



## Original article

## Competences of internal medicine specialists for the management of patients with multimorbidity. EFIM multimorbidity working group position paper



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## ABSTRACT

Patients with multimorbidity increasingly impact healthcare systems, both in primary care and in hospitals. This is particularly true in Internal Medicine. This population associates with higher mortality rates, polypharmacy, hospital readmissions, post-discharge syndrome, anxiety, depression, accelerated age-related functional decline, and development of geriatric syndromes, amongst others. Internists and Hospitalists, in one of their roles as Generalists, are increasingly asked to attend to these patients, both in their own Departments as well as in surgical areas. The management of polypathology and multimorbidity, however, is often complex, and requires specific clinical skills and corresponding experience. In addition, patients' needs, health-care environment, and routines have changed, so emerging and re-emerging specific competences and approaches are required to offer the best coordinated, continuous, and comprehensive integrated care to these populations, to achieve optimal health outcomes and satisfaction of patients, their relatives, and staff. This position paper proposes a set of emerging and re-emerging competences for internal medicine specialists, which are needed to optimally address multimorbidity now and in the future.

### 1. The impact of multimorbidity on our health-care systems, hospitals, and different fields of internal medicine

By 2060, the number of Europeans above age 65 is projected to increase from 88 to 153 million [1]. In consequence, the true challenge for European health care systems is to prepare for this monumental change in demography. Aging is closely related to the development of chronic diseases, which cumulate during life. This relatively recent phenomenon has given rise to the term multimorbidity (MM), defined as the presence of two or more chronic diseases at the same time in the same patient or a more recent and restricted definition the complex interactions of several co-existing diseases (<https://www.ncbi.nlm.nih.gov/mesh/?term=Multimorbidity>). The increasing presence of aging citizens

suffering from multiple chronic conditions requires an extensive reorganization of health care delivery systems, which ought to adapt their services to the real needs of patients: from a disease-oriented to a person-oriented approach. This is the most important and fundamental idea, that must underly all initiatives oriented towards chronic care [2, 3].

Multimorbidity is associated with a decline in many aspects of health and in consequence with an increase in hospital admissions, psychological, familial, and social distress, polypharmacy, and use of health care and social resources [3–8]. The management of patients with MM has given emphasis to the continuity of care, teamwork, holistic integral and integrated coordinated care, with the involvement of patients, families, caregivers, and social networks [9–12]. A new set of emerging

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tasks and interventions are currently on the table like self-care, patient empowerment and patient activation, drug-prescription optimization, deprescribing, shared decision-making, or personalized care plans [13–17]. Many institutions have also proposed new models of care to address this social and health paradigm change [18]. Nevertheless, despite this idea, studies show, that multimorbid patients are less likely to receive necessary coordinated, comprehensive, and continuous care. Research, clinical guidelines, and health-care services must shift focus from single conditions to the requirements of increasingly complex patient populations [19]. Fortunately, in recent years MM has drawn increasing attention of many international organizations. A good example is the European Commission's large collaborative project named Joint Action on Chronic Diseases and Promoting Healthy Ageing across the Life Cycle (CHRODIS) in the context of the 2nd EU Health Programme 2008–2013 [20].

Patients with MM are increasingly present in most hospital areas, especially in IM. As a matter of fact, their prevalence in IM wards and outpatient clinics may be up to 50% depending on the hospital and IM department characteristics [21–25]. This epidemiological pattern urgently necessitates adapting protocols, interventions, and clinical routines to current needs. Nevertheless, changes enter most centres slowly because they require deep changes in the knowledge, vision, and style of professional practice at all levels. This includes management, physicians, nurses, and other health care staff. In consequence this gap between patients' requirements on the one side and faulty inertia of hospital care on the other side increases the so called posthospital syndrome and hospital readmissions. Both issues have surfaced as internationally recognised potential indicators of healthcare quality because they impact patients, families, and healthcare system [26, 27]. Nearly a third of patients with MM develop a posthospital geriatric syndrome with one or more manifestations (functional decline, malnutrition, hospital-acquired infections, sarcopenia, sphincter problems, dysphagia, sleep disorders or delirium), raising mortality rates after discharging up to 16% [28]. Some studies found that most of the causes of readmission to be different from the first diagnosis of original admission, suggesting consequences of underlying comorbidities, health-care related complications, and deconditioning syndrome [29, 30].

As mentioned above, there has been a notable social and epidemiological change lately, with the increasing prevalence and proportion of MM populations in most areas of health care. Health care systems, primary care, hospitals, and especially IM departments must adapt to this change and offer alternatives for optimal care. For this, internists need to acquire and demand new skills, in addition to current ones, to successfully face the challenge of MM.

