

# 15. IDENTIFYING THE MOST COST-EFFECTIVE HEALTHCARE INTERVENTIONS USING MPI

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## BACKGROUND:

The MPI Age is a project co-funded by the European Commission that aims to identify reference models of appropriate interventions by using Multidimensional Prognostic Indices (MPI) in older adults in different European regions.

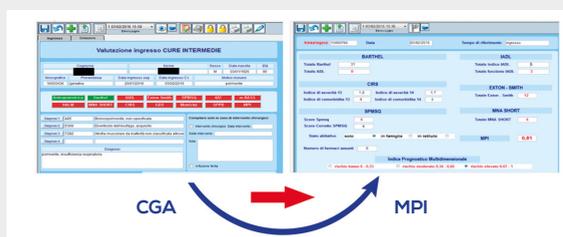
## OBJECTIVES:

- To identify the accuracy of the Comprehensive Geriatric Assessment (CGA)-based MPI in predicting in-hospital mortality and length-of-stay (LOS) in older patients admitted to nine Geriatric Units across Europe and Australia
- To evaluate whether the use of the MPI affects quality indicators of in-hospital care:
  - length of hospital stay (LOS)
  - use of diagnostic tests (DT)
  - activation of home-care services
  - institutionalisation
  - re-hospitalisation

## METHODS:

Older patients consecutively admitted to hospital for acute disorders underwent a CGA to calculate MPI at admission and at hospital discharge by integrating information on functional status (Basal and Instrumental activities of Daily Living-ADL, IADL), cognitive status (Short Portable Mental Status Questionnaire-SPMSQ), nutrition (Mini Nutritional Assessment-Short Form MNA-SF), risk of pressure sores (Exton Smith Scale-ESS), comorbidity (Comorbidity Illness Rating Scale-CIRS), polypharmacy and co-habitation status.

Patients were divided into: MPI-1 low-risk, MPI-2 moderate-risk and MPI-3 high-risk of mortality. Logistic and Cox regression modelling were applied, adjusting for age, gender and hospital centre.



Integrated Geriatric Record for physicians and nurses. Source: E.O. Ospedali Galliera

## RESULTS:

### What has been achieved?

- 1142 hospitalised patients were recruited (mean age 84.1±7.4 years, females 60.8%) and were classified according to the MPI score at admission as:
  - MPI-1 = 168 patients (14.1%)
  - MPI-2 = 503 patients (44.0%)
  - MPI-3 = 470 patients (41.2%)
- Logistic modelling confirmed good accuracy
- No differences were observed in TC, MRI or nuclear medicine diagnostic prescriptions
- MPI class was significantly predictive of LOS; a significant correlation was observed between MPI continuous value and LOS
- During hospitalisation, patients in MPI-1 group were more often diagnosed using X-Ray tests and less frequently using ultrasonography or endoscopy
- Cox regression adjusted for sex, age and hospital centre showed that MPI at admission significantly predicted in-hospital mortality; an MPI higher by one decimal point translated into a significant mean higher mortality risk of ~24%

**MPI and 1-year outcomes**  
NN patients=1069 F=60.8%, mean age = 84.1±7.4 years; 1-year mortality 26.6% (285 pts)

	Home-care services		Nursing-home care		Hospital Re-admission	
	No	OR	95%CI	OR	95%CI	OR
MPI 1	167	1	Ref.	1	Ref.	1
MPI 2	482	2.4	1.5-4.0	2.2	1.3-3.8	1.8
MPI 3	413	1.8	1.1-3.0	1.7	0.9-2.9	1.6

MPI is a significant predictor of post-discharge outcomes. Source: E.O. Ospedali Galliera

## TAKE-AWAYS:

### What worked well?

- MPI significantly predicts in-hospital mortality and in-hospital length-of-stay (LOS)
- MPI significantly predicts 1-year mortality, re-hospitalisation, use of Home-Care Services and admission to Nursing Homes during one year after hospital discharge
- MPI stratification may identify different rates of diagnostic prescriptions
- MPI confirmed to be an accurate, reliable and feasible tool in older patients hospitalised in different centres across Europe and Australia
- MPI is useful to identify the most cost-effective interventions in terms of improved survival according to their MPI profile in high-risk, frail, older patients
- In 2016 MPI, was included in the NICE-National Guideline Centre as 'Life expectancy Risk Tool'
- In 2018, the European Medicine Agency (EMA) described MPI as 'able to extract information from CGA to categorize frailty in three subgroups with excellent prognostic value'

