

Assessing frail patients in the emergency department

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Frail, elderly patients appropriately use hospital emergency services with increasing frequency. An effective evidence-based model for evaluating such patients in the emergency department has not been developed. Nonetheless, when assessing the frail elderly we are advised to establish clear objectives appropriate to their overall situation so that a multidimensional diagnosis can be made and treatment priorities set. An evaluation of functional status is useful for planning continuity of care to be provided by the primary care team after these patients are discharged. [Emergencias 2009;21:362-369]

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Introduction

In recent decades, the population aged over 65 years has increased by over 200% and it is estimated that this population, in 2040, will be 10 times greater. The increase in the population aged over 85 years will be even higher. Between 10% and 20% of people aged 65 years and over can be considered frail, and this percentage exceeds 50% in the population aged 85 years and over, also known as the "oldest old"¹.

The use of hospital emergency departments (EDs) by this group is higher than expected. ED attendance rate for citizens aged 80-84 years stands at 463 patients per 1,000, and reaches 819 patients per 1,000 citizens aged over 84 years, of whom a large proportion are considered frail and elderly. This frail population (more than 20% of people aged >64 years and more than 50% of those aged >85 years), together with multi-pathological patients treated in the ED, are considered to account for the increased number of hospital admissions in the last decades. In addition, these patients have longer average stays. The frail and elderly are, for obvious reasons, large consumers of healthcare resources, and use up to 50% of healthcare time and 62% of pharmacological expenses¹.

In the broad sense of the word, frail (from the Latin *fragilis* adj.) means physically weak, easily broken or destroyed. Applied to humans, a frail person is one at high risk of losing functional ability, but is still independent².

In the ED setting, which today is organized to diagnose and treat disease, little or no assessment is performed regarding functional capacity and daily activities. It is therefore important to know what we mean by functional capacity and how we assess it, to detect the frail patient in the ER and thereby improve our attention of this increasingly numerous sector.

We understand functional capacity as the ability of a person to fend for themselves, to carry out a given activity. This ability can refer to cognitive and physical function, or both. At birth, we lack functional capacity, both physical and cognitive, and are therefore totally dependent on others for survival. As we grow we progressively acquire functional capacity. Initially, we develop the abilities to meet our basic needs like eating, drinking, walking, sphincter control, etc. (basic activities of daily living - BADLs-). We then acquire more complex skills enabling us to engage in life in society, such as the acts of buying, using money, using transport, etc. (instrumental activities of daily liv-

ing - IADLs). At a third level of complexity, we acquire the capacities of the socio-cultural level that we belong to, depending on our innate ability to learn, such as the ability to read and interpret what is read, plan ahead, to belong to associations, etc. (advanced activities of daily living - AADLs). Finally, we acquire the highest level of cognitive function, which not everyone attains, such as creative ability (special activities of daily living - SADLs), which not everyone may attain. A simple example using the case of a pianist: SADLs correspond to being able to compose music (a special capacity), the AADLs would be reflected in being able to read musical scores and knowing how to execute them correctly (which comes with learning), while IADLs would include the abilities required to go out, identify stores selling musical instruments and to choose the piano that best suits his needs, economy and being able to pay. Finally, without BADLs such as autonomous eating, drinking, dressing, movement etc. all the other activities previously described would be impossible, and the assistance of another person to fill these needs would be required.

As we grow, we acquire the ability to perform increasingly complex activities of daily living (ADLs), gradually increasing our level of autonomy. With disease and/or aging, the process is reversed and we lose these skills, in the reverse order of acquisition, and the last to be acquired are the first to be lost, which is the start of disability.

At this point, we would emphasize how wide the concept of functional capacity is. It might actually be used to refer to many and varied activities (implementation of various instrumental activities, implementation of crafts, creative activities of varying complexity, etc.). However, in daily medical practice, we often use the term BADLs to refer to the functional capacity of patients, as they mark the level at which autonomy is lost and reliance on third parties is required.

Table 1 lists the websites of major functional assessment scales for different ADLs (basic and instrumental), along with other scales and tests used in comprehensive geriatric assessment, which are useful in the ED to assess the frail patient³.

