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MANAGING FRAILITY

<b>Title:</b>	<b>Management of Frailty at Individual Level: A Systematic Review</b>
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## EXECUTIVE SUMMARY

### Background:

Due to the fact that it is proved that frailty emergence or its onset can be delayed if intervened in the early stages, the present report is of high importance, as it addresses the management of frail older adults or those at risk for developing it. The main objective of this work package was to collect and review the existing literature on the topics on the management of frailty at individual level. It focuses on six key fields of intervention that must be taken into consideration while tackling frailty: prevention, clinical management, nutrition, physical exercise, medicines, and information and communication technologies (ICTs).

### Methods:

The report is based on the systematic literature review and the opportunist review of good practices and grey literature, to collect and evaluate the data for creation of a report on the management of frailty at individual level.

### Results:

- The prevention of frailty should include both the promotion of healthy lifestyles among the middle-aged and older people and service organisation and emphasise enablement and maintaining independence.
- To tackle frailty, we should fight against the low awareness of empowerment of older people who have a strong aversion to the term “frail”.
- Nutritional intervention is proposed widely to be an important component of frailty management, while inadequate nutritional intake is an important modifiable risk factor for frailty.
- Sedentary lifestyle is a risk factor for developing frailty. Exercise can improve physical performance and reduce physical frailty. Exercise in frail elderly is effective and relatively safe, and may reverse frailty.
- Many tools are available to assess polypharmacy, but none address all aspects of appropriate polypharmacy. The various aspects to be considered include multimorbidity, safety, efficacy and acceptability of medicines, the patient’s wellbeing, social circumstances and goals. There is an urgent need for research on effective strategies for managing polypharmacy and for robust evaluation of both clinical benefits for patients and value for the system.
- ICT offers a variety of opportunities in terms of clinical purposes for which ICT can be used, technological tools that can be chosen, as well as the way the services can be implemented into everyday practice. Results of these reviews suggest that the acceptance and employment of these new technologies remains problematic, especially for elderly people.

Recommendations for ADVANTAGE:

Level I

1. The gold standard of management of frailty is the comprehensive geriatric assessment (CGA). The purpose is to plan and carry out a personalized multidomain intervention plan.
2. Provide structured multicomponent exercise programs (consisting of endurance, flexibility, balance, and resistance training) performed at low intensity, in sessions of 30 to 45 minutes, three times per week. Follow or substitute by exercise programs of strength training: minimum of 8 weeks and medium to high exercise load (from 8 to 12 repetitions, from 30% - 60-70% of maximum intensity). They must be combined with nutrition programs.

Level II

Level II.1

3. Promote the Mediterranean diet, assuring a protein intake of at least 1-1.2 g per kilogram of body weight per day.
4. Reduce polypharmacy if it is possible, especially if the patient takes more than ten medicines or has a high-risk of adverse drug reactions.

Level II.2

5. Advise patients with a body mass index (BMI) of more than 35 kg/m<sup>2</sup> a moderate weight loss of 0,5-1 kg per week or losing 8-10% of initial body weight after 6 months, with a final target of BMI < 30, always combined with physical activity and/or exercise.
6. Provide Vitamin D supplementation in frail patients who are at elevated risk for falls and fracture and 25-OH vitamin D levels below 30 ng/ml, with 20 a 25 µg/day (800 a 1000 IU/day) until they reach a minimum serum 25-OH vitamin D level of 30 ng/ml.

Level III

7. Start prevention among the middle-aged following the habitual health-enhancing recommendations.
8. Assess which geriatric patients are at risk for malnutrition using the Mini Nutritional Assessment (MNA).
9. Organize fall prevention programs that challenge balance and are effective in frail older persons.
10. Use tools in order to manage inappropriate prescribing and reducing polypharmacy, as BEERS or STOPP-START.

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## ACRONYMS

ADL = Activities of daily living.

ADR = Adverse drug reactions.

