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# Changes in the clinical features of older patients admitted from the emergency department

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ABSTRACT

Demographic changes and healthcare reforms may impact the profile of hospitalized older persons. In this study, we sought to compare the characteristics of two prospective cohorts recruited at a ten-year interval (1999, $n = 253$–2009, $n = 355$). They included older patients (≥75 years) admitted through the emergency department for at least 48 h in acute non-geriatric wards in the same university hospital. The exclusion criteria were patients who were admitted directly to the intensive care unit, who were dependent for all 6 Activities of Daily Living (ADL), who had recently suffered from a major stroke, or whose with a life expectancy of less than 3 months. Median age was higher in 2009 than in 1999 (83 vs. 81; $p = 0.020$), with a higher proportion of those aged 85 years and over ($p = 0.026$). Patients in the 2009 cohort were less likely to live in a nursing home ($p = 0.018$), more dependent for the basic ADL ($p < 0.001$), more independent for the instrumental ADL ($p < 0.001$). They were more likely to have fallen in the previous year ($p < 0.001$). They took more medications ($p < 0.001$). Their length-of-stay was shorter ($p < 0.001$), but they were more likely to be discharged to a rehabilitation center ($p < 0.001$). They underwent more early re-admissions ($p = 0.020$) and similar 3-month functional decline ($p = 0.614$). In conclusion, within a decade, the social, functional and medical characteristics of older patients admitted to hospital have changed significantly. In view of the high consumption of in-patient services by this population, hospitals must adapt to these rapid changes.



## 1. Introduction

Demographic changes, together with the epidemiologic transition in the aging population, have a major impact on care needs and represent a significant challenge for healthcare systems.

New models of care are being developed to address the needs of a growing population of older persons, especially those of the oldest old. Older people are more likely to suffer from chronic diseases, they have more comorbidities and associated polymedication, and are at higher risk for functional decline. Their needs and expectations are therefore different to the general population and require a multidimensional and integrated approach, focusing on functional health promotion and prevention of diseases in primary care and long-term institutional settings (Stuck & Lliffe, 2011; Tinetti & Fried, 2004).

Older patients also pose a specific challenge in the hospital setting. The number and proportion of older people admitted in acute hospital settings are increasing and they contribute significantly to the number of hospital discharges and hospital days (Hall, DeFrances, Williams, Golosinskiy, & Schwartzman, 2010; Landefeld, 2006; Parker, Fayadevatan, & Lee, 2006). Furthermore, acute hospital stays represent a critical episode for frail older adults, whose risk of complications is high. Preventing and managing the functional consequences of an acute decompensation of chronic disease requires a continuous process of care that takes into account patients' pre-morbid functional status and geriatric features, and promotes early functional rehabilitation (Ellis & Langhorne, 2005; Landefeld, 2006).

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At the same time, economic constraints have led European countries to reform their health care systems. Together with rapid technological and scientific innovation, reforms have led to hyper-specialized wards, a reduction in the number of acute hospital beds and in length of stays, and an increase in outpatient services, e.g. day care hospitalization (Rechel, Wright, Edwards, Dowdeswell, & McKee, 2009).

In this context, the specific needs of the older population could be not met while their hospitalization rate is rising (Ekdahl, Linderholm, Hellström, Anderson, & Friedrichsen, 2012; Sin Dan & Tu Jack, 2000).

In order to anticipate the needs of older people and allocate appropriate services to this population, both demographers and economists continue to debate the trends in health and functional status of this population (Freedman, Martin, & Schoeni, 2002; Robine & Michel, 2004). Although data are available regarding these issues in the community, little is known about changes in the profile of the older hospitalized population. The aim of this present study was to address this question by comparing the geriatric characteristics of older patients in two cohort studies conducted respectively in 1999 and in 2009.

## 2. Method

This is a first step analysis of two prospective observational cohort studies, conducted for the construction (Cornette, 2005) and validation of a screening tool for functional decline.

### 2.1. Design, setting and patients

Data were collected in the medical and surgical wards of the same urban Belgian university hospital (960 beds), named Cliniques Universitaires Saint-Luc, over a period of 9 months in 1999 and 13 months in 2009. To be eligible, patients had to be aged 75 years or older and admitted for at least 48 h through the emergency department. We excluded patients who were admitted directly to the intensive care unit, who were admitted to the acute geriatric ward, who were dependent for all 6 ADL, who had recently suffered from a major stroke, or whose life expectancy was estimated to be shorter than 3 months. These exclusion criteria were related to the primary aim of the studies.

