

The comprehensive geriatric assessment in emergency and intensive unit settings

Mariagiovanna Cozza,¹ Annalisa Paglia,² Simone Dini,³ Vincenzo Di Francesco,⁴ Pierluigi Dal Santo,⁵ Virginia Boccardi⁶

¹Intermediate Care Program, Department of Integration, AUSL Bologna; ²Operational Unit of Internal Medicine, P.O. “S.Caterina Novella”, ASL Lecce, Galatina; ³Geriatrics Unit, Department of Geriatric Care, Orthogeriatrics and Rehabilitation, E.O. Ospedali Galliera, Genoa; ⁴Department of Biomedical and Surgical Sciences, Geriatric Unit, University of Verona; ⁵Department of Geriatrics, Santa Maria della Misericordia Hospital, Rovigo; ⁶Department of Medicine, Institute of Gerontology and Geriatrics, University of Perugia-Santa Maria della Misericordia Hospital, Perugia, Italy

Abstract

This review discusses the challenges that hospitals face when caring for older patients in emergency departments and intensive care units. Beyond chronic diseases, the older person is often affected by acute events, which require, in addition to the typical knowledge of emergency medicine and anesthesia, the holistic and

targeted approach of the comprehensive geriatric assessment in the emergency room and intensive care setting. With Italy's health centers struggling to manage the increasing pressure of patients, the COVID-19 pandemic has highlighted the need for a geriatric approach to address this challenge. This review outlines the Geriatric 5Ms Model of Care, which addresses five domains, and the Domain Management Model, which provides acute medical management.

Correspondence: Simone Dini, Geriatrics Unit, Department of Geriatric Care, Orthogeriatrics and Rehabilitation, E.O. Ospedali Galliera, Genoa, Italy.
Tel.: 3332053263.
E-mail: simone.dini@galliera.it

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Introduction

Half of Italy's health centers are struggling to accommodate an ever-increasing pressure of patients, often in red code, with few places available. Approximately 28% of the 24 million yearly emergency service accesses in Italy concern people over 75 years old.¹ The COVID-19 pandemic has shown a significant decline in the number of older patients presenting to the emergency department (ED) for potentially time-dependent illnesses such as stroke or cardiac complaints.² However, sicker patients who need intensive care unit (ICU) or intensive treatment unit and prolonged mechanical ventilation support were unable to receive the geriatric principles learned in previous years.³ The Italian Society of Hospital and Territory Geriatrics (SIGOT) and the Italian Society of Emergency Medicine (SIMEU) propose the use of screening tools for older patients within the ED to identify those at greater risk, subjecting them to a comprehensive geriatric assessment (CGA) to define an individual clinical care plan. A traveling geriatric team could administer the CGA to relieve the commitment of the ED.⁴ The European Task Force for Geriatric Emergency Medicine, a collaboration of the European Society for Emergency Medicine and the European Geriatric Medicine Society, has created a prioritized list of topics related to geriatric emergency medicine using a modified Delphi procedure.⁵ However, even if greater attention has been given to the management of older patients in intensive care settings, many questions remain open and unresolved, especially in terms of recovery.

Comprehensive geriatric assessment in the emergency department or life-threatening situations

The identification of the frailty state of older adults in the ED is the turning point in understanding illness severity and avoiding

underestimating some clinical conditions, stigmatizing them as associated with the age or distress of the caregiver.^{6,7} The Multidimensional Prognostic Index (MPI) and the Brief MPI are good tools for the screening of multidimensional frailty in older people, particularly for clinical decision-making,^{8,9} as well as the Clinical Frailty Score (CFS), which is associated with different outcomes in older patients admitted to the ED.¹⁰ Consequently, the frailty must be evaluated with rapid management through the CGA. Due to the fast-paced nature of the ED, it is often impossible to conduct a full CGA. However, the evaluation can include the Geriatric 5Ms Model of Care, which addresses five domains: mind (addressing dementia, delirium, and depression), mobility (maintaining mobility and avoiding falls), medications (reducing unhelpful polypharmacy), multi-complexity (addressing the multifaceted needs of older people, medical, psychological, social, functional, and environmental), and what matters most (ensuring that a person's individual, personally meaningful health outcomes, goals, and care preferences are reflected in treatment plans).