Indicators/predictors of frailty in the elderly

Given that frailty is a risk factor for disability, it is understandable that those predictors of disability for BADLs can be used also as predictors of frailty. We know that SADLs are more complex

Table 1. Useful scales and tests applied in emergency department geriatric assessment

Scale/Test	WEB Assessment	
Barthel Index	BADL	http://www.hipocampo.org/Barthel.asp
Katz Index	BADL	http://www.hipocampo.org/katz.asp
Lawton and Brody Scale	IADL	http://www.hipocampo.org/lawton-brody.asp
Pfeiffer Test (SPMSQ)	Cognitive Deterioration	http://www.hipocampo.org/pfeiffer.asp
Reisber GDS	Dementia Staging	http://www.hipocampo.org/reisberg.asp

BADL: Basic Activities of Daily Living. IADL: Instrumental activities of daily living. SPMSQ: Short mental state drinking questionnaire. GDS: Global determination scale.

than AADLs and that these, in turn, are more complex than IADLs; the IADLs also require a higher level of skills (shopping, cooking, laundry, house cleaning, using the telephone, money, public transportation, taking medication) than BADLs. It is therefore evident that the deterioration in the performance of instrumental tasks usually precedes deterioration in the execution of BADLs. Some studies have shown that the loss of IADLs could be used as indicators of risk of disability and, therefore, would be predictive of frailty. This has been assessed in a sample of apparently healthy older women, living in the community. The loss of one or more of the IADLs was associated with the presence of chronic diseases, cognitive impairment, falls and less social activity⁴. At the hospital level, it was found that the loss of IADLs was a predictor for the development of dependence, and is a good marker for risk of disability or, in other words, a good marker of frailty⁵. Referring to the ADLs (SADLs, AADLs, IADLs, BADLs), the loss of IADLs already indicate that disability has started much earlier, with the initial loss of SADLs, if they existed, and then the loss of AADLs, so that IADLs in our opinion, are possibly a late marker of frailty.

To detect the earliest indicators of frailty, other markers have been used, such as the frequency of medical visits, the presence of geriatric syndromes prevalent in older people associated with frailty, such as malnutrition and falls, among others. In many cases, we use immobility, loss of sphincter control, confusion and cognitive impairment as predictors of frailty, when in fact such situations in themselves indicate the existence of manifest disability, rather than the risk of developing it, provided that such situations are not acute or of re-

cent onset. This is a difficult concept to understand. However it may be an atypical form of disease that frail patients may have, including the elderly. The presentation of an acute disease in a frail and elderly person may be in the form of confusion, loss of mobility or sphincter control, among others.

In the model of Fried et al⁶, there was good correlation between frailty, defined as clinical syndrome characterized by three or more of the criteria validated by their group (Table 2), and the existence of impairment in the execution of at least one IADL.

In practical terms, we would define frailty as vulnerability^{7,8}, derived from loss of physiologic reserve of the various systems that make up the human body. This vulnerability responds to different triggers (acute disease, immobility, malnutrition, depression and other multi-causal processes) in the form of initial functional impairment, which if not detected and corrected early, may progress to physical and/or cognitive dependence. So, a stay in the ED and/or hospitalization of frail elderly patients is a situation of maximum risk of developing complications⁹⁻¹¹. These, as previously described, are due to the disease itself which led to admission and the risks resulting from hospitalization itself and bed rest that comes with that. All this, in a vulnerable body (with a reduced functional reserve capacity of the various body systems), may precipitate the onset of the "cascade" of dependency.

The identification and prevention of these avoidable complications such as loss of functional activities, is one of the principles which should underpin ED attention of the frail and elderly¹², which is why they should be identified at the time of attention.

The progressive increase of the frail and elderly population, treated at hospitals, requires planning strategies for geriatric assessment and intervention right from the start of admission (including admission in previous phases) for this population, as defined in the Emergency Monograph on geriatric assessment in a general hospital emergency service¹³. An example would be the implementation of screening protocols for frail geriatric ED patients, leading to rapid specialist action by the hospital geriatric support team or other geriatric services. Another possibility is a differentiated model, at the primary care level, on ED discharge of those patients identified as frail, elderly patients. These are the only two models referenced in the literature that show benefits for ED geriatric assessment. They prevent new admissions to the emer-

Table 2. Fried's frailty criteria

Unintentional weight loss

> 5 kg or > 5% of body weight in the past year.

