Complexity in hospital internal medicine departments: what are we talking about?

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ABSTRACT

Internal medicine (IM) patients are mostly elderly, with multiple complex co-morbidities, usually chronic. The complexity of these patients involves the intricate entanglement of two or more systems (e.g. body and disease, family-socio-economic and environmental status, coordination of care and therapies) and this requires comprehensive, multi-dimensional assessment (MDA). Despite attempts to improve management of chronic conditions, and the availability of several MDA tools, defining the complex patient is still problematic. The complex profile of our patients can only be described through the best assessment tools designed to identify their characteristics. In order to do this, the Federation of Associations of Hospital Doctors on Internal Medicine FADOI has created its own vision of IM. This involves understanding the different needs of the patient, and analyzing diseases clusters and the possible relationships between them. By exploring the real complexity of our patients and selecting their real needs, we can exercise holistic, anthropological and appropriate choices for their treatment and care. A simpler assessment approach must be adopted for our complex patients, and alternative tools should be used to improve clinical evaluation and prognostic stratification in a hierarchical selection of priorities. Further investigation of complex patients admitted to IM wards is needed.

Introduction

Modern medicine suffers from two main paradoxes: i) we are still practising acute care medicine in a world of chronic disease.1,2 We defined acute illness as a disease with an abrupt onset and usually a short course, an illness of short duration, rapidly progressive, and in need of urgent care, sudden onset and short course regardless of drug intervention. A chronic disease was intended as a prolonged illness, not resolving spontaneously, rarely cured completely, developing slowly and persisting for a long period of time, often for the remainder of the lifetime of the individual; ii) traditional medical models have been found to be linear, restrictive and over-simplified.3 The mismatch between the acute care-orientation of the delivery system and the chronic care needs has several consequences (Table 1).

Internal medicine patients

Internal medicine (IM) patients are mostly elderly. They have multiple co-morbidities, which are usually chronic, rather than self-limiting or acute diseases. Neither administrative indicators nor co-morbidity indexes, though validated in elderly patients, are able to completely define these complex patients or to allow physicians to correctly manage them. It is important to underscore the differences between the concepts of co-

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Key words: comorbidity, multimorbidity, complexity, frailty, assessment, internal medicine patient.

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Licensee PAGEPress, Italy
Italian Journal of Medicine 2013; 7:142-155
doi:10.4081/itjm.2013.142
morbidity and complexity, to discuss instruments for their measurement, and to highlight related implications, areas of uncertainty, and the responsibilities of internists in the assessment and management of inpatients on their wards on the basis of several clinical and management care characteristics. For the complex patients admitted to IM wards, internists not only need to find the best diagnosis and treatment, but also to apply a comprehensive assessment and both continuous and multi-disciplinary care. This will promote their good health and ability to function, and prevent or delay disability, frailty, and displacement from home and community. In fact, these are the true every day job challenges for internists\(^5\) (Table 2) (Figures 1-3).

### The challenge of defining patient co-morbidity

The common situation of people having more than one condition presents even more challenges\(^{24}\) and patient co-morbidity could be described in different ways (Table 3).

A co-morbidity, as a pre-existing secondary diagnosis of the hospital patient, differs from a complication, a condition acquired during a hospital stay\(^{32}\) (Table 4). Comorbidities are serious medical conditions that are not directly related to the primary diagnosis itself but that may involve any other major organ system. These are usually chronic rather than self-limiting or acute and easily treated conditions. In the REPOSI study, a *cluster of diseases* was defined as *two or more co-occurring specific chronic diseases*.\(^{33}\) Feinstein defined comorbidity as *any distinct additional entity that has existed or may occur during the clinical course of a patient who has the index disease under study*.\(^{34}\) In comorbidity, in which several pathological conditions in the same patient influence each other, it is necessary to hierarchize the priority for subsequent diagnostic and therapeutic decisions. Van den Akker *et al.* underline the difference between multimorbidity (i.e. the co-occurrence of multiple chronic or acute diseases and medical conditions in one person) and comorbidity as defined by Feinstein.\(^{35}\) By definition, no index disease is used to investigate multimorbidity, whereas for research into comorbidity an index disease is obligatory\(^{36}\) (Table 5).