BMI = Body mass index.

CGA = Comprehensive geriatric assessment.

CINAHL = Cumulative Index of Nursing and Allied Health Literature.

EIP-AHA = European Innovation Partnership on Active and Healthy Ageing.

EU = European Union.

ICT = information and communication technology.

JA = Joint action.

JA CHRODIS = Joint Action on Chronic Diseases And Promoting Healthy Ageing Across The Life-Cycle.

MNA = Mini Nutritional Assessment.

NICE = National Institute for Health and Care Excellence.

NIJZ = Nacionalni Institut Za Javno Zdravje.

SIMPATY = Stimulating Innovation Management of Polypharmacy and Adherence in the Elderly.

WP6 = Work Package six.

## INTRODUCTION

The process of frailty can potentially be prevented and treated, particularly if interventions occur early. Therefore, it is important to know how to manage older adults with frailty or those at risk for developing it (Clegg et al., 2013). The present report focuses on six key fields of intervention that must be taken into consideration while tackling frailty, namely: prevention, clinical management, nutrition, physical exercise, medicines, and information and communication technologies (ICTs).

The objectives of Work Package 6 (WP6) for contributing to the state of art report were to collect and review the existing literature on the topics on the management of frailty at individual level, to identify and select examples of good practices on the management of frailty in these fields, and finally, to develop this report that could be used to illustrate the recommendations for frailty prevention at individual level.

By obtaining and analysing all these pieces of information and data, it is possible to determine what policies and policy issues need to be addressed, as well as which gaps exist and must be filled in the future to tackle frailty. In addition, it is possible to identify the gaps of knowledge in the fields that would benefit from further research.

The overall results of this WP indubitably contribute to the main goals of ADVANTAGE JA as they pertain to the management of frailty at individual level: to create good practise guidelines for the prevention and clinical management of frailty at individual level and on the use of nutrition, medicines, physical exercise and ICTs to prevent, delay or manage frailty.

## METHODS

Systematic literature review and good practices review was conducted to obtain the results on six tasks of the WP6 – the Management of Frailty at Individual Level: Prevention, Clinical management, Nutrition, Physical exercise, Medicines, and ICTs.

### Peer-reviewed literature

A systematic literature review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA-P) 2015 guidelines (Moher et al., 2015), as it enables the obtainment of data from various sources, and ensures a holistic understanding of the research subject. The scientific literature reviews were performed analysing the following databases: PubMed, The Cochrane Library, Embase, UpToDate and Cumulative Index of Nursing

and Allied Health Literature (CINAHL). The descriptive research methodology was used to review the peer-reviewed medical literature.

The criterion in selecting the literature was that articles were published in a time period of 15 years, from 2002 to 2017. Key words were selected from a proposal of key words that were prepared by task leaders and the working group on 6 tasks: Prevention, Clinical management, Nutrition, Physical activity, Drugs, and ICTs. Several combinations of selected search words (see Annex 1) in the English language and their synonyms were prepared and used with Boolean operators AND or OR, searching by title, key words and in abstract.

Articles regarding current policies and guidelines on 6 tasks which were published in peer-reviewed scientific journals, as well as in international documents, standards, guidelines, and research studies performed in the EU, were reviewed. Information from editorials, letters, interviews, posters, and articles with no access to full text were not included in the study. Grey documents which were identified and proposed by task leaders were also reviewed and included in the study. Grey documents were identified through an opportunistic search, meaning a targeted or focused one, based on the information that each partner was able to find regarding their own country.

In total, for Task Prevention, 391,910 search results were identified and 31 articles/sources included in analysis; for Task Clinical management, 67,432 search results were identified and 27 articles/sources included in analysis; for Task Nutrition, 39,885 search results were identified and 28 articles/sources included in analysis; for Task Physical activity, 620,043 search results were identified and 25 articles/sources included in analysis; for Task Drugs, 28,796 search results were identified and 25 articles/sources included in analysis; for Task ICTs, 124,634 search results were identified and 33 articles/sources included in analysis.