Alternatively, the Domain Management Model addresses acute medical management (identification of comorbid diseases, medication management, and facilitating medical transitions of care), cognitive impairment (dementia, delirium), and associated psychological or behavioral problems, baseline functional status, screening for functional decline and fall risk, and finally living arrangements of the older adult (situation and home safety), social support systems (family members, caregivers, elder abuse risk, community resources), and financial management (e.g., exploitation risk) (Figure 1).⁵ The Triage Risk Screening Tool, even with its limitations, is validated for clinical use at an international level and can be used from triage.¹¹ An airway, breathing, circulation, disability, exposure approach should be incorporated in the interpretation of the change in physiological state, and mobility scales should be added to the triage system. The typical National Early Warning Score (NEWS) approach may not be predictive for older people. The NEWS is based on a simple aggregate scoring system in which

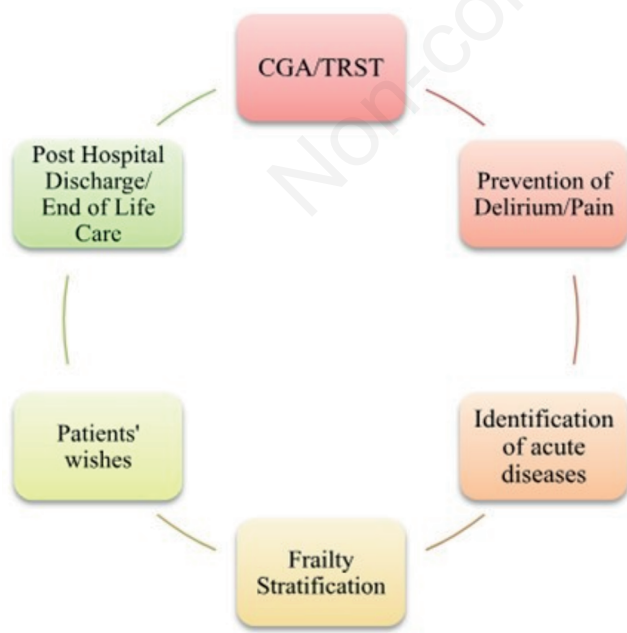


Figure 1. Management of older patients in the emergency department. CGA, comprehensive geriatric assessment; TRST, Triage Risk Screening Tool.

a score is allocated to physiological measurements, already recorded in routine practice, when patients present to or are being monitored in the hospital. The six simple physiological parameters form the basis of the scoring system: respiration rate; oxygen saturation; systolic blood pressure; pulse rate; level of consciousness or new confusion, and temperature. Attention should be given to low body temperatures, heart rate below 50 beats and above 100 beats, systolic blood pressure below 120 mmHg in sepsis, and 110 mmHg in trauma.⁵ The presentation of a serious medical or surgical illness is often atypical and subtle. Nonspecific complaints, such as weakness or feeling unwell, are onset symptoms, especially in older, frail patients, and are associated with poor outcomes, considering that specific complaints manifest themselves lately.¹² Older patients with an infection may not develop an increased heart rate or raised temperature but may develop new arrhythmia in response to an infection or have changes in cognitive function or acute changes in functional abilities.

The disposition of a septic patient out of the ED may be one of the most consequential decisions the treating clinician can make, with the main sites of sepsis being the lung, urinary tract, abdomen, and skin. Advanced age, comorbidity, decline in general health, pneumococcal infection, and absence of classical symptoms are markers of a poor prognosis.¹³ Precisely because the onset of acute disease is more insidious when an older patient arrives in the emergency room, the clinician must think that he/she has a more serious pathology than a young patient and that many onsets of symptoms are masked, with particular attention to non-occlusive mesenteric ischemia, in which laboratory tests including indices of inflammation, C-reactive protein, or lactate could be misleading. Lactate levels in bowel strangulation can rise up to an hour away from the ischemic event by a seizure in the gut lumen, as demonstrated by experimental animal models. In patients aged 75 years or older, acute myocardial infarction (AMI) is a more prevalent cause of acute abdomen than appendicitis. The incidence of AMI in an 80-year-old is roughly tenfold that of a 60-year-old patient.¹⁴ Remembering Einstein's Sign, any abdominal pain in a patient with an abdominal aortic aneurysm should be suspected of being caused by a rupture of an aneurysm.¹⁵ Fixation errors such as constipation in the case of abdominal pain or urinary tract infection as the definitive cause of delirium should be avoided.¹⁶