### Functional dependence

Mostly people live with chronic conditions rather than die from them.\(^{37}\) In both the short and long term, symptoms and disability are the principal outcomes, and these become the focus of protracted personal and medical care.\(^{38}\) The World Health Organization’s International Classification of Impairments, Disabilities, and Handicaps (ICIDH) defines a taxonomy of disease impacts.\(^{39}\) The ICIDH has three central concepts: impairment, disability, handicap. Another scheme developed by the sociologist Saud Nugi describes the relationships between four central concepts: active pathology, impairment, functional limitation and disability\(^{40}\) (Table 6).

Functional dependency refers to persons dependent in at least one activity of daily living (ADL) or instrumental activity of daily living (IADL). The ADLs are bathing, dressing, eating, getting in or out of bed or chair (transferring), mobility, using the toilet, and continence. The IADLs are preparing meals, shopping, managing money, using the telephone, doing light housework, doing heavy housework, and getting outside. Approaches to disability are summarized in Table 7.

### Frailty

Future studies should consider how complexity and frailty overlap.\(^{45}\) Frailty is not easy to define and there is no single generally accepted clinical definition of frailty. The terms *complexity* and *frailty* are often used with a meaning for both additive when they should instead be considered separately.\(^{46}\) As a condition, frailty has a high risk of a negative outcome and a worsening quality of life that is frequently associated with disability and socio-economic problems. In the frail patient, vulnerability is summarized in his or her susceptibility to actual or potential stressors that may adversely affect outcomes. Frail patients are less resilient and their ability to return to a restorative level of functioning by using compensatory and coping mechanisms is compromised.\(^{47}\) Recalling the complexity concept, Rockwood *et al.* defined frailty as a *vulnerable state of health, arising from the complex interaction of medical*...

| Table 1. Failures related to the acute-chronic care mismatch. |
|---------------------------------------------------------------|
| Too many physicians and sub-specialists involved in the manage- |
| ment of the same patient                                       |
| Poor patient information, education and counseling for the pa- |
| tient, their family and/or caregivers                          |
| Under-diagnosis of the main chronic illness                   |
| Underestimation and inability to recognize precipitating fac- |
| tors in the destabilization of the main chronic illness        |
| Over-diagnoses, overestimation of co-existing (sometimes mostly|
| emphasized sub-specialties related) diseases, not able to mo- |
| dify the natural history of the main underlying disease        |
| Inconsistent disease/patient monitoring                       |
| Poor co-ordination of care and duplication of some services/|
| inap-propriate omission of others                              |
| Medical errors, poor adherence to treatment, ADRs, conflicting |
| advice                                                         |

ADR, adverse drug reactions.
Table 2. Attributes for clinical management of internal medicine patients.

| Attributes                                                                 | Meaning and features                                                                                   |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Comorbidity, multimorbidity, burden of morbidity                          | Most people admitted in IM wards have more than one condition, with several more challenges for their management (see further text for each patient’s characteristics definition) |
| Iceberg diseases, unreported needs                                       | Elderly people tend to not report and/or underestimate symptoms and underlying problems, both for fear of the consequences and the risk of hospitalization |
|                                                                          | In the global assessment of the patient we can often find some not overt or unrecognized diseases and conditions, but in themselves able to modify the natural clinical course and prognosis |
|                                                                          | Some common underlying diseases may be related to unreported needs (Figure 1)                           |
| Severity of illness                                                       | Refers to the extent of physiological failure or organ system loss of function                          |
| Risk of mortality and end-of-life care                                   | Refers to the likelihood of dying. In our patients the problem of end-of-life care often arises, not only in the final days or hours of their lives, but more broadly, in defining which best medical care is needed, when a terminal illness or terminal condition has become advanced, progressive and incurable |
| Prognosis                                                                | Refers to the probable outcome of an illness, including the likelihood of improvement or deterioration in the severity of the illness, the likelihood for recurrence, and the probable life span |
| Treatment difficulty                                                     | Refers to patient management problems that a particular illness presents to the healthcare provider |
|                                                                          | Such management problems are associated with illnesses without a clear pattern of symptoms, illnesses requiring sophisticated and technically difficult procedures, and illnesses requiring close monitoring and supervision |
| In hospital AEs                                                          | Examples of AEs: falls, nosocomial infections, sepsis, drug ADRs, bed restraints, pressure ulcers, bedridden syndrome, etc, with possible consequences after hospitalization such as: longer hospital stay, cascade events, need of further nurse/medical intervention, loss of independence, repeated hospitalization or death |
| Contextual errors and failures in individualizing patient care           | A contextual error occurs when a physician overlooks elements of a patient’s environment or behavior that are essential to planning appropriate care; inattention to contextual information, such as a patient’s transportation needs, economic situation, or caretaker responsibilities, can lead to contextual error, which is not currently measured in assessments of physician performance |
|                                                                          | Error rates (as a measure of complexity) are associated with not only volume, but diversity, variability, and time limitations as well |
| Need for intervention                                                    | Relates to the consequences, in terms of severity of illness, that lack of immediate or continuing care would produce |
| Clinical (in)stability                                                   | Stability refers to a patient’s ability to maintain a steady-state equilibrium, compliant with normal physiological functions |
|                                                                          | It is related to the presence (absence) of vital functions (ABC: airways, breathing, circulation), blood pressure, body temperature, heart and respiratory rate impairments, altered state of consciousness |
|                                                                          | By considering five simple physiological parameters (systolic blood pressure, pulse rate, respiratory rate, body temperature and level of consciousness) with MEWS is possible, even once on admission, to predict a worse in-hospital outcome |
| Resource availability                                                    | Refers to resources available for the patient, the family, and the community brought to a situation: resources are personal, psychological, spiritual, social, technical and financial |
| Resource intensity                                                       | Refers to the relative volume, professionals (nurses, doctors, others) and services, types of diagnostics, therapeutics, monitoring and bed availability used in the management of a particular illness |
|                                                                          | It also takes into account the amount of provided care, weighted by its diversity and variability |
| Complexity of nursing care                                               | Breathing, oro-tracheal tube, non-invasive ventilation, etc.; means of venous central or peripheral access; nutrition (enteral, parenteral) and hydration; urinary and gut elimination; personal hygiene; posture and movement of the patient; rest and sleep; cardiovascular function; safe environment; interaction and communication; advanced dressings and medications; therapeutic and diagnostic procedures; monitoring; management devices and instruments |