### 2.2. In-hospital data collection

Within 48 h of admission, one resident in geriatric medicine (PC (1999 cohort), IDB (2009 cohort)), assessed participants' cognitive function and pre-hospital functional status, and collected socio-demographic and medical data. The same questionnaire was used in 1999 and in 2009. To assess cognitive function, we used a short version of Folstein MMSE (21 points) (Folstein, Folstein, & McHugh, 1975). In patients with overt cognitive impairment, further data were collected by interviewing their caregiver. Pre-hospital functional status was defined as two-weeks prior to admission. We used dichotomous KATZ index (0–6) (Covinsky et al., 2000) to evaluate dependence in six basic ADL, i.e. bathing, dressing, walking, toileting, continence and feeding, and dichotomous LAWTON index (0–7) (Lawton & Brody, 1969) to determine performance in seven instrumental ADL, i.e. telephoning, shopping, preparing meals, doing housework, using transportation, managing finances and taking medication. Higher scores indicate higher levels of independence. The International Standard Classification of Education 2011 was used to assess educational level. A level 5 or more was defined as higher education level. We collected diagnosis at discharge based on ICD-9-CM codes.

### 2.3. Three-month follow-up

Three months after discharge, all patients were followed up by phone for basic ADL status, residency, rehospitalization and mortality.

### 2.4. Statistical analyses

The research assistant (IDB) coded and recorded data using NCSS and PASS statistical software, version 2004. Descriptive reports include mean, standard deviation (SD) and median for continuous variables and percentages for categorical and ordinal variables. We used Wilcoxon Rank tests to compare continuous data and chi-square tests to compare categorical and ordinal data. We defined the threshold of statistical significance at 0.05.

### 2.5. Ethical considerations

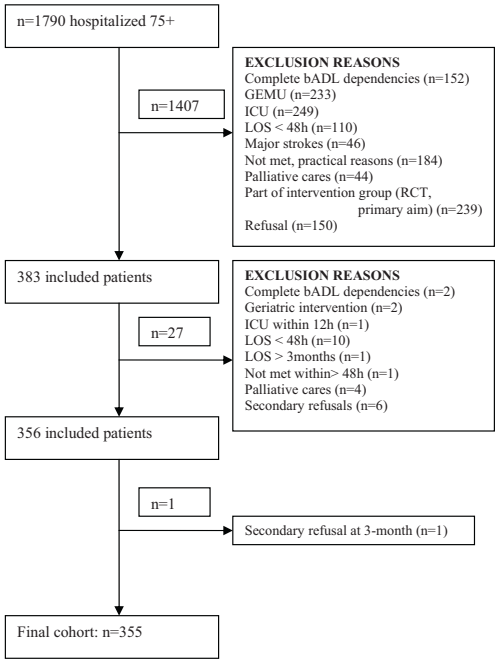
The study was approved by the hospital's medical ethics committee. Informed consent was obtained from the patient or caregiver in case of cognitive impairment.

## 3. Results

In 1999, on the 1196 patients eligible, 315 were included in the Cliniques Universitaires Saint-Luc. The great majority of patients who were not included were for logistical reasons; few refused ($n = 32$) and 58 were lost of follow-up during hospital stay or at discharge. Fifty-three patients were excluded because of age 70–74 years and 9 because of complete basic ADL dependency (6-point KATZ). In the 1999 cohort, 253 patients were analyzed.

Fig. 1 summarized the inclusion process for the 2009 cohort from which finally, data from 355 patients were analyzed. Participant features are summarized in Tables 1–3.

Participants in the 2009 cohort were older (82.9 vs. 82.0, $p = 0.020$), with a greater proportion of patients aged over 85 (38% vs. 29%, $p = 0.026$) (Table 1). Subgroup analyses were thus




bADL: basic Activity of Daily Living; GEMU: Geriatric Evaluation and Management Unit; ICU: Intensive Care Unit; LOS: Length Of Stay; RCT: Randomized Control Trial;

**Fig. 1.** Inclusion Tree 2009 cohort.