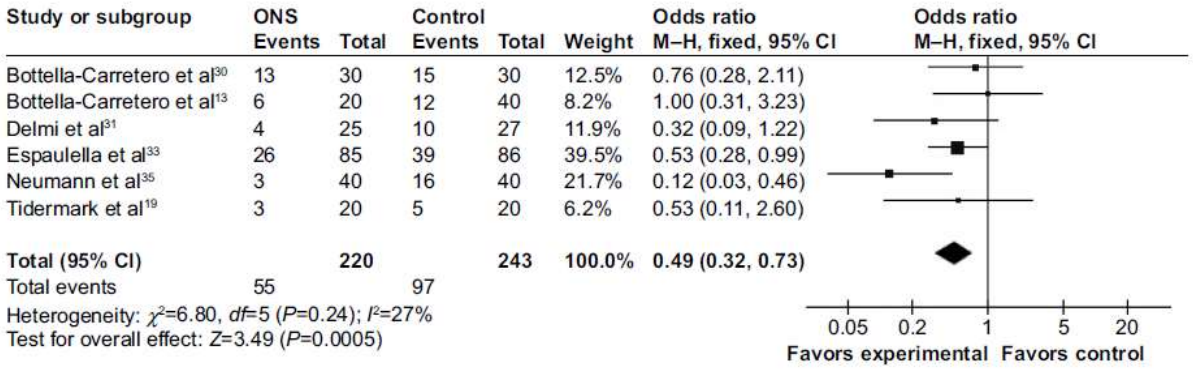


Figure 3 Forest plot for complications.

Notes: This forest plot displays the odds ratios of complications estimated from six cohort studies. The combined data indicate that there were fewer complications in the intervention group compared to the control (OR =0.49 [95% CI: 0.32, 0.73]; P=0.0005). Heterogeneity: I^2=27%; P=0.24.

Abbreviations: CI, confidence interval; *df*, degrees of freedom; ONS, oral nutritional supplementation; OR, odds ratio; M–H, Mantel–Haenszel.

Arch Orthop Trauma Surg. 2016;136(5):639-47

Which frailty measure is a good predictor of early post-operative complicat

100 subjec
82% had s
37.8 % (n
Frailty mea
MFC
REFS

Predicted
complicati

At 6 month
REFS sign
OR 6.19, p

Table 7 REFS logistic regression models for 6 months outcome variables

	Beta	S.E	Wald	OR (95 % CI)	*p* value
Coefficients of model predicting mobility at 6 months[1]					
Mobility prior to fracture[b]	1.83	0.82	4.97	6.25 (1.25–31.32)	*0.03**
REFS[c]	0.32	0.60	0.28	1.37 (0.42–4.46)	0.60
MCF[d]	1.69	1.16	2.14	5.44 (0.56–52.49)	0.14
Coefficients of model predicting BADL at 6 months[2]					
Age[a]	0.01	0.04	0.05	1.00 (0.93–1.09)	0.83
CCM[d]	0.57	0.26	4.80	1.78 (1.06–2.97)	*0.03**
MFC[e]	1.63	1.19	1.87	5.11 (0.49–52.96)	0.17
REFS[c]	1.82	0.65	7.85	6.19 (1.17–22.16)	*0.01**
Coefficients of model predicting IADL at 6 months[3]					
Age[a]	0.10	0.06	2.74	1.01 (0.98–1.23)	0.10
CCM[d]	0.25	0.31	0.65	1.28 (0.70–2.34)	0.42
MFC[e]	1.08	0.79	1.83	2.92 (0.62–13.88)	0.18
REFS[c]	1.47	1.17	1.59	4.36 (0.44–43.16)	0.21
Coefficients of model predicting mortality at 6 months[4]					
REFS[c]	0.67	1.20	0.31	1.95 (0.19–20.28)	0.58
Age[a]	−0.10	0.07	2.41	0.91 (0.79–1.03)	0.12

[1] $R^2 = 0.155$ (Cox and Snell) 0.214 (Nagelkerke), [2] $R^2 = 0.345$ (Cox and Snell) 0.461 (Nagelkerke), [3] $R^2 = 0.188$ (Cox and Snell) 0.341 (Nagelkerke), [4] $R^2 = 0.036$ (Cox and Snell) 0.108 (Nagelkerke)

* $p < 0.05$

[a] Age, defined as a continuous variable

[b] Mobility prior to fracture, defined as two groups: community ambulant and home bound

[c] Reported edmonton frail scale, defined as two groups: REFS ≤ 7 (non-frail) and REFS > 7 (frail)

[d] Charlson's comorbidity index score, defined as a continuous variable

[e] Modified fried criteria, defined as two groups: MFC = 0 (non-frail) and MFC ≥ 1 (frail)

[b] Reported Edmonton Frail Scale, defined as two groups: REFS ≤ 7 (non-frail) and REFS > 7 (frail)

[c] Modified Fried Criteria, defined as two groups: MFC = 0 (non-frail) and MFC ≥ 1 (frail)

[d] $p < 0.05$

[e] Age, gender and ASA included into the model

The New APGAR SCORE: A Checklist to Enhance Quality of Life in Geriatric Patients with Hip Fracture

Joseph Bernstein, MD, Sara Weintraub, BA, Eric Hume, MD, Mark D. Neuman, MD, MSc, Stephen L. Kates, MD, and Jaimo Ahn, MD, PhD

J Bone Joint Surg Am. 2017;99(14):e77

10 elements include attending to problems of :

Alimentation and nutrition

Polypharmacy

Gait

Advance care planning;

Reversible cognitive impairment

Social support

Cataracts or other impairments of vision

Osteoporosis

Referrals

Safe environment after discharge.

Osteoporos Int
DOI 10.1007/s00198-016-3868-0

Osteoporos Int. 2017; 28(3): 775–780.

ORIGINAL ARTICLE

Imminent risk of fracture after fracture

H. Johansson[1] · K. Siggeirsdóttir[2] · N. C. Harvey[3,4] · A. Odén[5] · V. Gudnason[2,6] · E. McCloskey[5] · G Sigurdsson[2] · J. A. Kanis[1,5]

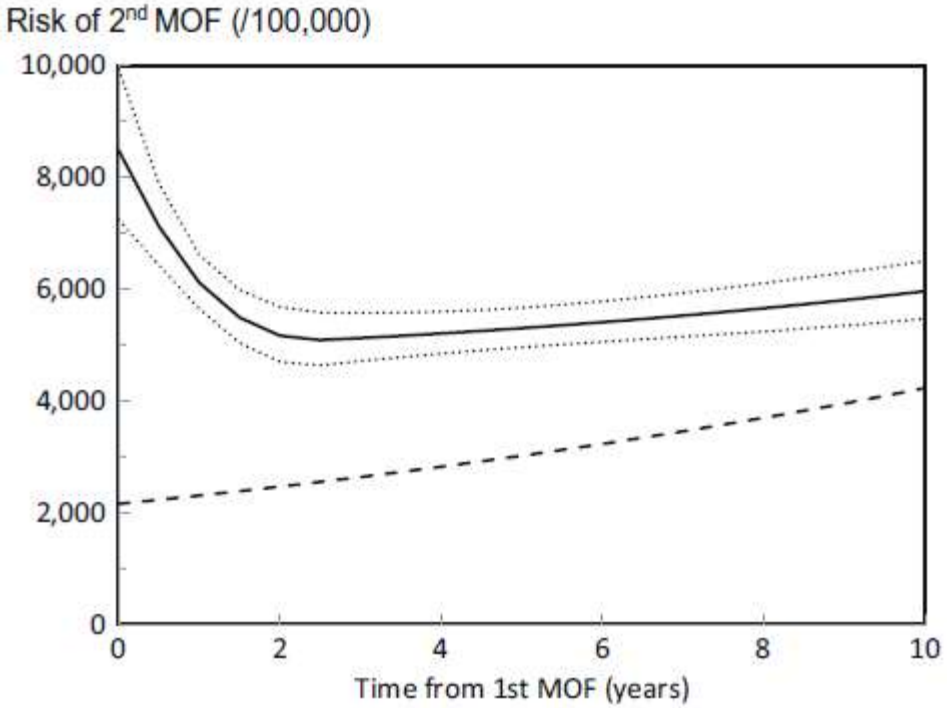


Fig. 1 Risk per 100,000 (95% CI) of a second MOF after a first MOF for a woman at the age of 75 years at her first fracture. Knots for the spline function are set at 0.5, 2.5 and 15 years of follow-up after the first fracture. The *dashed line* is the risk of first MOF in whole population ($n = 18,872$) for a woman 75 years at baseline

Risk of a second MOF:
Increased by 4% for each year of age
(95% CI 1.02–1.06)

41% higher for women than men
(95% CI 1.25–1.59).

Afer 1 year	**After 10 years**
2.7 (CI 2.4– 3.0)	1.4 (CI 1.2–1.6)

Implementation of Models of Care for secondary osteoporotic fracture prevention and orthogeriatric Models of Care for osteoporotic hip fracture

Best Practice & Research Clinical Rheumatology 30 (2016) 536–558

FLS & OTG: Complementary models?

Table 1

Differences between FLS and OGS. The differences highlight the complementary nature of the 2 Models of Care.

Component of model	FLS	OGS
Coordinator	Y	N
Setting of patient identification	Emergency department, outpatient or inpatient	Emergency department or inpatient
Setting of assessment	Inpatient or outpatient	Inpatient
Setting of initiation of management	Inpatient, outpatient or primary care	Mostly as inpatient, rehabilitation or primary care
Types of fractures	Mainly non-hip fractures	Mainly hip fractures
Age	50 years and over	70 years and over
Falls assessment	Y	Y
Scope of responsibility	Secondary fracture prevention	Perioperative management (optimisation for surgery, optimising management of post-operative complications), secondary fracture prevention

Osteoporos Int
https://doi.org/10.1007/s00198-017-4290-y

ORIGINAL ARTICLE

Comorbidities and medication use in patients with a recent clinical fracture at the Fracture Liaison Service

L. Vranken[1,2] · C. E. Wyers[1,2] · R. Y. Van der Velde[1,2] · H. M. Janzing[3] · S. Kaarsemaker[4] · P. P. Geusens[5,6] · J. P. Van den Bergh[1,2,6]

Comorbidities and medications associated with:
Increased fracture risk (two-thirds of patients visiting the FLS).

Proportion of patients having a combination of BRR and FRR increased significantly with:
Age
BMI
Fracture severity.

Systematic evaluation of these factors is important:
Profound assessment of subsequent fracture risk in FLS care.

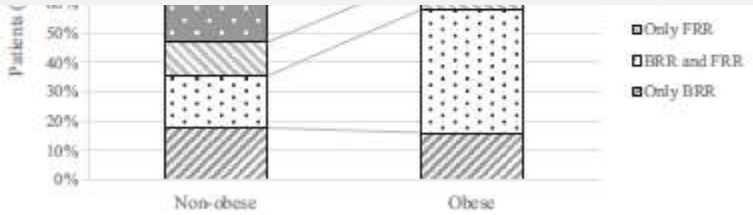
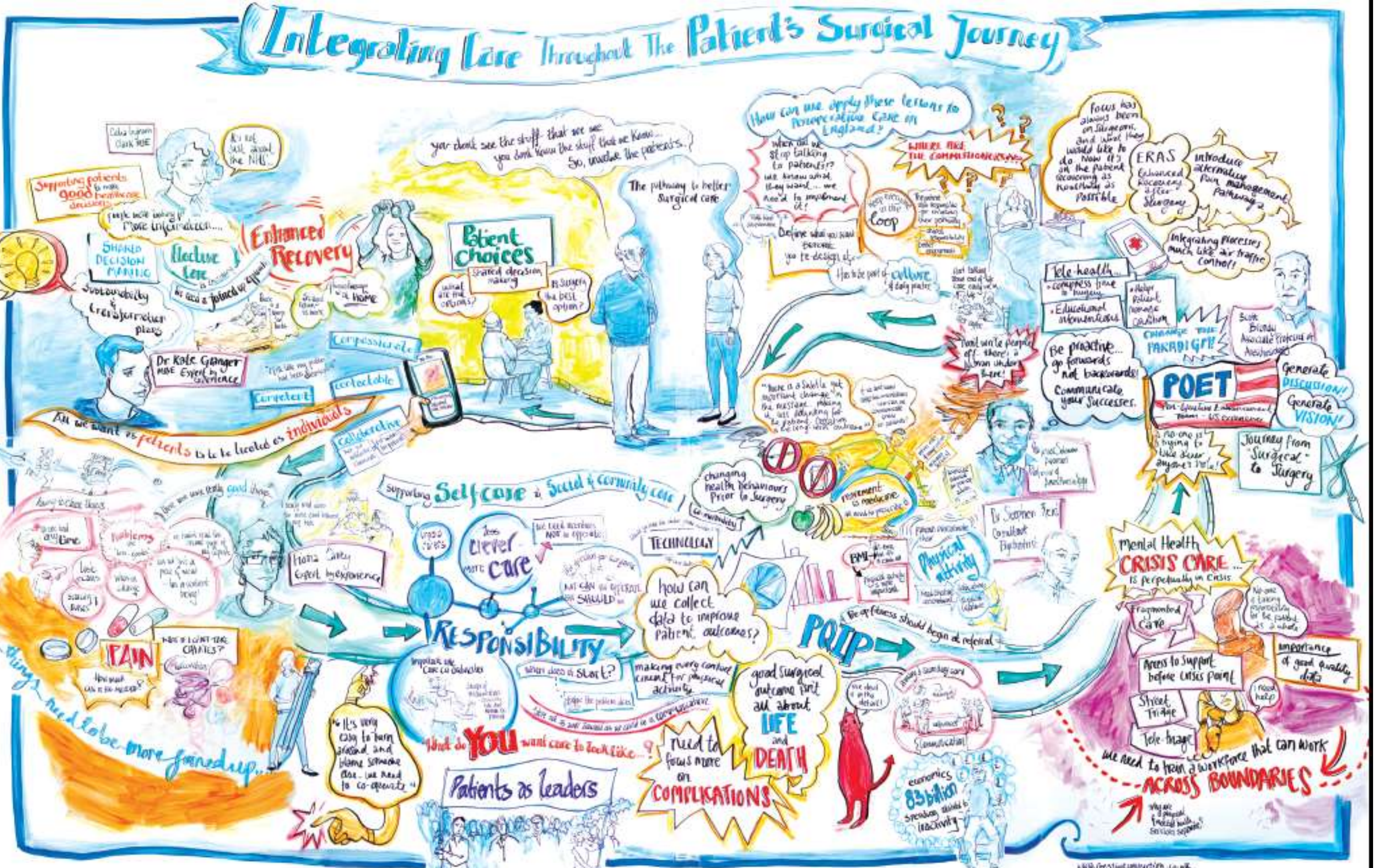