To be continued on next page
### Table 2. Continued from previous page.

| Attributes                        | Meaning and features                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Difficult patients               | Some patients (sometimes their families) are hostile, too aggressive, too dependent, unco-operative, hysterical, suspicious and so can be difficult and frustrating to the physician[^14^]                                                                                                     |
| DHDs[^15^][^16^]                 | In addition to the nature and severity of the diseases, DHDs are conceived as situations involving an economic, human and organizational burden exceeding patients’ and their families’ capacities, inducing hospital bed blocking, discharge delays and longer LOS Patient are at high risk of a poor outcome after discharge (i.e., unscheduled hospital readmission), requiring the involvement of primary care/out-of-hospital services |
| Unscheduled hospital readmissions | The number of patients discharged from an acute care hospital and readmitted to any acute care hospital within 30 days divided by the total number of people who were discharged alive from acute care hospitals[^17^] Readmission rate after a given time                                                                                             |
| Multidimensional comprehensive assessment | Defines the state of health an elderly person through careful analysis of functional capacity and their needs at various levels: biological and clinical, psychological, social, environmental, functional It is useful in defining priorities of care, as a judgment of frailty or robustness of each individual patient, for which decision may or may not be taken with diagnostic and therapeutic, invasive interventional and/or preservative and/or palliative measures, as appropriate |
| Decision making                  | Any bed side decision would be taken upon an appropriate clinical judgment, according to evidence-based current guidelines (if disposable and validated) We have to select robust patients from those needing mostly conservative/palliative care A multi-dimensional comprehensive assessment may useful in selecting fit or compromised and frail patients, also according to a gut feeling based practice, exercised as defined realistic end-points, mostly in cancer patients[^18^] (Figure 2) |
| Care management and communication issues[^19^] | The aging population demands a healthcare system that can manage multiple aspects of care across multiple settings and providers Patient reports to parent/caregiver that medicines are not given; patient is verbally abusive to staff Patient may also be non-adherent to treatments/medications The medical team has changed multiple times, as well as the plan of care There are multiple consulting services involved Patient has been to numerous hospitals and numerous doctors for the same diagnosis Patient has not had follow up or it has been inconsistent and only in times of medical emergencies Communication and co-ordination are essential tools for the care of complex patients. |
| Discharge planning               | A comprehensive range of services is not enough: It is necessary to guide people through the healthcare system[^20^] (Figure 3)                                                                                                                                                                                                                      |
| Post-discharge management        | Identifying patients at risk for prolonged hospital stay and in need of discharge planning resources                                                                                                                                                                                                                                                   |
| Continuity of care               | Continuity of care is commonly defined as a connected and coherent series of healthcare events, or seamless care.[^21^] For the healthcare professional it means having all the necessary information about the patient at the point of care (informational continuity) and co-ordinating actions with other providers to deliver services in a complementary and timely manner along a recommended care pathway (management continuity). Continuity of care also requires good care relationships between the patient and attending team (relational continuity)[^22^] Complementary strategies are needed, supporting clinicians to provide personalized, comprehensive continuity of care, especially in socio-economically deprived areas[^23^] |

