

Multimorbidity care model: Recommendations from the consensus meeting of the Joint Action on Chronic

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INTRODUCTION

Worldwide health care systems are currently faced with a significant and growing challenge of multimorbidity, defined as the co-occurrence of multiple chronic diseases in a single patient. The prevalence of multimorbidity is high (Tinetti et al, 2012) and increases with age, affecting more than 60% of people aged 65 or older (Barnett et al 2012, Melis et al, 2014, Marengoni et al, 2008, Marengoni et al, 2011). Multimorbidity is associated with numerous negative outcomes, including mortality, disability, low quality of life and high healthcare costs (Onder et al, 2015).

Patients with multimorbidity have complex health needs but, due to the current traditional disease-oriented approach, they face a highly fragmented form of care that leads to incomplete, inefficient, ineffective and possibly harmful clinical interventions, and are likely to receive complex drug regimens which increase the risk of inappropriate prescribing, drug-drug interactions, and poor adherence (Fortin et al, 2007)

As the care and treatment of multimorbidity patients is complex, it often involves a large number of healthcare providers and resources. There is limited evidence on the currently available care pathways for multimorbidity; there are few examples of integrated care programs for chronic diseases implemented in relatively small populations (for a review see Hopman et al, 2015). Most of the interventions implemented have been multi-dimensional, including different components, but are but poorly standardized. Therefore, evidence on the efficacy of care pathways for multimorbidity provide conflicting results, and there are no widely accepted care models for multimorbidity (Smith et al, 2012). All these factors lead to a need to develop a system that works for multimorbidity to deliver good quality of care to these patients (Banerjee, 2014).

With this challenge in mind, a group of experts met to discuss the components of a multimorbidity care model. The aim was to assess these components to discuss their definition, aims, key characteristics, target population and relevance for patients with multimorbidity in order to develop a framework for care of multimorbidity patients that can

be applied across Europe. This was done within a project funded by the European Commission; the Joint Action on Chronic Diseases and Promoting Healthy Ageing across the Life Cycle (JA-CHRODIS). This project specifically focuses on development of common guidance and methodologies for care pathways for multimorbid patients (Onder et al, 2015, Cordis 2015), and includes over 60 European partners, including national and regional departments of health and research institutions from 26 EU Member States.

The process for developing this multimorbidity care model is as follows. First, we identified a list of components from existing comprehensive care programs for patients with multiple chronic conditions or frailty (for a systematic review, see Hopman et al. 2015). These components were present in one or more care programs, either in isolation or combined with other components. Twenty components were identified across five domains (Table 1). Based on discussion, the experts decided that from the initial list of twenty components, sixteen were selected by the experts. These sixteen components are discussed in depth later.

Table 1. Original list of components discussed during the 1st JA-CHRODIS WP6 Expert Meeting, identified by a systematic review (Hopman et a, 2015).

Type of component	Components
Delivery of system design	<ul style="list-style-type: none"> - Regular comprehensive assessment - Multidisciplinary team - Individualized care plans - Appointment of a case manager
Decision support	<ul style="list-style-type: none"> - Implementation of evidence-based medicine - Team training
Self-management support	<ul style="list-style-type: none"> - Training of care providers to tailor self-management support for patients - Providing options for patients to improve their health literacy

	<ul style="list-style-type: none"> - Patient education - Involving family members and family education - Offering approaches to strengthen patients' self-management and self-efficacy - Involving patients in decision-making - Training patients to use medical devices, supportive aids and health monitoring tools correctly
Clinical information system	<ul style="list-style-type: none"> - Electronic patient records and computerized clinical charts - Exchange of patient information - Uniform coding of patients' health problems - Patient platforms allowing patients to exchange information with their care providers
Community resources	<ul style="list-style-type: none"> - Access to community resources - Involvement of social network - Psychosocial support

Second, after identification of the possible components of the care model, a selection of experts met to discuss the relevance of the components (see author list). The experts were chosen to ensure a diverse group who represent both the patients and care providers, and included physicians specialized in different specialties (neurologists, geriatricians, internists, cardiologists, endocrinologists), epidemiologists, and psychologists, as well as representatives from patient organizations such as the European Patient Forum. The 1st JA-CHRODIS WP6 Expert Meeting was held on October 28, 2015 in Brussels, Belgium.

