63° CONGRESSO NAZIONALE SIGG

GLI ANZIANI: LE RADICI DA PRESERVARE

ROMA 28 novembre 01 dicembre 2018 Auditorium della Tecnica, Roma

Simposio: L'ANZIANO CHIRURGICO

Il ruolo del geriatra nella gestione del post-operatorio

Francesco Cacciatore

Università degli Studi di Napoli "Federico II"

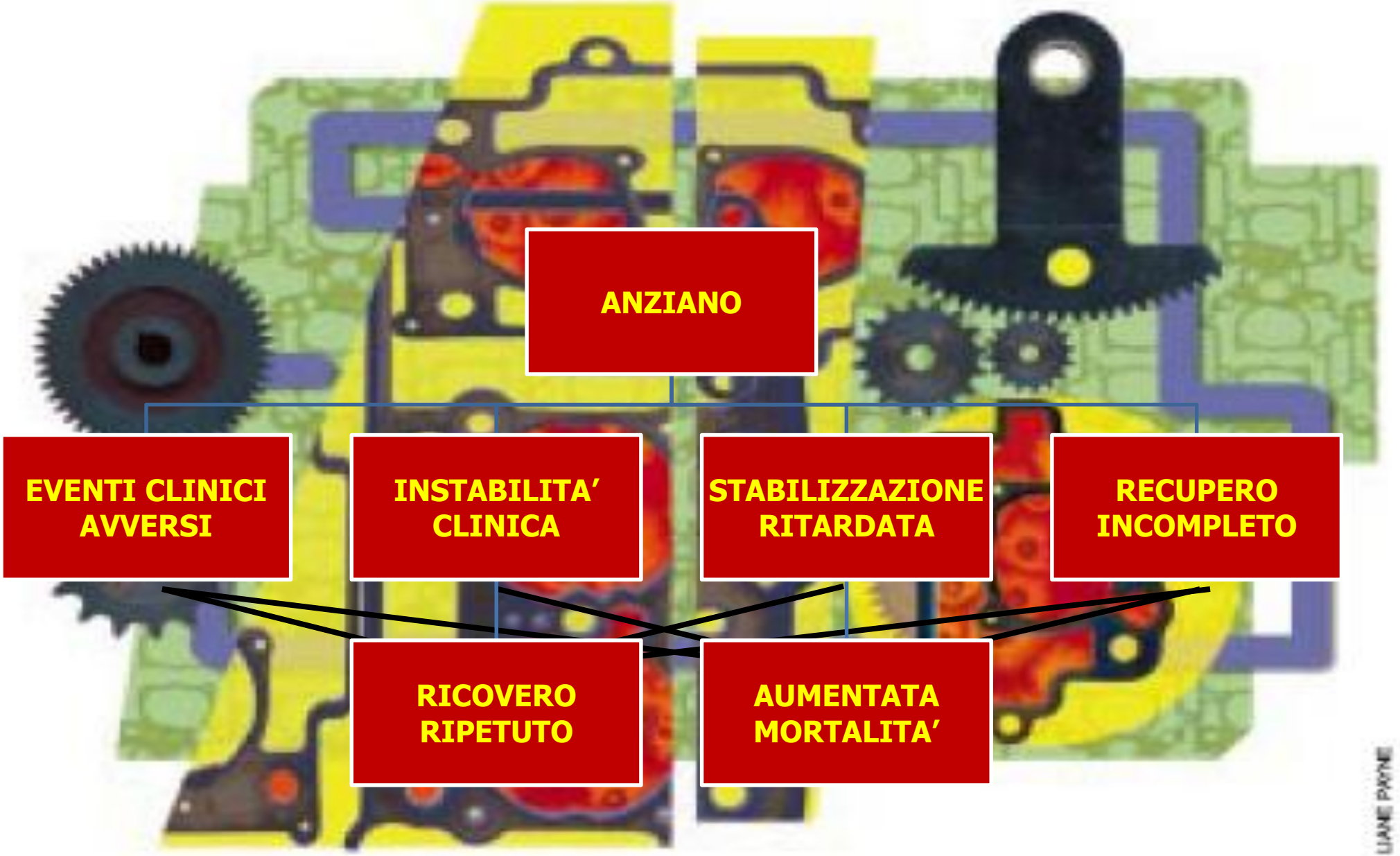
Dipartimento di Scienze Mediche Translazionali

Principles of geriatric surgery.

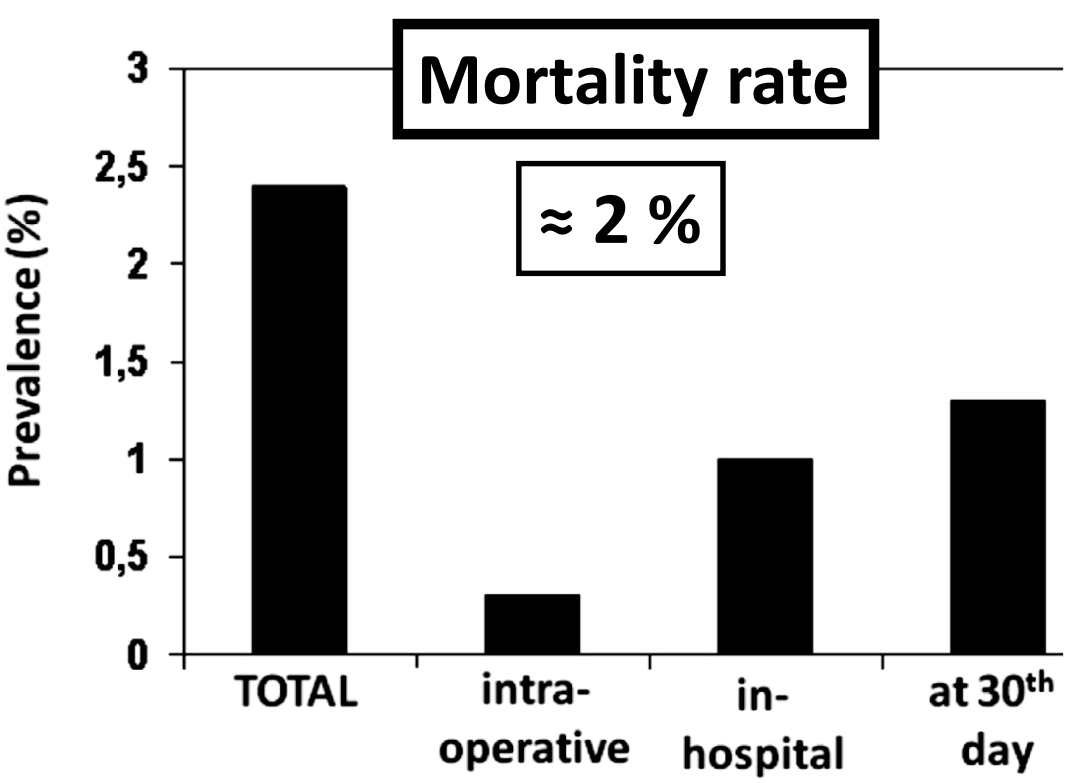
Atipia di presentazione
Riserva funzionale ridotta
Valutazione e preparazione prechirurgica
Buoni i risultati della chirurgia in elezione Non così per la chirurgia in urgenza
Scrupolosa attenzione al momento chirurgico
L'età non è una controindicazione

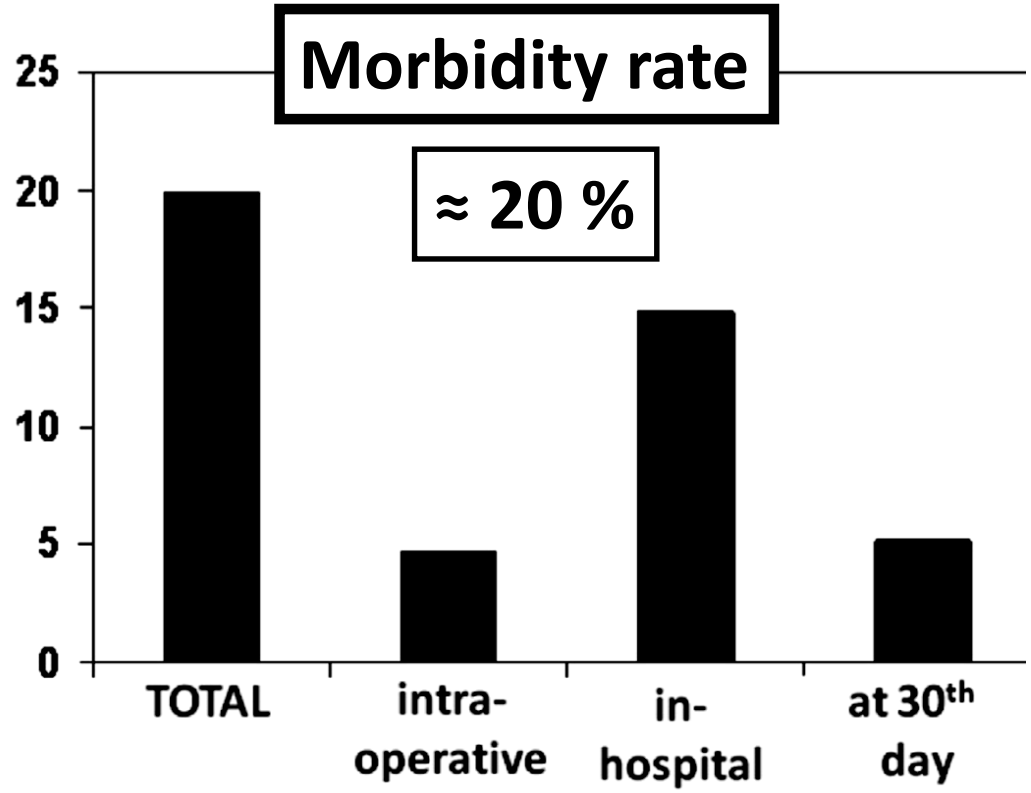
CMAJ·JAMC

Mark R. Katlic CMAJ 2010;182:1403-1404


ANZIANO
EVENTI CLINICI AVVERSI
INSTABILITA' CLINICA
STABILIZZAZIONE RITARDATA
RECUPERO INCOMPLETO
RICOVERO RIPETUTO
AUMENTATA MORTALITA'
LIANE PAYNE

Total, intraoperative, inhospital, and at 30th day mortality and overall morbidity of older patients undergoing surgical intervention





The American Journal of Surgery®

Abete P et al., Am J Surg 2016

Multivariate analysis on mortality and morbility

COGNITIVE IMPAIRMENT →

MORTALITY			
Variable	RR	CI 95%	P
MMSE	**0.77**	**0.61-0.97**	**<0.02**
POSSUM	**1.11**	**1.01-1.23**	**<0.04**

The American Journal of Surgery®

Abete P et al., Am J Surg 2016

Possum score

- **Physiological Parameters**
  - Age Range
  - * BOTH FIELDS MUST BE COMPLETED
  - Actual Age * BOTH FIELDS MUST BE COMPLETED
  - Cardiac
  - Respiratory
  - ECG
  - Systolic BP
  - Pulse Rate
  - Haemoglobin
  - WBC
  - Urea
  - Sodium
  - Potassium
  - GCS
  - If calculating risk in a preoperative patient you will need to estimate the parameters below. You can return and modify the parameters post-operatively if required.
- **Operative Parameters :Operation Type/ Malignancy Status/ CEPOD**

Multivariate analysis on mortality and morbility

COGNITIVE IMPAIRMENT →

MORTALITY			
Variable	RR	CI 95%	P
MMSE	**0.77**	**0.61-0.97**	**<0.02**
POSSUM	**1.11**	**1.01-1.23**	**<0.04**

COMORBILITY →

MORBIDITY			
Variable	RR	CI 95%	P
CIRS	**2.12**	**1.06-4.23**	**<0.03**
ASA	**2.18**	**1.31-3.63**	**<0.01**
NCEPOD	**2.03**	**1.03-4.00**	**<0.04**

The American Journal of Surgery®

Abete P et al., Am J Surg 2016

The NCEPOD Classification of Intervention

This classification came into effect in December 2004, and replaced the categories of Emergency, Urgent, Scheduled and Elective previously used by NCEPOD

IMMEDIATE – Immediate life, limb or organ-saving intervention – resuscitation simultaneous with intervention. Normally within minutes of decision to operate.
Life-saving
Other e.g. limb or organ saving

URGENT – Intervention for acute onset or clinical deterioration of potentially life-threatening conditions, for those conditions that may threaten the survival of limb or organ, for fixation of many fractures and for relief of pain or other distressing symptoms. Normally within hours of decision to operate.