Muscle weakness

Gripping force < 20% of the normal limit, adjusted for sex and by body mass index.

Low stamina & tiredness

Self-reported and identified by two questions from the CES-D scale (Center for Epidemiological Studies-Depression).

Slow gait

Walking speed for a distance of 4.5 m < 20% of normal limit, adjusted for sex and height.

Low level of physical activity

Calculation of weekly caloric intake below the lower quintile, adjusted for sex.

Fulfillment of 3 or more of these criteria indicates frailty.

gency services and improve physical and cognitive function over time, for those who have not had any geriatric intervention. Both models include the collection of information on aspects of functional capacity before application of a quantitative scale for basic activities of daily living such as the Barthel Index (BI)^{14,15}. To evaluate the cognitive level of patients, the primary care provider should provide information about the patient's previous cognitive status and then an initial screening can be performed with the Short Portable Mental Status Questionnaire (SPMSQ, Pfeiffer test)^{16,17}. Any previous diagnosis of dementia will help us to support the diagnosis with the disease stage according to the Reisberg global deterioration scale (GDS-FAST)¹⁸.

Use of emergency services by frail patients

ED attention of the frail and geriatric population is a vital issue. In the study by our group, aimed at assessing the suitability of ED use by this population group, applying a validated protocol [the Appropriateness Evaluation Protocol (AEP)], the results demonstrate that the frail patient is amongst those that most and best use this level of care^{19,22}. In our work, 59.7% of patients attending the Emergency Department Observation Area (EDOA) were aged 65 years or more. Considering that over 20% of the community over 65 years of age is frail, it is logical to assume that the percentage is higher among the elderly attending the ED. Several studies, including that our group conducted in EDOA^{19,20} with 4700 consecutively admitted patients [of whom 1,894 (40.3%) were under 65 years (mean age: 43.3 years, SD ± 14.5) and 2,806 (59.7%) were over 65 years (mean age: 77.2 years, SD ± 7.4)], have shown that by applying the appropriate admission criteria (AAC)

in the elderly population, not only the admission criteria are more suitable than in the young adult population but they also apply to subsequent EDOA visits (Tables 3 and 4)^{13,19,23,24}, either because of their clinical condition or because of the need for attention deriving from that condition. It is also necessary to note that this population group is that which is most often admitted to a conventional hospital floor and to the EDOA (Table 5)^{19,20,25,26}.

We should attach great importance to medical appointments generated by frail patients in the ED due to the significant impact of care this entails. First, these patients have a mortality of 10% at three month follow up, an ED revisit rate of 24% within three months up to 44% at 6 months, and an overall need for hospitalization of 24%. Also, deterioration of physical function is observed in 14-45% of patients treated, with consequent loss of autonomy and the social consequences thereof, which is precisely what defines the frail patient.

With frail patients, whether young or older adults, the immediate cause of the visit to the ED usually represents only the tip of the iceberg; the detection of risk factors associated with the use of the ED is necessary, identifying what might be correctable, or at least partly improved, and implementing intervention programs that optimize the quality and adequacy of attention of these patients.

Diseases attended in the ED and models of assessment of the frail and elderly

The frail and elderly usually visit the ED for exacerbation of chronic disease such as chronic obstructive pulmonary disease (COPD) or heart failure (HF), compared with the young adult who usually presents abdominal pain and asthma.

We have sufficient evidence that ED attendance of key protocolized problems, particularly of frail patients, leads to immediate favourable clinical results²⁶⁻³³.

Problems such as depression, delirium, malnutrition, falls, dehydration, previous functional state and atypical presentation of disease are the conditions that complicate diagnosis and management by ED professionals^{22,25}. Moreover, most of these conditions are predictors of prolonged hospital stays, readmissions and mortality³⁴⁻⁴⁰. A particular issue is the case of patients with dementia, especially very advanced stages of the disease, a frequent cause of admission, fever without a clear

Table 3. Adequate Admission Criteria (AAC) for a group of 4,700 patients admitted consecutively to an ED observation area^{19,20}