The older patient with minor trauma should be considered at risk of major effects (Figure 2). Older patients are 3.31 times more likely to develop delirium with an increase in the time spent in the ED hallway and more ED room transfers.¹⁷ Bo *et al.* found a doubled risk for incident delirium, measured with 4AT, in patients aged 75 and older with ED length of hospital stays of 10 hours. Moderate to severe cognitive impairment and older age were also associated with delirium onset.¹⁸ To reduce the length of stay in the ED, it is important to document in the clinical chart when a patient had delirium in a previous hospitalization, report it to the hospitalization department, and communicate the risk of post-discharge incident delirium to family members. It also stresses the need to minimize changes in room and ward and the importance of the Hospital Elder Life Program as a multicomponent prevention program that includes non-pharmacological interventions for temporal-spatial reorientation, limited use of psychoactive drugs, early mobilization avoiding urinary catheters or other devices, sleep hygiene, adequate hydration and maintenance nutrition, and supply of visual and hearing aids (if used by the patient) and involvement of the figure of the caregiver.⁵ Tools that can help to detect delirium in ED include age ≥ 75 years old, dementia, hearing impairment, and chronic use of psychotropic drugs, as shown in a retrospective study from two different sam-

ples of patients over 65 years old admitted to the ED of a northern Italian hospital.¹⁹ Another important cause of delirium or hospitalization is withdrawal or intake of a drug or polytherapy. The Screening Tool of Older Persons' Prescriptions/Screening Tool to Alert Doctors to Right Treatment criteria are screening tools that aim to improve prescribing in older patients at admission and upon discharge because one in seven cases of ED visits by older adults were medication-related.²⁰

In the EDs and prehospital setting, older patients who complain of pain are less likely to receive pain relievers than younger patients.²¹ In the presence of mild to moderate pain, paracetamol 1000 mg orally three times a day or injectable paracetamol intravenous at a dose of 500-1000 mg every 6 hours is the drug of first choice. Non-steroidal anti-inflammatory drugs (NSAIDs) should be used with extreme caution in older patients because they are associated with renal insufficiency and increased risk of upper gastrointestinal bleeding.²² In the presence of severe pain, the drug of first choice in older people remains morphine at an initial dose of 0.05 mg/kg intravenous, *i.e.*, 0.5-1 mg at a time or low-dose of fentanyl (Figure 3).²³ The boarding phenomenon is unacceptable for these patients. Once the need for hospitalization has been stabilized and shared, patients must be sent early to their chosen destination, minimizing the time spent in the ED as much as possible and with a specific diagnosis. The Post Hospital Discharge CGA/Hospital Home Assessment Service is usually initiated 1-2 days before hospital discharge to reduce hospital length of stay and readmission rates and improve the coordination of services following discharge from the hospital.²⁴ When possible, the caregiver burden and their capacity to carry out instructions and the patient's drug regimen, taking into consideration patient preferences, life expectancy, and comorbidities, should be assessed.⁴ This approach should not only consider the patient's condition in the ED but also their likely trajectory following admission, as sometimes the patient may not only need the drug but also the person who administers it to them in the right way and at the right time.

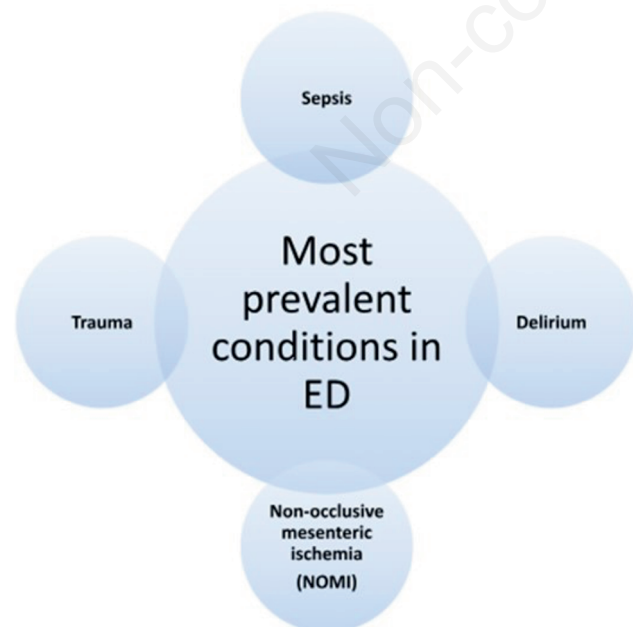


Figure 2. Severe diseases to deal with older persons in the emergency department (ED).