[^1]: IM, internal medicine; AEs, adverse events; MEWS, Modified Early Warning Score; DHDs, difficult hospital discharges; ADRs, adverse drug reactions; LOS, lengths of stay.
Figure 1. Iceberg diseases and unreported needs in the elderly.

Figure 2. Fitness of old cancer patients: from gut feeling to assessment based decision making.18

Figure 3. Discharge planning: a cultural comparison.
and social problems, resulting in a decreased ability to respond to stress, and associated with a decline in functional performance.\(^4\) In the old or very old or old-old elderly, frailty is the condition in which the complexity of the patients makes the prognosis unfavorable and particularly burdensome from point of view of care. The frail elderly person, in general, is a weak subject of advanced or very advanced age, with disabilities at different levels and presence of associated geriatric syndromes. Frailty describes a phenotype of older people with comorbidities and clinical instability, disability and risk of adverse events, with a high incidence of hospitalization or death. Essentially, frailty is defined by severe reductions in reserves and resistance to stress caused by the cumulative decline of most physiological systems, and creating an additional burden to the normal aging process. From a more strictly clinical point of view, frailty of the elderly is characterized by high susceptibility to develop diseases (often with atypical clinical course, decreased motor skills, and propensity to immobility and rapid fluctuations in the subject’s state of health), tendency to cascade, risk of adverse events and complications, reduced ability to improve and difficulties of recovery (failure to thrive), the need for constant medical treatments, frequent and repeated hospitalizations, need for continuing care, and a higher risk of mortality (Table 8).

The multidimensional assessment of the patient forms the base index of frailty (Figure 2). The Canadian Study of Health and Ageing has introduced the Clinical Frailty Scale that includes assessment of confirmed illnesses, patient motivation, control of symptoms, functional status and degree of dependence.\(^4\)

The global clinical-social prognosis in hospitalized patients is assessed by the Flugelman’s index. This evaluates seven parameters: mobility, sphincter control, mental competence, feeding ability, presence of...
pressure sores, medical condition and family status. The sum of the scores of all parameters makes up the prognostic index. The index offers a simple and relatively accurate tool for the assessment of the prognosis of elderly patients. The score of 17 or more has a bad prognostic significance (such as still hospitalized or deceased) with 92% sensitivity, 83% specificity, and 94% predictive value.49

**Definition of complexity**

What makes our patients complex and how can we measure their complexity? These questions still have to be answered.50 Defining and measuring patient complexity has important implications for how care is organized, how the management recognizes the workload of nurses and physicians, and how resources are allocated. In order to redesign our healthcare systems to more effectively care for complex patients, we need to understand better exactly who they are.51

The concept of complexity lacks a precise definition. It presents a specific challenge in clinical decision-making and processing the patient in ways that go beyond standard routine care.52 Complexity is the quality of being intricate and compound. It refers to the degree of complication of a system or of a system component, determined by such factors as the number and intricacy of interfaces, the number and intricacy of conditional branches, the degree of nesting, and the types of data structures.53,54 According to these meanings, complexity in a patient involves the intricate entanglement of two or more systems (e.g. body diseases, family-socio-economic status, therapies). In complexity, the interaction of multiple different factors in the same patient (social, medical, family, therapy, etc.) and its consequence have to be assessed in a multidimensional approach. Research to identify the profile of clinical complexity and instability of the resident in nursing homes graded clinical complexity by applying twelve frailty correlated clinical indicators, such as more than 4 drugs/die, malnutrition, artificial nutrition, dehydration, tracheostomy and/or any other stoma, bladder catheter, urinary incontinence, pressure ulcers, any other skin