## 2. Aging and multimorbidity. The emergence of mixed clinical phenotypes

Aging is associated with chronic diseases and is, by far, the main risk factor for developing MM; slowing down the aging process is an effective approach to prevent chronic diseases and therefore MM [31, 32]. During life, several biological deficiencies accumulate, disturbing the body's homeostasis progressively. The accumulation of chronic diseases over time results from the interaction between genetic predisposition, life-long exposure to the environment and behavior. In addition, medical and social advances have achieved substantial increases in survival from previously deadly conditions, for the price of converting them into chronic diseases [32–35].

Classical cardiovascular risk factors such as unhealthy lifestyles and sedentarism induce many chronic conditions which merge into MM [34–36]. In addition, lower socioeconomic status and lower education are well-known risk factors for MM. This is evident in the development and outcomes of many diseases and conditions and particularly marked in mental health disorders [37, 38]. Different combinations of determinants induce a variety of MM patterns and sometimes very typical clusters, which have been recently evaluated in different studies,

identifying models of associative MM [39–43]. Understanding disease clusters is extremely important, as MM models can improve health and cost in a major way through relatively simple changes in health care delivery. A recent study of older primary care patients from 2 different European countries identified 3 major patterns of MM clustering (the first one comprised a combination of cardiovascular and metabolic diseases, the second one was related with mental health problems, and the third one with musculoskeletal disorders) [43].

The epidemiology and clinical phenotypes of non-communicable diseases change in parallel with social and behavioural changes, in the same way as communicable diseases do. These changes have been evident in the last 30 years, with a significant switch in the clinical profile of patients with MM compared to descriptions of the last decades in 20th century. The increased age, and the generalized preventive measures implemented in last 20–30 years, have delayed the onset and extent of the most common chronic diseases [21, 44, 45]. Thus, the impact of chronic diseases now intertwines with the impact of aging such as frailty, sarcopenia, and other geriatric conditions in most patients with MM, leading to mixed phenotypes as detailed in Fig. 1 [46–48, 37, 49].

## 3. Multimorbidity, society and health care research

Multimorbidity affects our societies doubly: In high-income countries and in the most economically affluent sectors of the population, it clearly decreases longevity and hinders healthy and disease-free aging. In low- and middle-income countries and in the most economically vulnerable sectors of the population, MM appears at younger ages, impacts life expectancy, leads to catastrophic health expenditures in many families, and consequently pushes them into the spiral of greater impoverishment [50].

Despite the high prevalence of MM, current medical practice and research is still largely based on single disease models, without considering the coexistence of several diseases [46–48, 37, 49]. Dealing appropriately with this emergent and changing arena of MM also requires the acquisition of new, and re-emergent competences. However, we face a substantial lack of adequate scientific evidence, guidelines, and guidance for patients with MM, because patients with relevant comorbidities have been excluded from studies. Thus, evidence on the feasibility and effectiveness of interventions is scarce in MM, and consensus on appropriate care is difficult [31, 51–54]. For all these reasons it is important to ensure, that internists now and in the future acquire necessary skills to cope with the important challenges associated with MM.

## 4. European Board of Internal Medicine curriculum and its implications to manage patients with multimorbidity

The practice of IM in Europe is highly variable. In most countries IM is a hospital-based specialty with outpatient activity. Nevertheless, the profile of patients seen by European internists is very similar. However, there are essentially two models of clinical practice delivery: In some countries most internists are dedicated to general IM, whereas in others a high percentage of internists are dedicated to one of the many more specialized fields of IM such as cardiology, gastroenterology, endocrinology etc., including palliative and geriatric medicine. These distinctions between countries leads to the additional variability in the internists' performance of diagnostic and therapeutic procedures [55].

Aware of this reality, and with the aim of homogenizing missions, values, and competences for the performance of the specialty in Europe, the *Union Européenne des Médecins Spécialistes* together with the European Federation of Internal Medicine has created the European Board of Internal Medicine (EBIM) as a collaborative group committed to advancing postgraduate education in IM in Europe. The EBIM generated in 2016 a curriculum to guide postgraduate education in the specialty of IM. This curriculum presents the minimum training requirements for the