Comprehensive geriatric assessment in intensive care units

The 1-year overall mortality of very old ICU patients varied from 40 to 70% in 11 different studies. Despite apparently increasing numbers of very old patients, physicians are often reluctant to admit them into the ICU.²⁵ In March 2020, during the full pandemic emergency, the Italian Society of Anesthesia, Resuscitation, and Intensive Care was forced to publish clinical ethics recommendations for admission to intensive treatments and for their suspension in exceptional conditions of imbalance between needs and available resources.²⁶ However, biological age does not necessarily parallel chronological age, and although frailty is associated with increased age, not all older people are frail, with cognitive bias for ICU admission, especially for older patients with cognitive disorders. Older people admitted to intensive care are characterized by biological and functional differences and are predisposed to disability, comorbidity, polytherapy, and severity of the acute condition to reduced resistance to “age-related” stress and poor outcomes in the ICU. In a prospective multinational study of 3920 very old intensive care patients (≥ 80 years), the multivariable analysis identified the usual predictors of 30-day outcome in age, 1.02 (1-1.03, $p=0.01$); emergency surgery, 0.64 (0.52-0.78, $p<0.0001$), Sequential Organ Failure Assessment (SOFA) (increase in the risk of death per one-point increase), 1.15 (1.14-1.17, $p<0.0001$) and CFS (increase in the risk of death per one-point increase), 1.1 (1.05-1.15, $p<0.001$).²⁷

Within an ICU, identifying phenotypes at risk of adverse outcomes has become a priority. In the Very Old Intensive Care Patients Study 2, phenotype F and G were considered “geriatric”, in consideration of the fact that they identified frail patients (CFS ≥ 5) with limitations in their activities of daily living (Katz < 5) or cognitive impairments (Informant Questionnaire on Cognitive Decline in the Elderly), with significant differences between the two phenotypes in their SOFA score and the highest mortality found in phenotype G (50% of patients died in the ICU, 57% within 30 days) (Figure 4).²⁸ ICU clinicians must become adept at managing age-related complexity and vulnerability. In a discussion on intensive care treatment of geriatric patients, another important endpoint is to overcome the perspective of the life-threatening disease, but it is important to recognize when medical therapy is no longer indicated or can be terminated; thus, quality of life and independence must be entered in the assessment of intensive care treatment. In a prospective observational study amongst 43 hospitals in 8 countries involving 1133 patients triggering rapid response teams (RRTs) review, 72% of patients screened as frail at the time of clinical deterioration were either dead or dependent on hospital care at 30 days, even after adjustment for potential confounders such as age and acuity of illness. So, the RRT call could be an indicator of serious deteriorations.²⁹ The relevant issue for frail older patients, discharged from the ICU, is survival with unfa-



Figure 3. Management of pain in older persons in the emergency department.

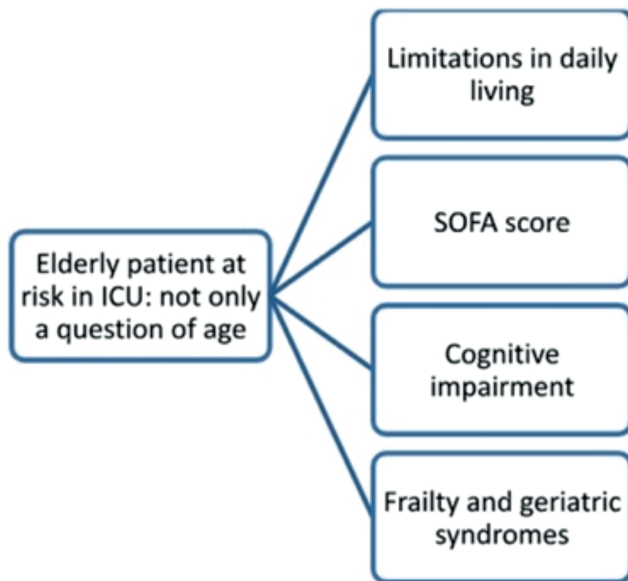


Figure 4. Phenotypes at risk of worse outcomes in intensive care unit. ICU, intensive care unit; SOFA, Sequential Organ Failure Assessment.