Fig. 2 Proportion of patients with only bone-related fracture risks, only fall-related fracture risks, a combination of both, and none according to fracture type (**a**), age per decade (**b**), and obesity (**c**). The proportion of patients with only BRR (± 20%) and the proprotion of patients with only FRR (± 10%) remained constant; whereas, the proportion of patients with a combination of BRR and FRR increased significantly with fracture severity ($p < .001$), increasing age ($p < .001$), and obesity ($p < .001$). *BRR* bone-related fracture risk, *FRR* fall-related fracture risk



Integrating Care Throughout The Patient's Surgical Journey
you don't see the stuff that we see... you don't know the stuff that we know... So, involve the patients.
The pathway to better surgical care
How can we apply these lessons to Perioperative Care in England?
When did we stop talking to patients!? We know what they want... we need to implement it!
WHERE ARE THE COMMISSIONERS?
Keep everyone in the loop
Define what you want before you re-design it.
Has to be part of culture of daily practice
Focus has always been on surgeons. And what they would like to do. Now it's on the patient recovering as healthily as possible
ERAS Enhanced Recovery After Surgery
Introduce alternative pain management pathways
Integrating processes much like air traffic control!
Supporting patients to make good healthcare decisions
It's not just about the NHS
Enhanced Recovery
Shared Decision Making
Elective Care
Sustainability & transformation plans
Dr Kate Granger MBE Expert by Experience
Compassionate
Competent
Collaborative
Patient Choices
Shared decision making
What are the options?
Is surgery the best option?
All we want as patients is to be treated as individuals
Tele-health
Educational interventions
Be proactive... go forwards not backwards! Communicate your successes.
CHANGE THE PARADIGM!
POET
Generate DISCUSSION!
Generate VISION!
Journey from "Surgical" to Surgery
Changing health behaviours prior to surgery
Movement is medicine
Dr Stephen Ford Consultant Psychiatrist
Physical activity
Supporting Self-care & Social & community care
Less clever more care
TECHNOLOGY
How can we collect data to improve patient outcomes?
Hons Carey Expert by Experience
PAIN
RESPONSIBILITY
When does it start?
Making every contact count for physical activity
Good surgical outcome isn't all about LIFE and DEATH
POQIP
Pre-op fitness should begin at referral
"It's very easy to turn around and blame someone else... we need to co-operate"
What do YOU want care to look like...?
Need to focus more on COMPLICATIONS
Patients as leaders
economics 8.3 billion spending related to inactivity
Mental Health CRISIS CARE... is perpetually in crisis
Fragmented care
Access to support before crisis point
Importance of good quality data
Street Triage
Tele-triage
We need to train a workforce that can work ACROSS BOUNDARIES
things need to be more joined up...
www.creativeconnection.co.uk

Clinical Interventions in Aging

Dovepress

open access to scientific and medical research

Tarazona-Santabalbina FJ, Belenguer-Varea A, Rovira E, Cuesta-Peredo D. Clin Interv Aging. 2016;11:843-56.

Open Access Full Text Article

REVIEW

Orthogeriatric care: improving patient outcomes

Questions opened

Analgesic, anesthetic and thromboembolic prophylaxis protocols

Surgical and rehabilitation approach to patients with cognitive impairment

Efficiency of rehabilitation programs (Intermediate care)

Age and Ageing 2014; **43:** 301–305
doi: 10.1093/ageing/afu011
Published electronically 20 February 2014

NEW HORIZONS

Orthogeriatrics moving forward

DARREN AW, OPINDER SAHOTA

Proactive care of older people undergoing surgery ("POPS"): Designing, embedding

Comparison of 2 cohorts of elective orthopaedic patients (pre-POPS vs POPS, N = 54) showed:

POPS group had:

1.- Fewer post-operative medical complications including:

Pneumonia (20% vs 4% [p = 0.008])

Delirium (19% vs 6% [p = 0.036])

A proactive multidisciplinary CGA service indicate that it is:

- A feasible approach to providing more efficient

- Clinically effective care for older elective surgical patients

- With potential for wide NHS implementation.

3.- Length of stay was reduced by 4.5 days:

Fewer delayed discharges relating to medical complications (37% vs 13%)

Waits for OT assessment or equipment (20% vs 4%).

- Dressing
- Walking
- Likely to need a complex discharge package

COSTS

Orthogeriatric Units:
Utility in hip fractures.

Arthritis Care & Research
Vol. 64, No. 5, May 2012, pp 751–757
DOI 10.1002/acr.21580

Hip Fractures in the United States: 2008 Nationwide Emergency Department Sample

SUNNY H. KIM,[1] JOHN P. MEEHAN,[2] THOMAS BLUMENFELD,[1] AND ROBERT M. SZABO[1]

USA: 341.000 (95%CI 323.000–358.000) patients with hip fractures in 2008.

90% were age >60 years.

Ages 60–85 years, risk of fracture doubled for every 5- to 6-year increase in age.

The hip fracture risk increased slowly after age 85 years.

The overall trochanteric-to-cervical fracture ratio was nearly 2:1.

Trochanteric fractures were twice as common as cervical fractures.

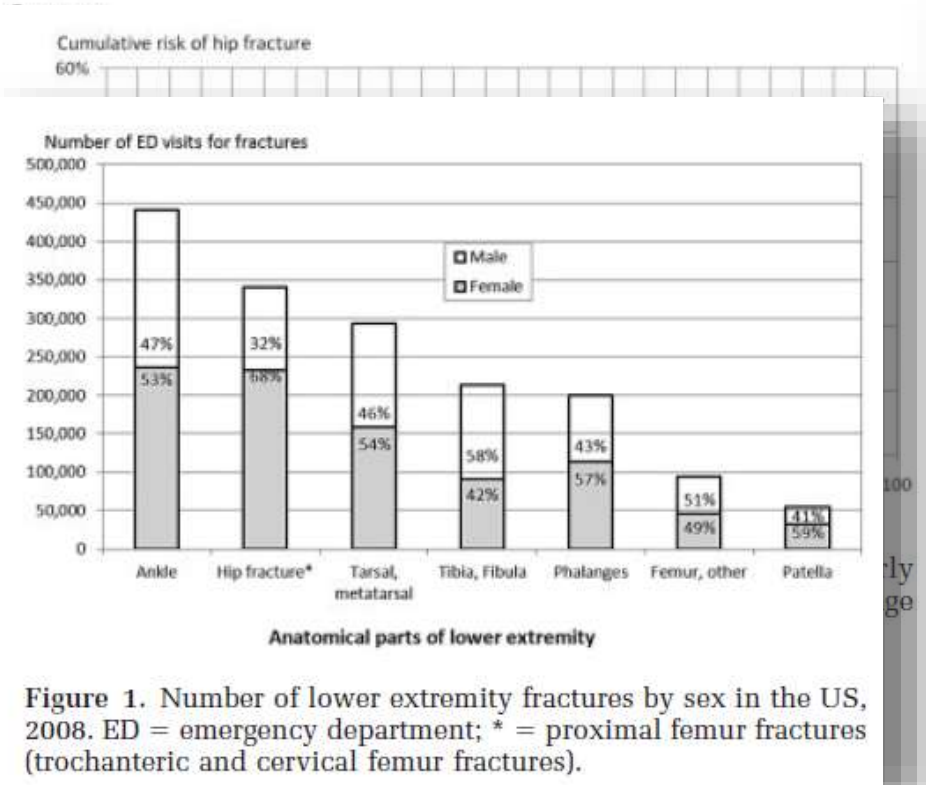


Figure 1. Number of lower extremity fractures by sex in the US, 2008. ED = emergency department; * = proximal femur fractures (trochanteric and cervical femur fractures).

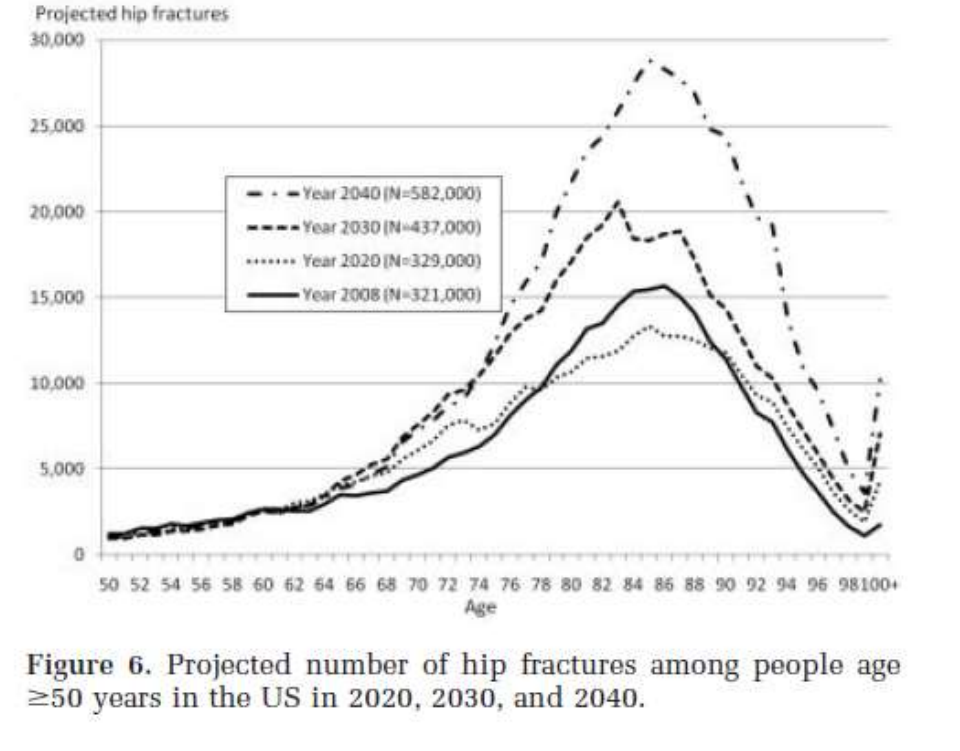


Figure 6. Projected number of hip fractures among people age ≥50 years in the US in 2020, 2030, and 2040.