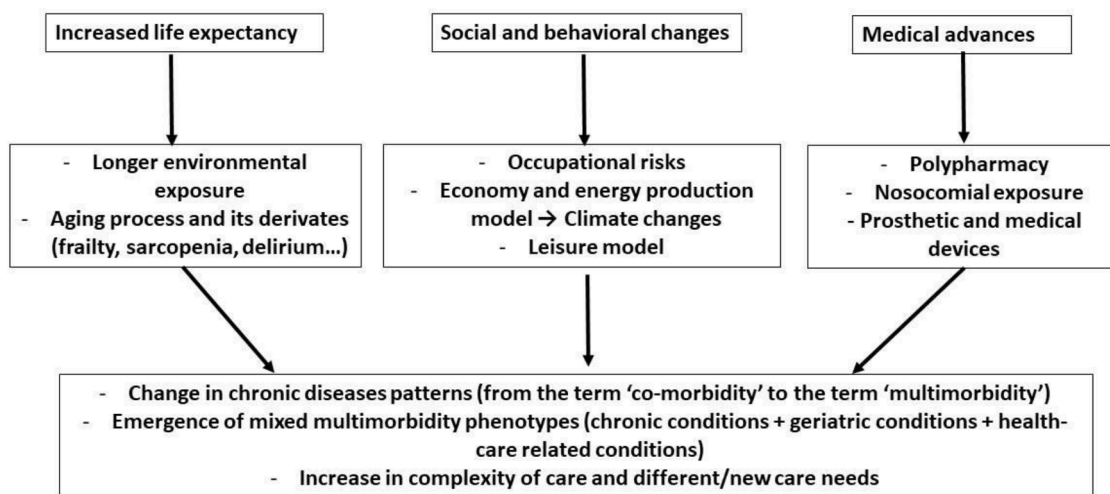


Fig. 1. Development of mixed clinical phenotypes in patients with multimorbidity, due to the interaction of aging processes with chronic conditions and health-care related issues.

qualification as a specialist in IM across Europe, to provide consistency in the practice across Europe [56, 57].

Already in the definition of the specialty, the EBIM curriculum emphasized the increasing prevalence of the chronic and complex diseases in European societies. Furthermore, it emphasised the substantial role of internists as health advocates in the field of MM, and patients with co-morbidities and polypharmacy. In the field of specific areas of expertise, authors proposed ‘multimorbidity and ageing’ as the first one of nine; in addition, they also proposed three more areas directly related to MM management (shared decision-making, transition of care, and vulnerable adults). In the evaluation of patients with common clinical presentations, authors included the end-of-life care, and geriatric issues. In addition, they listed clinical pharmacology, thereby underlining the importance of managing polypharmacy in MM [57]. Thus, the EBIM curriculum establishes a framework in which the approach to MM is very relevant. The main motivation of this current document is to further develop these principles and to propose new emerging and re-emerging competencies that have arisen in recent years in the field of MM.

The most important somatic conditions in the elderly are cardiovascular and lung diseases, arthrosis, loss of sight and hearing and neurological disorders. These conditions, most often in combination, lead to loss of autonomy, functional decline, and progressive disability and poor quality of life [58]. The frequent coexistence of somatic, mental, and social conditions in patients with MM require integral and frequent assessments. For this purpose, the comprehensive geriatric assessment (CGA) is very useful and has demonstrated benefits in health outcomes [59–63].

Placing vulnerable patients and their care givers at the center of treatment plans, providing realistic lifestyle management, customised and personalised care for each patient, involving patients in treatment choices, and offering an optimal end-of-life care are additional emergent competencies in managing MM. This requires a personalised approach, and a knowledge of the global situation, as well as the goals, preferences, and possibilities of the patient.

Finally, patients with MM benefit from coordinated care networks, in which care professionals work together to shape optimal care with the needs of the patient as the starting point. Keeping an overview of the various treatment plans can be a challenge for the patient, given the patients often limited medical knowledge and health literacy [64]. Also, contradictory advice from different health care professionals can make it difficult for the patient to keep a cohesive overview of the treatment policy and the choices to be made therein. Coordinated care can be initiated from the hospital but will increasingly be given in the context

of the patient’s milieu. It is essential to reinforce Primary Care-IM co-management programs for patients with MM, to ensure continuity of care. Caring for MM in the future will require a specialised generalist approach beyond the current specialist approach. This places the internist in a prominent, specialised and coordinating role.

All these previously outlined emergent and reemergent tasks are detailed in Table 1, and the related competences will be discussed in the following sections.

### 5. The importance of prognostication and comprehensive geriatric assessment

Establishing a prognosis is an essential medical task, which becomes even more important in vulnerable and high-risk populations. Its relevance is obvious for clinical management, as it avoids possible nihilistic deviations from clinical practice (denying opportunities to patients with

**Table 1**  
Emergent and re-emergent tasks and targets for the optimal management of patients and populations with multimorbidity.

TASK	PRIMARY TARGET
Leading multimorbid patients from symptom to diagnosis and triage	Patient, potential referral to other health care givers
Prognostication: Functional decline risk, and death risk stratification	Patient
Comprehensive geriatric assessment	Patient and close environment
Establishing personalized care plans and propose patient itineraries	Patient and close environment
Shared Decision Making	Patient together with caregiver
Self-care promotion and guidance in lifestyle improvement	Patient, other health care givers such as physiotherapists, nurses, nutritional advisors, etc.
Managing polypharmacy	Patient, other health care givers such as home nurses and pharmacists
Multidisciplinary and teamwork	Patient, close environment and other professionals
Coordination and continuity of care, including guidance for patient itineraries	Patient, and other professionals
Co-management with Primary Care and all other involved Physicians	Patient, and other professionals
Integral end-of-life care	Patient and close environment
Management of new technologies and digital health tools	Patient, close environment and other professionals
Advising on health decisions regarding multimorbidity	Health authorities and society
Raising awareness of the importance of multimorbidity in the population	Health authorities and society