### Grey literature

The collection of good practices was opportunistic, rather than systematic. It was based on the former European Union (EU)-funded programmes, European Innovation Partnership on Active and Healthy Ageing (EIP-AHA) and Joint Action On Chronic Diseases And Promoting Healthy Ageing Across The Life-Cycle (JA CHRODIS), and key stakeholders and national policy documents known by partners. Task leaders, as experts in the field, sought partners' suggestions on good practices and submitted them to the WP Co-Leader. The Co-leader used the following exclusion criteria: Lack of relevance or respect to ethical principles; absence of evaluation (the practice should have been evaluated at least from a process evaluation perspective); and inability to be transferred to other settings (that includes a not clear enough description of the practice). The inclusion criteria used were equity, sustainability, participation, and inter-sectoral collaboration. They were entered into an Excel spreadsheet and validated by internal reviewers using a bespoke points-based scoring system developed by the Co-leader. Each subcategory of the proposed criteria (they may be found in the Annex 2) was allocated equal weighting (ie. one point) and summed up to create the Good Practices score. The practices with scores higher than eighteen were identified and proposed below.

## RESULTS

The number of hits for the several combinations of selected search words and final articles/sources selected are included in Table 1.

Table 1: Search results in the systematic literature review for different tasks

Task	Prevention	Clinical management	Nutrition	Physical activity	Drugs	ICTs
Number of hits	391910	67462	39885	620043	28796	124634
Selected articles and sources	31	27	28	25	25	33
Grey literature	3	6	2	1	1	2

### Prevention at individual level:

The main factors associated with frailty are age, female gender, low income, lifestyle (sedentary), comorbidity, obesity, depressive symptoms, poor hearing, previous falls, lack of social support, environment (for example education, marital status...) and living in urban populations (Clegg et al., 2013).

The monitoring of frailty indicators might be helpful to target disability prevention programmes to reduce the burden that frailty places on individuals and society. To tackle frailty, health and social care professionals, partner agencies, and carers should fight against the low awareness of empowerment of some older people who have a strong aversion to the term “frail”. Besides, many elements of frailty are an unavoidable part of ageing (BritainThinks, 2015).

Frailty is viewed as a continuum, preceded by a pre-frail state, where early intervention may delay progression to frailty. The National Institute for Health and Care Excellence (NICE) (2015) and the report of the National Academy of Medicine of France (Michel et al., 2016) recommend health promotion activities in mid-life to encourage healthy behaviours, such as reducing smoking and alcohol consumption, increasing physical activity, and improving diet to achieve and maintain a healthy weight to improve health and reduce the risk of frailty in later life.

### Clinical management:

The management of frailty involves three principal points: to screen frail older adults in clinical practice, to assess them by looking after the causes of frailty and to propose strong and long-term useful interventions. The purpose is to plan and carry out a personalized multidomain intervention plan. Today, the gold standard of diagnosis and management is the comprehensive geriatric assessment (CGA) and its associated interventions. This is a multidimensional and



multidisciplinary evaluation designed to determine the underlying causes of frailty (Morley et al., 2013). This intervention plan will vary because frailty has different causes in different people (Vellas et al., 2016).

A recent meta-analysis assessed effective interventions to prevent or reducing frailty: only nine out of the fourteen studies were effective. The effective interventions included exercise, nutrition, cognitive training, comprehensive geriatric assessment and management and prehabilitation (Puts et al., 2017). In relation to the studies about CGA, they were not comparable. Out of the three studies that evaluated the use of geriatric assessment, only one showed a significant reduction in the prevalence of frailty and the total number of frailty markers. The rest of the studies showed non-significant results. However, one of them, developed in Japan, considered frailty as having experienced a change in care level, and the other study which did not have positive results, showed nevertheless a delay in deterioration of self-rated health and activities of daily living (ADLs) in the short term in older adults at risk of becoming frail.