Journals of Gerontology:
Cite journal as: J Geront
doi:10.1093/gerona/glt09

teoporosis

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To alleviate **tures:**

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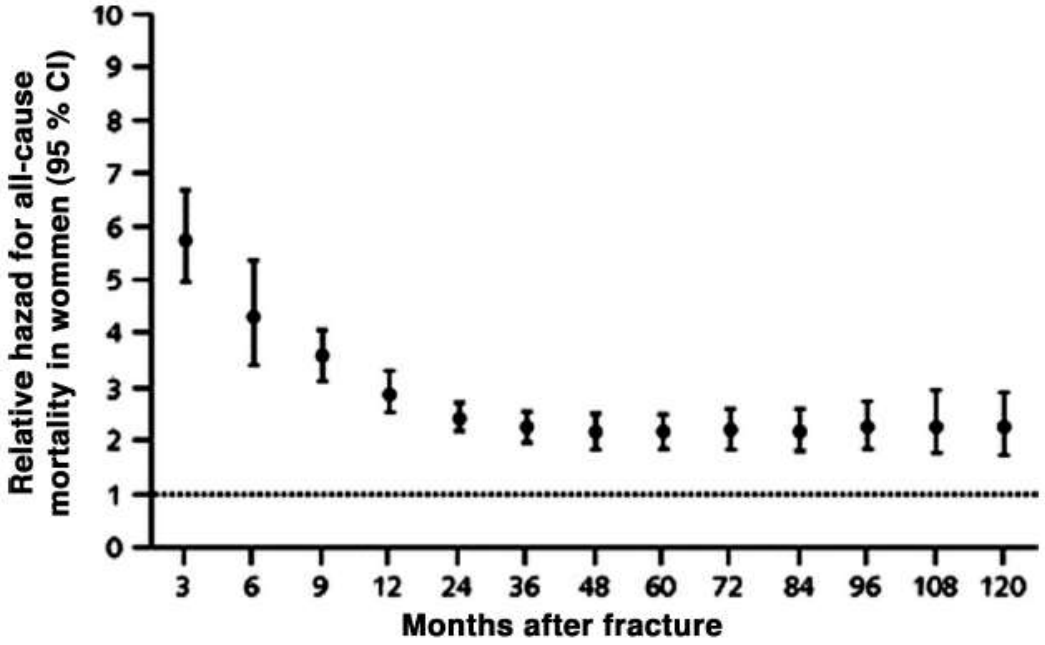

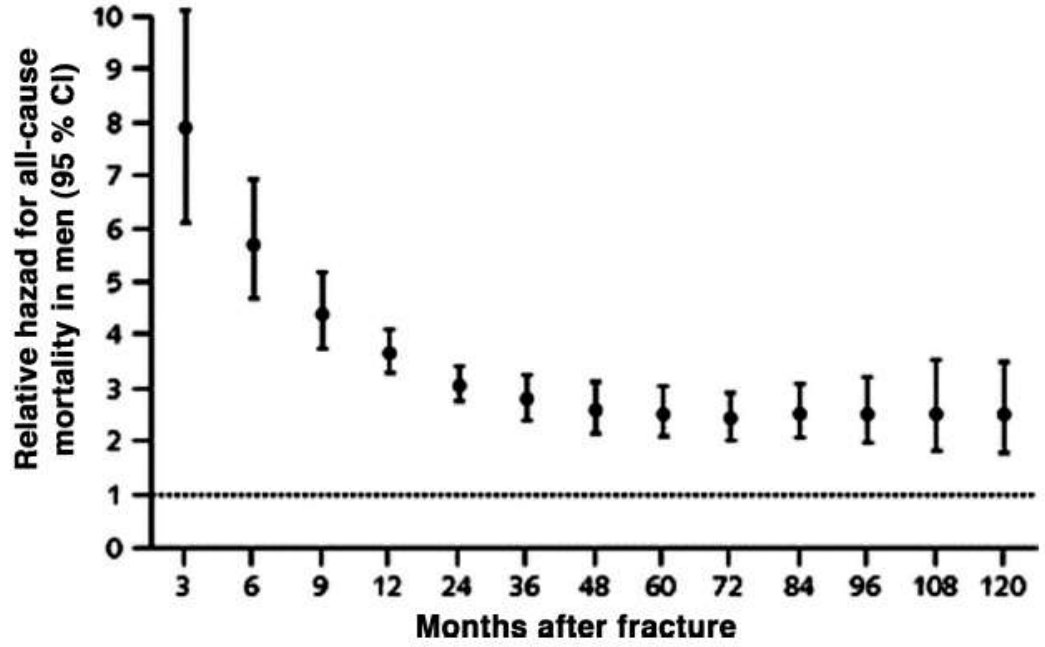

Figure
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Figure 1. Relative hazard of all-cause mortality for women and men with hip fracture versus control groups during a given follow-up period starting at the time of injury. Solid circles represent the pooled relative hazard. Vertical bars represent the corresponding 95% CIs. The dotted horizontal line is the null effect (22).

REVIEW ARTICLE

Pharmacoeconomics 2012; 30 (2): 147-170
1170-7690/12/0002-0147/$49.95/0

Osteoporotic Fractures

A Systematic Review of US Healthcare Costs and Resource Utilization

Sangeeta Budhia,[1] *Yeshi Mikyas,*[2] *Michael Tang*[1] and *Enkhe Badamgarav*[2]

33 included studies

26 reported an estimated total medical cost and hospital resource use associated with osteoporotic fractures.

In the year following a fracture, medical and hospitalization costs were:

1.6–6.2 higher than pre-fracture costs

2.2–3.5 times higher than those for matched controls.

Hospitalization costs by osteoporotic fracture type:

Hip fractures is the most expensive **(unit cost range $US 8.358–32.195)**

total costs were highest for the older population **(≥65 years of age)**

Osteoporosis in the European Union: medical management, epidemiology and economic burden

E. Hernlund · A. Svedbom · M. Ivergård · J. Compston · C. Cooper · J. Stenmark · E. V. McCloskey · B. Jönsson · J. A. Kanis

Arch Osteoporos (2013) 8:136

A report prepared in collaboration with the International Osteoporosis Foundation (IOF) and the European Federation of Pharmaceutical Industry Associations (EFPIA)

Incident fractures represented 66 % of cost

Long-term fracture care 29 %

Pharmacological prevention 5 %.

Previous and incident fractures accounted 1,180,000 quality-adjusted life years lost (2010)

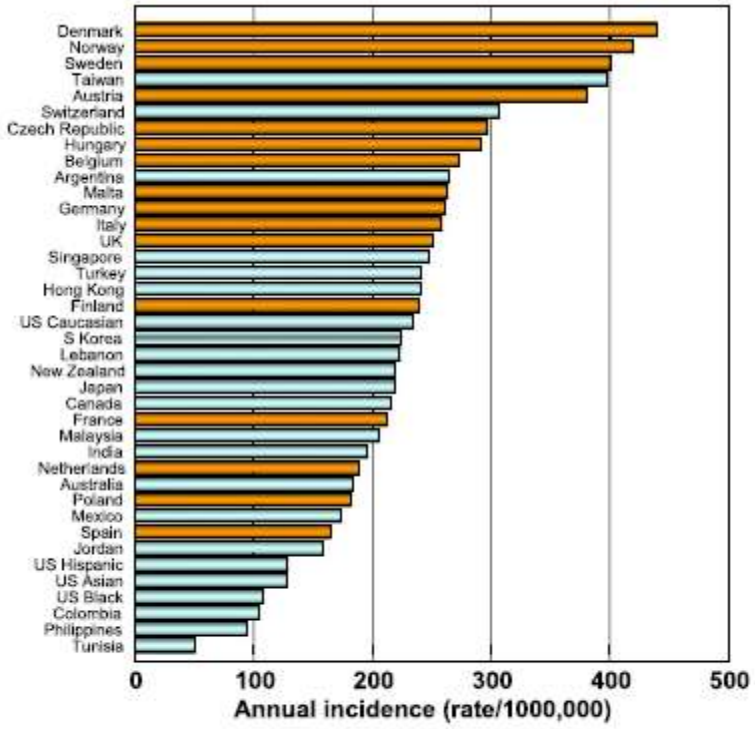


Fig. 6 Annual incidence of hip fracture in men and women from selected countries standardized to the world population for 2010 [28]. EU countries are highlighted

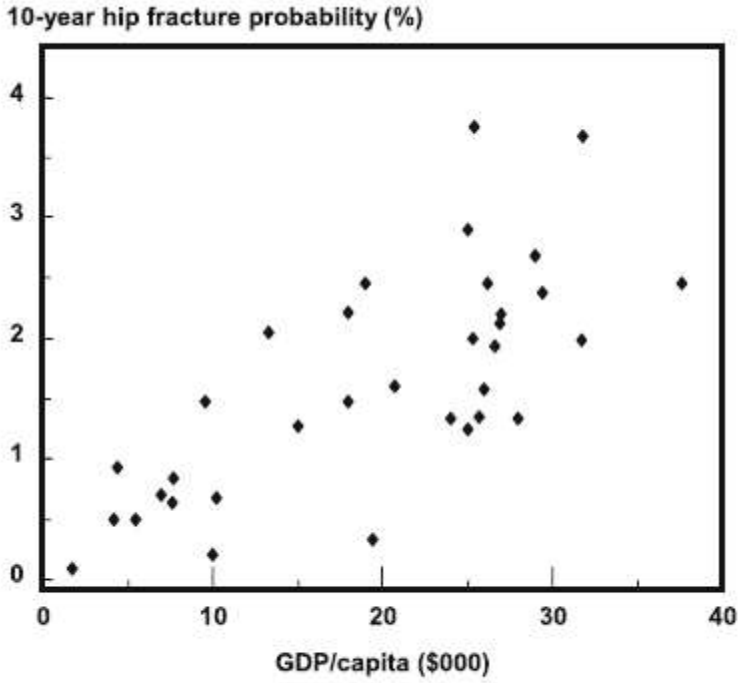


Fig. 7 Correlation between age standardized incidence of hip fracture in women in different countries and gross domestic product (GDP) per capita [70]

Osteoporos Int
DOI 10.1007/s00198-015-3277-9

ORIGINAL ARTICLE

Impact of hip fracture on hospital care costs: a population-based study

J. Leal[1] · A. M. Gray[1] · D. Prieto-Alhambra[2,3,4] · N. K. Arden[2,3] · C. Cooper[2,3] · M. K. Javaid[2,3] · A. Judge[2,3] · The REFReSH study group

A cohort (2003 – 2013) of 33.152 patients. Mean age 83 years (SD 8.2)

The mean censor adjusted hospital costs after index hip fracture were:

1-year £14,163 (95 %CI) £14,008 to £14, 317)

2-year £16,302 (95% CI £16,097 to £16,515).

Main predictors of 1-year hospital costs:

Second hip fracture

Non-hip fractures with hospitalisation

Hip fracture-related complications.

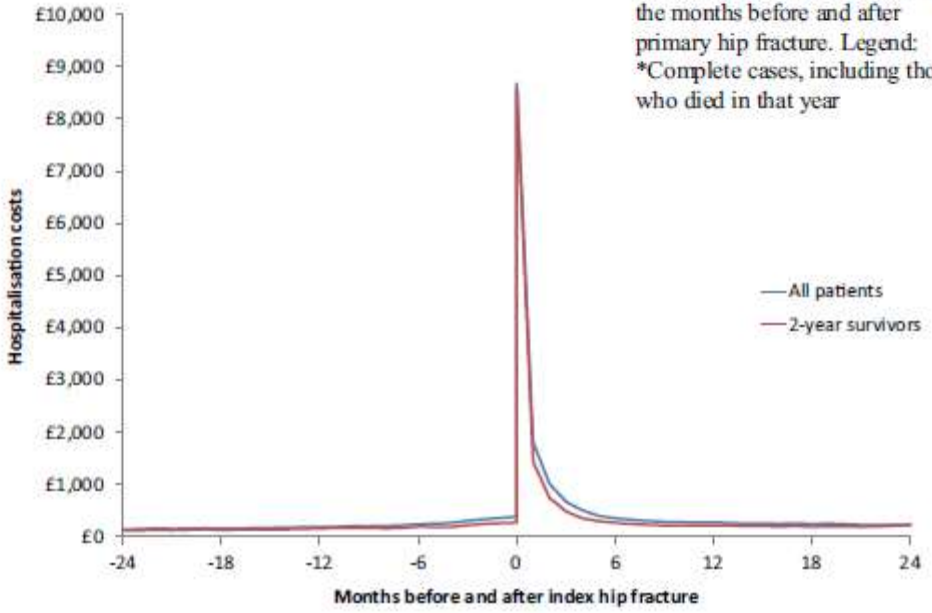


Fig. 1 Hospitalisation costs in the months before and after primary hip fracture. Legend: *Complete cases, including those who died in that year