a good life expectancy), but also futile and aggressive actions (with little benefit and a high risk of iatrogenesis for patients in their end-of-life trajectory). It is also very relevant for patients and their families, in terms of life planning. Closely related to prognostication is the term ‘time to benefit’, which can be defined as an estimate of the time needed until an intervention/treatment becomes significantly effective in a group of patients. This concept is seldom mentioned in trial results, although the time to benefit from an intervention may exceed life expectancy. When examining the balance of desired and undesired effects, benefits and risks of interventions, medicine interactions, treatment burden, and patient capacity, prognostication is crucial.

Nowadays we have several reliable prognostic tools, which can be of great help in making decisions [65]. Among them, there are some very recent tools adapted for patients with MM [66–70]. However, despite recognizing their importance, many European internists do not apply them in their usual clinical practice due to a lack of time and probably learned inertias [71]. An important effort should be made by our collective to incorporate this task in the routine evaluation of patients with MM, as a first cornerstone for the global care planning.

Multimorbidity and its consequences have progressively had a large impact on patients’ physical and psychosocial functioning, leading to a gradual overall deterioration, and the development of functional decline, immobility, frailty, sarcopenia, cognitive and mood disorders, among others, as pointed in Table 2. Hence, frail patients with MM are at risk for all kinds of negative health care outcomes like disability and dependency, institutionalization, falls and hospitalizations [72]. recognizing this cascade at early stages can help in precise prognostication as well as in offering appropriate multicomponent interventions. For this task the CGA is the gold standard, since it systematically examines,

detects, describes, and explains the multiple problems of an older person and examines the person’s capabilities and care needs. The CGA has shown to have positive effects in different settings (clinic, co-treatment, outpatient department, emergency department) [59–63]. The adoption of CGA, classically performed in Geriatric Medicine, for patients with MM should be one of the cornerstones in the optimal management of these populations. A proposal of CGA for internists dealing with MM is detailed in Table 3.

### 6. Competences in developing personalised care plans and shared decision-making with patients and families

The ethical principle of autonomy has become increasingly important in medical practice in recent years. Citizens are better educated and informed, and as a natural consequence, their role in dealing with their illnesses should be proactive. During the past years, patients’ values, preferences, and experiences have been given a central role in clinical interactions to promote patient-centered care. Patient-centered care resulted in improving patient satisfaction and therapy adherence, and some studies have found evidence for improved clinical outcomes [73, 74]. Nevertheless, data from surveys and observational research show that clinicians often do not really consider patients’ preferences and values during the decision-making process, probably due to a shortage of time, combined with a paternalistic approach, and inertia [75, 15, 76]. In the management of MM, personalised care is an emergent and probably a future central key task.

The dialog should consider a description of the patient and his family context, and be assisted to recording conversations, decisions and agreed outcomes. Patients should be incited to focus on what matters to

**Table 2**  
Multidimensional framework proposal (biological, clinical, and interventional) of multimorbidity and its natural evolution.

MULTIMORBIDITY STAGE		CLINICAL AND CARE FEATURES	PATHOPHYSIOLOGICAL SUBSTRATE	CURRENT OPTIMAL APPROACH	FUTURE INTERVENTION TARGETS
Pre-clinical	Genetic predisposition	Type 2 diabetes, hypertension, dyslipidaemia, neoplastic disorders, neurodegenerative diseases, other	Gerontogenes, oncogenes, HLA, monogenic and polygenic determinants, telomer length	Genetic counselling (only in some of them)	Genetic therapy, stem cell therapy
	Environment lifestyles	Environmental pollution, occupational exposure, sedentarism	Oxidative stress, mitochondrial damage, nuclear DNA damage, imbalances in cellular metabolic pathways	Healthy lifestyles promotion, Primary prevention, Institutions and community partnerships	Global change in productive, energetic, agrifood industry and leisure models; environmental preservation, geroprotectors, antioxidants,
Clinical	Multimorbidity	Cardiovascular, lung, gastrointestinal, and osteoarticular diseases, among others	Inflammasome activation, necrosis, apoptosis, telomer shortening	Secondary prevention, etiological approach, treatment intensification, patient empowerment	Slowing progression/reversion of multimorbidity, organ replacement, artificial devices, telomer preservation
	Severe multimorbidity, polyopathy	Gradual organ failure, recurrent decompensations, admissions, functional decline, frailty, geriatric syndromes	Progression of multiorganic and multisystemic dysfunction, progressive failure of compensatory mechanisms	Tertiary prevention, pathogenic approach, case management, care coordination, functional status preservation	Adapting the environment to disability, using advanced technology to improve functionality and quality of life.
	Terminal multimorbidity	Refractory symptoms, severe dependence, death	Exhaustion and depletion of biological reserve	Quaternary prevention Palliative care, symptomatic approach, integral management, spiritual care,	Promoting patient’s home as the center of all health, community and social care actions

HLA: human leukocyte antigens; DNA: desoxyribonucleic acid.