### Nutrition/diet:

Inadequate nutritional intake is an important modifiable risk factor for frailty. To analyse which geriatric patients are at risk for malnutrition, it is strongly recommended to use the validated tool Mini Nutritional Assessment (MNA). The existing evidence supports the importance of adequate dietary amount and, especially quality, to ensure enough intakes of energy, protein, and micronutrients.

One recent revision (Goisser et al., 2016) analyses the relation between nutrition and frailty including most of the articles selected by us. On the one hand, they found four articles that showed that a higher BMI (more than 30 kg/m<sup>2</sup>, but certainly more than 35 kg/m<sup>2</sup>) aggravates the risk of mobility limitations and frailty, especially in sarcopenic obesity. On the other hand, four articles claimed that weight loss in older persons may be related with sarcopenia, bone loss, nutritional deficiencies, disability and even excess mortality. Therefore, it is of utmost importance for these individuals to achieve a weight gain. They found nineteen articles that suggested to increase the protein intake at least to 1.0-1.2 g per kilogram of body weight per day in order to maintain, or help regain, muscle mass. Moreover, in seven articles it is showed that the combination with exercise and/or physical activity was the most effective to reinforce lean/muscle mass and physical performance and in one of them to decrease frailty. In addition, three papers recommended to reduce the risk of frailty through a Mediterranean diet (characterized by high consumption of nutrient-dense foods such as fruits and vegetables, whole meal cereals and oily fish, but low intake of saturated fats). Finally, they suggested a moderate weight loss of 0.5-1 kg per week (or 8-10% of initial body weight after 6 months) in obese patients, while assuring a protein intake of at least 1 g per kilogram of body weight per day and an appropriate intake of micronutrients, and always combined with physical activity and/or exercise.

In a meta-analysis of thirty articles with participants with a mean age of 61 years (n=5615), results revealed a small but significant positive effect of vitamin D supplementation on global muscle strength and no effect on muscle mass (Beaudart et al., 2014). Supplementation is significantly more important in people with 25-OH vitamin D level < 30 ng/ml and seems more effective in people aged 65 years or older. The results of a review of evidence regarding the role of vitamin D in the elderly frail population suggest a potential effect of vitamin D on physical frailty, but large clinical trials are lacking at the time to provide solid evidence of a vitamin D benefit beyond bone health (Bruyère et al., 2017). The European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis states in the same review that, in frail elderly patients who are at elevated risk for falls and fracture, a minimum serum 25-OH vitamin D level of 30 ng/ml should be reached through doses of 20 a 25 µg/day (800 a 1000 IU/day).

### Physical exercise:

An important part of the management of frailty at individual level is physical exercise. Most studies confirmed positive effects of included interventions on motor and functional outcomes as well as on frailty reduction. Some papers indicated that sedentary individuals had significantly increased odds of developing frailty compared with the exercise active group (Binder et al., 2005).

In a systematic review, Theou et al. (2011), provided evidence that multicomponent exercise programs (consisting of endurance, flexibility, balance, and resistance training) performed with low intensity, in 30 to 45 minutes sessions, three times per week, have a positive effect on functional ability and overall health of frail people, but resistance training alone was more effective in reducing physical and psychosocial deterioration. In addition, exercise seems to be more effective in the earlier stages of frailty compared to the later stages of frailty.

Several clinical trials (Cadore et al., 2013), show that frailty and frailty related syndromes (falls, sarcopenia) respond positively to structured exercise programs of strength training, consisting on low to medium exercise load (from 30% -low- to 60-70% -medium- of maximum intensity). The duration of the trials was extremely variable, from eight weeks minimum to a year and a half maximum, but even the shortest trial duration produced an increase in strength.