**Table 7. Approaches to disability.**

| ADL | ADLs are elementary tasks that allow getting around with minimum autonomy and independence, including any daily activity we perform for self-care, work, homemaking, and leisure. There are two major groups of ADL: basic activities related to self-care, such as bathing, dressing, eating, voluntary control of sphincters, grooming and walking; and instrumental activities, such as light housework, preparing meals, taking medications, shopping for groceries or clothes, using the telephone and managing money. This model was used to develop the Katz ADL index42 and the Barthel index,43 which is still a standard rating scale to measure disability |
| WHO environmental approach to functional disability | This is a biopsychosocial/integrative approach, considering three main components: body functions and structures, activities and participation and contextual factors (environmental and personal factors). Independence is defined as the ability to perform an activity with no or little help from others, including having control over any assistance required rather than the physical capacity to do everything oneself44 |

ADL, activities of daily living; WHO, World Health Organization.

**Table 8. Prognostic consequences related to frailty.**

- Higher susceptibility to develop acute illnesses, mostly expressed with atypical clinical features (mental confusion, urinary incontinence, postural instability and falls, etc.)
- Reduced mobility to immobility, with frequent weakness and adynamy, not fully justified by each disorder present
- Rapid fluctuations of health performances
- Marked tendency to develop complications (failure cascade)
- Higher risk of adverse iatrogenic/hospital/healthcare related events
- Slow resilience, however, almost always partial
- Failure to thrive, often associated with increased incidence of infections, cell-mediated, depression, hip fractures, pressure ulcers, increased post-surgery mortality
- Frequently required medical intervention, repeated hospitalizations, need for continuity of care
- Hospital discharge delay
- Higher risk of mortality
ulcer, falls, oxygen therapy. In a primary care setting, physicians defined approximately one-quarter of their patients as complex, with older, more experienced physicians and those working in community health centers reporting higher proportions. Compared to non-complex patients, complex patients were older, more often women, and had more clinic visits to many different providers. Complex patients also had more medicines prescribed, including prescriptions for anti-psychotic medicines, were more likely to miss appointments, and were more likely to live in neighborhoods with lower income and education levels.

Regardless of its definition, the complexity of the patient involves some important practical implications (Table 9).

The bedside Internist’s professionalism in managing complex patients should be based on best care patterns with growing levels of competence (Table 10).

Unscheduled hospital readmissions and post-discharge management

Rehospitalizations are prevalent and costly. Unscheduled hospital readmissions may be due to new acute disease/new diagnosis, relapse or progression of the most important clinical disease, re-activation of a comorbidity or failure to recover after a previous discharge. The conceptual models of considering re-hospitalizations, as patients’ characteristics in and/or out of hospital healthcare are reported in Figures 4 and 5. In 11,855,702 hospitalized Medicare patients discharged from a hospital, one-fifth (19.6%) were readmitted within 30 days and 34% within 90 days. Within one year 67.1% of patients who had been discharged with medical conditions and 51.5% of those who had been discharged after surgical procedures were re-hospitalized or had died. Among patients who were re-hospitalized within 30 days after a surgical discharge, 70.5% were re-hospitalized for a medical condition. Among all heart failure (HF) patients, 64.6% were readmitted. The most frequent diagnosis for re-hospitalization were HF, pneumonia, chronic obstructive pulmonary disease (COPD), sepsis, and ulcer, falls, oxygen therapy. In a primary care setting, physicians defined approximately one-quarter of their patients as complex, with older, more experienced physicians and those working in community health centers reporting higher proportions. Compared to non-complex patients, complex patients were older, more often women, and had more clinic visits to many different providers. Complex patients also had more medicines prescribed, including prescriptions for anti-psychotic medicines, were more likely to miss appointments, and were more likely to live in neighborhoods with lower income and education levels.

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On the contrary, a longer LOS may be considered as a negative prognostic factor: in the LACE index, unscheduled hospital readmissions are assessed as the length of stay (L), acuity of the admission (A), comorbidity of the patient (measured with the Charlson comorbidity index score) (C), and use of emergency department (measured as the number of visits in the six months before admission) (E) (Table 11).

The Blaylock Risk Assessment Screen (BRASS) is administered on admission and identifies patients at risk for prolonged hospital stay and in need of discharge planning resources. This is assessed by the nursing team to identify, shortly after hospital admission, those patients who are at risk for prolonged hospital stay and in need of discharge planning resources, in order to reduce or prevent post-discharge problems. The index contains 10 items: age, living situation/emotional support, functional status, cognition, behavior pattern, mobility, sensory deficits, previous admissions/emergency room (ER) visits, active medical problems and drugs. A total score can range from 0 to 40. The index categorizes patients into three groups based on the total score. Scores ranging from 0 through 10 suggest that the patient is at low risk for having post-discharge problems and thus has little need for discharge planning (low-risk group). Scores ranging from 11 through to 20 suggest that the patient’s problems are more complicated and require extensive planning to prevent problems after discharge (medium-risk group). Scores above 20 suggest that the patient’s problems are so great that extensive discharge planning is required and that the patient is at risk for a discharge destination other than home (high-risk group).