During the meeting, each component was discussed by the experts to decide on a definition, and discuss aims, key characteristics, target populations, and relevance for patients with multimorbidity in order to develop a framework for care of multimorbidity patients that can be applied across Europe. The overall aim was to describe the components of a multimorbidity care model to implement in the care and treatment of patients with multimorbidity. In this article we describe the sixteen components that were identified by

the experts as being key for an optimum care model for multimorbidity patients, outlining the description and aims of each component, the key characteristics, and the specific relevance to patients with multimorbidity. This report outlines an ideal clinical scenario to be applied within different health care systems in Europe, with room for interpretation applicable to the different systems.

SECTION 1: DELIVERY OF THE CARE MODEL SYSTEM

Component 1. Regular comprehensive assessment of patients

Description and aims: Regular comprehensive assessment of patients, including, i) assessment of the complexity of conditions and/or medical treatment, as well as treatment burden and interactions, and ii) evaluation of patients' preferences and personal resources (e.g. coping skills, health literacy), and social resources (e.g., available social network). Comprehensive assessment is a diagnostic process that should be used to determine the medical, psychological, and functional capabilities of patients with multimorbidity in order to develop a coordinated and integrated care plan for multidisciplinary treatment and long-term follow-up of patients. This comprehensive multidisciplinary assessment should examine the burden of treatment and assess specific diseases and patterns, as well as evaluate the desires and opinions of patients and relatives, social support, and resources available to patients in order to achieve an agreement on the patient's individualized care plan (see Component 4). Patient risk stratification should be done during comprehensive assessment, to identify the risk of complications and level of care needs (for example, a low risk patient might be one with few co-morbid conditions requiring little self-management and no home-help care needs, whereas a high risk patient might be one with multiple comorbidities requiring numerous pharmaceutical drugs, daily self-management, and significant care needs to support functional limitations).

Key Characteristics: Regular comprehensive assessment should be done using standardized assessment tools where possible, along with a clinical interview. The assessment should preferably take into account all current and previous information from other resources,

such as clinical records and other physician assessments. It should assess the complexity of conditions including treatment burden, drug interactions, and disease patterns etc. The comprehensive assessment should identify key aspects which will be used in any consequent care planning steps, including patient empowerment and allocating resources, through the construction of an individualized care plan, which is reviewed and updated during the regular subsequent assessments and shared between care providers, as well as with patients and their families (see Component 4).

Relevance to multimorbidity patients: Due to complexity of multimorbidity patients, adverse outcomes related to the presence of multiple diseases, and the risk of drug-drug interactions, multimorbidity patients need a comprehensive and extensive assessment that takes into account all underlying medical disorders and evaluates the complex care needs of the patient. Regular reassessment is of particular importance to these patients, due to changing symptoms and severity of ongoing multiple chronic disorders.

Component 2: Multidisciplinary, coordinated team

Description and aims: One of the main features of the regular comprehensive assessment (see Component 1) is the inclusion of a multidisciplinary team and network to evaluate and deliver treatment and care relating to the patient's functioning, impairments, and social support. The use of a multidisciplinary team aims to address disease specific needs, avoiding fragmentation and ensuring continuity of care. The objectives are to increase efficiency and accessibility of care by providing multidisciplinary care both in terms of different levels of the healthcare profession (nurses, physicians, physiotherapists, social workers etc), and different disease specializations.

Key Characteristics: Teams should be composed of a clinician with a generalist approach (e.g., geriatrician, internist, general practitioner), as well as specialists in the relevant diseases, and healthcare professionals addressing pharmacological needs, social care, and psychological aspects. One nominated clinician responsible for overseeing the care and making clinical decisions about the patient's treatment and care is essential to ensure continuity of care, and where necessary, the provision of a case manager to act as the

primary contact for the patient and coordinate their care plan, manage care, and arrange social support should be considered (see Component 3). Involvement of the patient's general practitioner should be emphasized, and coordination between all relevant team members must be maximized (supported by the information systems described later).

Relevance to multimorbidity patients: Multimorbidity patients have, by definition, multiple comorbid conditions requiring care and treatment from different medical specialists and might also have functional and social care needs requiring access to multiple care service providers. Providing these patients with a coordinated and integrated team to manage their overall care aims to maximize outcomes and increase continuity of care, while decreasing fragmentation and optimizing access to care and services.

Component 3: Professional appointed as coordinator of the individualized care plan and contact person for patient and family (“case manager”)

Description and aims: Patients with complex care needs should be appointed a case manager, who is the primary contact point for the patient and their family, representing a single entry point into the system. The case manager should act as coordinator between patient and various members of the multidisciplinary team to manage care, actively linking the patient to providers, medical services, residential, social, behavioral, and other support services where needed in the most effective way, monitoring continuity of care, follow-ups, and documentation. This aims to increase accessibility to healthcare, and improving continuity and effectiveness of following the individualized care plan.