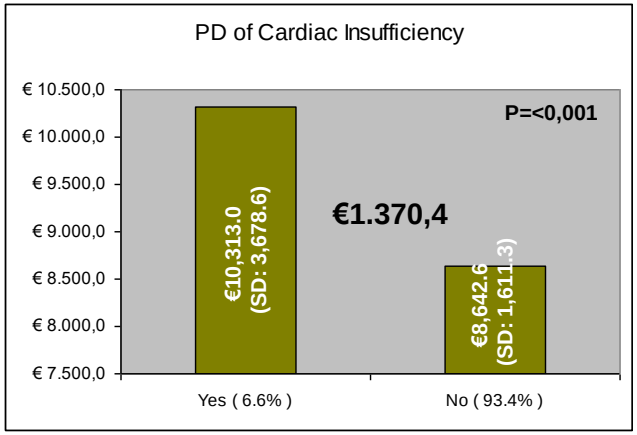
	2 years before	Year before	Year 1	Year 2
2 year survivors vs year before	£1,561	£2,258	£13,231	£2,380
Difference	-£697 (-1980 to -1839) N=15,787	- N=15,787	£10,974 (10772 to 11175) N=15,787	£122 (-29 to 274) N=15,787
All patients* vs year before	£1,906	£2,966	£13,829	£2,775
Difference	-£1,060 (-946 to -1174) N=30,430	- N=30,430	£10,860 (10709 to 11011) N=30,430	-£192 (-56 to -328) N=18,541

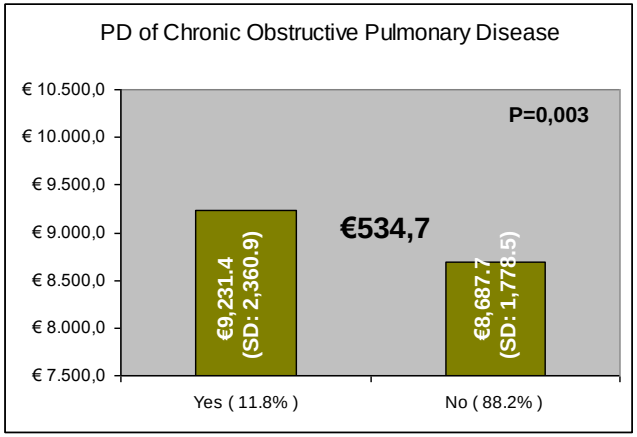
Estudio de costes

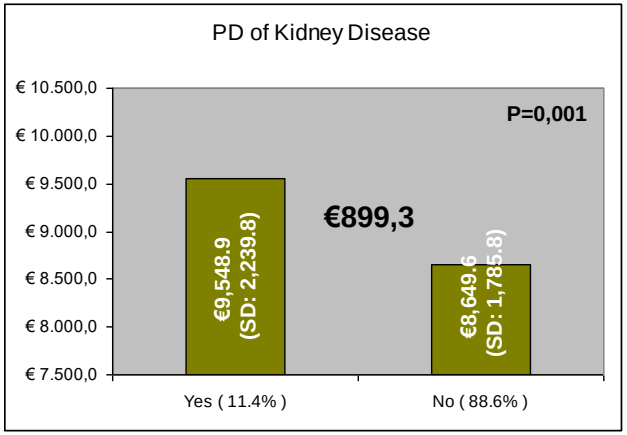
GENERALITAT VALENCIANA Conselleria de Sanitat Universal i Salut Pública
DEPARTAMENT DE SALUT DE LA RIBERA

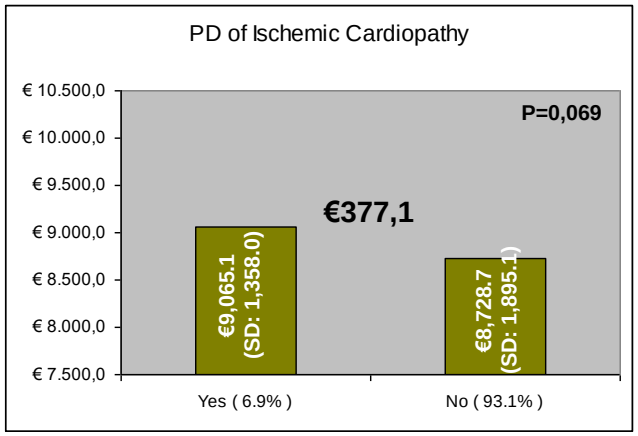
Average cost per patient (€8,752.1) HULR 2012-2016
Very close to other detailed analysis of HF acute costs:

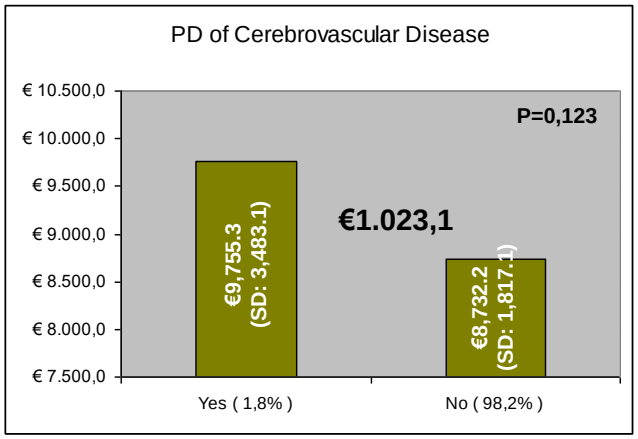
Germany (€8,853)
Europe €2,000 to €25,000
Asia $774-14,198.
US $7,788-31,310 .

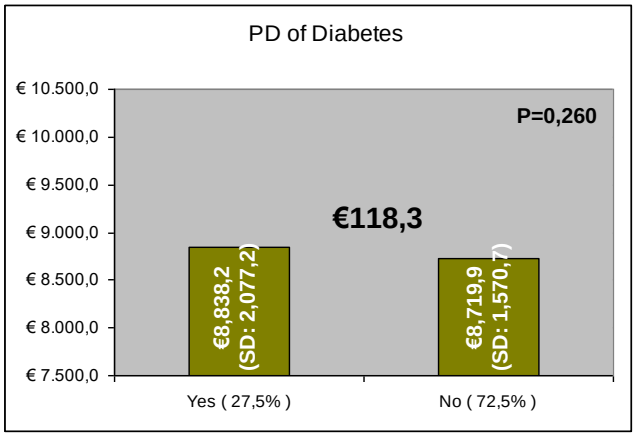












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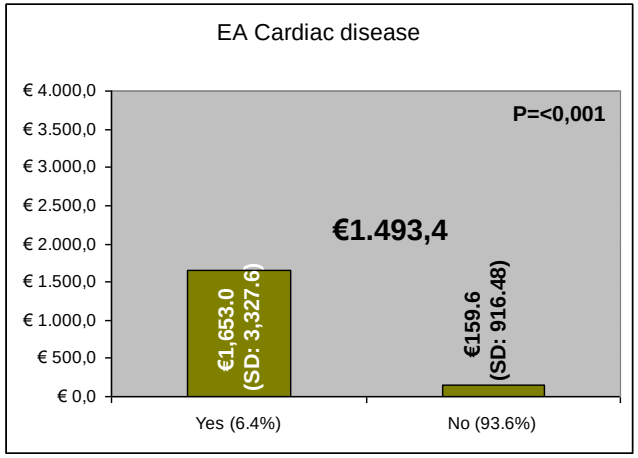
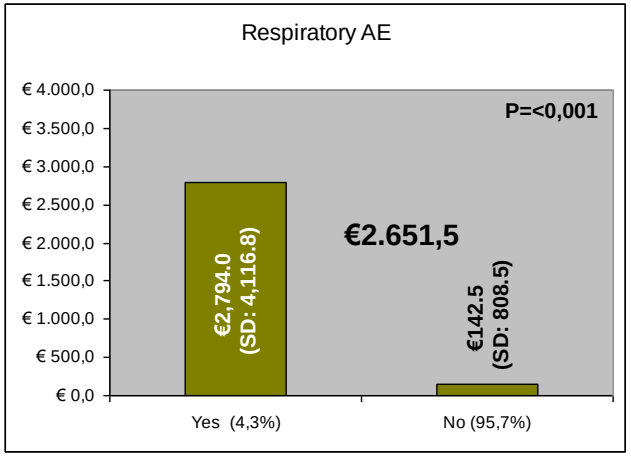
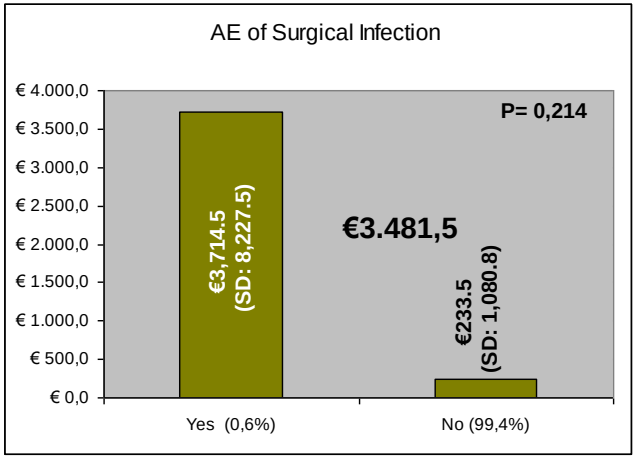
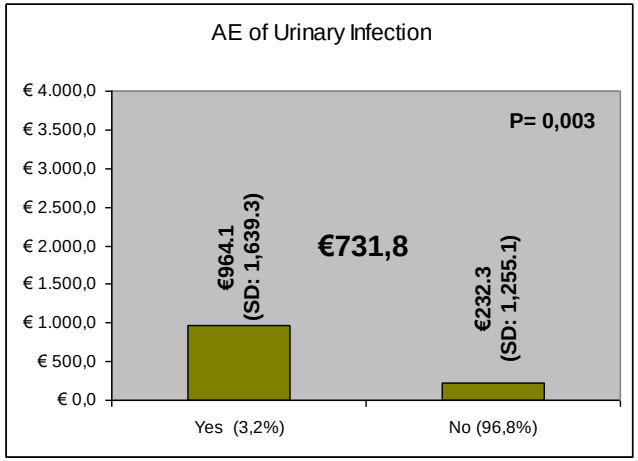
DEPARTAMENT DE SALUT DE LA RIBERA

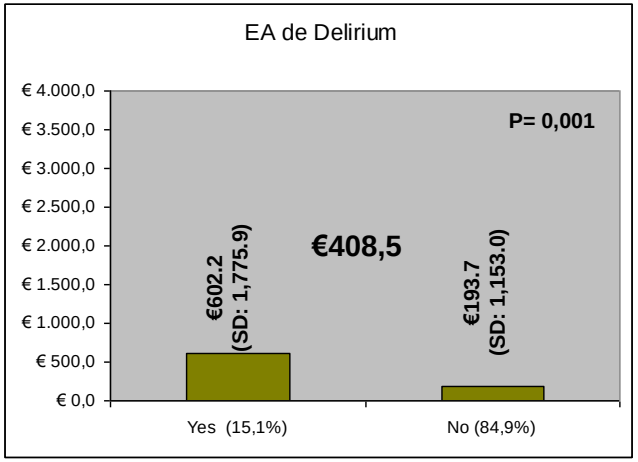
Adverse Event Difference Cost (average)











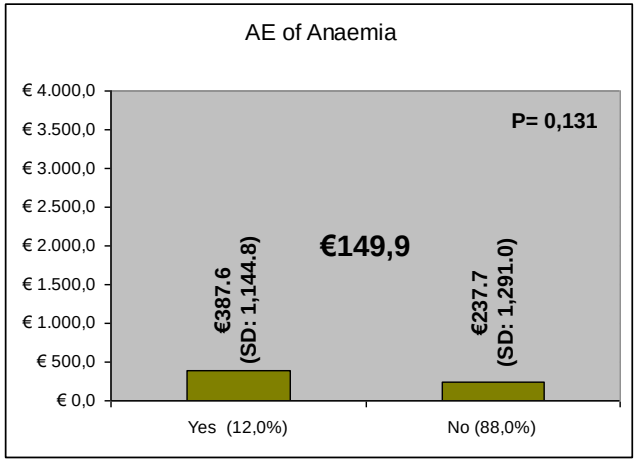


Table 4
Logistic regression model for serious adverse events (SAEs) outcome.

Variable	Crude		Adjusted[a]	
	OR	2.5% to 97.5%	OR	2.5% to 97.5%
Time to surgery (per 10 h)	1.16	1.06 to 1.27	1.12	1.02 to 1.23
Age (per 10yrs)	1.27	1.03 to 1.58	1.22	0.96 to 1.55
Sex				
Female (ref)	1.00		1.00	
Male	1.59	1.03 to 2.45	1.69	1.06 to 2.67
ASA class (per increment)	2.43	1.77 to 3.35	2.26	1.62 to 3.17
Cognitive dysfunction				
No (ref)	1.00		1.00	
Yes	0.86	0.56 to 1.34	0.68	0.43 to 1.09
Fracture type				
Femoral neck (ref)	1.00		1.00	
Intertrochanteric	1.20	0.78 to 1.84	1.21	0.77 to 1.91
Subtrochanteric	2.30	1.16 to 4.58	2.32	1.13 to 4.79

ref = this is the reference group.
[a] Adjusted for age, sex, ASA classification, fracture type and the presence of cognitive dysfunction.