Proposals carried out for assessment of the complexity of the medical patients in internal medicine wards

Different tools have been proposed to evaluate the complexity of medical patients. Some elements have already been validated. The Comprehensive Geriatric Assessment (CGA) for defining 1-year mortality in complex patients is a useful tool and was introduced by Pilotto et al. with the Multidimensional Prognostic Index (MPI). This considers clinical, cognitive, functional, nutritional, and social parameters by using six standardized scales and information on medications and social support network, for a total of 63 items in eight domains. An MPI was developed from CGA data by aggregating the total scores of the eight domains and expressing it as a score from 0 to 1. Three grades of MPI were identified: low risk, 0.0-0.33; moderate risk, 0.34-0.66; and severe risk, 0.67-1.0. In COPD patients, we recently confirmed the relevant level of comorbidity in such a chronic disease, with more than two-
Table 9. Bed-side implications related to the complexity of the hospitalized patient in internal medicine practice.

- Avoiding any decision making delay, under the burden of a state of uncertainty
- Exercising a comprehensive global assessment in patients admitted in IM wards
- Searching for comorbidities (both as overt and/or underlying iceberg diseases)
- Identifying frail patients and those with functional deficits
- Rightly using guidelines according to a clinical judgment
- Exerting the ability of a global direction in the management of active/secondary problems
- Selecting the treatments really necessary, by constructing the hierarchy of priorities
- Exercising capacity of advocacy, i.e. the ability to represent the concerns of the patient, family and community, helping resolve related ethical and clinical issues
- Predicting the summative patient characteristics that allow doctors and nurses to expect a certain trajectory of illness
- Tailoring a targeted treatment, by defining clinical endpoints upon a multidimensional comprehensive assessment of the patient
- Avoiding, if possible, a hospital discharge delay, by planning the tailored program management for the difficult patient
- Considering the possibility of absence of a fragmented co-ordination of care, owing to shared interventions by several specialists
- Considering the consequent risk of poor adherence to treatment
- Implementing a proactive interaction with multiple subspecialists in ongoing care and holistic interrelationships across healthcare systems
- Facilitating a self-management of chronic diseases
- Facilitating the contribution of family components and caregivers in decision-making, such as the plan of care and the outcomes
- Considering the need of co-management for a shared responsibility, authority and accountability in the management of complex surgical hospitalized patients by hospital medicine physicians (internists and or hospitalists)\(^5\)
- Managing the risk of errors and of the higher risk of iatrogenic damage (polypharmacy, drug interactions, ADR, incompatibilities, contraindications).

IM, internal medicine; ADR, adverse drug reaction.
thirds of patients with moderate to severe prognosis if stratified according to the MPI score. The PROFUND index of the Spanish Society of Internal Medicine (SEMI) considers the following variables: demographic (age), clinical (presence of neoplasia, dementia, disabling dyspnea, and delirium in last hospital admission), laboratory (hemoglobin), functional (Barthel Index), socio-familial (no caregiver or caregiver other than spouse), and care (number of hospitalizations in last 12 months). This prognostic

![Figure 5. The model analysis of unscheduled hospital re-admission.](image)