EXPEDITED – Patient requiring early treatment where the condition is not an immediate threat to life, limb or organ survival. Normally within days of decision to operate.

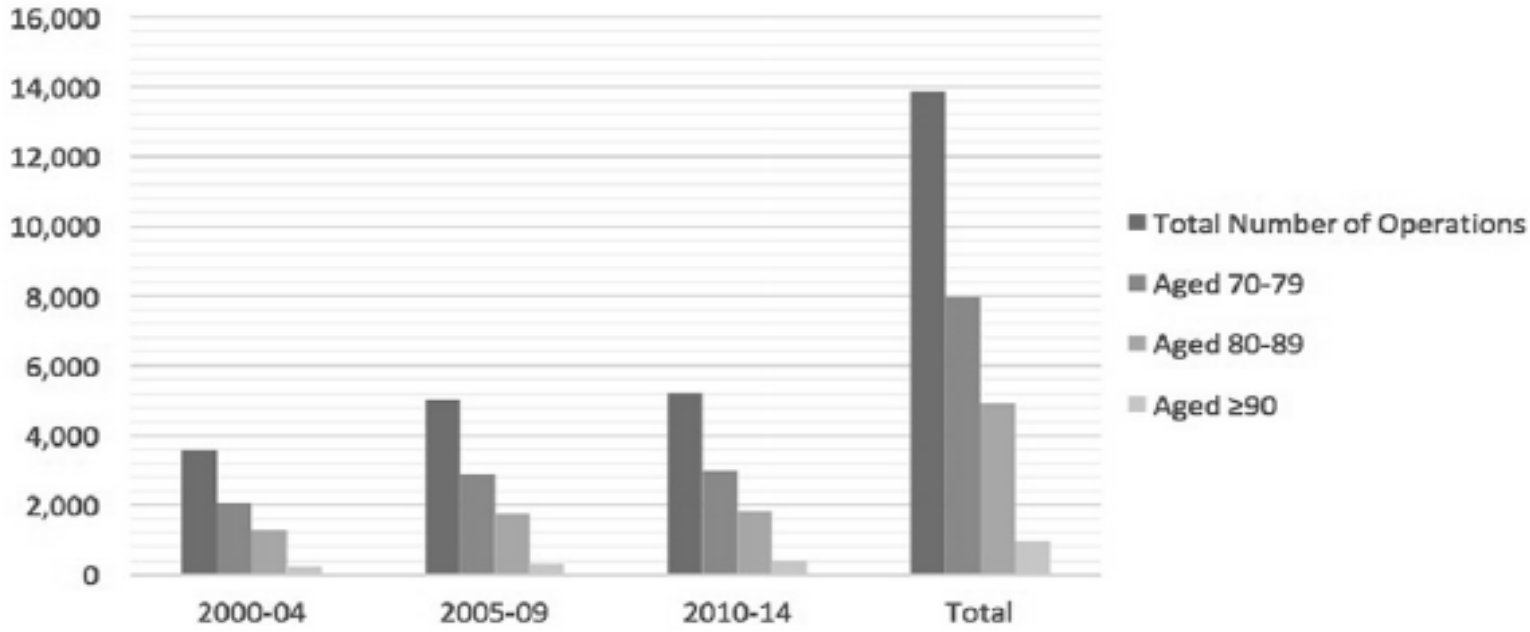
ELECTIVE – Intervention planned or booked in advance of routine admission to hospital. Timing to suit patient, hospital and staff.

A 15-year retrospective analysis of the epidemiology and outcomes for elderly emergency general surgical admissions in the North East of England: A case for multidisciplinary geriatric input

Ross C. McLean, Iain J.D. McCallum, Steve Dixon, Paul O'Loughlin*

Department of Colorectal Surgery, Queen Elizabeth Hospital, Gateshead, NE9 6SX, UK

Total number of emergency general surgical operation by year and age group



ELSEVIER

Contents lists available at ScienceDirect

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journal homepage: www.journal-surgery.net

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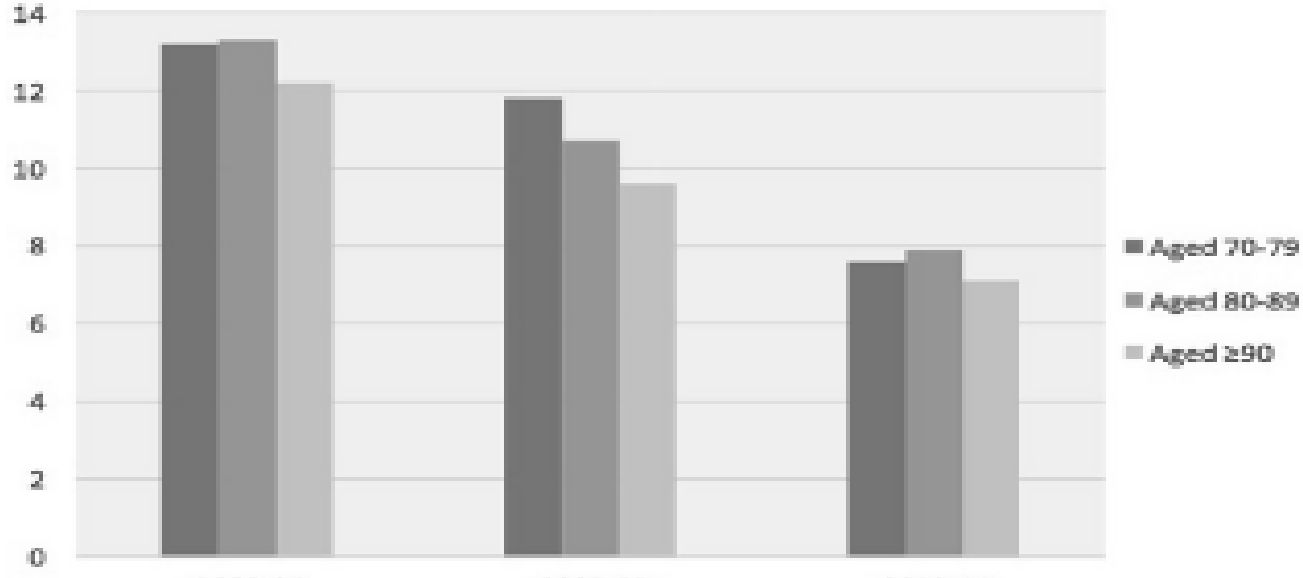
In Hospital 30 days mortality of emergency general surgical operation



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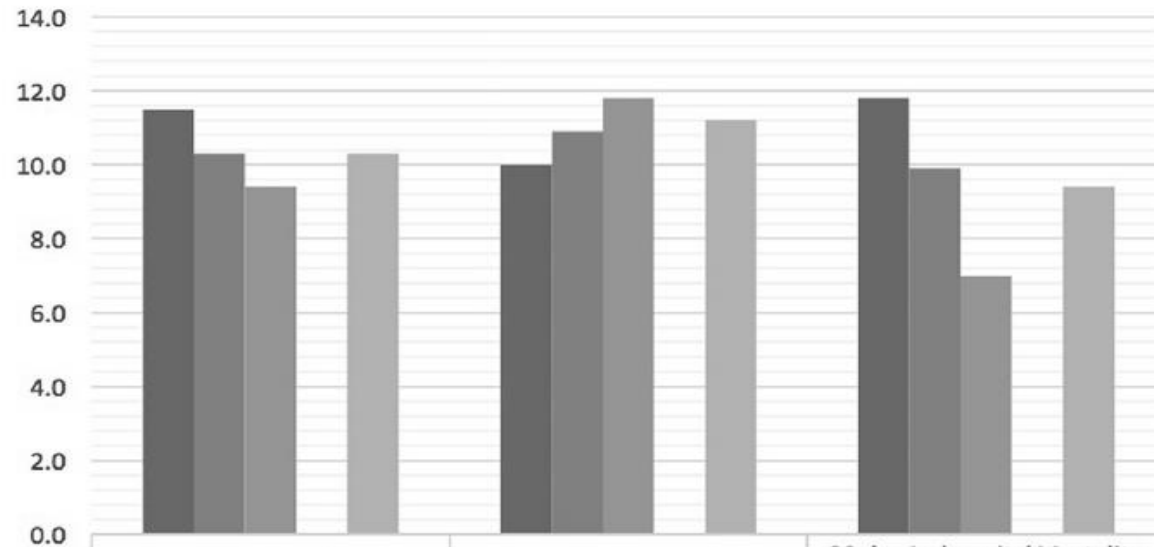

	Length of Stay (days)	Readmission Rate (%)	30 day In-hospital Mortality Rate (%)
Period 2000-04	11.5	10.0	11.8
Period 2005-09	10.3	10.9	9.9
Period 2010-14	9.4	11.8	7.0
p-value	< 0.001	< 0.001	< 0.001
Overall	10.3	11.2	9.4

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Top 5 most common surgical diagnoses and mortality rates of procedures and conservative management over time in patients aged over 70 years admitted as an emergency to general surgery.

Diagnosis	ICD-10 code	Overall mortality [N (%)]	Procedural mortality [N (%)]				Conservative mortality [N (%)]			
			Period 2000–04	Period 2005–09	Period 2010–14	p-Value	Period 2000–04	Period 2005–09	Period 2010–14	p-Value
Uncomplicated biliary disease	K80.0,K80.1, K80.2, K80.4, K80.5, K81.0	188 (4.4)	12 (7.3)	28 (7.6)	20 (4.2)	0.060	30 (4.8)	44 (4.1)	54 (3.5)	0.152
Diverticular disease of colon	K57.3, K57.9	649 (6.6)	40 (21.6)	76 (18.3)	62 (12.4)	0.001	7 (5.0)	204 (6.2)	190 (4.9)	0.416
Intestinal obstruction	K56.5, K56.6	799 (19.8)	84 (27.2)	111 (22.2)	88 (15.9)	<0.001	135 (24.3)	197 (20.2)	184 (16.0)	<0.001
Acute pancreatitis	K85.X	382 (10.6)	11 (31.4)	10 (10.5)	12 (8.6)	0.002	99 (14.3)	148 (12.1)	102 (7.1)	<0.001
Acute intestinal vascular disorder	K55.0	530 (53.0)	75 (47.8)	107 (50.0)	105 (47.1)	0.845	66 (71.7)	79 (60.8)	98 (53.3)	0.003

Note: Comparisons between mortality and time periods by chi-square test for trend.