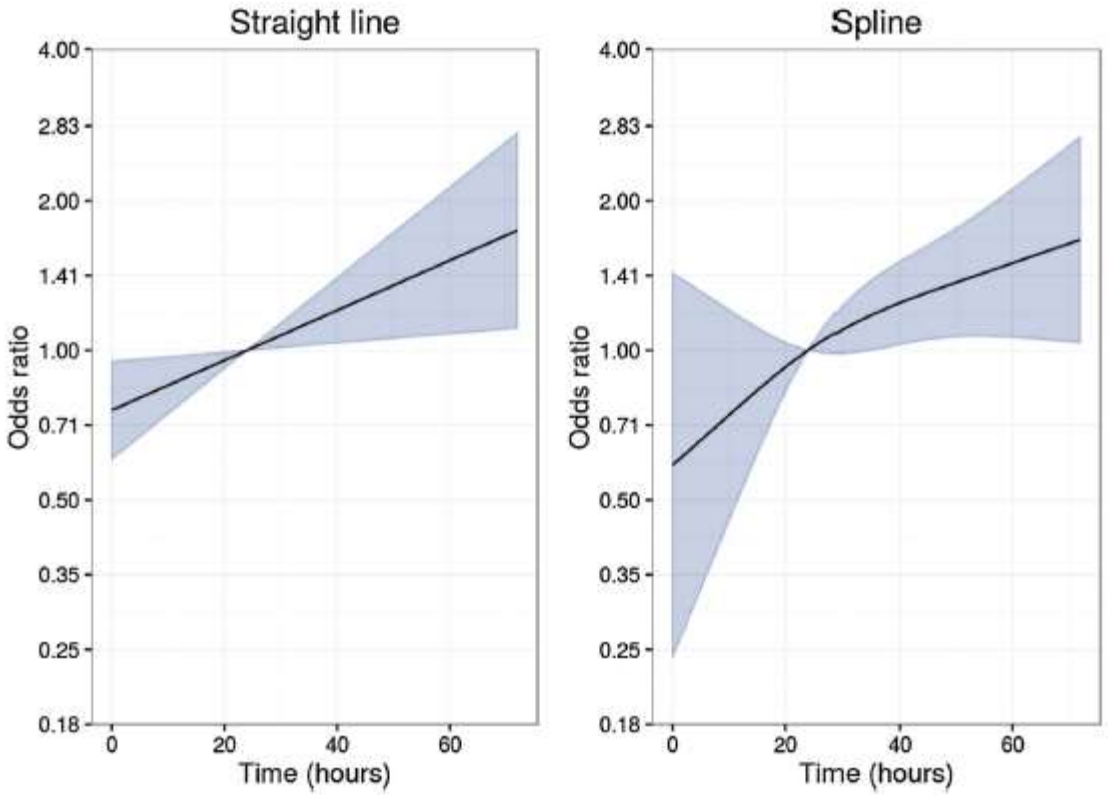


Fig. 3. Linear (left graph) and spline (right graph) graph showing how the adjusted risk for a serious adverse event increases linearly over time. The reference point is 24 h. The shaded grey area shows the 95% confidence interval.

Patient Variables Which May Predict Length of Stay and Hospital Costs in Elderly Patients With Hip Fracture

Anna E. Garcia, BSPH, J. V. Bonnaig, BS,† Zachary T. Yoneda, BS,* Justin E. Richards, MD,‡ Jesse M. Ehrenfeld, MD, MPH,‡ William T. Obremskey, MD, MPH,‡ A. Alex Jahangir, MD,‡ and Manish K. Sethi, MD‡*

What factors contribute to increased length of stay and increased costs?

660 patients ≥60 yo with hip fractures. January 2000 and December 31, 2009.

No correlation existed between: body mass index or specific comorbidities and LOS.

ASA classification was a predictor.

Each ASA increase of 1, average LOS increased 2.053 days (P , 0.001).

Given total daily cost to the hospital for these patients was $4530

Each increase in ASA classification translate to an increase of $9300.

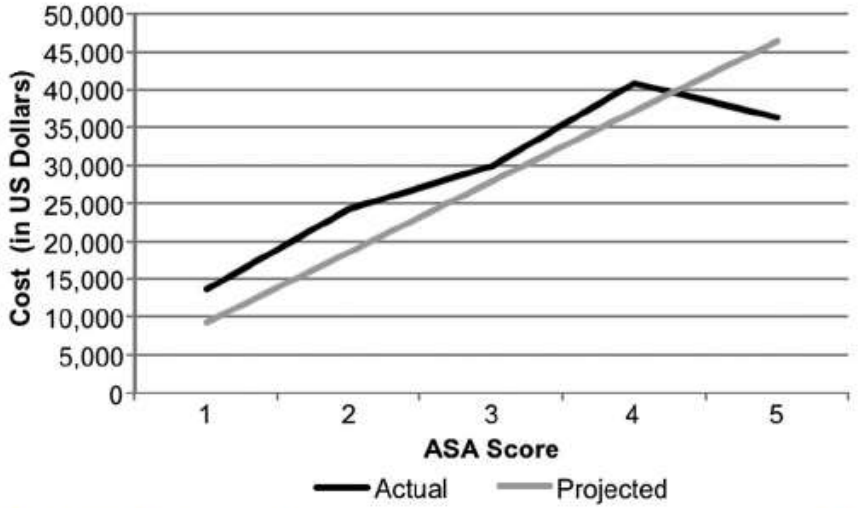


FIGURE 1. Projected cost assumes a female patient, without comorbid conditions other than ASA classification in a non-elective case.

TABLE 3. Comparison of ASA Score, LOS, Actual Cost, and Projected Cost

ASA Class	N	Mean Age	LOS	LOS After Surgery	Actual Cost	Projected Cost
1	1	75	3	2	13,590	$9300.09
2	63	72.44	5.392	4.159	24,231.9	$18,600.18
3	453	77.73	6.585	5.276	29,830	$27,900.27
4	142	78.29	9.021	6.937	40,865.7	$37,200.36
5	1	101	8	5.523	36,240	$46,500.45

Impact of Comorbidities on Hospitalization Costs Following Hip Fracture

Lucas E. Nikkel, BA, Edward J. Fox, MD, Kevin P. Black, MD, Charles Davis, MD,
Lucille Andersen, MD, and Christopher S. Hollenbeak, PhD

32,440 patients ...ple.
Impact of como...
Comorbidities m...
Average estimat...
The comorbidity...
Weigh...
Pulmc...
Most ...ation.

Compared with ...

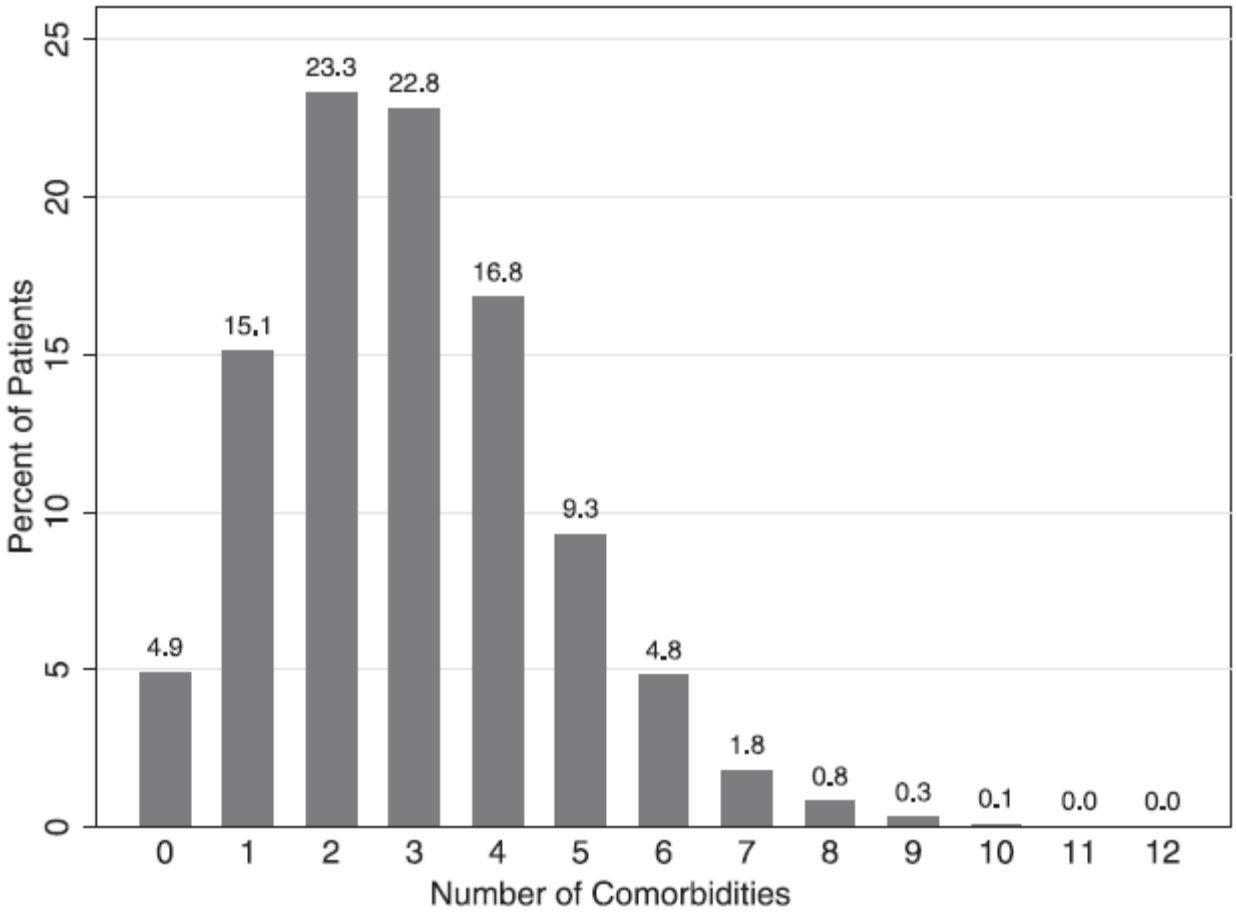


Fig. 2
Distribution of the number of comorbidities found in patients with hip fracture.