	<65 years n (%)	≥ 65 years n (%)	p
According to patient's clinical condition			
Electrolyte alteration or blood gases	2,260 (14.8%)	631 (24.1%)	< 0.0001
Loss of consciousness or disorientation	149 (8.5%)	212 (8.1%)	n.s.
Pulse < 50 or >140 beats per minute	51 (2.9%)	183 (7.0%)	< 0.0001
Sudden paralysis of any body part	51 (2.9%)	149 (5.7%)	< 0.0001
Without criteria	621 (35.4%)	514 (19.6%)	< 0.0001
According to attendance needs			
Administration of i.v. medication	1,181 (67.3%)	1,695 (64.7%)	n.s.
Surgery or scheduled procedure	21 (1.2%)	8 (0.3%)	< 0.0001
Monitoring	279 (15.9%)	681 (26.0%)	< 0.0001

n.s.: not significant.

reason and other poorly defined symptoms. This situation reflects the limited experience in dealing with these patients, despite the fact that they constitute a large group of ED patients²⁰.

In summary, clinical and care differences between older patients compared to healthy adults lead us to the need for a specific approach in the ED⁴¹. The use of various instruments for the assessment of the frail and elderly in the ED, although difficult, has been analyzed in different studies^{20,25}. In a study conducted by our group in EDOA, where this analysis was possible because the average stay of patients in this area was more than 24 hours, the acute condition was stabilized, and the patients were usually accompanied by their carers and also in a more comfortable place. Table 6 shows some results from

Table 4. Criteria for Adequate Stay during less than 48 hours, for a group of 4,700 patients admitted consecutively to an ED observational area^{19,20}

	< 65 years n (%)	≥ 65 years n (%)	p
Medical cure			
Medical attention 3 times/day	1,109 (63.2%)	1,598 (61.0%)	n.s.
Nursing Cure			
Nursing care 3 times/day	1,193 (68.0%)	1,651 (63.0%)	0.03
Parenteral therapy	1,243 (70.8%)	1,674 (63.9%)	0.0002
Measurement of water balance	607 (34.6%)	1,270 (48.5%)	< 0.0001
Respiratory Therapy	254 (14.5%)	681 (26.0%)	< 0.0001

n.s.: not significant.

Table 5. Destination at discharge from the ED Observation Area (EDO) and average stay for a group of 4,700 consecutive patients^{19,20}

	< 65 years	≥ 65 years
Hospital Ward Admission (HWA) [n (/%)]	994 (52.5%)	1,961 (69.9%)
Discharge home (DH) [n (/%)]	856 (45.2%)	786 (28%)
Average stay EDOA (HWA) (mean)	32.2 hs	33.4 hs
Average stay EDOA (DH) (mean)	22.8 hs	26.9 hs

our study, showing significant loss of BADL (previous Barthel Index below 70 in only 30.7% of patients seen, whereas it was 83.1% at the time of being attended). We also note that 35.8% of patients had a score > 3 in the SPMSQ (Pfeiffer test) indicating cognitive deterioration, but only 20.6% had known prior cognitive impairment with a score >3 on the Reisberg Scale, which reflects that an undetermined number of diagnoses of dementia were not previously made, from which we must subtract 18.7% of patients who had delirium [Confusion Assessment Method (CAM)-positive]⁴². In patients with delirium, cognitive deterioration is acute and not always present in patients diagnosed with dementia. Lobo's Mini-Examen Cognoscitivo (MEC)⁴³ is unsuitable for ED use for different reasons (such as the level of clinical instability of the patient, level of education, fatigue produced by the fact of applying this scale in a patient with minimal functional reserve, and the medical researcher's discomfort). In our study, the MEC could not be implemented in 67.8% of patients or produced a pathological result on recording scores of < 24 points.

Given the large number of screening tests that were altered or not possible to implement, we attach great importance to being able to have a global assessment of the frail patient prior to admission. If we understand the EDOA as the interface between primary care and hospitalization, this assessment facilitates dialogue between the different levels of care. This information leads us much closer to the previous state of the patient, just before becoming ill, thus helping to decide on the therapeutic approach and where to refer the patient on discharge from the emergency department. Sound knowledge of both the disease that led to the ED visit and the level of frailty facilitates decision-making on what level of care will provide greater efficiency, whether admission to specific hospital units, conventional hospital units with interdisciplinary support, even directly to medium-stay units for the sub-acute patient, dis-

charge home combined with interdisciplinary support in home care programs or simply home hospitalization⁴⁰.