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Table 1 Prognostic factors for postoperative complications among older adults undergoing elective surgery

Prognostic factor	Number of studies	Number of patients	Odds ratio (95% CI)	Heterogeneity (I^2)
Poor performance status	5	889	2.58 (1.56–4.25)	0
Smoking status	3	907	2.43 (1.32–4.46)	0
IADL impairment	7	1036	2.27 (1.65–3.14)	0
Frailty	8	1527	2.16 (1.29–3.62)	54.69
Cognitive impairment	8	1851	2.01 (1.44–2.81)	0
ADL impairment	4	829	1.98 (1.31–2.99)	0
Geriatric depression screen	4	777	1.77 (1.22–2.56)	0
Comorbidity score	5	1000	1.55 (1.29–1.87)	0
Depression	2	257	2.04 (0.67–6.23)	0
Poor mobility	2	477	2.51 (0.92–6.84)	63.37
Older age	9	2917	1.07 (1.00–1.14)	17.96
General anesthesia	2	172	0.78 (0.38–1.59)	0
ASA score ≥ 3	3	420	2.62 (0.78–8.79)	0
Malnutrition	7	847	1.22 (0.66–2.24)	31.02
Hypertension	3	912	0.90 (0.52–1.54)	0
Cerebrovascular disease	2	845	0.81 (0.11–5.94)	83.39
Diabetes mellitus	3	912	0.70 (0.39–1.26)	0
Polypharmacy	4	442	1.46 (0.9–2.37)	0
Male sex	6	2141	1.60 (0.88–2.91)	66.24

ADL activities of daily living, *ASA* American Society of Anesthesiologists, *IADL* instrumental activities of daily living, *CI* confidence interval

The pooled incidence of postoperative complication = 25.17%

Predictors of postoperative complications

Geriatric syndromes of frailty: (OR=2.16, 95% CI 1.29–3.62)
Cognitive impairment: (OR=2.01, 95% CI 1.44–2.81)

There was no association with traditionally assessed prognostic factors such as age (OR=1.07, 95% CI=1.00–1.14) or American Society of Anesthesiologists status (OR=2.62, 95% CI=0.78–8.79).

Besides frailty, other potentially modifiable prognostic factors, including depressive symptoms (OR =1.77, 95% CI=1.22–2.56) and smoking (OR=2.43, 95% CI=1.32–4.46), were also associated with developing postoperative complications.

Frailty Staging System

Per ogni dominio analizzato, il punteggio sarà di 0 in assenza di deficit e di 1 se la funzione è persa.

In tal modo la valutazione permetterà di evidenziare come fragili soggetti con almeno una ADL persa, con deficit nella mobilità (valutata con il 6-minute Walking test), con deficit visivo (incapacità a leggere il giornale e distinguere i volti delle persone), con deficit delle funzioni cognitive (MMSE < 24), deficit uditivo (incapacità a sentire la voce di una persona seduta di fronte), incontinenza urinaria, scarso supporto sociale.

Lo strumento permette di sviluppare un punteggio che identifica diversi gradi di deficit dividendo i soggetti in 3 classi di fragilità. Il punteggio di 0 indica soggetti non fragili, 1 identifica soggetti con fragilità lieve, un punteggio tra 2 e 3 soggetti con fragilità moderata, un punteggio tra 4 e 7 soggetti con fragilità severa

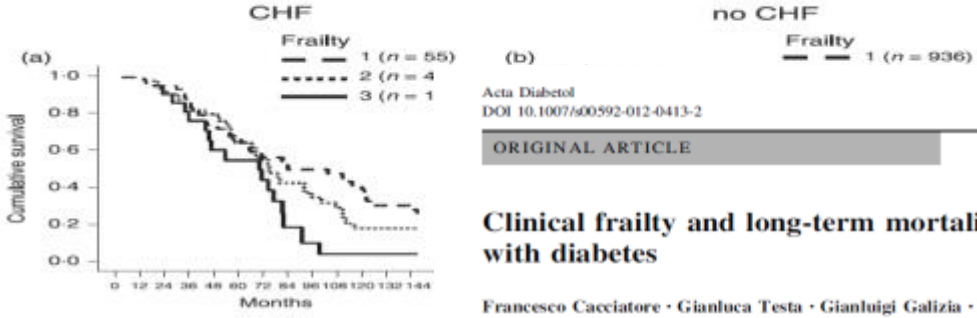
Deficit	**Assente**	**Presente**
Disabilità	0	1
Mobilità	0	1
Funzione cognitiva	0	1
Funzione uditiva	0	1
Funzione visiva	0	1
Continenza urinaria	0	1
Supporto sociale	0	1

(*Cacciatore F et al Eur J Clin Invest 2005).*

European Journal of Clinical Investigation (2005) 35, 723–730

Frailty predicts long-term mortality in elderly subjects with chronic heart failure

F. Cacciatore*, P. Abete†, F. Mazzella‡, L. Viati*, D. Della Morte‡, D. D'Ambrosio‡, G. Gargiulo‡, G. Testa‡, D. De Santis‡, G. Galizia‡, N. Ferrara*‡ and F. Rengo*‡
*'Salvatore Maugeri Foundation', Institute of Care and Scientific Research, Telese (BN), †Department of Clinical Medicine, Cardiovascular and Immunological Sciences, Division of Genetics, University of Naples 'Federico II' and ‡Department of Animal, Vegetable and Environmental Sciences, Division of Internal Medicine, University of Molise, Italy



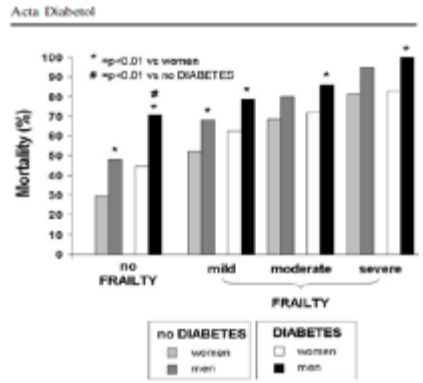
Conclusions Thus mortality among e
frailty. Moreover, frailty is more predi
than in those without CHF. Hence,
predicting long-term mortality in elde

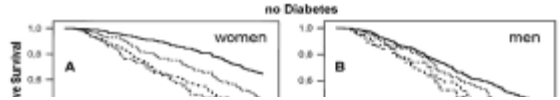
Acta Diabetol
DOI 10.1007/s00592-012-0413-2

ORIGINAL ARTICLE

Clinical frailty and long-term mortality in elderly subjects with diabetes

Francesco Cacciatore · Gianluca Testa · Gianluigi Galizia · David Della-Morte · Francesca Mazzella · Assunta Langellotto · Gilda Pirozzi · Gaetana Ferro · Gaetano Gargiulo · Nicola Ferrara · Franco Rengo · Pasquale Abete





Aging Clinical and Experimental Research

Role of clinical frailty on long-term mortality of elderly subjects with and without chronic obstructive pulmonary disease

Gianluigi Galizia[1,6], Francesco Cacciatore[2], Gianluca Testa[1,3], David Della-Morte[1,4], Francesca Mazzella[1,2], Assunta Langellotto[1], Carolina Raucci[1], Gaetano Gargiulo[1], Nicola Ferrara[2,5], Franco Rengo[1,2] and Pasquale Abete[1]

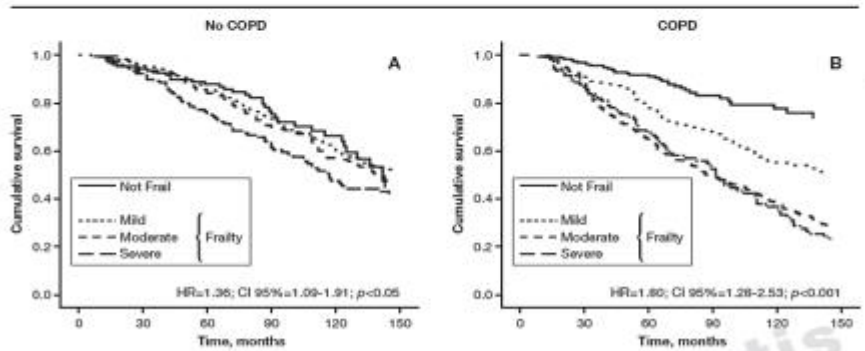
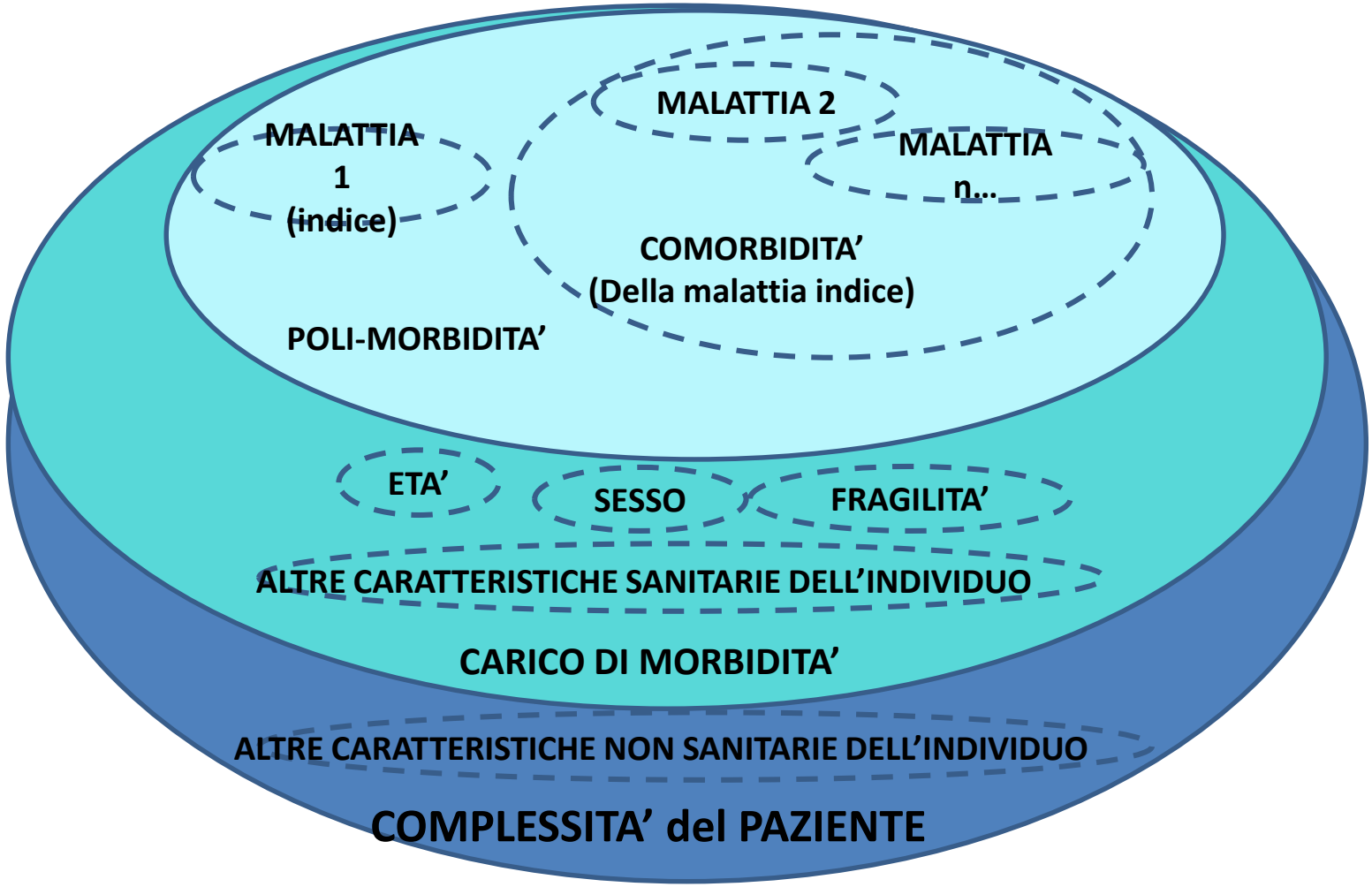


Fig. 2 - Cox regression adjusted survival curve in non-frail subjects and subjects stratified by frailty degree, without (A) and with (B) with COPD.

