A P P C A R E

A P P R O P R I A T E   C A R E   P A T H W A Y

D9.1 PREVENTIVE CARE

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INTRODUCTION

1.1 Background

Demographic change and ageing are a common challenge for Europe. In Europe, the number of people aged +65 will almost double over the next 50 years, from 85 million in 2008 to 151 million in 2060. While increased longevity is a great achievement, it is also a formidable challenge for both public and private budgets, for public services and for older people and their families. Greater longevity, "modernization" of lifestyles, with increasing exposure to many chronic disease risk factors, and the growing ability to intervene to keep people alive have combined to change the burden of diseases confronting health systems. As a result of reduced mortality rates and the demographic shift, there will be a higher frail population in need of long-term care in the near future.

Because frail patients are at a relatively high risk of experiencing health problems, avoiding hospitalization cannot depend exclusively on keeping them well. Achieving high-quality geriatric care and minimizing the need for hospitalization will require the widespread of specialist competences for an optimum management of geriatric syndromes and an integrated, coordinated system of care. To meet the multiple needs of the frail elderly in an efficient and effective manner, it is widely acknowledged that numerous service providers will need to combine their efforts in a coordinated manner. There is also mounting evidence stating that the development of integrated care arrangements can be cost effective and enhance quality of care delivery.

APPCARE (Appropriate care for elderly patients: a comprehensive model), a project granted by the European Commission, is aimed at creating a new model for the management of frail elderly people to demonstrate how an innovative and comprehensive management of complex and co-morbid clinical situations, may maintain patient's functional status in its clinical trajectory, optimizing health care systems.

1.2 Scope of the document

According to the Work Package 5 APPCARE model, this document will describe the Preventive Care Model in the three pilot sites (Treviso, Italy; Valencia, Spain; Rotterdam, The Netherlands). The Preventive Care Model is embedded as part of the APPCARE Model, which also includes a Hospital Care Model (explained in D7.1) and a Coordinated Care Model (explained in D8.1). Furthermore, this document will feed the overall impact assessment to be presented in D10.2. Final Impact Assessment and Sustainability.

1.3 Distribution list

This document is a public and official deliverable that will be upload on the Participant Portal (for European Commission approval) and on the APPCARE project website at the following link:

http://www.app-care.org/deliverables/

1.4 History of changes

Version	Date	Main changes
APPCARE D9.1 _B.1	6TH February 2019	First draft
APPCARE D9.1 _B.2	26th February 2019	Draft to be circulated to partners
APPCARE D9.1_B.3	4th April 2019	Final version for approval
APPCARE D9.1_A.1	30th June 2019	Final version uploaded
APPCARE D9.1_A.2	31st July 2019	Review of visibility policy requirements

1. APPCARE model for Preventive Care

2.1 General requirements

The Preventive Care Model focuses on health promotion and prevention. Relevant preventive pathways have been suggested to the patients included in the Hospital Care Model and their general physician after discharge from the hospital to prevent falls, disability and loneliness and to promote polypharmacy management. Patients included in the Hospital Care Model were at least 70 years of age and admitted to the inpatient ward of a geriatric department. The preventive pathways are in line with current guidelines in primary care and have been developed in agreement to existing guidelines by experts in the context of the APPCARE project. Preventive approaches have been made available on a voluntary basis through existing facilities (primary health care centers and neighbourhood facilities).

Preventive pathway	Treviso	Valencia	Rotterdam
Follow-up by primary health care centers			√
Geriatric clinical follow up in the hospital			√
Fall Prevention	√		√
Polypharmacy Intervention	√		√
Social Support		√	√
Cognitive Stimulation		√	

2.2 Preventive Care Model - Treviso adaptation

The Preventive Care Model in Treviso was offered to all patients included in the Hospital Care Model. Patients were recruited exclusively from the geriatric ward of the Treviso Hospital. The Preventive Care Model concerned two different but complementary preventive pathways:

a) Fall Prevention

After the assessment measurement, instructions on fall prevention with manuals have been provided at discharge to at risk patients and instructions and education for patients / caregivers on proper mobilization by nursing staff.

- Patient and caregiver instruction
- Rationalize dosing regimens
- START and STOPP and Beers criteria to reduce unnecessary prescription

b) Polypharmacy Intervention

After the assessment measurement, detection of the risk of improper polypharmacy therapy management, drugs reconciliation and counselling on appropriate management have been provided.