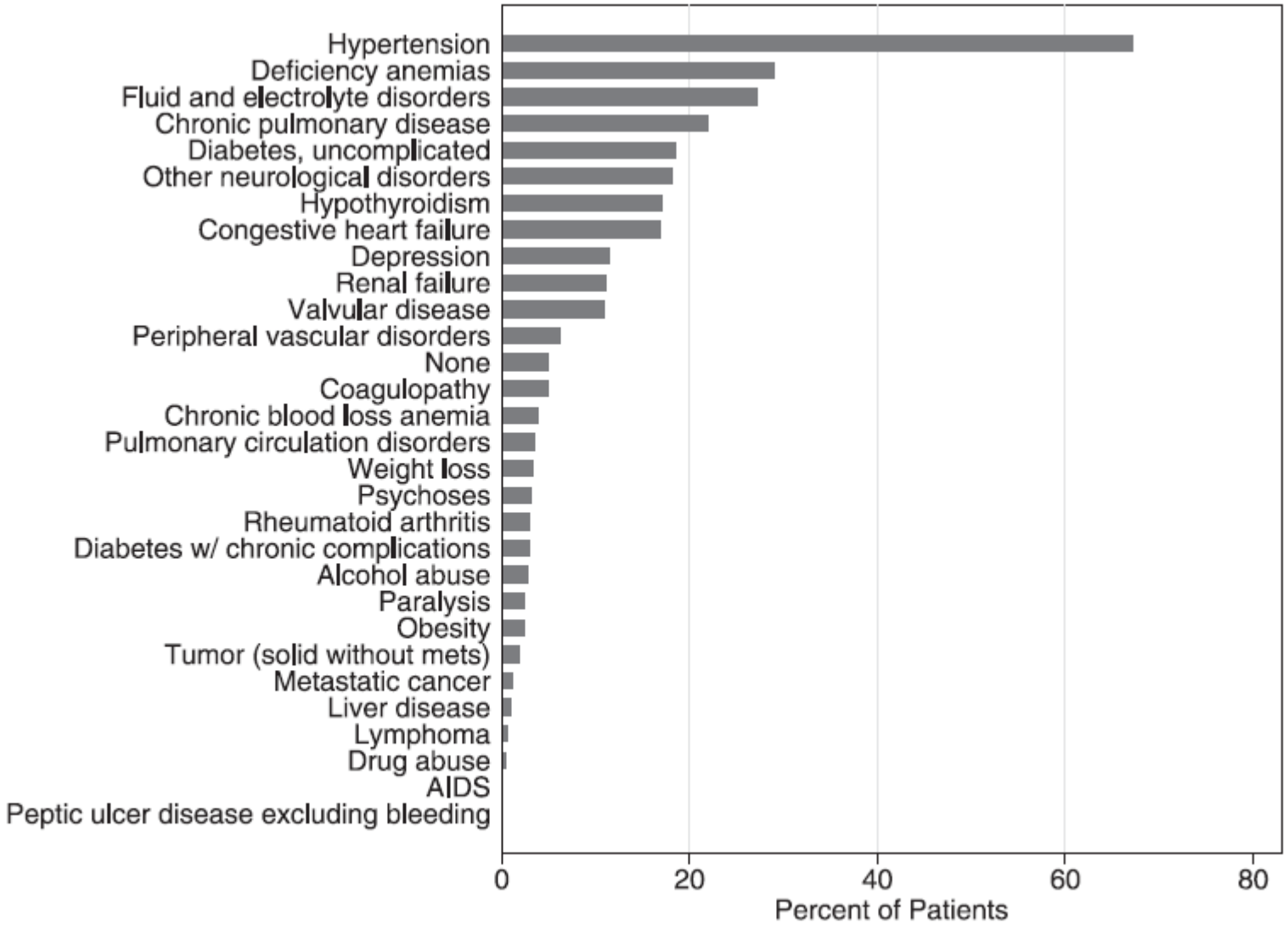
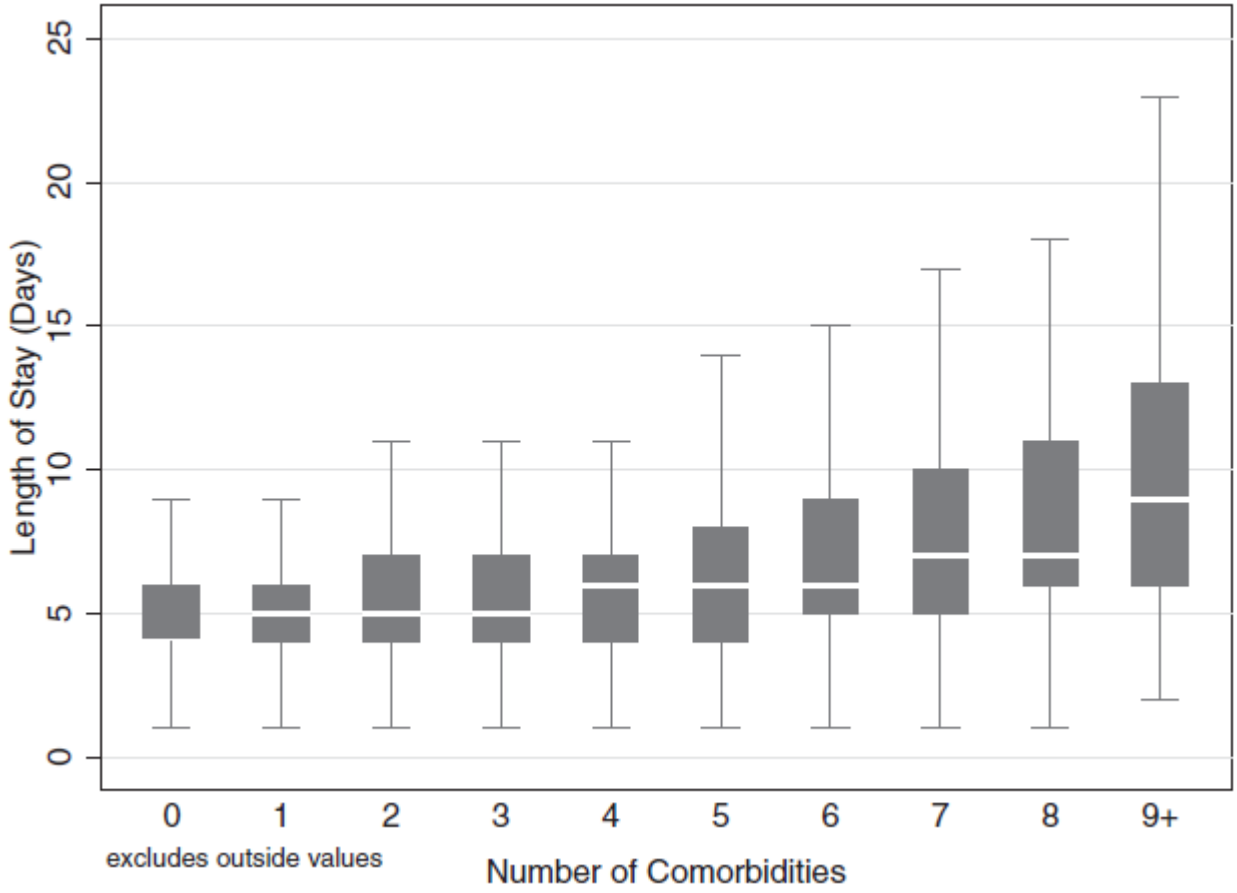


Fig. 1

Prevalence of comorbidities in the entire cohort of patients. Mets = metastases, and AIDS = acquired immunodeficiency syndrome


Length of Stay (Days)
0
5
10
15
20
25
0
1
2
3
4
5
6
7
8
9+
excludes outside values
Number of Comorbidities

The Determinants of Costs and Length of Stay for Hip Fracture Patients

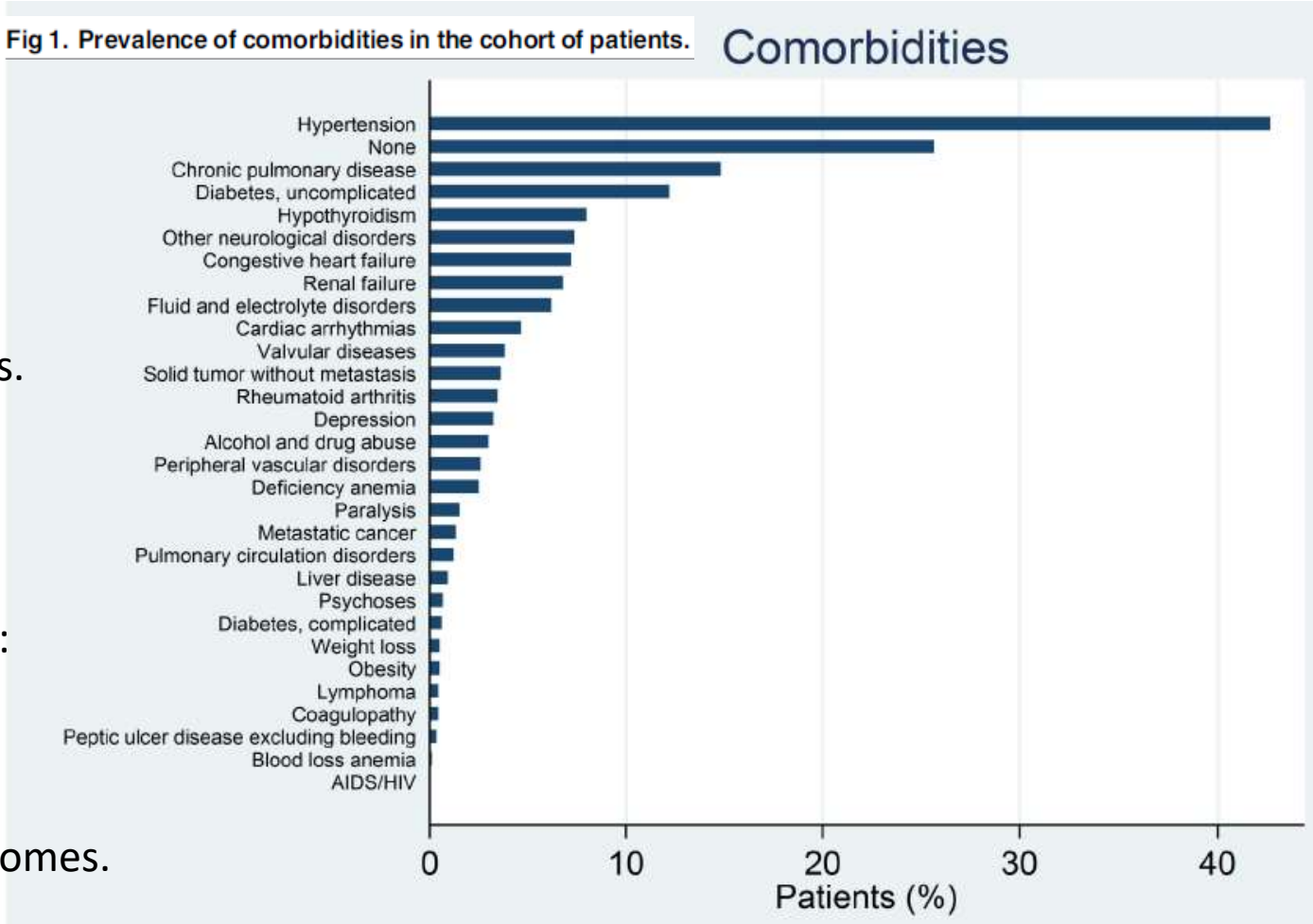
Adriana Castelli[1]*, Silvio Daidone[2], Rowena Jacobs[1], Panagiotis Kasteridis[1], Andrew David Street[1]

Analyse the variation in LOS and costs across the acute care pathway for hip fracture.
60,000 hip fracture patients. Control for socio-economic characteristics, type of fracture and intervention, co-morbidities, discharge destination of patients, quality indicatorsand social care characteristics.

Higher costs and LOS:
Older patients
More deprived areas
Specific co-morbidities
Develop pressure ulcers,
Transferred hospitals
Readmitted within 28 days.

Costs are also higher for:
CT scan
Cemented arthroscopy.
Costs and LOS were lower:
Admitted 24h emergency
Receiving surgery the day of admission
Discharged to their own homes.

Fig 1. Prevalence of comorbidities in the cohort of patients.



OUR RESULTS

Orthogeriatric Units:
Utility in hip fractures.

CLINICAL SCIENCE

Early interdisciplinary hospital intervention for elderly patients with hip fractures – functional outcome and mortality

Francisco José Tarazona-Santabalbina,[I] Ángel Belenguer-Varea,[I] Eduardo Rovira-Daudi,[II] Enmanuel Salcedo-Mahiques,[III] David Cuesta-Peredó,[IV] Juan Ramón Doménech-Pascual,[I] María Isabel Salvador-Pérez,[I] Juan Antonio Avellana-Zaragoza[I]

Geriatrics & Gerontology International

ORIGINAL ARTICLE: EPIDEMIOLOGY, CLINICAL PRACTICE AND HEALTH

Severity of cognitive impairment as a prognostic factor for mortality and functional recovery of geriatric patients with hip fracture

FREE

Francisco José Tarazona-Santabalbina[1,*], Ángel Belenguer-Varea[1], Eduardo Rovira Daudi[2], Enmanuel Salcedo Mahiques[3], David Cuesta Peredó[4], Juan Ramón Doménech-Pascual[1], Homero Gac Espínola[5] and Juan Antonio Avellana Zaragoza[1]