**Table 10. Some potential bedside decision making patterns of internal medicine doctors.**

| Basic professionalism | Optimal professionalism | Excellent professionalism | Distinctive professionalism |
|-----------------------|-------------------------|--------------------------|-----------------------------|
| Knowing how to make decisions in a global manner: questioning and examining patients, reasoning as to what they present with, not omitting the psychodynamic aspects and emotions, explicit and also implicit willingness, actual needs, socio-economic and familial context, possible comorbidities, functional limitations or cognitive dysfunctions and alterations of the emotional sphere | Knowing how to carry out both inductive and deductive methods of clinical reasoning | Innovating and implementing protocols | Possessing a specific professional competence-certified according to excellence criteria to be made available – as an added value – to the local hospital, in the interest of the patient |
| Knowing how to utilize the methods of EBM | Knowing the entire path of evidence-based practice, guidelines, clinical governance, audit | Knowing how to describe the process of health technology assessment and its instruments | Knowing how to identify and research the MID or MCID in clinical trials |
| Knowing how to distinguish statistical significance from clinical relevance | Critically evaluating protocols and knowing how to apply them to the actual patient | Critically evaluating a study protocol | Applying EBM to actual patient using the PICO methods |
| Knowing how to identify and its integration with clinical experience | Knowing how to identify and examine patients, reasoning as to what they present with, not omitting the psychodynamic aspects and emotions, explicit and also implicit willingness, actual needs, socio-economic and familial context, possible comorbidities, functional limitations or cognitive dysfunctions and alterations of the emotional sphere | Knowing how to identify and examine patients, reasoning as to what they present with, not omitting the psychodynamic aspects and emotions, explicit and also implicit willingness, actual needs, socio-economic and familial context, possible comorbidities, functional limitations or cognitive dysfunctions and alterations of the emotional sphere | Conducting a clinical audit |

EBM, evidence-based medicine; IM, internal medicine; PICO, patient intervention comparison outcome; MID, minimally important difference; MCID, minimal clinically important difference.
index provided an accurate and transportable method of stratifying 1-year death in risk in poly-pathological patients.\textsuperscript{66}

**Are the doctors’ rounds important for the global bedside assessment of the complex internal medicine patient?**

The current hospital organization tends to emphasize the improvement of care processes, as pre-ordained tools, mostly upon guidelines, clinical paths and standards of care concerning a single disease.

We are firmly convinced that the treatment of the person according to his real needs is the true key-stone of quality of care. This should be based on a multi-dimensional comprehensive assessment, and by exploring their complexity characteristics for which they are different from normal and/or usual, standard cases, as represented in randomized clinical trials.\textsuperscript{67} The medical ward round is a fundamental, yet all too often neglected, component of daily clinical activity. In the complex ward environment, the daily process of reviewing patients requires careful preparation, prioritization, attention to detail and continuous re-evaluation. Furthermore, all medical ward rounds should be tailored to the needs and wishes of the individual patient, promoting shared decision-making and self-management. Implicit in the recommendations outlined by this document is the depth of cultural change and clinical engagement required to deliver high-quality care. All healthcare professionals have a responsibility to protect and prioritize quality, patient experience and safety on medical ward rounds.\textsuperscript{68}

**Conclusions**

IM patients are mostly elderly, with multiple complex co-morbidities, usually chronic, often frail, some potentially unstable (i.e. requiring monitoring support, oxygen delivery therapy, treatment with fluid infusion and in a coma and/or state of shock, etc). Although several indices have been proposed to classify co-morbidities, co-morbidity cannot in itself explain all of the characteristics of the elderly patient admitted to an IM ward.\textsuperscript{69} More attention should be paid by hospital management to the IM departments and to recognizing the complexity of their patients’ needs; however, it is difficult to provide firm evidence for this. In recent years, budgetary pressures on hospital care, according to related structural and/or administrative indicators, assessing the complexity of case mix on the basis of the mere nosological encoding, have not allowed the internists’ clinical practice to be evaluated other than with regards to their complex patients. Furthermore, many interventions carried out in IM departments are complex in that they involve multiple interacting components and are delivered in different ways and circumstances. But there are no means to measure these.

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**Table 11. Modified LACE tool.**

| Attribute               | Value                           | Points Prior admit. | Points Present admit. |
|-------------------------|---------------------------------|---------------------|-----------------------|
| **Length of stay**      | Less 1 day                      | 0                   |                       |
|                         | 1 day                            | 1                   |                       |
|                         | 2 days                           | 2                   |                       |
|                         | 3 days                           | 3                   |                       |
|                         | 4-6 days                         | 4                   |                       |
|                         | 7-13 days                        | 5                   |                       |
|                         | 14 or more days                  | 6                   |                       |
| **Acute admission**     | Inpatient                       | 3                   |                       |
|                         | Observation                      | 0                   |                       |
| **Co-morbidity**        | No prior history                 | 0                   |                       |
|                         | DM no complications; cerebrovascular disease, Hx of MI, PVD, PUD | 1                   |                       |
|                         | Mild liver disease, DM, with no organ damage; CHF, COPD, cancer, leukemia, lymphoma, any tumor, cancer; moderate to severe renal dz | 2                   |                       |
|                         | Dementia or connective tissue disease | 3                   |                       |
|                         | Moderate or severe liver disease of HIV infection | 4                   |                       |
|                         | Metastatic cancer                | 6                   |                       |
| **Emergency room visits during previous 6 months** | 0 visits                       | 0                   |                       |
|                         | 1 visits                         | 1                   |                       |
|                         | 2 visits                         | 2                   |                       |
|                         | 3 visits                         | 3                   |                       |
|                         | 4 or more visits                 | 4                   |                       |