- Early mobilization during hospital stay
- Patient and caregiver instruction (home safety, behavioural rules, physical activity)
- Information and advice (written or video format) for patients at discharge
- Informative Brochure for territorial services

It should be said that about 50% of enrolled patients had a functional and cognitive status already severely compromised before admission. Therefore the condition at discharge cannot be better than premorbid conditions. These considerations led us to include only the most autonomous patients according to the criteria given by APPCARE and described in previous section, but also - also due to large number of sample size - to a non-stressful prevention activity for patient and caregiver. For this reasons, actions for fall prevention were limited to instructions for proper mobilization and advice regarding the patient's living environment (removal of risk factors: carpets, and advice for use of handrails in bathrooms). On the other hand, actions concerning polypharmacy (adherence and / or appropriate prescription actions with particular attention to pharmacological reconciliation at the time of hospital discharge also based on the STOPP and START criteria - were provided to all recruited patients (n=2.498).

2.2.1 Assessments

After hospital discharge, a further comprehensive assessment was conducted to all patients in order to identify other care needs, apart from the medical ones assessed in the Hospital Care Model. Follow up took place after 3 months (during the clinical follow up) and 6 months of the intervention (with a specific interview). The follow-up was performed by the Geriatric Ward of the Treviso Hospital and by the Primary Care of the Districts involved in the management of recruited patients. For at risk patients coming from or referred to nursing homes after hospital stay, the management of fall prevention and polypharmacy after the assessment were in charge of nursing home teams.

This comprehensive assessment included the following measures:

ASSESSMENT OF	MEASURES
Physical functionality	Short Physical Performance Battery (SPPB)
Fear and Risk of falling	Falls Self-efficacy Scale (FES-I short) Questions: • Did you fall in the past 12 months? • Are you afraid of falling?
Polypharmacy	Medication Risk Questionnaire (MRQ-10)

- SPPB and FES I short: only for patients with Barthel score ≥ 60, SPMSQ ≤ 4 at T0
- For patients at risk, proposal of already existing initiatives (walking group, gym classes etc) and, in case of polypharmacy, leaflet on drug management and/or pharmacological reconciliation if possible.

2.3 Preventive Care Model - Valencia adaptation

The Preventive Care Model was offered to all patients included in the Hospital Care Model who were evaluated as suffering from loneliness and/or moderate cognitive impairment. The Preventive Care Model was intended to intervene beyond the medical needs ensuring that the psychological and social aspects of care were also addressed. This care model followed the same approach as the Coordinated Care Model but the patients included in this model had a slightly different profile (as can be seen in the inclusion criteria). The Preventive Care Model concerned two different but complementary preventive pathways:

a) Social Support

Inclusion criterion → Loneliness: De Jong Gierveld loneliness scale > 2

The Social Support pathway was designed with the objective to improve the social needs and loneliness feelings of APPCARE patients. The professionals in charge of this preventive pathway were social workers. The objective of the Social Support pathway was to promote social participation among those patients assessed as having unmet social needs and/or loneliness. To this aim a motivational approach (Prochaska and DiClemente, 1984) was followed. The motivational approach consisted of an initial motivational interview with the patient in which a change plan was negotiated in a collaborative way between the professional and the patient. Usually the plan was developed following these steps:

- *Setting Goals:* In order to set the goal/s, the professional provided information on the available social activities and resources at the community level (such as painting classes, walking groups, etc.). Based on this information and the patients' needs and interests, the goals were defined (e.g. to spend more time with my family or to join a group activity).

- *Considering Change Options*: the next step was to consider the possible ways to achieve the goals. In this regard, small tasks, strategies and commitments that move the patient little closer towards the goal need to be defined (e.g. making a phone call to a family member at the end of the day or asking form information and a full schedule of recreation programs at the community centre).

- *Arriving at a Plan*: At this point, the professional and the patient wrote the change plan detailing the goal/s and the steps to achieve the goal/s. This document served as a basis for the follow-up.

- *Commitment to the Plan*: In order to know if the patient was committed to the plan, follow-up calls and visits were made every two-weeks.