Improving balance and reducing falls is even more important in frail older people. Studies concluded that falls prevention interventions are effective; they actually reduce falls by 19-22% (El-Khoury et al., 2013) and fear of falling. Frail persons will benefit more from falls reduction exercise interventions that prefrail ones. A combination of strength and balance training improve balance outcomes (Fairhall et al., 2014); no additional effect from walking or other functional exercise on balance outcomes was reported (El-Khoury et al., 2013). Lifestyle integrated exercises were proven similarly effective in promoting balance.

Different training interventions (single vs multicomponent, home or community based, group or one by one) have shown an increase of strength in healthy older adults as well as in frail ones

(Pahor et al., 2014). Trials of physical activity suggest that this offers a low-risk and effective preventive and therapeutic intervention to prevent or mitigate frailty (Cesari et al., 2014).

### Drugs/medicines:

Polypharmacy was defined as the use of at least five medicines and hyperpolypharmacy as the use of at least ten medicines. Prescribing multiple medicines is common and a growing global challenge driven by the ageing population and associated multimorbidity (Patterson et al., 2012). Applying single disease guidelines often increases the treatment burden for older people, and more than 50% of people aged 65 years or over receive five or more drugs. Prescribing medicines which are either inappropriate or are no longer indicated increases adverse drug reactions (ADRs), drug interactions, hospitalisations, costs of care, and may exacerbate frailty (Gnjidic et al., 2012). Therefore, tackling inappropriate polypharmacy is important to both prevent and manage frailty in individuals. The European Union-funded project, Stimulating Innovation Management of Polypharmacy and Adherence in the Elderly (SIMPATY), defined appropriate polypharmacy as when all medicines are prescribed for the purpose of achieving specific therapeutic objectives that have been agreed with the patient; therapeutic objectives are actually being achieved or there is a reasonable chance that they will be achieved in the future; medicines have been optimised to minimise the risk of ADRs; and the patient is motivated and able to take all medicines as intended.

Different authors reviewed single tools used to manage inappropriate prescribing and reducing polypharmacy. The most widely used include Beers criteria, STOPP-START and Laroche criteria (Kaufmann et al., 2014). Many tools are available to assess polypharmacy, but none address all aspects (Cooper et al., 2015).

Successful implementation requires an interdisciplinary approach supported by guidance on targeting people who need a more holistic approach to prescribed and pharmaceutical care (Stewart et al., 2017).

### ICTs:

Several ICTs solutions and health technologies have been developed with the purpose of promoting social interaction and communication, physical activity and exercise, better dietary habits or supporting other activities of daily life for frail older people. Some of these solutions, duly categorised (Rogante et al., 2010), were the following: synchronous communication technologies (online and ICT platforms); asynchronous communication technologies (web portals with health-related information); sensor-based technologies (monitoring biosignals); exercise applications to actuate patients to exercise or rehabilitate (web-based exercise programme); and virtual reality and gaming technologies (interactive games applications).

There is a systematic review (Barlow et al., 2007) of home telecare for frail elderly people and for patients with chronic conditions. They suggested that the most effective telecare interventions are automated vital signs monitoring (in order to reduce health service use). However, there is not enough evidence on the cost-effectiveness of these interventions nor about the effects of home safety and security alert systems and results of those reviews suggest that the acceptance and employment of these new technologies remains problematic, especially for older people. Some reasons for the latter are that clinicians and patients are lost in the variety of services that apparently exist, that they doubt about the clinical effectiveness and acceptance of the services, and that they have no idea on how to start the implementation in the clinical practice (Niehaves and Plattfaut, 2014).

### CONCLUSION

The presented review expanded the depth and scope of our understanding about the prevention, detection and management of frailty at individual level and will therefore support policy-oriented actions to improve the skills of the workforce and our understanding of frailty.

Outcomes of the review support the adoption of an approach with a perspective on the quality of life and interventions for the individual affected by or at risk of developing frailty.

