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## Original Study

## Short-term Resource Utilization and Cost-Effectiveness of Comprehensive Geriatric Assessment in Acute Hospital Care for Severely Frail Elderly Patients

Niklas Ekerstad MD, PhD<sup>a,b,\*</sup>, Björn W. Karlsson MD, PhD<sup>c</sup>, David Andersson PhD<sup>d</sup>, Magnus Husberg BA<sup>b</sup>, Per Carlsson PhD<sup>b</sup>, Emelie Heintz PhD<sup>e</sup>, Jenny Alwin PhD<sup>c</sup>

<sup>a</sup>Department of Cardiology, NU (NÄL-Uddevalla) Hospital Group, Trollhättan-Uddevalla-Vänersborg, Sweden

<sup>b</sup>Department of Medical and Health Sciences, Division of Health Care Analysis, Linköping University, Sweden

<sup>c</sup>Department of Molecular and Clinical Medicine, Institute of Medicine, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden

<sup>d</sup>Department of Management and Engineering, Division of Economics, Linköping University, Sweden

<sup>e</sup>Department of Learning, Informatics, Management and Ethics (LIME), QRC Research Unit, Karolinska Institutet, Stockholm, Sweden

## A B S T R A C T

**Keywords:**

Comprehensive Geriatric Assessment (CGA)  
frailty  
elderly patients  
cost-effectiveness  
emergency care

**Objective:** The objective of this study was to estimate the 3-month within-trial cost-effectiveness of comprehensive geriatric assessment (CGA) in acute medical care for frail elderly patients compared to usual medical care, by estimating health-related quality of life and costs from a societal perspective.

**Design:** Clinical, prospective, controlled, 1-center intervention trial with 2 parallel groups.

**Intervention:** Structured, systematic interdisciplinary CGA-based care in an acute elderly care unit. If the patient fulfilled the inclusion criteria, and there was a bed available at the CGA unit, the patient was included in the intervention group. If no bed was available at the CGA unit, the patient was included in the control group and admitted to a conventional acute medical care unit.

**Setting and Participants:** A large county hospital in western Sweden. The trial included 408 frail elderly patients, 75 years or older, in need of acute in-hospital treatment. The patients were allocated to the intervention group (n = 206) or control group (n = 202). Mean age of the patients was 85.7 years, and 56% were female.

**Measures:** The primary outcome was the adjusted incremental cost-effectiveness ratio associated with the intervention compared to the control at the 3-month follow-up.

**Results:** We undertook cost-effectiveness analysis, adjusted by regression analyses, including hospital, primary, and municipal care costs and effects. The difference in the mean adjusted quality-adjusted life years gained between groups at 3 months was 0.0252 [95% confidence interval (CI): 0.0082-0.0422]. The incremental cost, that is, the difference between the groups, was –3226 US dollars (95% CI: –6167 to –285).

**Conclusion:** The results indicate that the care in a CGA unit for acutely ill frail elderly patients is likely to be cost-effective compared to conventional care after 3 months.

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\* Address correspondence to Niklas Ekerstad, MD, PhD, Department of Cardiology, NU (NAL-Uddevalla) Hospital Group, Larketorsvägen, 46100 Trollhättan, Sweden.

E-mail address: [niklas.ekerstad@vregion.se](mailto:niklas.ekerstad@vregion.se) (N. Ekerstad).

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The current organization of acute care is often poorly adapted to the specific needs of frail elderly patients, who constitute a high percentage of emergency patients at all hospitals. Frailty is a biological syndrome implying vulnerability to stressors and reduced physiological reserves.<sup>1,2</sup> For the individual, frailty predicts a high risk of being institutionalized and dying within a short period of time. Frailty is also highly associated with functional decline, activity limitations, and prolonged recovery.<sup>3–7</sup> Consequently, frail elderly patients are characterized by high health care resource use.<sup>8,9</sup> A great part of

health care consumption among these individuals is related to acute inpatient care.

The aim of a comprehensive geriatric assessment (CGA) is to meet the needs of elderly patients through an interdisciplinary, structured assessment and intervention with focus on physiological, psychological, and social factors. There is evidence of beneficial effects of CGA for frail elderly people in general,<sup>10–13</sup> and, to some extent, in acute care settings,<sup>14–17</sup> also for severely frail patients.<sup>18</sup> It has been emphasized that the CGA in the acute care should be performed in a dedicated ward, that is, not through mobile consultant teams,<sup>17</sup> in order to reach its full potential.