Key Characteristics: A named contact person, acting as a single access point to the system for communication between the patient and the team. As described in Component 2, patients should also have a named senior clinician, who is responsible for overseeing the care and treatment of the patient.

Relevance to multimorbidity patients: A case manager is necessary for multimorbidity patients with complex care needs, who need a coordinated level of care that integrates various levels of healthcare and support.

Component 4: Individualized Care Plans

Description and aims: Individualized, coordinated, and integrated plans for the treatment and long-term follow-up of patients should be developed based on the comprehensive assessment by the multidisciplinary team, including a patient-centered approach that considers the preferences of the patients, and the prioritization of cross-disease, holistic approach, including targeting symptoms, functional ability, quality of life, desired patient outcomes etc.

Key Characteristics: Patient-centered, and focused on multiple outcomes, the written plan should be agreed with the patient (or with the family/caregiver in the case of patients with, for example, severe cognition impairment) and shared with the multidisciplinary team, including the senior clinician, care manager, general practitioner, and families (with permission of the patient). The individualized care plans should be reviewed and modified at each reassessment of the patient, and any changes shared with the team. The individualized care plan may include a risk assessment of the patient, identifying those with a high risk of adverse negative outcomes, and a case manager should be appointed (see Component 3). The plan should specify the nominated clinician in charge of the patients overall care decisions (see Component 2).

Relevance to multimorbidity patients: Individualized care plans are of particular relevance to multimorbidity patients because they incorporate the information from different physicians and health care providers, incorporating a plan that is integrated and coordinated, focusing on integrated outcomes rather than disease specific outcomes.

SECTION 2: DECISION SUPPORT

Component 5. Implementation of evidence based practice

Description and aims: Flexible application of disease-specific evidence based guidelines, with consideration of multimorbidity, disease interactions, and drug-drug interactions should be used. Healthcare providers should promote clinical care that is consistent with available scientific evidence and is consistent with patient preferences. As specific disease guidelines do not represent the evidence base for multimorbidity, caution is needed, applying a critical appraisal of the evidence, with critical review by the multidisciplinary team.

Key Characteristics: Assessment, treatment, and care should be consistent with scientific evidence. The use of guidelines is encouraged, but must be multimorbidity-centered, with focus on drug-drug and disease interactions, while also considering the preferences of the patient.

Relevance to multimorbidity patients: Current evidence specific to multimorbidity is relatively scarce, and future research needs to focus on this, moving away from disease-specific guidelines.

Component 6. Training members of the multidisciplinary team

Description and aims: Training members of the multidisciplinary team is an important element of multimorbidity care, aiming to improve knowledge and skills, focus on the following themes: comprehensive assessment concepts, multimorbidity and its consequences, health outcomes, innovation technologies, implementation of individualized treatment/care plans and goal setting, working effectively as a team, training in the critical appraisal of knowledge and evidence based knowledge, patient-centeredness, patient empowerment, and self-management (see Component 8). Key team members should receive training, as well as any external experts who provide treatment or care to the patient on specific occasions.

Key Characteristics. Training and education should focus specifically on multimorbidity and care of multimorbidity patients, despite the lack of current evidence based guidelines, and be targeted mainly towards case managers, persons who are responsible for the coordination of care, core team members, and preferably specialists who supply regular, significant care or treatment to the patient.

Relevance to multimorbidity patients: As the care of multimorbidity patients requires a more comprehensive and integrated care approach than patients with less complex clinical needs, training on effective teamwork and how to integrate care and treatment should aim to help to improve outcomes, increase motivation, and build care plans, among others.

Component 7. Developing a consultation system to consult professional experts

Description and aims: The development of a consultation system to discuss patient care and treatment with specialist with professional experts (e.g. highly specialized medical specialists, but also medical/clinical psychologists with specific expertise, e.g. cognitive problems, frailty). These consultants should be trained for the care of multimorbidity patients, or similar (see Component 6). This aims to provide decision support in situations where further clinical support or knowledge is needed outside of the core team. Providing the multidisciplinary team with access to high competence in all cases that are particular and delicate or when a sufficient expertise is not available will provide significant value. The aim is to increase accessibility to very specific professionals and specific knowledge.

Key Characteristics: Providing more simple access to expertise that is not part of the core multimorbidity team, e.g., via creation of a web-based official expert list at a national level.