As previously said, the inclusion criteria to be referred to the Social Support pathway was that to be assessed with low perception of social support and high scores in loneliness.

b) Cognitive Stimulation

Inclusion criterion → Moderate cognitive impairment: SPMSQ 3-4 errors

The Cognitive Stimulation pathway was designed with the objective to enhance patients' cognitive function through attention and memory training. The professionals in charge of this preventive pathway were psychologists. Patients assessed as suffering moderate cognitive impairment were referred to this pathway. During the early or mildest stage of dementia there are a number of things that can be done to help the person to maintain as much of their independence as possible, and help to keep their brain active, possibly slowing the onset of this initial symptoms for a little longer. To this aim, a specific workbook was designed including different types exercise: brain games, mandala colouring, word searches, daily routine diary and other activities to enhance brain function, which have proved to be effective to improve memory, attention, perception, and visuomotor coordination. Patients in this preventive pathway completed an extra assessment: The Mini Mental State Examination (MMSE) at the beginning and after the intervention.

Both preventive pathways were designed by experts in the frame of the APPCARE project. Both preventive pathways had a duration of 3 months; after which patients were followed-up using the same comprehensive assessment as after hospital discharge.

2.3.1 Assessments

After hospital discharge, a further comprehensive assessment was conducted to all patients in order to identify other care needs, apart from the medical ones assessed in the Hospital Care Model. This comprehensive assessment included the following measures:

ASSESSMENT OF	MEASURES
Functional Status	Barthel Index
Risk of pressure ulcer	Braden Scale
Dementia	Short Portable Mental Status Questionnaire (SPMSQ)
Routine physiological measurements	Weight, height, mean arterial pressure; Heart rate; Respiratory rate; Sodium (serum) (if available in patient file); Potassium (serum) (if available in patient file); Creatinine (if available in patient file); Haematocrit (if available in patient file); White blood cell count (if available in patient file)

Received care	- Professional help in household work (Yes/No); Nº of weeks
	- Professional help in personal care (Yes/No); Nº of weeks
	- Nº visits to healthcare professionals (GP or specialist)
	- Nº visits to emergency room
	- Hospitalization (Yes/No); Nº of days
Frailty	Tilburg Frailty Index (TFI)
Fear and Risk of falling	Falls Self-efficacy Scale (FES-I short)
Disability via IADL and ADL	Groningen Activity Restriction Scale (GARS)
Polypharmacy	Medication Risk Questionnaire (MRQ-10)
Health-related Quality of Life (QoL)	SF-12v2 Health Survey
Loneliness	Jong Gierveld (6 item)
Distress	Brief Symptom Inventory (BSI)-18
Social support	Community Support Questionnaire (CSQ)
Living Standards	Living Standards Capabilities for Elders (LSCAPE)
Other personal details	- Born country; Parents born country
	- Educational attainment
	- Marital status
	- Household composition
	- Source of income and approx. Income
	- Religion

2.4 Preventive Care Model - Rotterdam adaptation

The Preventive Care Model was offered to all patients included in the Hospital Care Model. Patients receiving the Hospital Care Model were predominantly recruited from the geriatric ward of 4 hospitals: Erasmus Medical Center (Rotterdam), Havenziekenhuis (Rotterdam), Amphia hospital (Breda) and Vlietland hospital (Schiedam). In addition, some patients were recruited at the daycare center of the Erasmus Medical Center and at the outpatient clinic of the Havenziekenhuis. The Preventive Care Model concerned different but complementary preventive pathways:

- Follow-up by primary health care centers
- Geriatric clinical follow up in the hospital between 1 and 6 months on indication and in accordance with the existing guidelines
- Other preventive pathways:
  - Fall Prevention; recommended evidence-based interventions were home-based exercise programmes, group exercise programmes and multifactorial assessment and intervention programmes.
  - Polypharmacy Intervention (adherence and/or appropriate prescribing actions); recommended evidence-based interventions focused on selfmonitoring programmes to improve adherence and/or multifaceted pharmaceutical care for appropriate prescribing.
  - Social Support; recommended evidence-based interventions were social activities and/or support within a group format.

The preventive pathways in the Netherlands concern usual primary care. Patients were followed-up 3- 6 months after enrolment in the Hospital Care Model using the same comprehensive assessment.