The current literature review was made on selected academic papers and good practices. We gained a lot of useful information; however, there was partly a lack of policy-oriented information about the frailty prevention and management actions and programmes. Furthermore, the articles have different definitions of frailty, and this made it difficult to extract general conclusions. Despite the limitations, we selected some good practices; nevertheless, none of them were evaluated.

We assume we could obtain more vital information (from this perspective) if we carry out the nationally based survey, by which we could cover also this kind of information and support the information gathered from this review.

The interventions in order to prevent and clinically manage frailty are very similar. The prevention should include both the promotion of healthy lifestyles among the middle-aged and older people and informal carers as well as actions focusing on enablement and maintaining independence. The interventions most effective are exercise, nutrition, cognitive training and geriatric assessment and management.

Inadequate nutritional intake is an important modifiable risk factor for frailty. Nutritional intervention is proposed widely to be an important component of frailty management; however, more research should be conducted to determine if those interventions are effective for the prevention or treatment of frailty.

There is abundant evidence from studies that physical exercise not only delays, but also prevents or reverses frailty. The nutritional intervention is the most effective when associated with an intervention on physical exercise.

Tackling inappropriate polypharmacy is important to both preventing and managing frailty. There is an urgent need for research on effective strategies for managing polypharmacy, and for robust evaluation of both clinical benefits for patients and value for the system. Comprehensive change strategies should plan for sustainability and include knowledge translation as well as decision support tools appropriate for the local delivery context, and be accessible to both professionals and patients. There is a need to train more physicians to manage polypharmacy, and to provide information and decision tools to support people to make informed choices about the benefits or burden of medicines in order to improve shared decision-making and adherence.

ICTs offers a variety of tools that can be used for clinical purposes and into everyday practice. Thus, there is a necessity of incorporating specific trainers for the use of ICTs by the older person; of developing technologies that would be more intuitive; and of doing further research in order to achieve market impact and for the practice to become a routine use.

The literature review identified that to prevent and manage of frailty at individual level the following Decalogue can be proposed according to levels of evidence\*:

### Level I

1. The gold standard of management of frailty is the comprehensive geriatric assessment (CGA). The purpose is to plan and carry out a personalized multidomain intervention plan.
2. Provide structured multicomponent exercise programs (consisting of endurance, flexibility, balance, and resistance training) performed at low intensity, in sessions of 30 to 45 minutes, three times per week. Follow or substitute by exercise programs of strength training: minimum of 8 weeks and medium to high exercise load (from 8 to 12 repetitions (from 30% - 60-70% of maximum intensity). They must be combined with nutrition programs.

### Level II

#### Level II.1

2. Promote the Mediterranean diet and assure a protein intake of at least 1-1.2 g per kilogram of body weight per day.
3. Reduce polypharmacy if it is possible, especially if the patient takes more than ten medicines or if he has a high-risk of ADRs.

Level II.2

4. Advise patients with a BMI of more than 35 kg/m<sup>2</sup> a moderate weight loss of 0,5-1 kg per week or losing 8-10% of initial body weight after 6 months, with a final target of a BMI between 30 and 35 at most, always combined with physical activity and/or exercise.
5. Provide Vitamin D supplementation in frail patients who are at elevated risk for falls and fracture and 25-OH vitamin D levels below 30 ng/ml with 20 a 25 µg/day (800 a 1000 IU/day) until they reach a minimum serum 25-OHD vitamin D level of 30 ng/ml.
6. Use telecare interventions in order to monitor vital signs.

Level III

7. Start prevention among the middle-aged following the habitual health-enhancing recommendations
8. Assess which geriatric patients are at risk for malnutrition using the MNA.
9. Organize fall prevention programs that challenge balance and are effective in frail older persons.
10. Use tools in order to manage inappropriate prescribing and reducing polypharmacy, as BEERS or STOPP-START.