**Table 3**

Areas, dimensions and useful tools of a comprehensive geriatric assessment applied to patients with multimorbidity.

AREA	DIMENSION	USEFUL TOOLS
Clinical (mainly somatic)	Standard Internal Medicine evaluation	Accordingly to detected diseases and conditions
Functional	Nutritional	MNA <sup>a</sup>
	Basic and Instrumental activities of daily living evaluation	Barthel index <sup>b</sup>
	Mobility	Lawton-Brody index
Mental	Fall risk	
	Cognitive assessment	Pfeiffer and mini-Pfeiffer test <sup>d</sup>
Social and Familial	Affective and emotional assessment	Yesavage GDS <sup>e</sup>
	Social network and social frailty assessment	Different Social assessment tools adapted to local-regional-national environments
	Caregiver assessment	Caregiver Strain Index <sup>f</sup>
Pharmacological	Prescription adequation	STOPP-START criteria (ref #105)
	Polypharmacy and interactions management	Morisky Medication Adherence Scale <sup>g</sup>
	Deprescribing	LESS-CHRON criteria (ref #113)
	Death-risk assessment	STOPP-Frail criteria <sup>h</sup>
Prognostic	Functional decline risk assessment	PROFUND index (ref #67), PROFUNCTION index <sup>i</sup> , Carey index (ref #63), Lee index (ref #68)
		HOPE questions <sup>j</sup>
Values and preferences (when end-of-life trajectory is detected)	Spiritual assessment	FICA spiritual assessment tool <sup>k</sup>
	Advanced care planning	Outcome prioritization tool (ref#96)

<sup>a</sup> Mini Nutritional Assessment (Guigoz Y, et al. *Nutr Rev* 1996; 54: 59–65).

<sup>b</sup> Barthel index (Mahoney FI, Barthel DW. *State Med J* 1965; 4:61–65)

<sup>c</sup> Lawton-Brody index (Lawton MP, Brody EM. *Gerontologist* 1969; 9:179–186).

<sup>d</sup> Pfeiffer test (Pfeiffer EA. *J Am Geriatr Soc* 1975; 22:433), Mini-Pfeiffer test (Bernabeu-Wittel M, et al. *Rev Clin Esp* 2017; 217:320–324).

<sup>e</sup> Yesavage Geriatric Depression Scale (Hoyl MT, et al. *J Am Geriatr Soc* 1999; 47:873–878).

<sup>f</sup> Caregiver Strain Index (Robinson, B. *Journal of Gerontology* 1983; 38:344–348).

<sup>g</sup> Morisky Medication Adherence Scale (Morisky DE, et al. *Medical Care* 1986; 24:67–74).

<sup>h</sup> STOPP-Frail criteria (Lavan AH, et al. *Age Ageing* 2017; 46:600–607).

<sup>i</sup> PROFUNCTION index (Bernabeu-Wittel M, et al. *Int J Gerontol* 2012; 6:68–74).

<sup>j</sup> HOPE questions (Spiritual assessment: HOPE questions. IAHPCC Pallipedia. <https://pallipedia.org/spiritual-assessment-hope-questions/>).

<sup>k</sup> FICA spiritual assessment tool (Borneman T, et al. *J Pain Symptom Manage* 2010; 40:163–73).

them, paying attention to their needs and health. In an efficient personalised care planning process, the patient should have enough time to develop one's plan in a reflective space with a clear access to all information and perspectives. They should also know what to expect, be supported by one designated coordinator, who in turn, should be able to discuss the patient's health status and further treatment with appropriate health and social care professionals [77–82]. A detailed description of the whole framework for personalized care planning is detailed in Fig. 2.

Another important emergent dimension of personalized care is shared decision-making (SDM), which provides a practical method of tailoring interventions in scenarios where there is no clear evidence, and the most appropriate step depends on the patient's preferences [83–85]. In this approach, the clinicians' role is to help patients become well-informed, help them develop their personal preferences for available options, and provide professional guidance. The principles of

shared decision making (SDM) are well documented, and there is an increasing number of papers, with proposals to implement them in routine clinical practice [86–91]. Besides, SDM is supported by evidence from 86 randomized trials showing knowledge gain by patients, more confidence in decisions, more active patient involvement, and, in many situations, informed patients elect to go for more conservative treatment options [88, 91]. There are different models of how to implement SDM in clinical practice, but all of them are based on three key steps, the first is a “Choice talk” (which illustrates the need of working as a team to make a decision that suits one's best); the second is an “Option talk” (which discusses alternatives in a more detailed, its benefits and risks, possible alternatives, and the possible consequences of ‘not doing anything’); and third is a “Decision talk” (which allows to take a patient-preference-based decision) [84, 92].