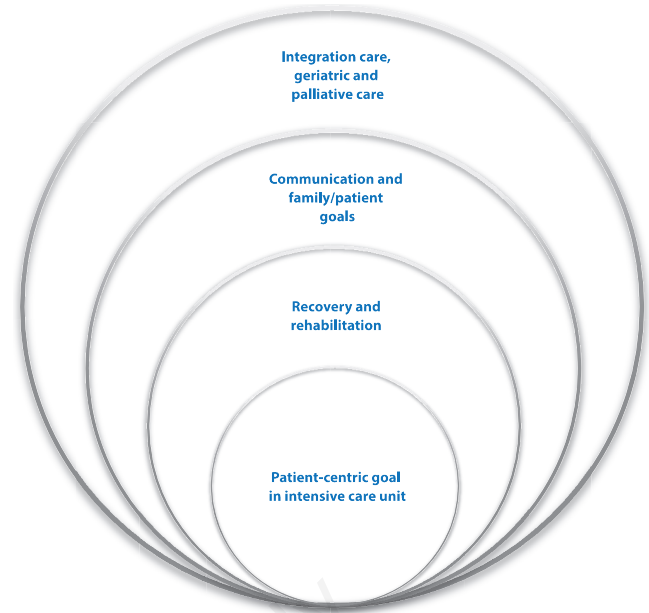


Figure 5. Comprehensive geriatric assessment in the intensive care unit: not only intensive care.

avorable outcomes, loss of recovery and autonomy, and need for support. In a study of 308 adults hospitalized at a Chronic Ventilator Dependent Unit in a Long-Term Acute Care Hospital (LTACH), the mortality rate was the highest among all consciousness states ($p < 0.001$), with an in-LTACH mortality rate at a high 45.5% during the study period and a small proportion of home or rehabilitation discharge.³⁰ We require a paradigm shift that shifts away from intensive monitoring and sophisticated modeling to predict the patient's outcome. Instead, we need a model that expands on the field of critical care for survival and survivorship, aiming for acceptable cognitive function and a high quality of life for patients after ICU discharge. This model places significant emphasis on strategies for sharing and communicating with patients and families, preparing them for the aftermath of the ICU (Figure 5).³¹

Conclusions

Recently, data from an Italian study conducted by geriatricians from SIGOT and the Italian Society of Gerontology and Geriatrics showed that access to the emergency room for older adults is more appropriate than for young people, with the presence of serious pathologies marked with a yellow or red code and hospital admissions more justified in the older patients.³² Besides, there is a need to understand the impact of strategies on older patients in ED and ED performance measures because a recent systematic review showed only some targeted interventions (reduction of polypharmacy, responding to acute trauma) as more effective ED interventions for older adults.^{33,34}

The applicability of CGA in ED, as shown in a previous systematic review, clashes with the available time.³⁵ CGA in the ED should be reserved for high-risk patients/frail patients, who are the greatest beneficiaries of its use.³⁶ In November 2023, the Italian National Institute of Health published guidelines on CGA, promoted by SIGOT and SIMEU, in collaboration with many other companies, to formulate detailed recommendations for different care settings. The literature has been analyzed to evaluate the effective-

ness of CGA, compared with standard care, in reducing numerous outcomes of clinical interest. The analysis of intervention studies in the emergency room has highlighted that performing a CGA is able to reduce the risk of hospitalization in elderly subjects by 9%, compared to the treatment standard.

Furthermore, performing CGA in the emergency room may reduce the risk of functional impairment in a follow-up period of between 4 and 12 months (estimated reduction of 24%) and the risk of re-admission to the emergency room within a period of 2 weeks to 12 months following first access (estimated reduction of 11%) compared to treated subjects according to normal clinical practice. At the same time, given the absence of differences between CGA and standard care regarding mortality rates and quality of life, further studies are necessary for these outcomes.³⁷

In geriatric emergency medicine guidelines, according to the modified Delphi procedure, similar to intensive care, the main topics of CGA are age/frailty adjusted risk stratification, delirium and cognitive impairment, environment, patient and family involvement, and particular attention to end-of-life care. Within the CGA in the ED, polypharmacy and silver trauma should always be considered a priority in older patients.^{5,27} On the other hand, in intensive settings, intensive therapy should be started as soon as possible since organ reserves are reduced, measured through SOFA, or Mortality Probability Models, or Simplified Acute Physiology Score, or Acute Physiology and Chronic Health Evaluation, because patients are at risk of morbidity and poor outcomes. Then, intensive care must walk hand in hand with a geriatric approach. Decision-making in intensive care, in which ethical issues and individual and social emotions are incorporated, is mediated by the presence of severe co-morbidities (chronic obstructive pulmonary disease, heart failure, cirrhosis, chronic renal insufficiency, malignancy), reasons for admissions (elective surgery *versus* trauma or acute surgery), CFS, previous functional status, and level of autonomy (nutritional status, Charlson Co-morbidity Index, Katz or Barthel activity daily living).³⁸ The recognition of the training and support of the field of geriatricians is still underdeveloped. In ED and intensive settings, geriatric and gerontology knowledge deserves to be spread to guarantee clinical and healthcare standards.³⁷⁻⁴⁰

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