Prevalent geriatric syndromes in frail patients

In ED attention of frail people, as with the elderly population in general, we observe a large number of unmet basic needs and undetected geriatric syndromes. In relation to the consumption of drugs, we would highlight polypharmacy and the high rate of failure to self-medicate, leading to non-compliance and drug failure. Other syndromes which are common in this population visiting the ED include acute onset urinary incontinence, often undiagnosed, and the high risk of developing pressure ulcers. Cognitive impairment, depression and falls are three common syndromes found in these patients visiting the ED^{34,37,38}. We know that the reason for visiting the ED in patients with cognitive impairment is different depending on their evolutionary stage; for example, falls are more frequent in the initial, mild-moderate stage of cognitive impairment³⁴. Falls are a major form of atypical presentation of illness in the frail patient. Detecting the risk of falls in the ED may lead to certain interventions³⁷, and avoid complications arising from dependence associated with falls in the frail population. Finally, depression is largely under-diagnosed, although it carries a significant risk of malnutrition, loss of function and greater possibility of re-visit^{38,39}.

Geriatric assessment as a tool for identifying risk groups in the emergency department

Our group conducted a study to identify predictor factors that would allow us to identify

Table 6. Percentage of screening tests spoiled / not performed in patients admitted to an ED observation area⁴²

Screening Tests	%
Reisberg > 3	20.6%
MEC < 24	67.8%
Pfeiffer > 3	35.8%
CAM +	18.7%
Yesavage > 4	48.9%
Prior Barthel < 70	30.7%
Barthel admission < 70	83.1%

MEC: Mini-exam cognoscitivo; CAM: Confusion Assessment Method.

those elderly patients with a high risk of subsequent readmissions (SR) and/or prolonged stays (PS, over 15 days) with increased mortality, to be able to provide them with specific attention^{13,39}. Multivariate Analysis showed that the predictors of PS > 15 days were the previous fall in the last year, and malnutrition evaluated with the Mini Nutritional Assessment (MNA). The predictors of SR were depression, assessed using the 15-item version of the Yesavage scale, and polypharmacy with 4 or more drugs. But we still lack a simple and effective model that provides clear benefits. Even so, it seems that the screening tests themselves are valid despite requiring specific training by ED professionals to be able to apply them correctly^{32,45,46}.

The implementation of screening protocols for frail elderly ED patients, offers the possibility of rapid specialist action by the hospital geriatric support team or other geriatric services such as acute geriatric units (AGU) or multi-pathologic care units, providing a differentiated model, at the primary care level, on ED discharge. These are the only two models referenced in the literature that show benefits for functional assessment and multidisciplinary intervention in frail patients⁴⁷⁻⁵¹. They prevent new admissions to the emergency services and improve physical and cognitive function over time, for those who have not had any previous specialized intervention.

Conclusion

Attention of the frail and elderly should be based, firstly, on a thorough knowledge of the reality that we are treating and that leads us to clearly differentiate the healthy adult from the frail population. Secondly, frail people attended in the ED present high overall complexity (clinical, cognitive, social and functional), about which ED professionals must acquire increased knowledge and training skills. Third, we must be familiar with the scales and tests commonly used in geriatric assessment that are also useful for the evaluation of frail patients in the ED since they provide complementary information relevant for medical decision making.

A good relationship and communication between the different levels of care, use of instruments in patient assessment and early detection of frail patients in EDOA, geriatric or not, will undoubtedly improve care for these patients, who constitute a population group that makes the best use of health resources.

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Valoración del paciente frágil en urgencias

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Los pacientes ancianos frágiles utilizan cada vez más y de forma adecuada los servicios de urgencias hospitalarios (SUH). No existen evidencias que demuestren la efectividad de un modelo concreto de valoración geriátrica aplicado en los servicios de urgencias. Sin embargo, la valoración del paciente frágil en los SUH se debería utilizar adecuándola al entorno y con unos objetivos claros que permitieran realizar un diagnóstico multidimensional y establecer prioridades terapéuticas. La valoración del estado funcional aporta beneficios en la continuidad de cuidados por parte de la atención primaria, cuando los pacientes son dados de alta del SUH. [Emergencias 2009;21:362-369]

Palabras clave: Fragilidad. Envejecimiento. Servicios de urgencias. Valoración Funcional.