*\*Canadian Task Force on the Periodic Health Examination's Levels of Evidence: I At least 1 clinical trial with proper randomization; II.1 Well designed cohort or case-control study; II.2 Time series comparisons or dramatic results from uncontrolled studies; III Expert opinions*

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## ANNEXES

### Annex 1: Words used in the literature review search

Prevention: Functional decline OR Frailty OR Frail OR Vulnerable OR Disability OR Elderly OR Aged OR Older OR adult OR Older person OR Older adult function OR Geriatric OR Prevention Health promotion OR Geriatric programmes OR Screening tools OR Family carer's OR Risks OR Social determinants OR Strategies.

Clinical management: Comprehensive Geriatric Assessment OR Frail Disability OR Frailty treatment OR Frail Older adult OR Frailty Screening OR Frailty management OR Frailty Intervention Therapy) OR Functional Decline OR Frail Older person OR Geriatric Vulnerable OR Elderly Vulnerable OR Frailty Scale.

Nutrition: Geriatric Nutritional OR Elderly Protein deficiency OR Frailty Energy intake OR Frailty D vitamin OR Osteoporosis Nutrition OR Frail Nutrition OR Frail Vulnerable Nutrition OR Functional decline Protein deficiency OR Older person Sarcopenia OR Frail D vitamin OR Aged Dietary supplements OR Cognitive decline OR Calcium Nutrition OR Calcium Older adult OR Geriatric Nutrition OR Disability Nutrition.

Physical activity: Frail Muscle strength OR Frailty Activity OR Elderly Exercise OR Older adult Functional ability OR Aged functional decline OR Older person Mobility OR Geriatric Disability OR Inactivity Vulnerable Elderly OR Physical activity Aged Function OR Training Aged OR Functional outcomes Geriatric OR Physical interventions Vulnerable OR Sports Older person OR Patterns of activity Older adult OR Leisure activity Elderly.

Drugs/medicines: Multimедication OR Multimедication Frail OR Poly medicine OR Polymedicine Older person OR Polypharmacy OR Polypharmacy Geriatric OR Polypragmasy Aged OR Polytherapy Elderly OR Multiple medication Disability OR Polypragmasy OR Polytherapy OR Multiple medication Frail OR Polypragmasy Function OR Multimедication Vulnerable OR Polypharmacy Functional decline.

ICT's: Elderly Mobile health OR Geriatric Mobile health OR Frailty ICT OR Vulnerable App OR Disability App OR Information and communication technology Frail OR ICT Elderly OR Mobile health Aged OR E health Elderly OR Older adult Tele care OR Screening Application OR Support ICT OR ICT Older person OR Treatment Monitor frailty OR Frail ICT OR Tele care Function.

Annex 2: Inclusion Criteria used in good practices selection (score).

A. RELEVANCE

1. Political/strategic context of the practice or intervention clearly explained and considered (ie. WHO targets on-Non Communicable Diseases).
2. Description of the practice: A priority public health area or a strategy at Local/Regional level or National level or the European level.
3. Description of the practice: put in place to support the implementation of legislation.

B. INTERVENTION CHARACTERISTICS

1. Target population is clearly described.
2. Detailed description methodology provided. SMART (Specific, Measurable, Assignable, Realistic, Time-related) objectives defined and actions to reach them are clearly specified and easily measurable.
3. Indicators to measure the planned objectives are clearly described.
4. Contribution of target population, carers and health professionals (and other stakeholders as applicable) was appropriately planned, supported and resourced.
5. Practice includes an adequate estimation of human resources, material and budget requirements in clear relation with committed tasks.
6. Information on the optimization of resources for achieving the objectives and a model of efficiency is included.
7. Evaluation process was designed and developed including elements of effectiveness and/or efficiency and/or equity including information affecting the different stakeholders involved.
8. Documentation (guidelines, protocols, etc.) supporting the practice including the bibliography is presented properly, referenced throughout the text and easily available for relevant stakeholders (e.g. health professionals) and the target population.