Relevance to multimorbidity patients: This is of particular relevance to multimorbidity patients, who may present for treatment to a specialist who does not have expertise in the other comorbid conditions of the patient. Sharing of expert knowledge, and assessing and treating the person's multimorbid condition rather than focusing on specific morbidities aims to increase treatment outcomes and improve quality of treatment and care. Involving

external experts in the multimorbidity team will enable continuity of the individualized care plan, while allowing a high level of professional input.

SECTION 3. SELF MANAGEMENT SUPPORT

Component 8. Training of care providers to tailor self-management support based on patient preferences and competencies:

Description and aims: The training of staff to support self-management among patients and their caregivers, via comprehensive training of health care professionals (such as through courses, online training, educational materials). This should also include encouraging patients to increase health literacy and tailored health promotion and prevention strategies.

Key characteristics: Focusing on communicating to patients (using lay language, listening actively to patients, apply human rights approaches), and encouraging adherence to treatment, and enhancing patient empowerment.

Relevance to multimorbidity patients: This is relevant to multimorbidity patients as they have complex care needs, constantly changing severity of disease, a higher need for self-management, and a greater risk of polypharmacy. Many of the conditions often need to be managed outside the clinical setting, frequently including non-pharmaceutical interventions such as lifestyle changes including diet and exercise.

Component 9. Providing options for patients and families to improve their self-management.

Description and aims: Providing options and support for patients and their families and caregivers to improve the self-management of their conditions, including patient training and support tailored to patients' preferences and competencies. This includes offering approaches (e.g. online courses, group-based courses, individual counseling, dependent on patients' preferences and competencies) to strengthen patients' self-management and self-efficacy, including explaining their diagnoses, diseases, and medical conditions, as well as

providing information on medication use, and training patients to use medical devices, supportive aids, and health monitoring tools correctly (for example, blood pressure and glucose monitoring tools etc). Family members should be included and family education should be encouraged where appropriate, with consent of the patient. The aims are to improve self-management, promote healthy lifestyles, and encourage patients to actively participate in decision making, while supporting them in coping with chronic conditions in their daily life.

Key Characteristics: Education should be personalized to the patients, consistent with their individualized care plans, taking into account their knowledge, educational level, health literacy, and functional aspects (such as whether they have visual problems or cognitive impairment, which might affect comprehension). It aims to empower patients, to enable shared decision making and encourage self-monitoring of outcomes, improving communication between patients and care providers, and increasing adherence to treatment. Care should be taken regarding confidentiality issues, according to privacy policies and patient preferences.

Relevance to multimorbidity patients: Self-management is often more complicated in patients with multimorbidity, as they have numerous conditions to monitor simultaneously, many of which affect the other comorbidities. Empowering patients is crucial for chronic conditions in order to improve outcomes without resulting in excessive healthcare costs.

Component 10. Shared decision making (care provider and patients)

Description and aims: Health care professionals should include the patient (and, where relevant, their family) in making decisions about their care and treatment, including identifying their individual needs as well as deciding on future goals and outcomes to aim for. Individualized care plans should be constructed that represent these shared desires and decisions, and shared with the patient and relevant care providers (See component 4).

Key Characteristics: The involvement of family members and caregivers should carefully consider confidentiality issues, and be done according to privacy policies and patient preferences.

Relevance to multimorbidity patients: This is relevant to multimorbidity patients as they often have complex care needs that need careful consideration of potential negative outcomes, including loss of physical functioning, depression, and reduced quality of life. Treatment side effects and lifestyle changes that affect these patients are not simple, and therefore need active involvement of the patient where necessary.

SECTION 4. INFORMATION SYSTEMS AND TECHNOLOGY

Component 11. Electronic patient records and computerized clinical charts

Description and aims: Electronic patient records and computerized clinical charts to allow exchange of patient information (with permission of patient) between the multimorbidity team and other care providers and sectors by compatible clinical information systems. This includes any electronic technology used to enter data and manage the care of patients, to keep track of their medical history, diagnoses, symptoms, hospital visits, health care utilization, care needs, or medications etc, allowing different providers of health and social care to share information about a single patient, preferably using standardized tools and similar diagnostic systems (see Component 13).

Key Characteristics: Preferably there should be a level of standardization of what is included within electronic records, with a minimum basic data set that includes, for example, results of the comprehensive assessment, individualized care plans, patient preferences etc.