It is important to emphasize that in order to offer real and optimal patient-centered care, several enablers that are lacking in many of our healthcare systems, are needed: committed health authorities that support, invest in and promote coordinated care; a healthcare system in which the health record is digital and shared between different medical experts; a well-established culture of teamwork; and professionals with advanced digital competences, engaged and motivated, and with enough time [90–93]. The best way for training all these competences is to use simulations, either with colleagues or with actors and the use of brief personalized care plans and SDM tools. The main current threats to implementing these changes are, the scarce of time, and most current decision aids are focused on individual diseases [88–91, 94, 95].

Although it may seem to us yet distant and perhaps a bit utopian reality, probably in the near future patient-centered care, personalized care plans and SDM will surface as milestones of daily clinical practice, especially in the management of complex patients with MM, and internists will play a substantial role in their implementation.

## 7. The management of drugs: appropriateness, reconciliation, adherence and deprescribing

Patients with MM are usually older adults with a complex drug regimen, multiple diagnoses, and the resulting polypharmacy, as multiple medications are prescribed. Although it is necessary for one condition, some drugs may adversely affect others. The prevalence of adults taking chronically five or more medications rounds 15–20%, increasing to 25–30% for those aged 60–69, to a whopping 51.8% for those over 80, and to an outrageous 85% in the case of patients with MM [96–100]. Evidence-based clinical guidelines for individual diseases should consider the emergent epidemiology of MM in their recommendations, and physicians, nurses, caregivers, and researchers should be aware and carefully evaluate each new medication, to avoid the deleterious effects of the ‘prescription cascade’ in these populations. In addition, populations with MM have been often excluded from clinical trials, and even though this situation is improving, external validity of many trials should be taken carefully in patients with MM; the recruitment and retention of these patients in clinical trials, which include both drugs and management models should be actively encouraged [101, 102]. For all these reasons we can affirm that, managing MM inherently involves addressing polypharmacy wisely. This requires specific competences, new approaches and tasks that are making their way in recent years in the field of MM.

The first one is prescription appropriateness. These patients are prone to over-prescription of drugs of questionable benefit and/or potential risks; but also, to under-prescription of drugs of demonstrated benefit. When prescribing medicine to patients with MM, all the risks and benefits, as well as possible interactions should be carefully considered, discussed with the patient, his/her wishes considered. The prescription appropriateness can be assessed by validated tools like STOPP-START criteria [103]. Closely related to prescription appropriateness is the drug reconciliation process, which identifies and resolves unintentional discrepancies between patients' medication lists across

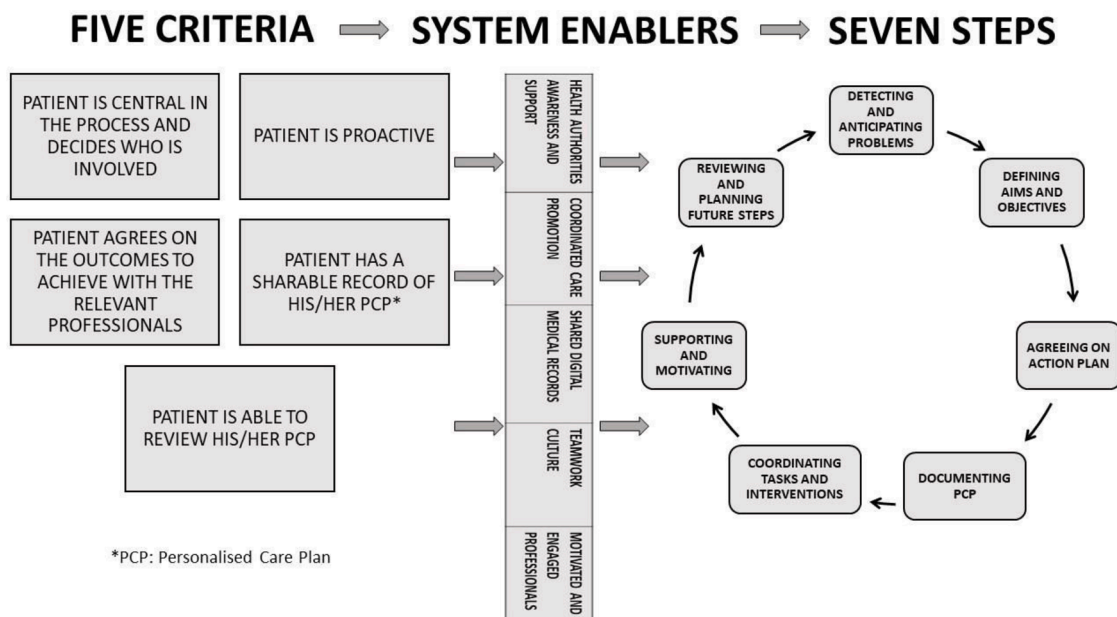


Fig. 2. Description of a framework to incorporate personalized care planning to patients with multimorbidity (adapted from NHS England (ref # 79), Coulter et al. (ref # 80), and Ollero-Baturone M. et al. (ref # 95).