In 2008, 2 acute elderly care units (ie, MÅVAs) were opened in the NÄL-Uddevalla (NU) hospital group, a large county hospital in the western part of Sweden.<sup>19</sup> The care in these units is based on CGA and care, and it has been shown to be beneficial for frail elderly patients regarding health-related quality of life (HRQoL) and mortality.<sup>18</sup>

## Importance

Two meta-analyses have suggested that care in a CGA unit is associated with a potential cost reduction, that is, the majority of the included relevant studies reported lower costs of CGA compared to conventional care,<sup>14,15</sup> and so did a study on the acute care of elders unit.<sup>20</sup> A few previous studies have reported results in the opposite direction.<sup>21,22</sup>

Similarly, some studies have indicated that CGA is cost-effective,<sup>23,24</sup> whereas in a recent study CGA was not found to be cost-effective.<sup>25</sup> The CGA performed in these studies differ in content and execution, as does the patient population and care setting. In summary, the evidence of the economic impact and cost-effectiveness of CGA is inconsistent. It is of importance to build scientific evidence for CGA and to identify interventions including organizational forms of care and target group, particularly severely frail elderly patients, where CGA may be cost-effective.

## Objectives

The primary objective of this study was to estimate the 3-month within trial cost-effectiveness of CGA in acute medical care for frail elderly patients compared to usual medical care. The objective was to further study the resource utilization and costs from a societal perspective. We hypothesized that the acute hospital care of frail elderly individuals in a CGA-unit is cost-effective compared to care in a conventional medical ward.

## Materials and Methods

This study was performed within the research project “Is the Treatment of Frail Elderly Patients Effective in an Elderly Care Unit” (TREEE). For full description of the selection of participants and interventions, see Ekerstad.<sup>18</sup> This is a clinical, prospective, controlled intervention trial with 2 parallel groups carried out at a county hospital group between March 2013 and July 2015. The total population of the corresponding health care system is 280,000 inhabitants. The study was approved by the independent ethics committee in Gothenburg (883-12, 20121212) and registered at the Swedish National Database of Research and Development; identifier 113021 (<http://www.researchweb.org/is/vgr/project/113021>; November 4, 2012).

### Participants

Patients aged 75 years and older in need of in-hospital treatment and who fulfilled the foundation of frailty according to the validated FRail Elderly Support research group (FRESH) screening instrument<sup>26,27</sup> were included. Patients were excluded if they declined

participation in the study, were unable to give informed consent, or were clearly suited for conventional acute care because of the type and severity of his or her acute condition (eg, acute stroke, sepsis, acute myocardial infarction, or other acute life-threatening conditions). When ambulance or primary care clinic staff had identified a patient who fulfilled the inclusion criteria, a CGA unit (MÅVA) doctor was contacted by phone. If he or she agreed, and there was a bed available at the CGA unit, the patient was admitted directly to the CGA unit and included in the intervention group. If no bed was available at the CGA unit, the patient was admitted to a conventional acute medical care unit through the emergency room. Written informed consent was obtained from the patient, or from a member of his or her next of kin, after oral and written information.

### Intervention

In the intervention group, patients were allocated to a CGA unit.<sup>18</sup> In addition to evidence-based standard procedures according to national and international guidelines, this unit is characterized by a systematic, structured, interdisciplinary CGA and care with validated instruments and standardized evidence-based procedures. This includes focusing on somatic and mental health, social situation, early discharge planning, medication review, and functional ability including an early rehabilitation strategy. The team focuses on the individual needs of frail elderly patients, that is, a person-centered approach.

The CGA involves physicians, nurses, physiotherapists, and occupational therapists as active team members. The CGA care efforts of the team members are facilitated by continuously sharing information and by a daily team conference. There is an early discharge planning in close collaboration with other health care providers in the municipalities and primary health care. The early rehabilitation strategy including assessment, care, and educational efforts is considered very important for the prevention of functional decline. This includes active physical endurance, strength, and muscle power training in the ward.

### Control Group

In the control group, patients were allocated to a conventional acute medical care unit. This care unit is characterized by evidence-based standard procedures according to national and international guidelines. Physicians and nurses are ordinary team members, whereas physical therapists or occupational therapists are not involved in any regular team meetings, and they only see patients after being actively contacted. From these units, care planning is performed prior to discharge, via the hospital's central care planning unit.

## Outcomes

### Health Care Utilization and Costs

Data on costs concerning hospital resource utilization were collected through the Cost-Per-Patient database (KPP). The KPP database is an administrative, full-coverage database where both health care utilization and costs of in- and outpatient hospital care can be retrieved.<sup>28</sup>

Primary care utilization data were collected from the VEGA register of Region Västra Götaland (VG) (of which the mentioned health care system is a part) and included all visits to primary care.<sup>29</sup> The data were delivered in the form of number of visits divided into contact category and personnel category responsible for the visit/contact. Each visit or contact was valued using a standard price list from the VG region provided by the VEGA register, which offers a full cover of primary care utilization. The VEGA administrative regional health care database, which was established in 2000, covers all hospitals, specialized

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