Relevance to multimorbidity patients: As multimorbid patients often have multiple care providers and attend numerous health care clinics, electronic patient records would represent a valuable tool for sharing information between the services, allowing physicians to access important information about the patient that might otherwise be missed, such as potential drug-drug interactions, additional medical diagnoses etc. Allowing healthcare providers to view the patient's individualized care plan, comprehensive assessment and medical history electronically, will increase efficiency, allowing new team members, for

example, to view the whole case and clinical history more efficiently, and therefore provide more appropriate care and treatment.

Component 12. Exchange of patient information (with permission of patient) between care providers and sectors by compatible clinical information systems.

Description and aims: This component involves different providers of health and social care sharing information about a single patient, preferably using standardized tools and similar diagnostic systems (see Components 11 and 13). It is important to have a comprehensive set of information available for all healthcare providers and decision makers because without it updating individualized care plans might be too slow, and therefore any acute care or management of the patient may be compromised. The benefits include increased speed of care and decision making, as well as improved comprehensiveness.

Key Characteristics: Patient confidentiality must always be paramount, and therefore, patients must give their permission for information exchange.

Relevance to multimorbidity patients: Multimorbidity patients frequently have multiple care providers, and information sharing may help to decrease adverse events related to their care and treatment, such as drug-drug interactions, etc. Viewing the patient as a person with comorbid conditions, rather than treating individual diagnoses, is an important part of multimorbidity care, which can be achieved via information sharing between physicians and care providers.

Component 13. Uniform coding of patients' health problems where possible.

Description and aims: Using the same classification system to evaluate and record symptoms, diagnoses, medication, patient-reported outcomes, individualized treatment/care plans, and aspects of health care utilization between nurses, physicians, and other care providers.

Key Characteristics: International Classification of Functioning, Disability, and Health (ICF) codes, or standardized patient reported outcomes, healthcare usage, and other factors relevant to the care plan, as well open, non-coded fields, for example, for patient preferences. These should preferably be standardized between different organizations, using inter-organizational communication forms.

Relevance to multimorbidity patients: Patients with multimorbidity often have multiple physicians and numerous diagnoses, and therefore a uniform system for coding diagnoses and other information relating to their treatment and care is essential for ensuring continuity of care and sharing of information between care providers.

Component 14. Patient-operated technology allowing patients to send information to their care providers.

Description and aims: Patient-operated technology allowing patients to send information (e.g., health monitoring data) to their care providers to complement face to face visits (with consent/desire of the patient). This should include technology tailored to the patient's needs which allows the health care professionals to view, monitor, and react to information directly from their patient via the technology (e.g., glucose levels, blood pressure etc), to compliment face-to-face meetings, aiming to reduce health care utilization and improve clinical outcomes. Potential target populations include patients who live remotely, or those with low social support or with reduced mobility. Using telemedicine (telemonitoring), should provide a bridge between self-management and healthcare providers, enabling faster and timely access to healthcare providers.

Key Characteristics: The team must target patients who have the motivation and capacity to utilize the technology effectively. These systems can support the delivery and monitoring of the components, and numerous systems already exist, such as the “telehealth” systems, but current evidence on their efficacy is limited, and caution is needed until more research is available.

Relevance to multimorbidity patients: These systems have particular relevance to multimorbidity patients because the sooner that health care providers react to small

changes in symptoms, the better. This also aims to empower the patients and increases their self-management while enabling faster and timely access to healthcare providers.

SECTION 5. SOCIAL AND COMMUNITY RESOURCES

During the consensus meeting the experts highlighted that they believe that access to social and community resources are relevant aspects of the care of patients with multimorbidity, but as these are not included in the formal care process and the availability of these services is extremely variable, the following components (15 and 16) are difficult to standardized and, thus, only a general description can be provided.

Component 15. Supporting access to community- and social-resources

Description and aims: Improving patient access to community resources, formal care, and patient associations, support groups, and psychosocial support (including home help, transportation etc), and supporting access to such services.

Key Characteristics: The comprehensive assessment should identify needs and help support access to the necessary resources.

Relevance to multimorbidity patients: Multimorbidity patients often have very comprehensive and extensive needs, and require to access to more services, and therefore need more support to access these services.

Component 16. Involvement of social network (informal), including friends, patient associations, family, neighbours.

Description and aims: Involving the patient's informal social network, including family, friends, patient associations, neighbours, with either their treatment or care, and finding ways to increase their social support network.

Key Characteristics: Relevant member of the social network can be identified during the comprehensive assessment. Care should be taken regarding confidentiality issues, according to privacy policies and patient preferences.

Relevance to multimorbidity patients: This aims to improve the provision of care in multimorbidity patients with very high care demands.

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