transitions in care, which are very frequent in patients with MM [104, 105]. This process is an opportunity to review patients' prescriptions and is of direct relevance to internists as professionals who usually care for patients with MM in hospital admissions. There is already increasing evidence of benefits of reconciliation programs in terms of patient's safety and avoidance the risk of hospital readmission [104, 105].

The second one is the adherence assessment and reinforcement. There are many factors that influence adherence: some depend on the patient and his/her environment (educational and economic level, family and social network, among others); and others depend directly on the professional and the healthcare system (number of drugs, dosage route and intervals, doctor-patient relationship, among others). The main skills needed to promote adherence are a trusting doctor-patient relationship, an adequate and adjusted prescription avoiding drugs with potential adverse effects, a comfortable dosage (ideally 'once a day'), as well as coaching and counselling techniques (remembering therapeutic achievements, not blaming for forgetfulness, and resolving doubts by dedicating enough time to this) [106–109].

At last, deprescribing has emerged as a new and interesting task for the optimal management of drug management in MM populations. Patients with MM often take medications that on paper are correctly prescribed, but for specific circumstances or clinical characteristics are no longer useful, or the risk-benefit ratio makes their use less desirable. Deprescribing is the planned and supervised process of dose reduction or withdrawal of medications that might be causing harm or are no longer of benefit. Deprescribing is part of good prescribing – backing off when doses are too high or stopping medications that are no longer needed in the circumstances of the patient [110]. Currently intense research is being performed in this area, and some tools have been already developed to guide clinicians in the process [111, 112].

### 8. Competences in managing and caring for the end-of-life trajectory

The natural evolution of chronic diseases is usually progressive, and this worsening may accelerate if several diseases occur in the same patient, as deleterious and cascading interactions develop. This cascade leads to organic and functional deterioration, and gradually increases the risk of death (Table 2). In fact, in many countries, deaths from chronic diseases have nowadays outnumbered deaths from cancer

[113]. Therefore, the supportive care approach, advanced planning of decisions, and early and progressive application of palliative care is a key element in the management of advanced MM [114]. Professionals dealing with MM need to acquire and maintain advanced competences in palliative- and end-of-life care.

Table 4  
Core competences in managing end-of-life situations and spiritual-care.

AREA	COMPETENCE
Knowledges	Management of most frequent symptoms
	dyspnea
	Pain
	Gastrointestinal symptoms (nausea, vomiting, constipation)
	Anxiety and Depressive disorders
	Terminal delirium
	Other symptoms (skin ulcers, nutritional issues...)
	Advanced use of opioids, sedatives, and adjuvant drugs
	Advanced care planning for patients and their carers/family
	Identification of agony process
	Integral management of palliative sedation
	Bereavement care and managing
	Legal issues
	Treatment rejection
Limitation of therapeutic effort	
Skills	Palliative sedation
	Euthanasia and physician assisted suicide
	Manipulation/Insertion of subcutaneous devices
	Ascites and pleural effusion draining
Attitudes	Oxygen therapy- and non-invasive respiratory support devices management
	Basic point of care ultrasonography
	Empathy
	Tolerance
	Compassion
	Authenticity
	Support vocation
	Resilience and psychological self-care
	Respect to diversity, individual's beliefs, customs and faith
	Advanced communication techniques
	Counselling skills
	Working in partnership with other professionals and social agents
	Assessing and promoting spiritual wellness
	- Advanced skills in spiritual conversations
	- Surfacing life achievements and legacy
	- Helping and accompanying the spiritual preparation for life passage

The core competences needed to deal with end-of-life situations are detailed in Table 4. It is crucial to perform them in an optimal balance that wisely combines knowledge, skills, and attitudes [115]. The final stage of life is a particularly important and transcendent time in everyone’s life, so having this package of competences will undoubtedly contribute to providing the highest quality of care to patients and their families. In the field of knowledges, it is essential to be familiarized with the advanced management of most frequent syndromes and symptoms of these stages of life, and the different therapeutic alternatives that have demonstrated greater efficacy with fewer side effects; it is also very important to identify situations of agony, and the indications, and protocols for palliative sedation, to have skills in family bereavement care, and to know the involved regulatory and legal aspects. It would be very useful for internists to know how to insert and manage subcutaneous lines, and to have skills in performing point-of-care ultrasound in most common modalities. At last, it is essential to be well trained and display the exquisite attitudes of optimal palliative care, which are so important to achieve the best benefits for patients and their families in this sensitive and transcendental context of life.