Polimorbidità, Comorbilità e Complessità



Comprehensive Geriatric Assessment

Physical

Nutritional

HISTORY

Physiological
Pathological
Pharmacological

Mental

Social

Physical

- Basic Activities of Daily Living (BADL)
- Instrumental Basic Activities of Daily Living (IADL)
- Comorbility (Cumulative Illness Rating Scale/*CIRS*)
- Number of drugs
- Balance tests
- Gait speed (4 or 3 meters)
- Chair stand test

Short Physical Performance Battery (*SPPB*)

- Muscle strength (grip strength)
- Muscle mass (bioimped.or DEXA)

SARCOPENIA

Mental

- Diagnosed dementia or cognitive impairment (Mini Mental State Examination, *MMSE*)
- Depression(Geriatric Depression Scale, *GDS*)

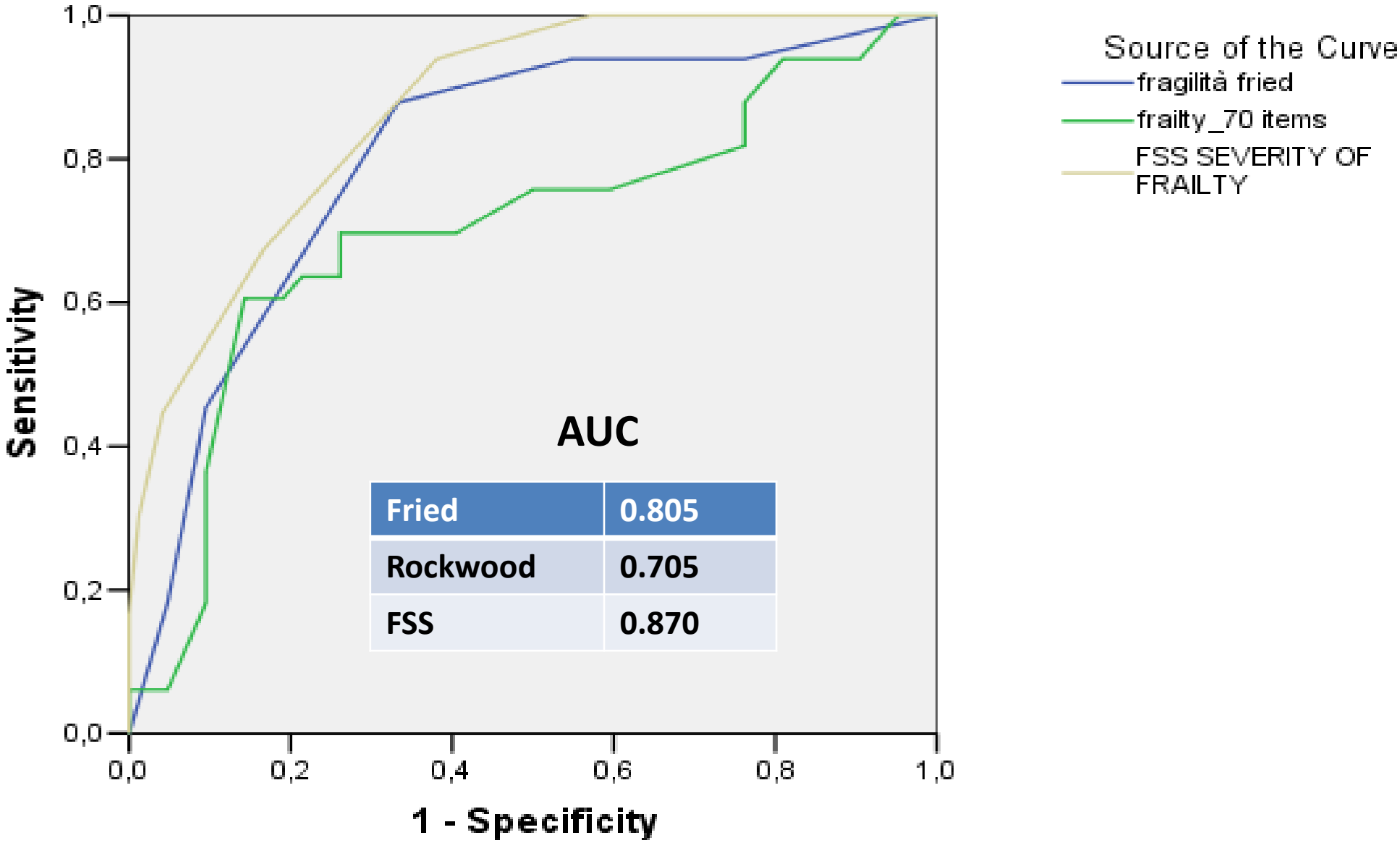
Nutritional

- Body weight
- Body Mass Index
- Waist circumference
- Mini Nutritional Assessment (*MNA*)

Social

- Social recourses
- Emptiness/missing people around
- Social support score

Cardiac Surgery and mortality



AUC

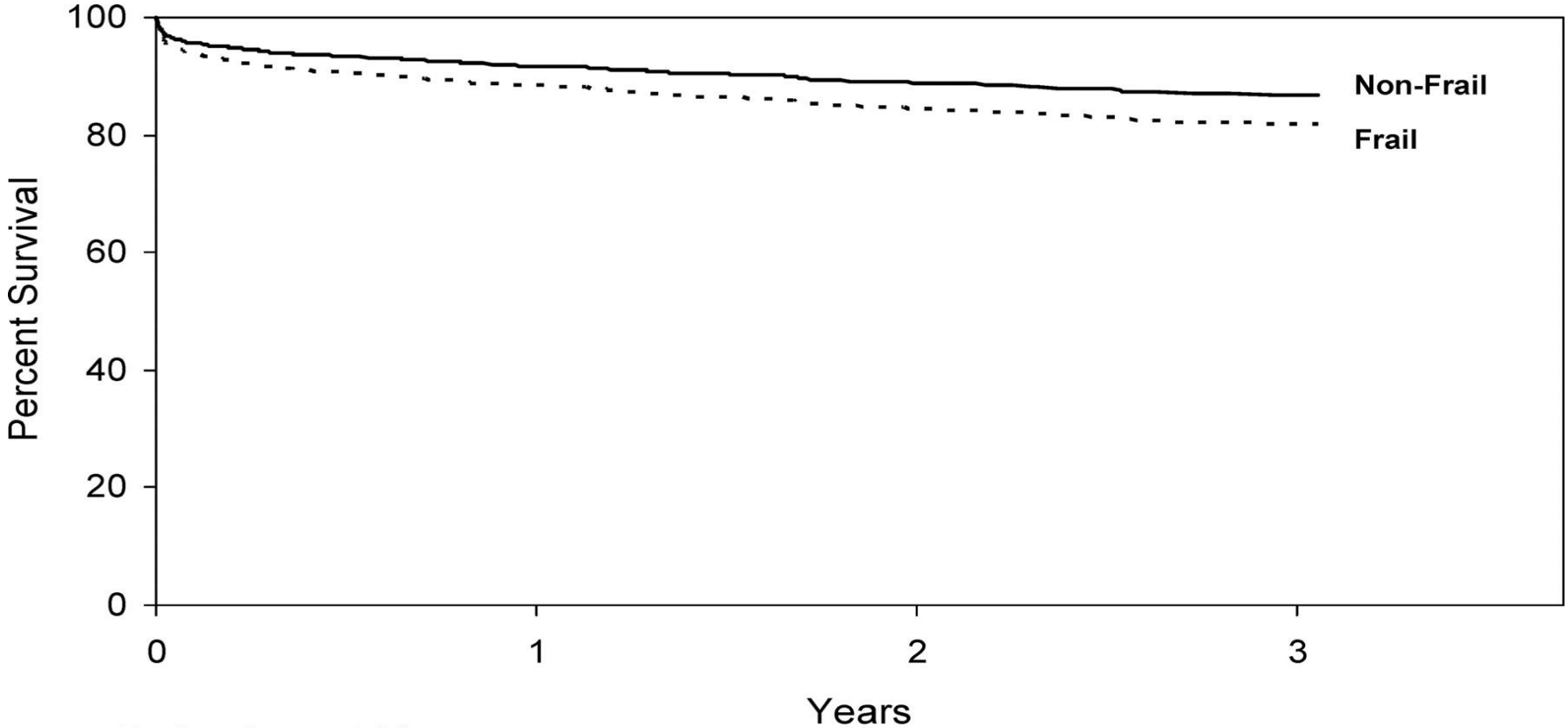
Fried	**0.805**
Rockwood	**0.705**
FSS	**0.870**

Diagonal segments are produced by ties

The Utility of Multidimensional Assessment in the Care of Older Adults Undergoing Surgery

- Preoperative risk assessment
- Trauma triage
- Pre-habilitation to modify risk
- Tailored anesthesia approach
- Implementation of team-based care pathways
- Delirium prevention
- Palliative care approaches

Frail Patients Are at Increased Risk for Mortality and Prolonged Institutional Care After Cardiac Surgery



Number of cases at risk

139	83	61	27	**Frail**
3115	2258	1413	608	**Non-Frail**

Lee DH et al. Circulation 2010

Frail Patients Are at Increased Risk for Mortality and Prolonged Institutional Care After Cardiac Surgery

Table 3. Risk-Adjusted Impact of Frailty on In-Hospital Mortality

Preoperative Characteristics	OR	95% CI	*P*
Frail	1.8	1.1–3.0	0.03
Age*	1.6	1.4–1.9	0.0001
Female sex	1.2	0.8–1.6	0.36
COPD	1.3	0.9–1.8	0.22
RF	2.3	1.5–3.5	0.0002
CHF	2.2	1.5–3.0	0.0001
PVD	1.5	1.1–2.2	0.03
Urgency of surgery			
Urgent/emergent	5.1	3.3–8.1	0.0001
In-house	1.6	1.1–2.4	0.03
Elective	1.0	—	—
Procedure (other vs isolated CABG)	1.8	1.3–2.5	0.0008
Reoperation (vs first operation)	1.7	1.1–2.7	0.03

*A restricted cubic spline transformation was applied to age, with knots at 49, 66, and 82 years; OR (odds ratio) represents the increase in risk for each unit change in transformed age.

In addition to the variables listed in Table 3, the model was also adjusted for hypertension, CVD, and a restricted cubic spline transformation of BMI.

ROC 81%, 95% CI 78%–85%.