Article first published online: 27 AUG 2014

DOI: 10.1111/ggi.12271

Issue

Geriatrics & Gerontology International

Volume 15, Issue 3, pages 289–295, March 2015

CLINICS 2012;67(6):547-555 DOI:10.6061/clinics/2012(06)02

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Mortality

1-year mortality

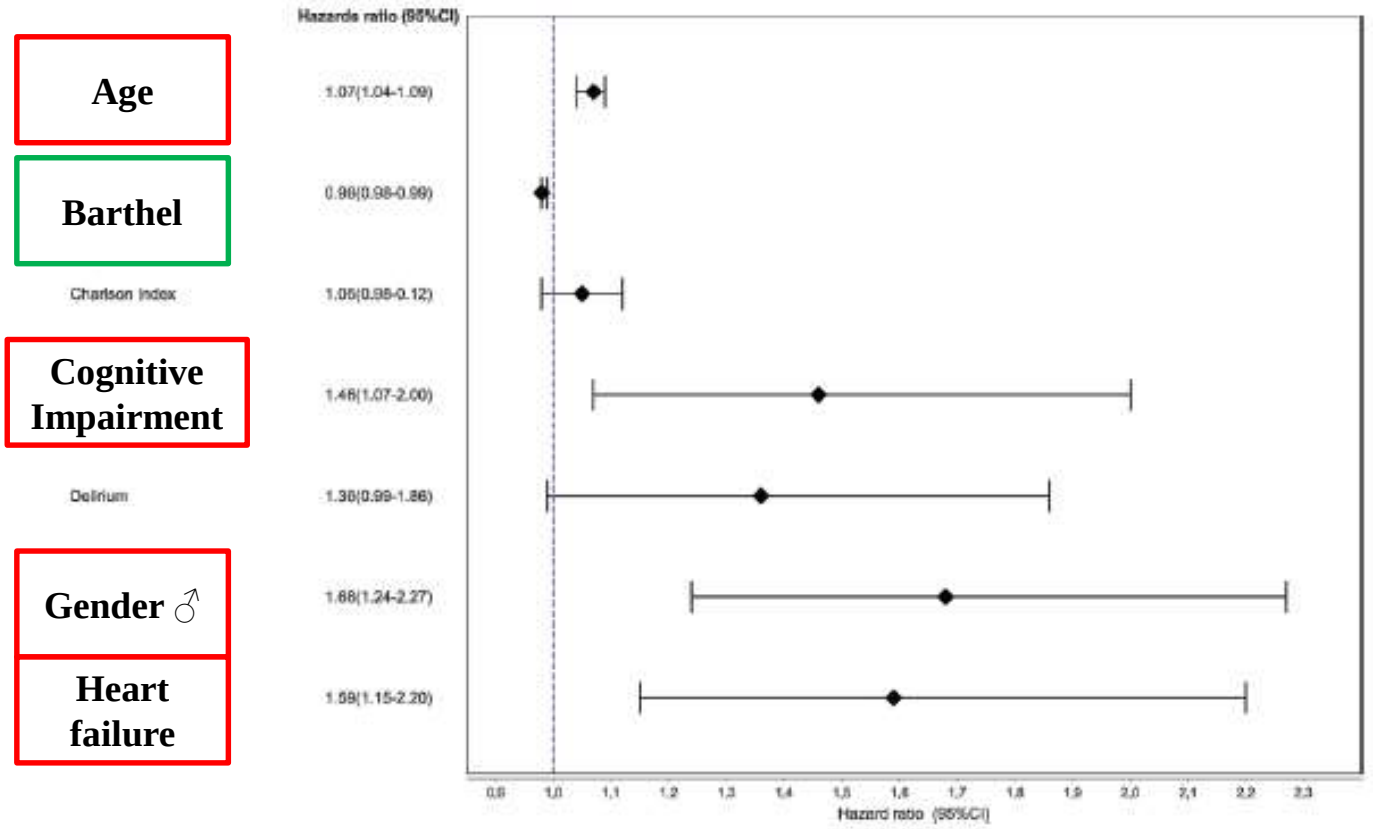

Figure 1 - Cox proportional hazards model for mortality at 12 months after hospital discharge.

Medline Indexed

ORIGINAL ARTICLE, EPIDEMIOLOGY, CLINICAL PRACTICE AND HEALTH

Severity of cognitive impairment as a prognostic factor for mortality and functional recovery of geriatric patients with hip fracture

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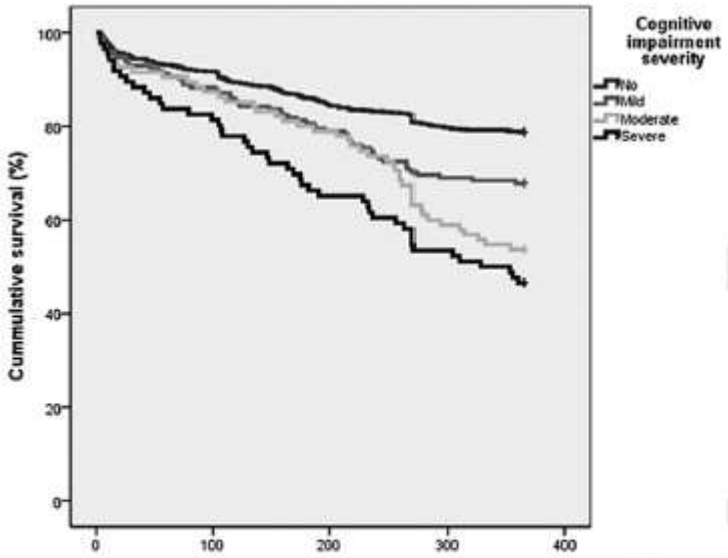


Figure 1 Survival according to cognitive impairment severity. Mild, mild dementia; moderate, moderate dementia; no, preserved cognitive status; severe, severe dementia.

Table 3 Mortality analysis at 12 months' follow-up period.

	Hazard ratio	95% CI	*P*-value
Dementia			
Mild	1.303	0.878–1.933	0.189
Moderate	1.451	0.915–2.302	0.114
Severe	1.640	1.020–2.635	0.041
Prior Barthel score	0.989	0.984–0.994	<0.001
Age (years)	1.073	1.049–1.098	<0.001
Male sex	1.653	1.219–2.241	<0.001
Charlson Index	1.083	1.015–1.155	0.016
Delirium presence	1.361	0.989–1.873	0.059

Preserved group (subjects without *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition, criteria for dementia); mild dementia (participants with *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition, criteria for dementia and stage 3 using the Reisberg Global Deterioration Scale (GDS); moderate dementia (stage 4 and 5 using GDS); severe dementia (GDS stages 6 and 7). Dementia severity groups were compared against preserved cognitive state group. Barthel prior score and Charlson Index are expressed by each point of change. CI, confidence interval.

CLINICS 2012;67(6):547-555 DOI:10.6061/clinics/2012(06)02

CLINICAL SCIENCE

Early interdisciplinary hospital intervention for elderly patients with hip fractures – functional outcome and mortality

Francisco José Tarazona-Santabalbina,[I] Ángel Belenguer-Varea,[I] Eduardo Rovira-Daudi,[II] Enmanuel Salcedo-Mahiques,[III] David Cuesta-Peredó,[IV] Juan Ramón Doménech-Pascual,[I] María Isabel Salvador-Pérez,[I] Juan Antonio Avellana-Zaragoza[I]

Walking recovery

6-month after hospital discharge

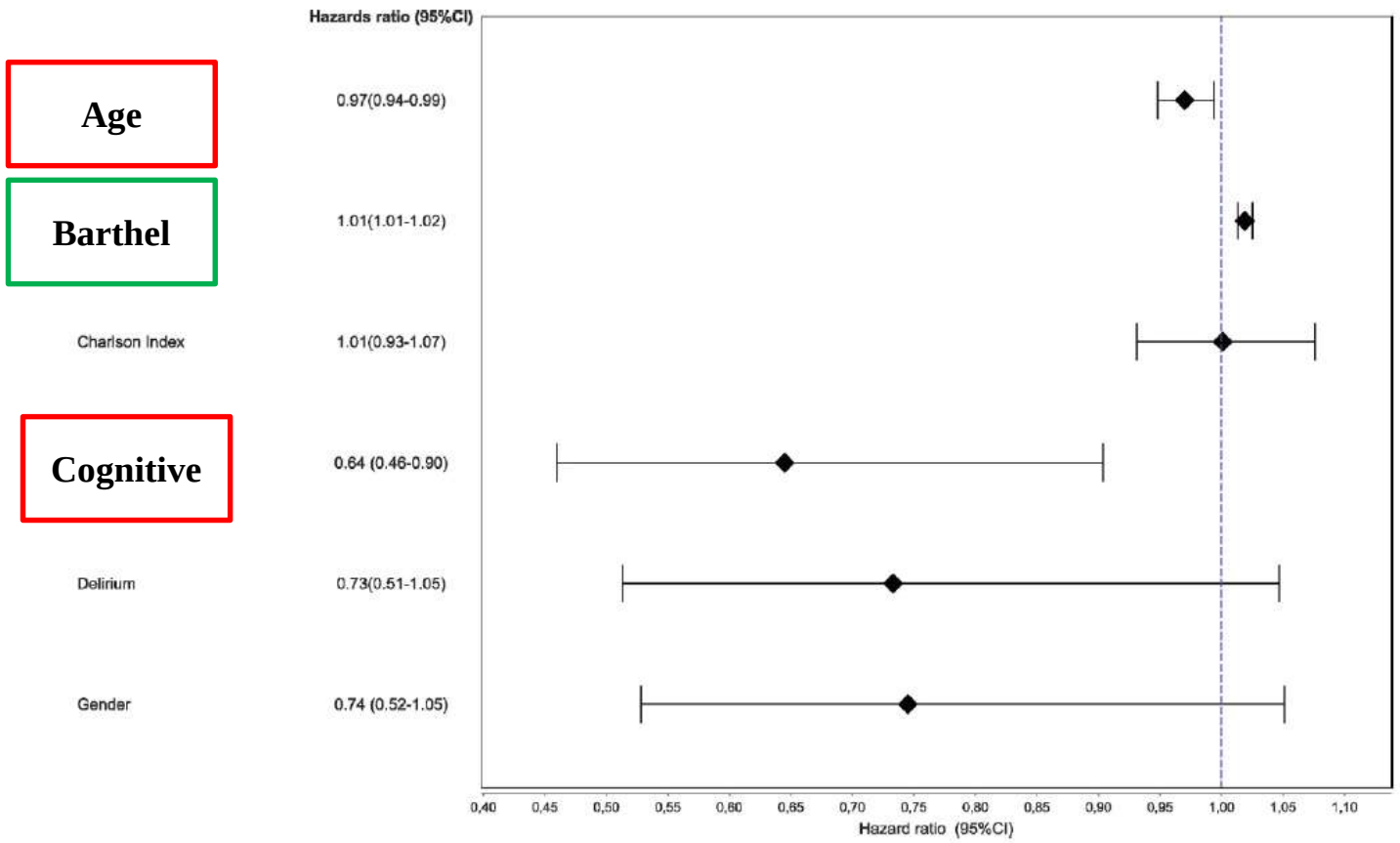


Figure 2 - Logistic regression analysis for variables associated with walking at the time of discharge.

Ph D work

Estudio de la Mejora de la Calidad Asistencial en el Proceso Hospitalario de Fractura de Cadera: Estimación indirecta de los costes producidos por los efectos adversos.

Presented by:

David Cuesta Peredo

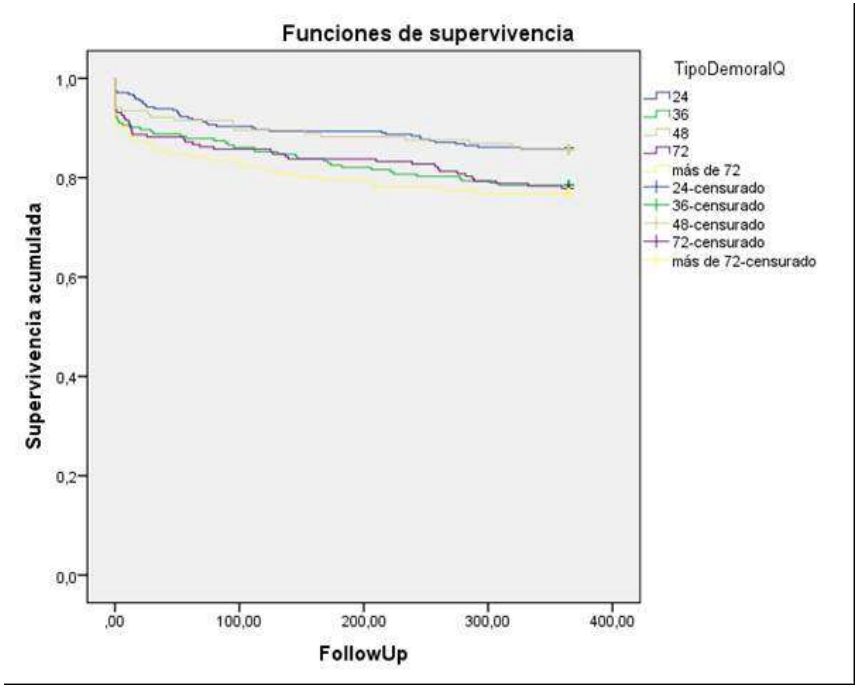
Ph D tutors:

Dr. D. Francisco Javier Arteaga Moreno

Dr. D. Francisco José Tarazona Santabalbina

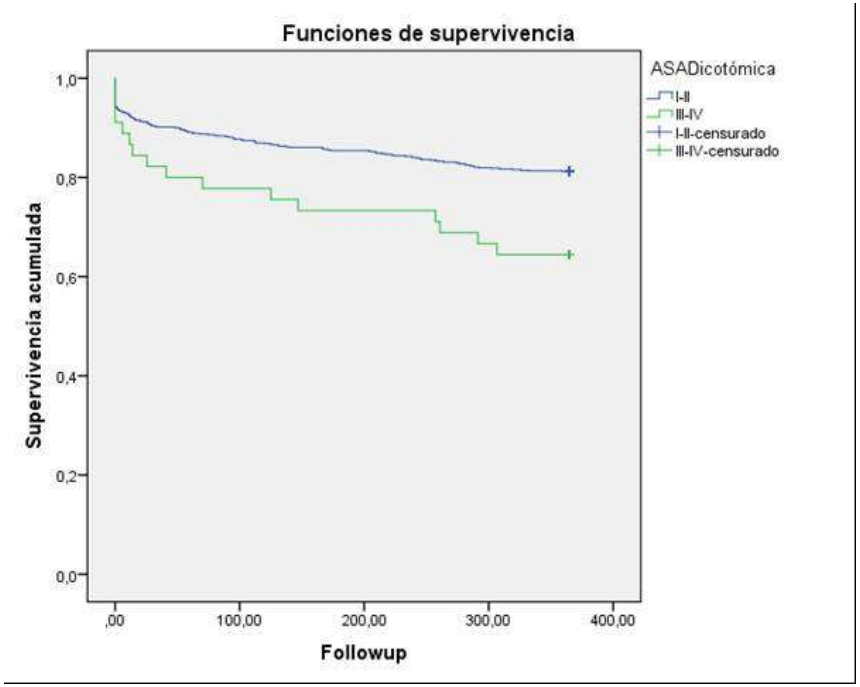
SURVIVAL

Surgical delay



TipoDemoralQ				
	Estimación	Intervalo de confianza de 95 %		Sig.
		Límite inferior	Límite superior	
24	326,332	314,917	337,747	0,026
36	304,245	287,897	320,593	
48	324,774	307,878	341,67	
72	305,425	288,254	322,596	
más de 72	294,001	272,444	315,558	
Global	312,592	305,406	319,778	

ASA Score



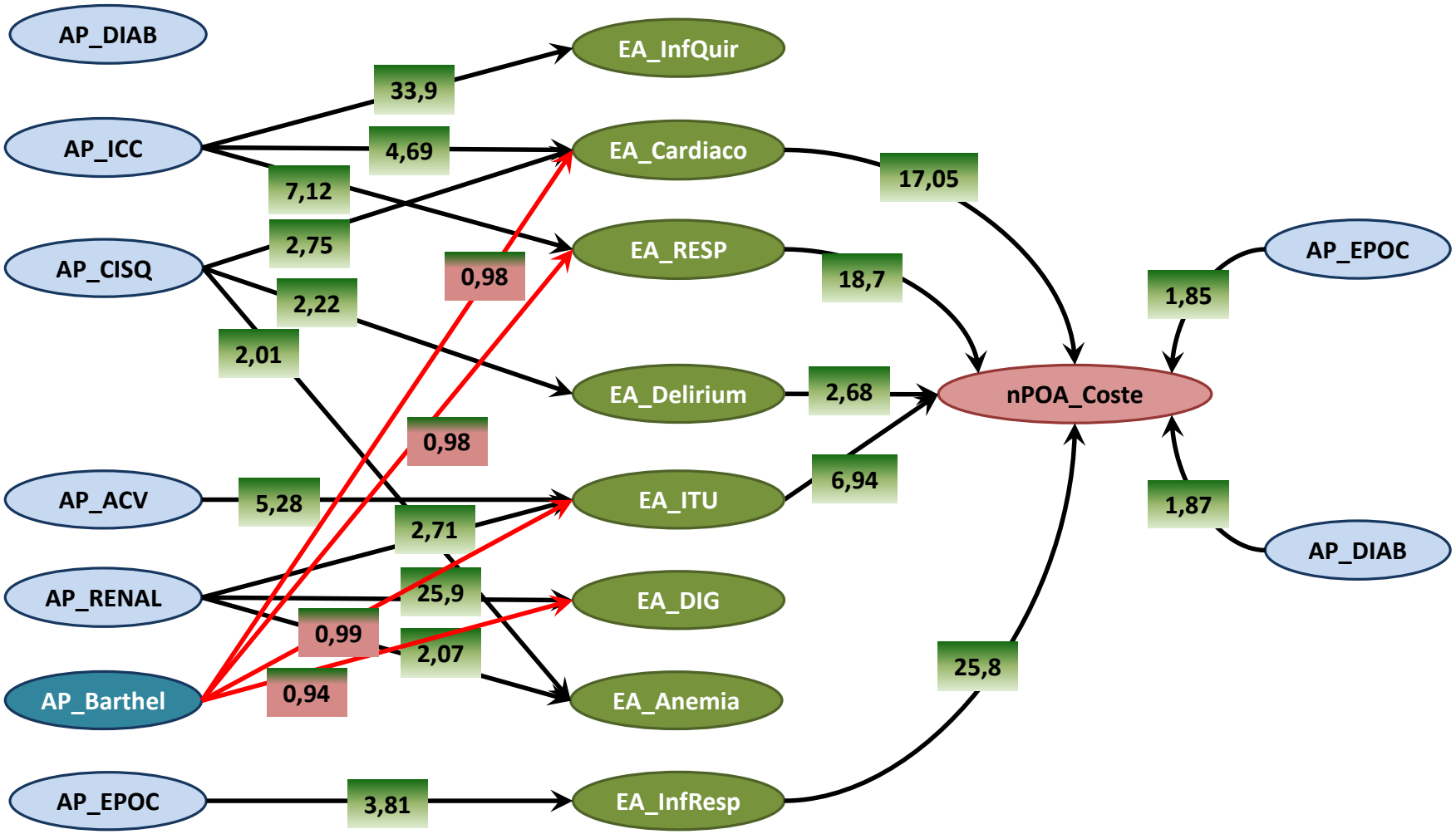
ASADicotómica				
	Estimación	Intervalo de confianza de 95 %		Sig.
		Límite inferior	Límite superior	
I-II	312,799	304,543	321,054	0,005
III-IV	269,807	227,45	312,163	
Global	310,457	302,289	318,624	

Geriatrics **2018**, *3*(1), 7; doi:10.3390/geriatrics3010007 Open Access Article

Estimate of the Costs Caused by Adverse Effects in Hospitalised Patients Due to Hip Fracture: Design of the Study and Preliminary Results

David Cuesta-Peredo [1,4,5,*], Francisco Jose Tarazona-Santabalbina [2,4], Carlos Borras-Mañez [3], Angel Belenguer-Varea [2,4], Juan Antonio Avellana-Zaragoza [2,4] and Francisco Arteaga-Moreno [4]

Resultados: Regresión logística multivariante



CUADRO DE MANDO GUÍA DE FRACTURA DE CADERA

INDICADORES	Fuente	Meta	2012	2013	2014	2015												Acum 2015
1. Servicio de Urgencias						Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dic	
1.1 Atención																		
Porcentaje de pacientes con prioridad P3 asignada en el triaje		80%	7,29%	46,50%	68,33%	68,18%	64,29%	65,63%	65,38%	69,57%	75,00%	56,67%	74,19%	50,00%				66,04%
Porcentaje de pacientes atendidos antes de 1 hora		80%	94,83%	96,96%	96,77%	88,64%	92,86%	93,75%	96,15%	100,00%	100,00%	93,33%	96,77%	86,36%				94,03%
Porcentaje de pacientes ingresados antes de 4 horas		75%	80,24%	80,24%	84,16%	90,91%	96,43%	78,13%	96,15%	82,61%	90,63%	96,67%	87,10%	81,82%				89,18%
1.2 Solicitud de pruebas radiológicas																		
Porcentaje de radiografías simples realizadas antes de 1 hora		50%	52,20%	46,69%	39,80%	28,21%	34,78%	22,22%	26,09%	36,36%	57,69%	33,33%	37,93%	66,67%				37,13%
Porcentaje de pacientes atendidos en urgencias con radiografía realizada		95%	89,67%	91,79%	89,15%	88,64%	82,14%	84,38%	88,46%	95,65%	81,25%	90,00%	93,55%	95,45%				88,43%
1.3 Aplicación de escalas clínicas para la medición del dolor en urgencias																		
Porcentaje de pacientes con Escala Numerica de Dolor		95%	0,00%	37,08%	43,40%	86,36%	82,14%	84,38%	88,46%	91,30%	84,38%	86,67%	100,00%					87,80%
Porcentaje de pacientes con Escala Visual de Dolor		95%	0,00%	15,81%	10,26%	0,00%	7,14%	0,00%	11,54%	17,39%	6,25%	6,67%	0,00%					5,28%
2. Hospitalización																		
2.1 Atención																		
Estancia media pacientes intervenidos de fractura de cadera		<10	8,17	7,39	8,02	7,85	8,61	9,70	7,62	7,84	8,52	7,82	8,82	8,88				8,39
Porcentaje de pacientes vistos por geriatría o internista en menos de 8h			5,24%	8,91%	8,09%	3,33%	9,09%	3,85%	8,11%	5,00%	7,41%	15,15%	22,22%	3,45%				8,30%
Porcentaje de pacientes vistos por geriatría o medicina interna		100%	79,44%	80,86%	78,64%	53,33%	72,73%	76,92%	94,59%	75,00%	85,19%	81,82%	88,89%	75,86%				78,26%
Porcentaje de pacientes con presencia de Delirium: con o sin tratamiento preventivo (CIE 239.	-	30,0%	15,36%	15,22%	21,02%	23,08%	18,18%	16,67%	11,76%	0,00%	6,45%	0,00%	4,55%	0,00%				9,78%
Porcentaje de pacientes con transfusión realizada		<50	66,27%	56,42%	58,60%	64,10%	63,64%	73,33%	58,82%	89,47%	61,29%	61,76%	72,73%					66,53%
Media de concentrados de hematíes transfundidos		<2	3,19	2,68	2,68	2,44	2,38	2,77	2,25	2,59	3,42	2,62	2,81					2,65
Porcentaje de pacientes con interconsulta a Rehabilitación		100,0%	60,8%	59,1%	66,5%	92,31%	57,58%	80,00%	64,71%	73,68%	80,65%	67,65%	95,45%	70,59%				75,4%
Porcentaje de pacientes con interconsulta de Rehabilitación informada antes de 24h		75,0%	81,7%	78,3%	81,6%	69,44%	84,21%	66,67%	63,64%	78,57%	80,00%	91,30%	90,48%	91,67%				78,7%
2.1 Cumplimentación de escalas clínicas en hospitalización																		
Porcentaje de pacientes con Escala Norton realizada		100%	0,00%	100,00%	99,42%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%					100,00%
Porcentaje de pacientes con Escala CAM realizada		100%	0,00%	55,82%	82,80%	82,05%	69,70%	46,67%	73,53%	73,68%	61,29%	79,41%	81,82%					71,07%
Porcentaje de pacientes con Escala CAIDAS		100%	0,00%	45,07%	87,76%	92,31%	75,76%	86,67%	100,00%	78,95%	96,77%	85,29%	90,91%					88,84%
Porcentaje de pacientes con Escala Numerica de Dolor realizada		100%	0,00%	100,00%	99,42%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%					100,00%
3. Cirugía																		
Porcentaje de pacientes intervenidos antes de 36h desde el ingreso		60,00%	50,00%	47,46%	47,81%	38,46%	50,00%	40,00%	61,76%	68,42%	67,74%	52,94%	45,45%	67,65%				54,18%
Porcentaje de pacientes intervenidos antes de 48h desde el ingreso		80,00%	63,25%	64,48%	63,85%	58,97%	56,25%	60,00%	85,29%	73,68%	80,65%	64,71%	68,18%	82,35%				69,82%
Porcentaje de pacientes con anestesia general		<15		12,24%	12,24%	5,13%	18,75%	13,33%	11,76%	26,32%	19,35%	17,65%	13,64%	20,59%				15,64%
Porcentaje de pacientes con anestesia epidural		<10		14,90%	13,50%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%				0,00%
Porcentaje de pacientes con anestesia raquidea		<10		76,42%	85,71%	87,18%	78,13%	80,00%	88,24%	73,68%	80,65%	76,47%	86,36%	73,53%				80,73%
Porcentaje de pacientes con anestesia loco-regional		85%		98,50%	94,20%	94,87%	81,25%	86,67%	88,24%	73,68%	80,65%	82,35%	86,36%	79,41%				84,36%
4. Indicadores de resultado																		
Tasa de mortalidad hospitalaria		<=4	4,52%	5,97%	2,92%	0,00%	0,00%	0,00%	2,94%	0,00%	6,45%	2,94%	0,00%	0,00%				1,45%

THANK YOU VERY MUCH