**9. Tips and timing for their implementation in internal medicine training programs**

Competences for optimal management of MM should start to be acquired in medical schools. Despite the huge impact of chronic diseases, MM is still rarely taught in the curricula of many universities. They can be incorporated transversally throughout the clinical subjects in theoretical and practical activities, or specifically in a particular subject [116].

This first education layer should be completed and reinforced during the IM program training [117, 118]. During the residency period, the internist in training will deepen his/her knowledge of clinical characterization of MM, prognostication tools, comprehensive approach, the adequation of health objectives, the building of individualized plans, the approach to polypharmacy, deprescription, coordination of care both home-based and institutionalized, personalized care and taking shared-decision, and palliative care. This further acquisition of competences should be based on clinical rotation periods, clinical rounds, programmed case discussions, and problem-based learning methods.

All IM specialists, independently of the area in which they develop

their profession, should build these competences because they will need them in their daily clinical practice now and increasingly in the future [119-121]. For this aim, specific advanced training actions, focusing on aspects of MM management (communication techniques, drug prescription, prognostication...) are recommended.

Finally, we would like to highlight the important role of clinical and translational research in MM, which should be promoted at all levels. Research in MM will create opportunities for further innovation in approaching MM, will attract the talent and vocation of young colleagues in the future, and hence will improve the health outcomes of this vulnerable population.

A representation of all these recommendations is detailed in Fig. 3.

**10. Conclusions**

In this position paper we have outlined the main necessary competences in the approach and management of patients with MM for current and future clinical practice. In addition to the already well rooted competences in the specialty of IM, additional emerging or re-emerging competencies are necessary, such as the use of prognostic tools and comprehensive geriatric assessment, the management of personalized care plans, the shared decision making, the expertise in the management of drug prescription, the wise approach to polypharmacy, and competences in a comprehensive end-of-life care. It is also particularly important to promote clinical research on MM and to adapt clinical practice guidelines to this emergent population.

**Authorship**

All authors have contributed substantially to the work, approve the content and form of the present manuscript, and represent all EFIM MMWG Members.

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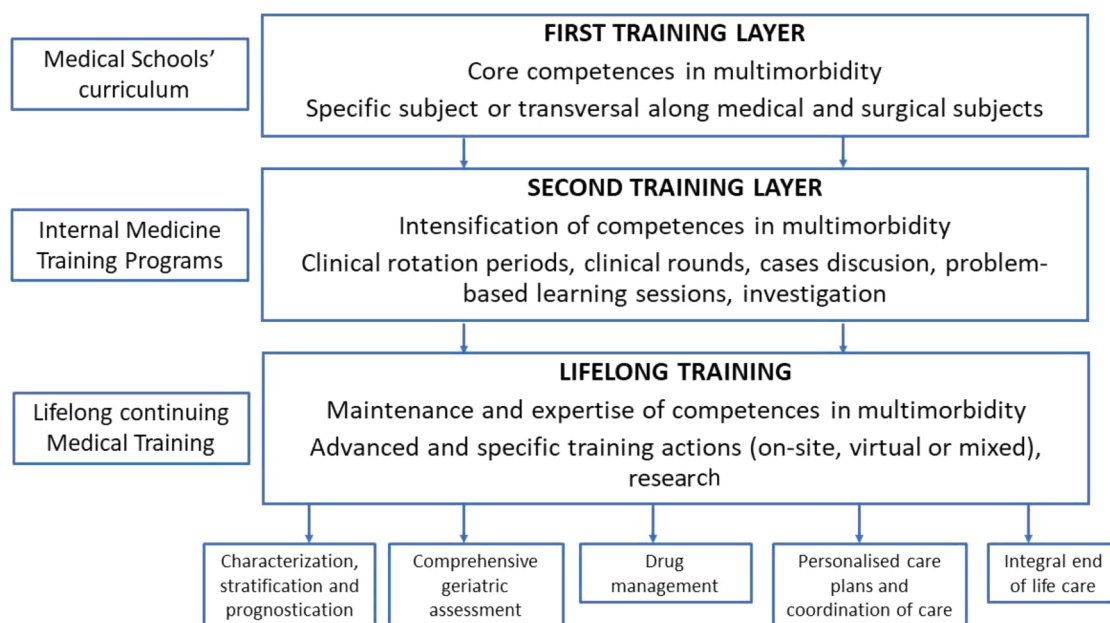


Fig. 3. Description of recommended actions and their timing in the multimorbidity training process.



## Declaration of Competing Interest

All authors declare that they have no financial relationships with any organizations that might have an interest in the submitted work in the previous three years, and they declare no other relationships or activities that could appear to have influenced the submitted work.

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