Table 5. Risk-Adjusted Impact of Frailty on Mid-Term Mortality

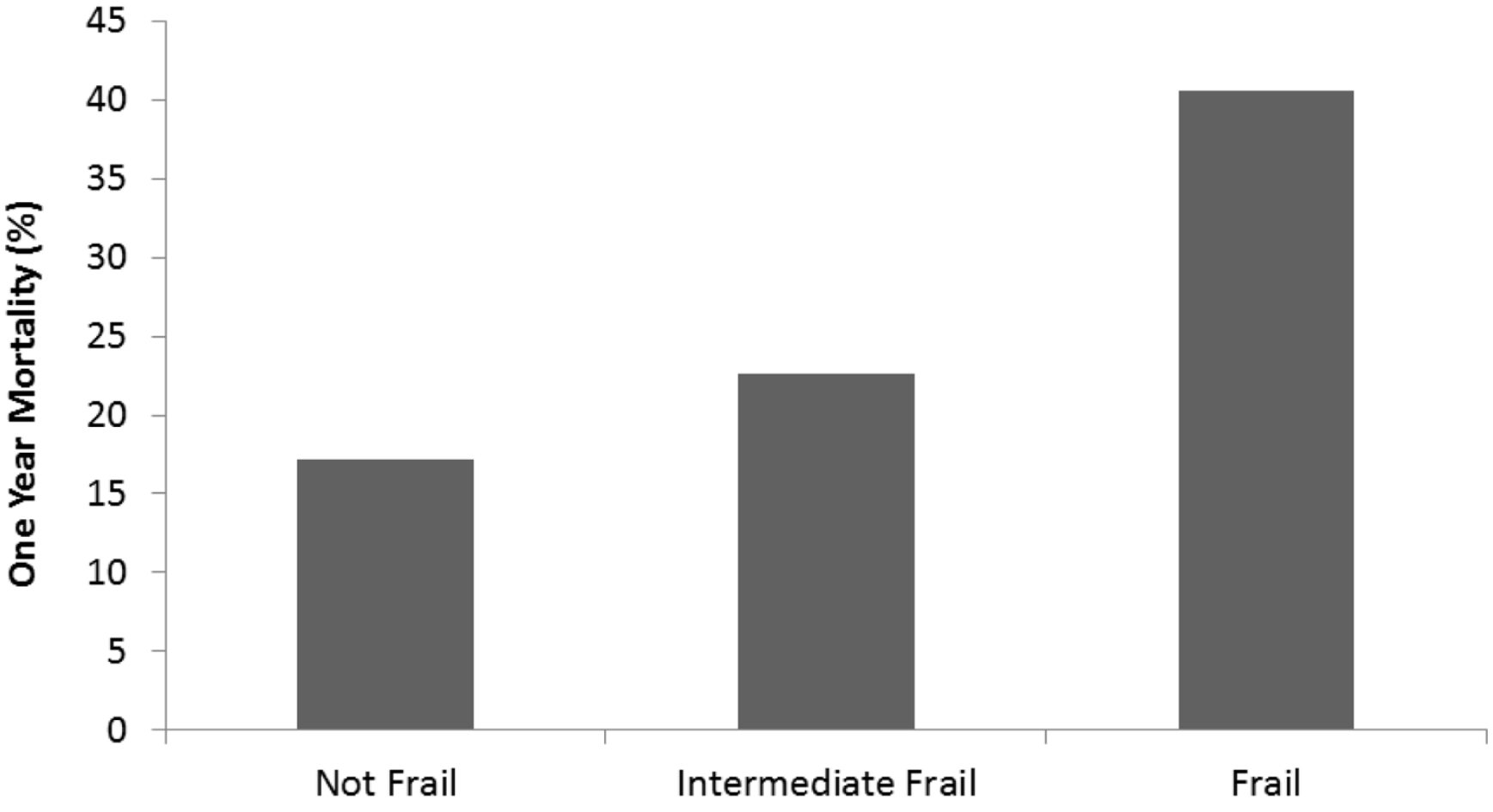
Preoperative Characteristics	HR	95% CI	*P*
Frail	1.5	1.1–2.2	0.01
Age*	1.5	1.4–1.7	0.0001
Female sex	1.2	0.9–1.5	0.19
Diabetes	1.3	1.1–1.7	0.02
COPD	2.5	1.9–3.4	0.0001
RF	1.9	1.5–2.6	0.0001
CHF	1.8	1.4–2.2	0.0001
PVD	1.8	1.4–2.3	0.0001
Urgency of surgery			
Urgent/emergent	1.8	1.2–2.7	0.0012
In-house	1.4	1.1–2.0	0.67
Elective	1.0	—	—
Procedure (other vs isolated CABG)	1.6	1.3–2.0	0.0001
Reoperation	1.3	1.0–1.8	0.09

*A restricted cubic spline transformation was applied to age, with knots at 49, 66, and 82 years; HR (hazard ratio) represents the increase in risk for each unit change in transformed age.

In addition to the variables listed in Table 5, the model was also adjusted for CVD, a restricted cubic spline transformation of BMI, and the time-dependent covariates associated with COPD and urgency of surgery.

Lee DH et al. Circulation 2010

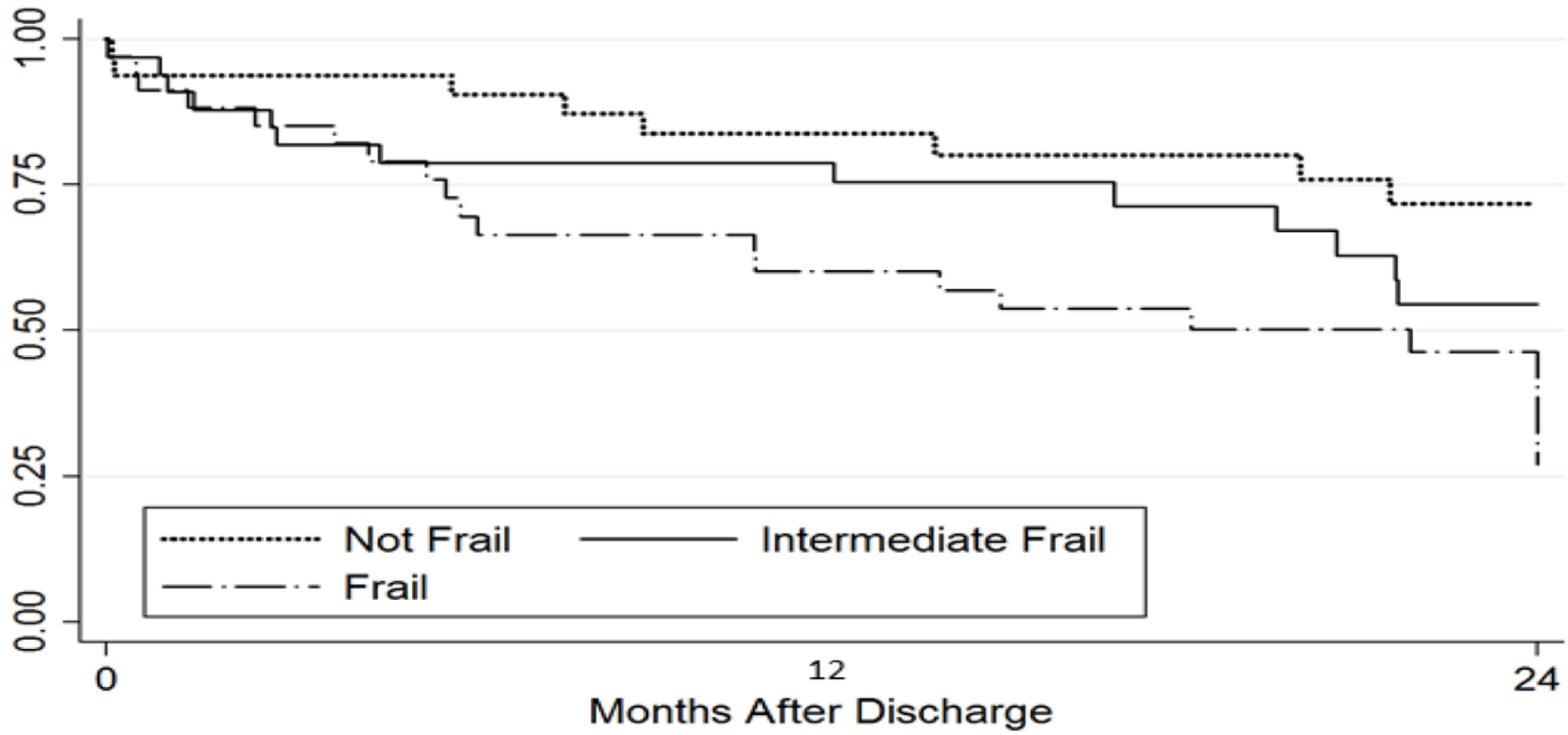
1 year mortality in LVAD as destination therapy at the Mayo Clinic, Rochester



Dunlay et al. J Heart Lung Transplant. 2014

Risk of Death and Rehospitalization by Frailty Tertiles

Fig 2b



Not Frail	**28**	**24**	**27**	**17**
Int Frail	**26**	**24**	**17**	**14**
Frail	**22**	**19**	**14**	**11**

Dunlay et al. J Heart Lung Transplant. 2014

Frailty and Outcomes Following Implantation of Left Ventricular Assist Device as Destination Therapy

- Frailty before destination LVAD implantation is associated with increased risk of death and may represent a significant patient selection consideration.

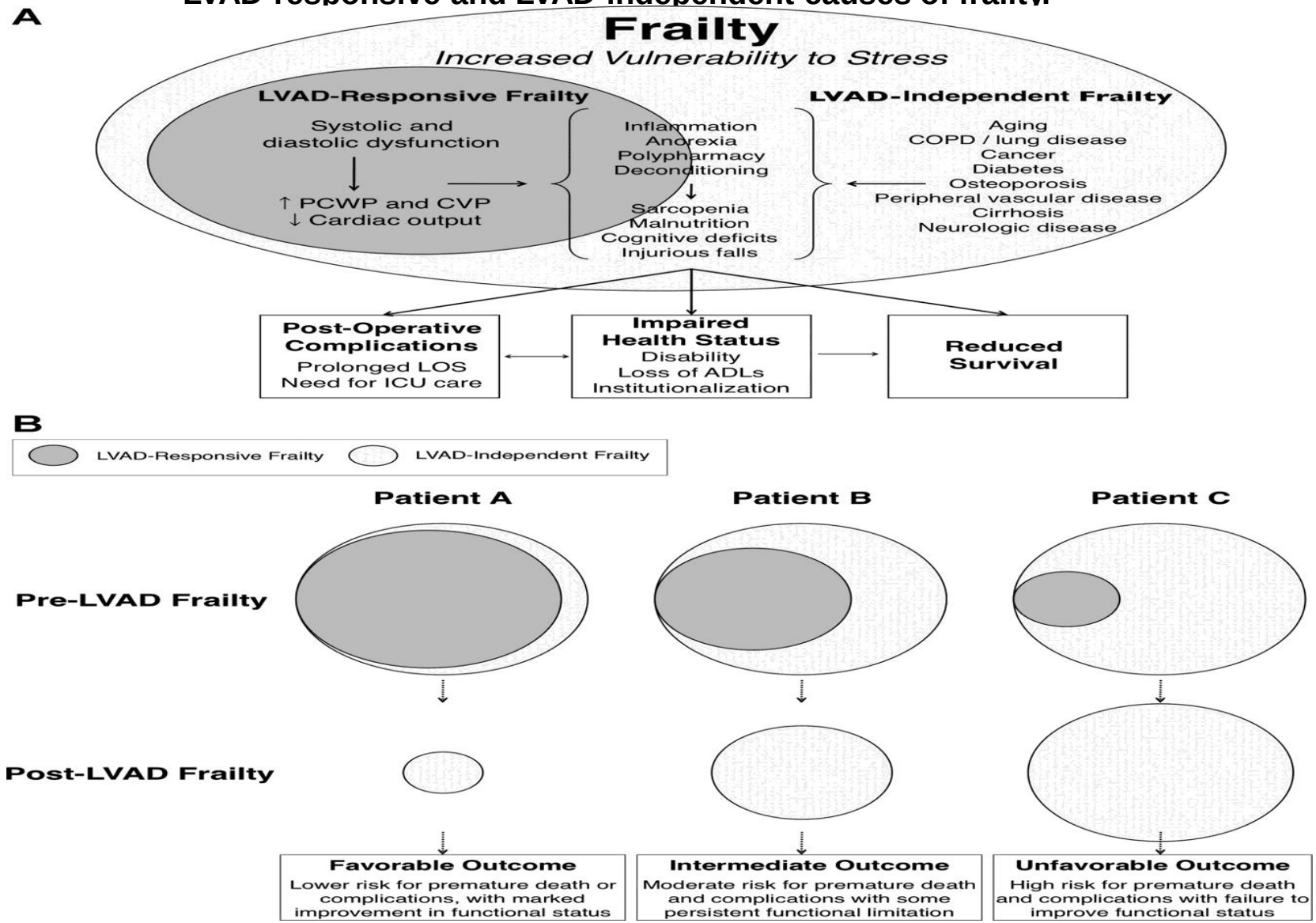
Dunlay et al. J Heart Lung Transplant. 2014

Frailty and the Selection of Patients for Destination Therapy Left Ventricular Assist Device

by Kelsey M. Flint, Daniel D. Matlock, JoAnn Lindenfeld, and Larry A. Allen

Circ Heart Fail
Volume 5(2):286-293
March 20, 2012

A, Breakdown of frailty into its underlying causes, manifestations, and clinical outcomes separated by LVAD-responsive and LVAD-independent causes of frailty.



