

PHYSICAL FUNCTION MEASUREMENTS TO PREDICT HOSPITAL OUTCOME IN OLDER IN-PATIENTS: RESULTS FROM THE CRIME STUDY

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INTRODUCTION

Identification of geriatric patients at risk of poor hospital outcomes



Effective health care service



Health care organisation
(manage resources)



Individual patient
(planning care)

Maguire 1986; Alarcón 1999; Kerr 2006; Roberts 2012

INTRODUCTION

- Need to take into account **multifaceted aspects** of ageing such as nutritional and functional status (Campbell 2004).
- Very few studies performed in the acute care setting have included **physical performance measures**.

OBJECTIVE

To identify which factors on admission can predict hospital outcomes in older patients admitted to an acute care ward.

Hospital outcomes:

- Length of stay
- In-hospital mortality
- Institutionalisation

DESIGN

- Criteria to assess appropriate Medication use among Elderly complex patients (CRIME) project
- Multicentre, observational study
- Acute care setting
- June 2010 up to May 2011



Tosato 2013; Vetrano 2013; Onder 2014

PARTICIPANTS

Patients, consecutively admitted to geriatric and internal medicine acute care wards of 7 Italian hospitals.

- Age of at least 65 years
- Willingness to participate

➔ 1123 hospitalized older in-patients

Participants were assessed at hospital admission & followed until discharge.

DATA COLLECTION

- Prospectively collected
- Questionnaire
- Completed by well-instructed study researchers
- Variety of information sources, including direct observation, clinical records, and interviews with the patients, family, friends or formal service providers

MEASUREMENTS

Multi-component approach

- Socio-demographic factors
- Medical history
- Medical diagnoses
- Clinical conditions (falls at home during the last year, pain, pressure ulcers, incontinence)
- Nutritional status (body mass index)
- Cognitive status (30 item Mini Mental State Examination)
- **Functional status (activities of daily living)**
- **Physical performance (walking speed, grip strength)**

RESULTS

Table 1. Characteristics of the study population (N=1123).

	Mean \pm SD	% (N)
	Median (IQR)	
Age (years)	81.5 \pm 7.4	
Gender (female)		56 (629)
Elective admission		49 (551)
Living alone		25 (279)
N of drugs before admission	6 \pm 3	
Nutritional status (BMI)	26 \pm 5	Malnourished: 4 (41)
ADL score (/6)	1 (0 – 5)	Totally dependent: 22 (252)
Walking speed (m/s)	0.65 \pm 0.25	Unable: 54 (603)
Grip strength (kg)	20 \pm 9	Unable: 27 (306)

RESULTS

Table 2. Hospital outcomes of the study population (N=1123).

	Median (IQR) or % (N)
Length of stay (days)	10 (7 – 14)
In-hospital mortality	4 (41)
Institutionalisation	3 (37)

RESULTS

Table 3. Independent predictors of length of stay (LN). Linear regression model.

Length of hospital stay (N=1123)			
	B (CI ₉₅)	P	% (N)
N of drugs before admission (/3)	0.04 (0.01 – 0.07)	0.01	
Metastasized cancer	0.31 (0.15 – 0.47)	< 0.001	4 (47)
Renal failure or dialysis	0.15 (0.08 – 0.23)	< 0.001	26 (286)
Infection	0.16 (0.05 – 0.27)	0.004	11 (119)
Falls at home during the last year	0.12 (0.04 – 0.19)	0.002	25 (278)
Pain	0.07 (0.00 – 0.14)	0.04	52 (589)
Walking speed category	-0.07 (-0.12 – -0.01)	0.01	

RESULTS

Table 4. Independent predictors of in-hospital mortality and institutionalisation. Logistic regression models. R² = 29% and 33%

In-hospital mortality (N=1123)			
	OR (CI₉₅)	P	% (N)
ADL total dependency	3.8 (1.5 – 9.8)	0.005	22 (252)
Grip strength inability	5.6 (2.0 – 16)	0.001	27 (306)
Institutionalisation (N=989)			
	OR (CI₉₅)	P	% (N)
Malnutrition (BMI < 18.5 kg/m²)	7.6 (2.0 – 29)	0.003	3 (31)
ADL total dependency	8.0 (2.8 – 23)	< 0.001	19 (192)

DISCUSSION - COURSE OF ACTION

- Implementing a **comprehensive geriatric assessment** at admission, that evaluates physical performance, functional dependency, nutritional status, polypharmacy, and falls.
- **Exercise and physical therapy interventions**, which may help to prevent falls and to improve physical performance.
- Careful **review of patients' drug use** in order to discontinue potentially inappropriate medication.

CONCLUSION

- Not only diseases, but also **multifaceted aspects** of ageing such as **physical function and malnutrition** are strong predictors of hospital outcomes.
- These variables should be systematically recorded.