C. EVIDENCE AND THEORY BASED

1. Intervention is built on a well-founded programme theory and is evidence-based.
2. Effective elements (or techniques or principles) in the approach are stated and justified.

D. ETHICAL ASPECTS

1. Practice is respectful with the basic bioethical principles of Autonomy, Non mal-efficiency, Beneficence and Justice.
2. Expected benefits are superseding the potential harms.
3. Intervention was implemented equitably - proportional to target group needs.
4. Individuals' rights (for example, data protection) have been protected according to national and European legislation.
5. Conflicts of interest (including potential ones) are clearly stated, including measures taken.

6. Practice does not advertise a specific product, device or relate to any commercial initiative.

E. EFFECTIVENESS AND EFFICIENCY

Process evaluation

1. Practice has been evaluated (internally or externally) taking into account social and economic aspects from both the target population and the perspectives of all other stakeholders concerned (e.g. formal or informal caregivers, health professionals, teachers).
2. Evaluation outcomes (eg clinical, health, economics) and objectives were linked to the stated goals.
3. A study has been performed (based on needs and challenges) between the initial and final situation. The purpose of this study would be to determine if the practice was implemented equitably (i.e. proportional to the identified needs).
4. Practice has been implemented in an effective and efficient way.

Outcome evaluation

5. Potential impact on the target population is assessed as positive. All improvements in comparison to the starting point, for example the baseline concerning e.g. structure, process and outcomes in different areas, are documented and presented.
6. Practice has been evaluated from an economic point of view.
7. Evaluation outcomes demonstrated beneficial impact.
8. Evaluation results are trustful.

F. EQUITY

1. Relevant dimensions of equity are adequately and actively considered throughout the process of implementing the practice (e.g. age, gender, socioeconomic status, ethnicity, rural-urban area, vulnerable groups).
2. Practice makes recommendations or guidelines to reduce identified health inequalities.

G. TRANSFERABILITY

1. Practice uses instruments (e.g. a manual with a detailed activity description) that allow for repetition/transfer.
2. Description of the practice includes all organizational elements, identifies the limits and the necessary actions that were taken to overcome legal, managerial, financial or skill-related barriers.
3. Description includes all contextual elements of the beneficiaries (eg. patients, general population) and the actions that were taken to overcome personal and environmental barriers.
4. A communication strategy and a plan to disseminate the results have been developed and implemented.
5. Practice have already been successfully transferred / repeated.
6. Practice shows adaptability to different needs encountered during its implementation.

H. SUSTAINABILITY

1. Practice has institutional support, an organizational and technological structure and stable human resources.
2. Practice presents a justifying economic report, which also discloses the sources of financing.
3. Continuation of the practice has been ensured through institutional anchoring and/or ownership by the relevant stakeholders or communities in the medium and long term in the planning of the practice.
4. Practice provides training of staff in terms of knowledge, techniques and approaches in order to sustain it.
5. Sustainability strategy has been developed that considers a range of contextual factors (e.g. health and social policies, innovation, cultural trends and general economy, epidemiological trends).

I. PARTICIPATION

1. Structure, organization and content (also evaluation outcomes and monitoring) of the practice was defined and established together with the target population and families or caregivers and all stakeholders involved.
2. Mechanisms have been established and well described facilitating participation of several agents involved in different stages of the intervention as well as their specific role.
3. Elements are included to promote empowerment of the target population (e.g. strengthen their health literacy, ensuring the right skills, knowledge and behaviour including for stress management and self-care).

J. INTERSECTORAL COORDINATION (Collaboration)

1. Practice has been carried out jointly by several sectors.
2. Multidisciplinary approach is supported by the appropriate stakeholders (e.g. professional associations, public institutions from education, employment, ICT, etc).
3. Promotes the continuity of care through the coordination between social and health services (if applicable).
4. Practice creates ownership among the target population and several stakeholders considering multidisciplinary, multi-/inter-sectoral, partnerships and alliances (if applicable).