American Heart Association

Kelsey M. Flint et al. Circ Heart Fail. 2012;5:286-293

Can a Left Ventricular Assist Device in Individuals with Advanced Systolic Heart Failure Improve or Reverse Frailty?

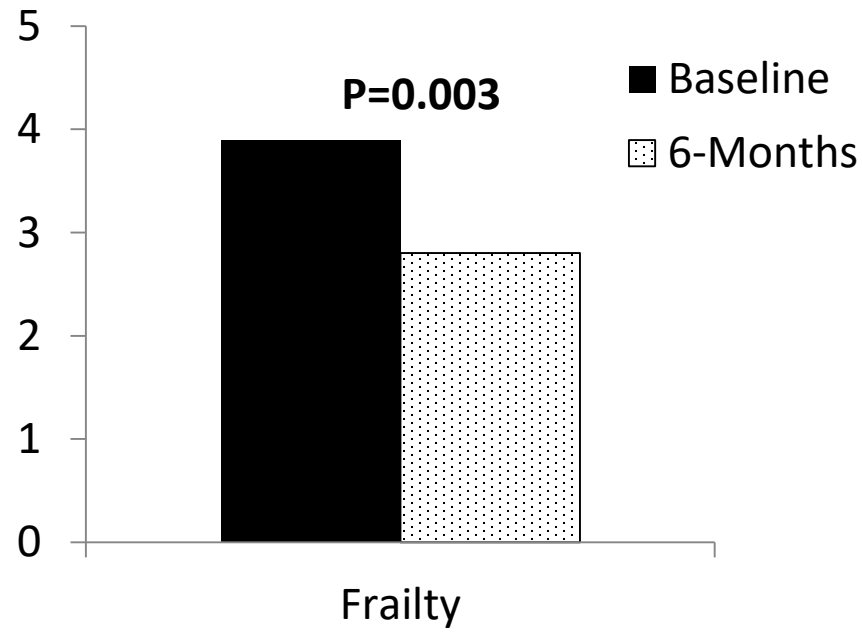
Frailty, defined as having 3 or more of the Fried frailty criteria, was assessed before LVAD implantation and 1, 3, and 6 months after implantation

N = 29; mean age 70.6 ± 5.5, 72.4% male

Improvements were observed after 3 to 6 months of LVAD support, although 10 (52.6%) participants still had 3 or more Fried criteria, and all subjects had at least one at 6 months.

Changes in frailty were associated with improvement in QOL but not with changes in mood or cognition.

Higher EGFR at baseline was independently associated with a decrease in frailty.



Mathew S. Maurer , nov 2017

Journal of the American Geriatrics Society
AGS 75 YEARS OF CARING FOR OLDER ADULTS

Determinants of prolonged intensive care unit stay after cardiac surgery in the elderly

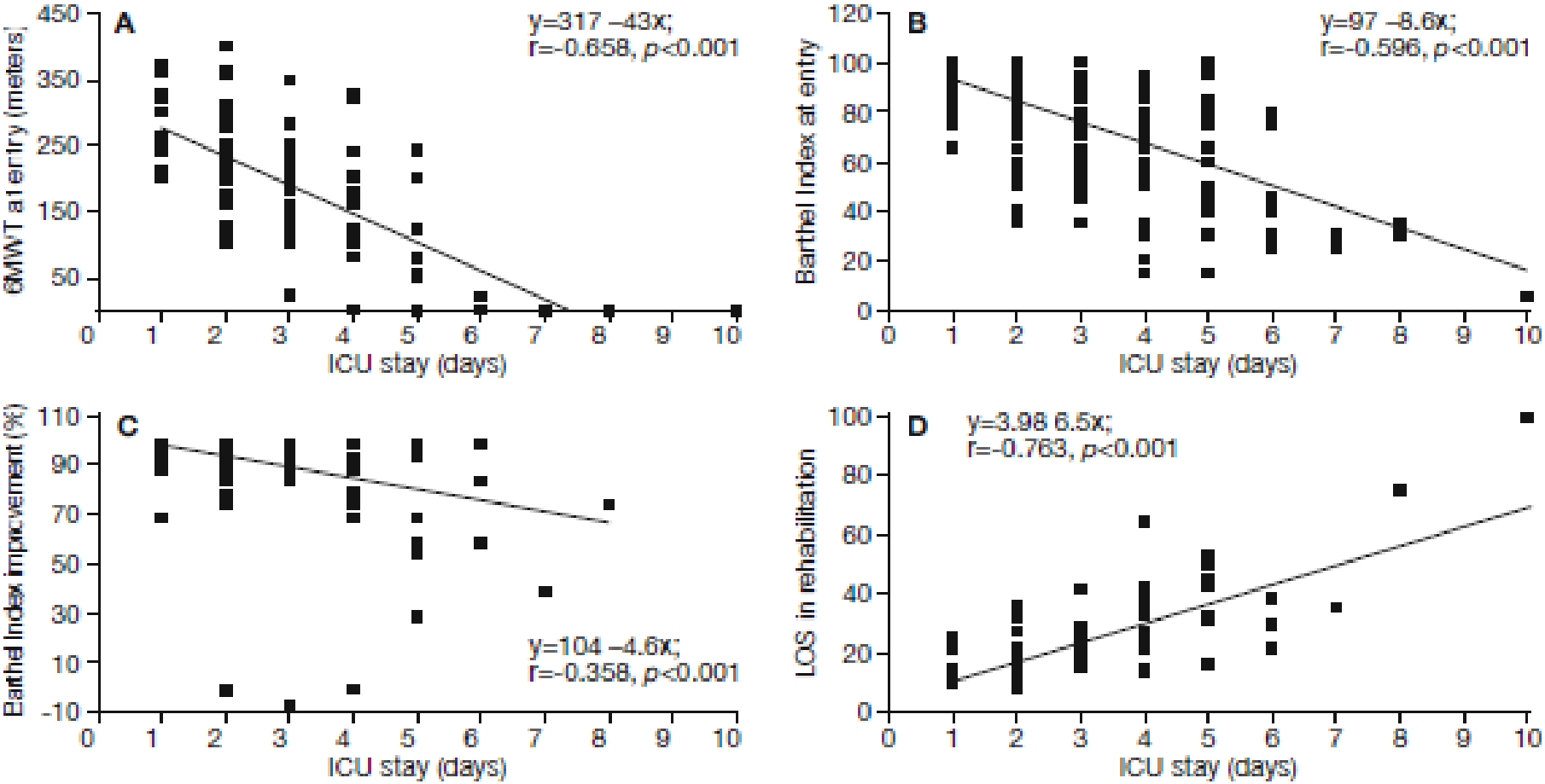


Fig. 1 - *Linear regression between intensive care unit (ICU) stay and 6-minute walking test (6MWT) (A), ICU stay and Barthel Index at entry (B), ICU stay and percent Barthel Index improvement (C), and ICU stay and length of stay (LOS) in rehabilitation (D).*

Cacciatore F et al, Aging Clin Exp Res, 2012

Determinants of prolonged intensive care unit stay after cardiac surgery in the elderly

Table 2 - *Univariable and multivariable logistic regression analyses to identify pre-operative factors associated with long intensive care unit stay.*

	Univariable		Multivariable	
	OR (95% CI)	*p*	OR (95% CI)	*p*
Age, yrs	**1.060 (1.002–1.121)**	**0.044**	1.047 (0.977–1.122)	0.196
Gender (female vs male)	**2.486 (1.412–4.376)**	**0.002**	**2.867 (1.358-6.057)**	**0.006**
CABG	0.814 (0.428–1.548)	0.531	-	-
Valve surgery	1.542 (0.869–2.736)	0.139	-	-
NYHA ≥ 3	**10.500 (3.324-33.169)**	**0.000**	**8.627 (2.155-35.544)**	**0.002**
OPCABG	**0.478 (0.274-0.834)**	**0.009**	0.868 (0.435-1.733)	0.688
CAD	0.978 (0.489-1.956)	0.950	-	-
Diabetes	0.795 (0.459-1.379)	0.415	-	-
Renal failure	**2.540 (1.213-5.313)**	**0.013**	1.725 (0.689-4.322)	0.245
Stroke	**3.347 (1.536-7.292)**	**0.002**	1.294 (0.464-3.613)	0.623
PAD	1.907 (0.904-4.022)	0.090	-	-
COPD	1.523 (0.889-2.677)	0.123	-	-
CIRS	**5.922 (2.638-13.294)**	**0.000**	**4.899 (1.744-13.742)**	**0.003**
PASE	**0.984 (0.977-0.992)**	**0.000**	**0.992 (0.983-1.000)**	**0.042**

OR: odds ratio; CI: confidence interval; CABG; coronary artery by-pass grafting; NYHA: New York Heart Association; OPCABG: off pump coronary artery by-pass grafting; CIRS: Cumulative Illness Rating Scale; CAD: coronary artery disease; COPD: chronic obstructive pulmonary disease; PAD: peripheral arterial disease; PASE: Physical Activity Scale for the Elderly; LOS: length of stay. Significant OR and p-values are shown in bold type.

Cacciatore F et al, Aging Clin Exp Res, 2012

Linguaggio Comune Condiviso

Università degli Studi di Napoli "Federico II"
AZIENDA OSPEDALIERA UNIVERSITARIA

Dipartimento assistenziale ad attività integrata (DAI) di
MEDICINA CLINICA, PATOLOGIA CLINICA

UOS: Teapia Subintensiva Internistica
Respons. Prof. P. Abete

li, _____/_____/_____

INDICE DI FRAGILITA'

___/40

lieve (da 0.1 a 16.0); moderato (da 16.1 a 27.0); severo (da 27.1 a 40.0)

Abete P et al., Aging Exp Clin Res 29 (5); 913-926, 2017

p.abete@unina.it

1.	Aiuto nel lavarsi	SI = 1	NO = 0				
2.	Aiuto nel vestirsi	SI = 1	NO = 0				
3.	Aiuto nel sedersi o alzarsi dalla sedia	SI = 1	NO = 0				
4.	Aiuto nel camminare in casa	SI = 1	NO = 0				
5.	Aiuto nel mangiare	SI = 1	NO = 0				
6.	Aiuto nella cura della casa	SI = 1	NO = 0				
7.	Aiuto nell'utilizzare il bagno	SI = 1	NO = 0				
8.	Aiuto nel salire o scendere le scale	SI = 1	NO = 0				
9.	Aiuto nell'alzare 4.5 kg	SI = 1	NO = 0				
10.	Aiuto nel fare la spesa	SI = 1	NO = 0				
11.	Aiuto nei lavori di casa	SI = 1	NO = 0				
12.	Aiuto nel preparare i pasti	SI = 1	NO = 0				
13.	Aiuto nell'assumere i farmaci	SI = 1	NO = 0				
14.	Aiuto nella gestione del denaro	SI = 1	NO = 0				
15.	Perdita di più di 4.5 kg di peso nell'ultimo anno	SI = 1	NO = 0				
16.	Giudizio sulla propria salute	scarsa = 1	discreta = 0.75	buona = 0.5	molto buona = 0.25	Eccellente = 0	
17.	Come è cambiata la sua salute nell'ultimo anno?	peggiorata = 1	migliorata/stessa = 0				
18.	Persistenza a letto almeno 1/2 giornata per motivi di salute, nell'ultimo mese?	SI = 1	NO = 0				
19.	Riduzione della solita attività nell'ultimo mese?	SI = 1	NO = 0				
20.	Uscire	<3 giorni = 1	≥3 giorni = 0				
21.	Affaticarsi per qualsiasi cosa	spesso = 1	qualche volta = 0.5	raramente = 0			
22.	Sentirsi depresso	spesso = 1	qualche volta = 0.5	raramente = 0			
23.	Sentirsi infelice	spesso = 1	qualche volta = 0.5	raramente = 0			
24.	**Social support Score (vedi allegato 1)**	**>13 = 1**	**6-13 = 0.5**	**1-5 = 0**			
25.	Avere difficoltà a mettersi in moto	spesso = 1	qualche volta = 0.5	raramente = 0			