Letters in italics (L,A,C,E) stand for the acronym of LACE tool. adm., admittance; DM, diabetes mellitus; Hx, history; MI, myocardial infarction; PVD, peripheral vascular disease; PUD, peptic ulcer disease; CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease. *Co-morbidity points are cumulative to maximum of 6 points.
and selecting their real needs, we can exercise holistic, intensive, conservative/frugal or palliative levels of care. By exploring the real complexity of our patients may be present in the same patient. Considering some problematic patient’s characteristics, such as:
- Difficult hospital discharge;
- Diseases intrinsically burdened by a poor prognosis, such as malignant tumors;
- Medically complex surgical patients;
- Frailty characteristics, as further factors in defining the vulnerability and complexity of a patient;
- Potential instability factors as causes of unscheduled readmission hospital rate

Therefore, we need to demonstrate on the basis of a comprehensive evaluation that the typology of our patients as complex requires effort and resources that are difficult to be quantified by routine assessment. In other words, we have to describe and profile the real complexity of the patient admitted to IM wards and the increasingly heavy workload for all of us, nurses and doctors (Table 12). By definition, internists are able to make clinical judgment; this includes clinical reasoning and decision making about real patient needs, critical thinking, and a global grasp of the situation presented, together with acquired skills. On the basis of a multidimensional assessment, we can decide what type of intervention to offer our patients, such as intensive, conservative/frugal or palliative levels of care. By exploring the real complexity of our patients and selecting their real needs, we can exercise holistic, anthropological and appropriate but also frugal medical treatment of the person, i.e. IM. In its principles, we can found the cultural and methodological tools to face the challenge of complexity. IM doctors will continue to pursue what has always been the internist’s task: the resolution of complex and ill-defined patient problems into proper diagnoses and therapeutic options, taking care of inpatients with a wide range of medical illnesses. It is our intention to further investigate this complex issue, using additional assessment tools, because we are convinced that we need extra validated instruments for assessing the complexity of our patients.

| Table 12. Stable complex, unstable, critically ill and frail patient definitions. |
|-----------------|-----------------|-----------------|-----------------|
| Stable complex patient | Unstable patient | Critically ill | Frail elderly |
| Normal state of consciousness. No alteration of any vital sign; ABC (airways, breathing, circulation) is not compromised. Body temperature, heart and respiratory rate and blood pressure are normal. Multi-organ complex, systemic disease or multiple (somewhere underlying but not clinically overt) co-existing diseases and/or contextual factors (bio-psychosocial, environmental and personal problems) may be present in the same patient. Considering some problematic patient’s characteristics, such as:
- Difficult hospital discharge;
- Diseases intrinsically burdened by a poor prognosis, such as malignant tumors;
- Medically complex surgical patients;
- Frailty characteristics, as further factors in defining the vulnerability and complexity of a patient;
- Potential instability factors as causes of unscheduled readmission hospital rate | Patient with impaired:
- consciousness,
- vital functions;
- ABC (airways, breathing, circulation);
- blood pressure (hypotension: SBP <90 mmHg despite filling);
- body temperature;
- heart rate;
- respiratory rate. Considering the need to monitor the patient according to its vital signs to detect early signs of clinical deterioration | Patient with a condition of current or recent acute failure of an organ and/or system, or of more organs or systems, with consequent possible risk to life, which requires continuous observation and personalized sub-intensive/intensive care. Considering the need to monitor the patient according to its vital signs to detect early signs of clinical deterioration | Vulnerable patient with reduced functional reserve, where the complexity of problems, (biological, clinical, functional, psycho-emotional and/or social and family related) can lead to an increased risk of: adverse cascade events, failure to thrive, impairment of quality of life and a poor prognosis. Considering some of the most often frequent geriatric syndromes: delirium, cognitive dysfunction, functional dependence, falls, chronic pain, polypharmacy, depression, urinary/fecal incontinence. |

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