Disabilità

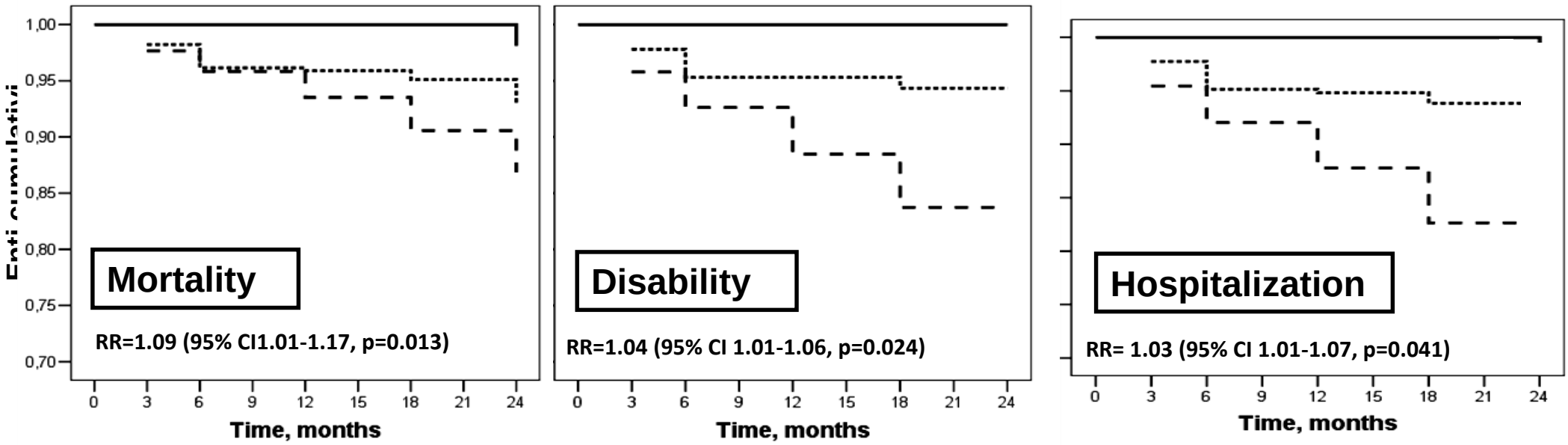
Abete P et al., Aging Exp Clin Res 2017

26.	Ipertensione	SI = 1	sospetta = 0.5	NO = 0			
27.	Angina pectoris	SI = 1	sospetta = 0.5	NO = 0			
28.	Insufficienza cardiaca cronica	SI = 1	sospetta = 0.5	NO = 0			
29.	Ictus	SI = 1	sospetta = 0.5	NO = 0			
30.	Cancro	SI = 1	sospetta = 0.5,	NO = 0			
31.	Diabete	SI = 1	sospetta = 0.5	NO = 0			
32.	Artrosi	SI = 1	sospetta = 0.5	NO = 0			
33.	Broncopneumopatia cronica	SI = 1	sospetta = 0.5	NO = 0			
34.	MMSE =	<10 = 1	11–17 = 0.75	18–20 = 0.5	20–24 = 0.25	>24 = 0	
35.	BMI =	<18.5, ≥ 30 = 1	25-<30 = 0.5	18.5-24.9=0			
36.	Picco flusso espiratorio = _____L/min 1=_____ 2=_____ 3=_____	≤340 (uomo), ≤310 (donna) = 1	>340 (uomo), >310 (donna) = 0				
37.	Forza muscolare sollevamento = Kg 1=_____ 2=_____ 3=_____	≤12 (uomo), ≤9 (donna) = 1	>12 (uomo), >9 (donna) = 0				
38.	Forza muscolare presa = Kg 1=_____ 2=_____ 3=_____	Uomo =1	Uomo = 0				
		BMI ≤24, kg ≤29	BMI ≤24 kg >29				
		BMI 24.1-28 kg ≤30	BMI 24.1-28 kg >30				
		BMI >28 kg ≤32	BMI >28 Kg >32				
		Donna = 1	Donna = 0				
		BMI ≤23 kg ≤17	BMI ≤23 kg >17				
		BMI 23.1-26 kg≤17.3	BMI 23.1-26 kg >17				
		BMI 26.1-29 kg ≤18;	BMI 26.1-29 kg >18				
		BMI >29 kg ≤21	BMI >29 kg >21				
39.	**Mini nutritional Assessment (vedi allegato 2)**	**<17=1**	**17-23.5=0.5**	**24=0**			
40.	Tempo impiegato per percorrere 4 metri con passo rapido (sec.) =	>10 = 1	≤10 = 0				
						TOTALE	

Comorbidità

Abete P et al., Aging Exp Clin Res 2017

Survival Cox analysis on mortality, disability and hospitalization stratified for "*frailty*" degree



FRAILTY

- Light
- Moderate
- Severe

RR=rischio relativo;
CI=intervallo di confidenza).

Abete P et al., Aging Exp Clin Res 2017

Proactive geriatric assessment in emergency surgery patients

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447 emergency surgery elderly patients → Geriatric Assessment

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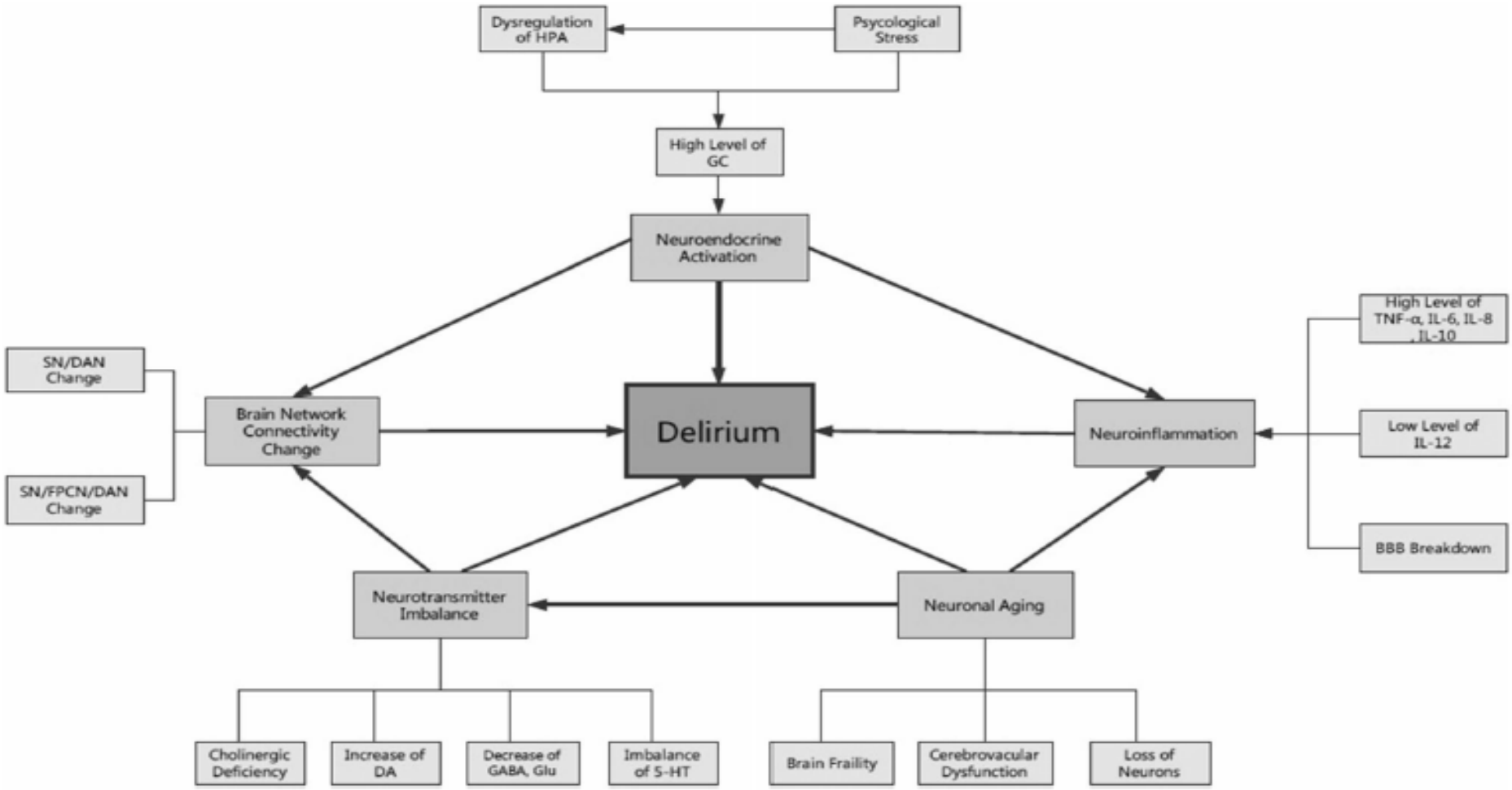
- **New medical diagnoses → 35%**
- **Polypharmacy → 30%**
- **Cognitive impairment → 22%**
- **Frailty → 38%**
- **Stopping medication → 40%**
- **Starting medication → 28%**
- **Referral to multidisciplinary team → 70.1**
- **LOS → Reduction of 0.55 days**

Mason et al, 2018, Int J Clin Pract

Postoperative delirium in the elderly: the potential neuro-pathogenesis



Wang S. et al. Aging Clin Exp Res, 2018

Postoperative delirium in the elderly: the potential neuro-pathogenesis

Predisposing factors	Precipitating factors
Older age (> 70 years)	Sedative-hypnotics
Cognitive impairment (dementia)	Multiple medication added
History of delirium	Use of physical restraints
Function impairment (vision impairment; hearing impairment)	Use of bladder catheter
Severity of illness	Laboratory abnormality (elevated BUN; abnormal serum albumin; metabolic acidosis)
Depression	Infection
Stroke	Surgery
Drugs or alcohol abuse	Trauma admission
	Urgent admission

BUN blood urea nitrogen

Wang S. et al. Aging Clin Exp Res, 2018

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Review

Risk factors of post-operative delirium after elective vascular surgery in the elderly: A systematic review

J.W. Raats [a,*], S.L. Steunenberg [a], D.C. de Lange [b], L. van der Laan [a]

[a] Department of Surgery, Amphia Hospital, Breda, The Netherlands
[b] Department of Geriatric Medicine, Amphia Hospital, Breda, The Netherlands

Table 3
Characteristics and outcome measures of the included studies describing identified risk factors for delirium.

Study author	Year published	Sample size	Type of elective surgery	Delirium assessment method	Incidence of delirium	Identified risk factors
Schneider [25]	2002	47	Carotid, aortal, peripheral artery surgery	DRS, DSM IV	36%	Depression (OR 3.3), cognitive impairment (OR 3.8), higher infusion and transfusion requirements (OR 2.9)
Böhner [20]	2003	153	Aortal, carotid, peripheral bypass surgery	DRS, DSM IV	39%	No history of supraaortic occlusive disease (OR 6.7), history of major amputation (OR 24.4), no history of hypercholesterolemia (OR 5.5), age > 64 years (OR 3.0), body length < 170 cm (OR 4.0), cognitive impairment (OR 28.0), intraoperative colloid infusion > 800 mL (OR 2.6), intraoperative minimal potassium < 3.5 mmol/L (OR 3.2)
Benoit [19]	2005	102	AAA repair: endovascular and open repair	DSM IV, CRDI	33%	Pack years smoked (OR 0.95), cognitive impairment (OR 2.1), no. of psychoactive meds (OR 0.147), no. of vasoactive meds (OR 3.8)
Bryson [21]	2010	168	Open aortic repair	CAM	36%	No association between serum Apolipoprotein genotype and delirium
Koebrugge [22]	2010	85	Open and endovascular aortoiliac surgery	DOS/DSM IV	14%	ASA score ≥ 3 (OR 8.7)
Sasajima [24]	2012	299	Chronic limb ischemia having arterial bypass surgery	CAM/DRS	29%	Age (OR 5.5) end stage renal failure (OR 5.0) multiple segments vascular occlusion (OR 2.9) dementia (OR 2.8) CLI (OR 2.0)
Pol [23]	2014	277	Open and endovascular aortic repair, endovascular procedures, peripheral bypass surgery, Percutaneous interventions, amputation surgery	DOS/DSM IV	6%	Post-operative CRP > 5 mg/L (OR 1.01), open aortic sugery or amputation surgery (OR 5.39)
Visser [27]	2015	463	Open and endovascular aortic repair, peripheral bypass, arteriovenous shunt surgery, percutaneous interventions, different types of amputation	DOS/DSM IV	5%	Cognitive impairment (OR 16.4) open aortic sugery or amputation surgery (OR 14.0) Current smoking (OR 10.5) Hypertension (OR 7.6) Age ≥ 80 years (OR 7.3)
Raats [15]	2015	206	Critical limb ischemia, diabetic foot ulcers, AAA, carotid surgery	DOS/DSM IV	17%	Amphia Risk Score for delirium (OR 1.77) Nurse help at home before admission (OR 3.61)
van Eijsden [26]	2015	92	Critical limb ischemia	DOS/DSM IV	32%	Diabetes mellitus (OR 6.2) SNAQ-RC ≥ 3 (OR 5.6)

OR: Odds Ratio, CAM: Confusion Assessment Measure, DSM: Diagnostic and Statistical Manual of Mental Disorders, DRS: Delirium Rating Scale, CRDI: Clinician-Rated Delirium Index, DOS: Delirium Observation Scale, CLI: Critical Limb Ischemia, AAA: Abdominal Aortic Aneurysm, SNAQ-RC: Short Nutritional Assessment Questionnaire for Residential Care.

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[b] Department of Geriatric Medicine, Amphia Hospital, Breda, The Netherlands

Overview of analysed and identified risk factors for delirium by univariable and multivariable statistics.

Study author	Age	Cognitive function	Comorbidity	Depression	Smoking	Alcohol	ASA-score	Visual and hearing impairment	Biochemical abnormalities	Pre-operative Hb	Blood loss	Duration of surgery
Schneider [25]	–	M*	M	M*	–		M	–	U	U	M*	–
Böhner [20]	M*	M*	M*	M	U	U	U	U	M*	U	M	U
Benoit [19]	U	M*	U	U	M*	M	–	–	–	–	–	–
Bryson [21]	U	U	–	U	–	–	U	–	U		–	–
Koebrugge [22]	U	–	U	–	–	–	M*	–	U	U	M	M
Sasajima [24]	M*	M*	M*	–	–	–	–	–	M	U	M	M
Pol [23]	M	M	M	M	–	–	U	–	M*	U	U	–
Visser [27]	M*	M*	U		M*	–	U	–	U	U	U	U
Raats [15]	M	–	M	–	U	U	M	–	–	–	–	–
van Eijsden [26]	U	–	M*	–	–	M	U	M	–	U	M	U

U: included in univariate analysis of risk factor for post-operative delirium.
M: included in multivariable analysis of risk factor for post-operative delirium.
M*: confirmed this factor as an independent risk factor for delirium (after correction for confounders).

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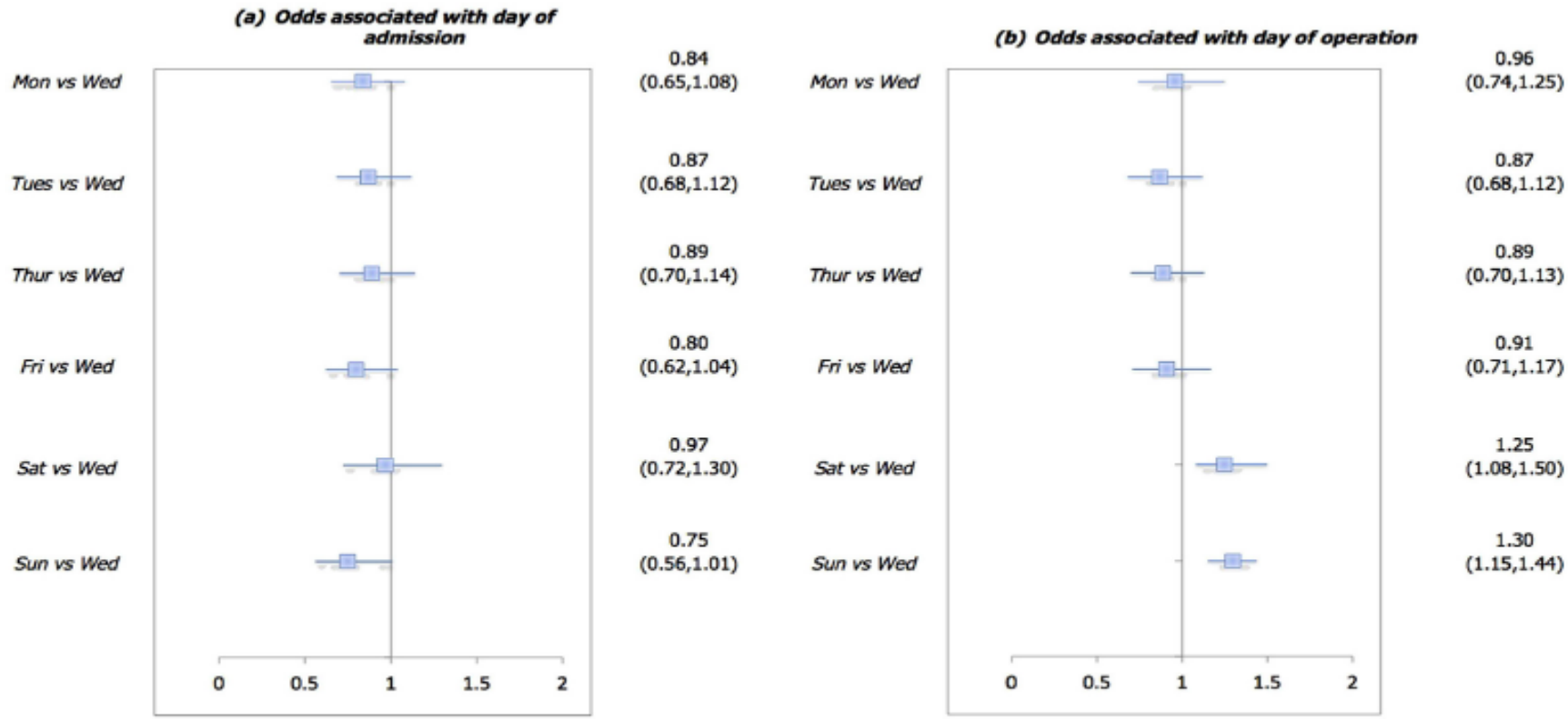


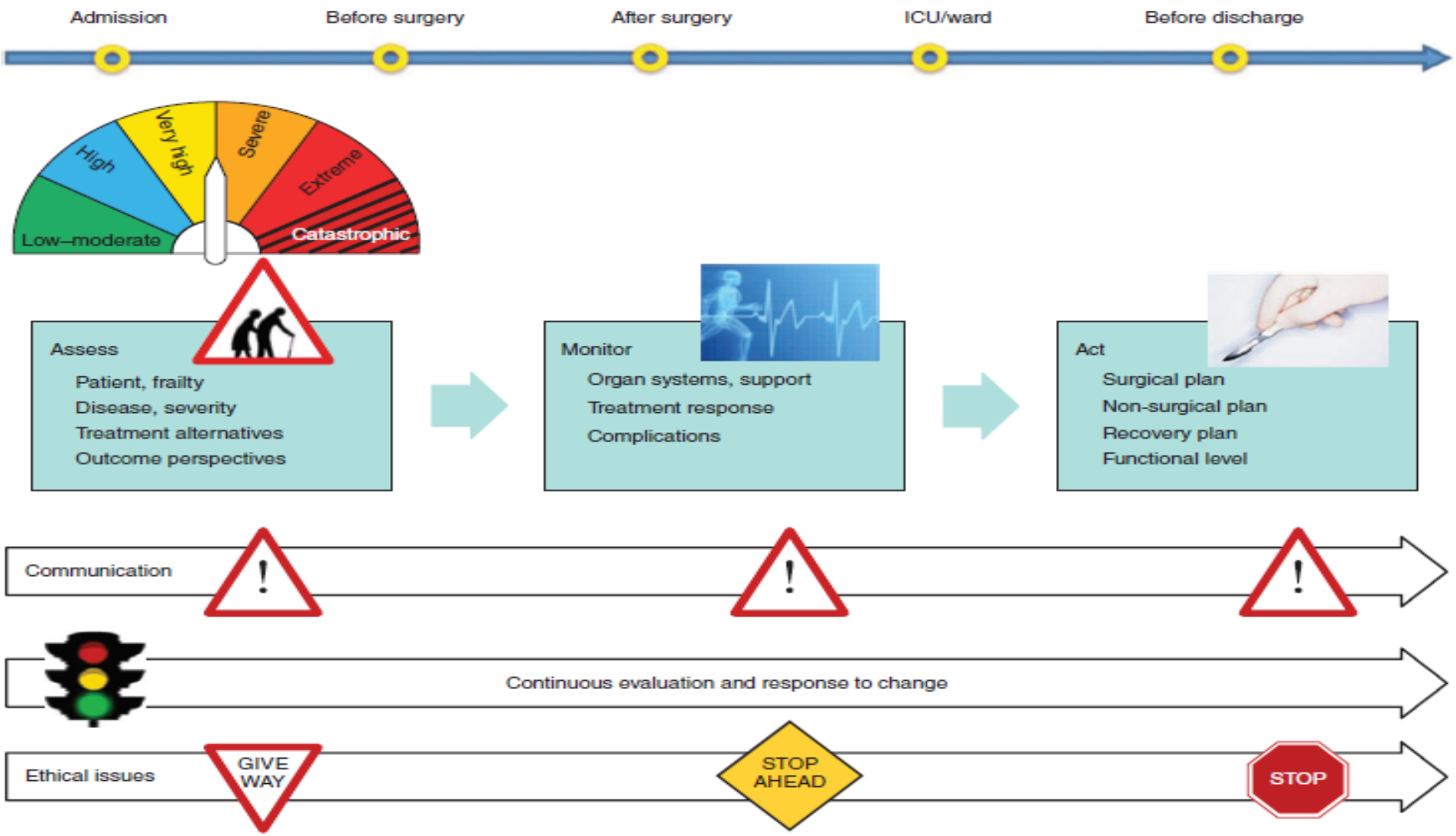
Fig. 4. Odds of 30 day in-hospital death associated with admission to hospital by day of the week of admission (a) and day of operation (b). Odds ratios and 95% confidence intervals compared to wednesday.

A 15-year retrospective analysis of the epidemiology and outcomes for elderly emergency general surgical admissions in the North East of England: A case for multidisciplinary geriatric input

Ross C. McLean, Iain J.D. McCallum, Steve Dixon, Paul O'Loughlin*

Emergency general surgery in the geriatric patient

K. F. Desserud[1], T. Veen[1] and K. Søreide[1,2]



Take home message

- ***Physical, mental, nutritional and social*** domains should be investigated in elderly patients.

- ***"Comprehensive Geriatric Assessment"*** represents the gold standard for the clinical evaluation of elderly patients.

- Elderly patients undergoing routinely surgical procedures ***should be always evaluated not only by "standard surgical risk assessment tools" but also by "Comprehensive Geriatric Assessment"***.