2.4.1 Assessments

At 3-6 months after baseline a Patient Questionnaire was provided to monitor whether the Preventive Care Model was applied as intended and to monitor how the patient was doing. The questionnaire concerns bio-psycho-social and environmental context after 3-6 months:

a) Measurements at follow up integrated in routine care:

ASSESSMENT OF	MEASURES
Functional Status	Barthel Index
Risk of pressure ulcer	Braden Scale

Dementia	SPMSQ
	Mini-Mental State Examination (MMSE)
Severity of disease	HALM's CRITERIA
Comorbidity	Cumulative Illness Rating Scale (CIRS)
Delirium	Clinical judgement (using Confusion Assessment Method; CAM)

b) Measurements at follow up assessed in the context of APPCARE:

ASSESSMENT OF	MEASURES
Physical activity and limitations	SHARE study FI and ES; and GALI single item (UHCE B6; C3)
Frailty	Tilburg Frailty Index (TFI); and SHARE study 4 items FI EN ES (UHCE A1-15; D2 D4)
Fear and Risk of falling	UHCE-study (A16-18); and Falls Self-efficacy Scale (FES-I = UHCE C6)
Disability via (Instrumental) Activities of Daily Living ((I)ADL)	GARS (UHCE C7)
Polypharmacy	MRQ-10; UHCE study A19-A28
Health-related QoL	SF-12v2 Health Survey (UHCE D5-D11)
Loneliness	Jong Gierveld 6 item (UHCE D1)
Co-morbid health conditions	UHCE study C4
Healthy life styles (smoking; alcohol use; BMI)	AUDIT C (alcohol); UHCE study B1-B5; C1- C2)
Use of aids	UHCE study C5
Living condition after 6 months	Alone, home-assisted by relatives or informal caregivers, homecare assistance with formal care givers, nursing home (UHCE study E and F)
Demographic and socio-cultural context	Only regarding changes
Adherence to proposed preventive pathway and user experiences	UHCE study follow-up questionnaire (F7- F9)

3. APPCARE Preventive Care model results

3.1 Treviso pilot site

The Preventive Care Model was offered to all patients included in the Hospital Care Model, of whom 68% results to be at risk after the first assessment. Among them, 45% received a 1-month follow-up at the Geriatric Hospital Outpatient clinic and 26% had a 1-month home-based follow up by the Primary District Care. This aspect was an absolute innovation with respect to the usual care and therefore perceived as a significant change with respect to the existing situation.

	Total Patients assessed (Hospital Care Model)	Patients meeting inclusion criteria	Patients included in the follow up
N	2.498	1.130	766
%	100.0	45.2	68.0

According to the pilot site trend, it is worth to underline that the follow-up initiative, although pleasing, had been complicated and therefore limited to one follow up due to the following aspects:

- Complexity of patients: although selected, patients of at least 75 years of age are very fragile patients with clinical and functional conditions that might change very quickly and sometimes unexpectedly. In case of worsening of clinical status, the offer of a second or third follow up appeared to be improper. In addition to this, we registered a significant percentage of patients that did not attend or refused follow up assessment.
- The deep reorganization of regional health system we experienced during the project asked for a very big organizational effort, affecting personnel workload. This lead to limited resources available to perform additional follow up assessment and was particularly true for homecare patients, where the collaboration among different services is essential.

3.2 Valencia pilot site

Social Support pathway

A total of 61 patients were assessed as suffering from loneliness and/or lack of social support, and therefore were referred to the Social Support pathway. Only 50.8% (n=33) agreed to participate.

	Total Patients assessed (Hospital Care Model)	Patients meeting inclusion criteria	Patients included in the follow up
N	152	61	33
%	100.0	40.4	50.8

Cognitive Stimulation pathway

A total of 56 patients were assessed as suffering moderate cognitive impairment. They were referred to the Cognitive Stimulation pathway. Only 55.4% (n=31) agreed to participate.

	Total Patients assessed (Hospital Care Model)	Patients meeting inclusion criteria	Patients included in the follow up
N	152	56	31
%	100.0	36.8	55.4

3.3 Rotterdam pilot site

The Preventive Care Models were offered to all patients included in the Hospital Care Model (n=137), of which 79 completed a follow up questionnaire. Among them:

- 94.7% (54/57) received follow-up by primary health care centers (missings: n=22)

The share of patients receiving follow-up by the general practitioner in primary health care centers is relatively high, because general practitioners in the Netherlands have a key role in the coordination of care; they do so in close collaboration with the medical specialists and nurses in the hospitals in their care area. So, care before a necessary hospital admission is coordinated by the general practitioner, but also the care after leaving the hospital. Every citizen is registered as a patient of a general practitioner, who generally closely collaborates with a staff of well-trained medical support personnel, nurses and nurse practitioners, and other health and psychology professionals (e.g. psychologist, physiotherapist).

- 60.7% (52/71) received a geriatric clinical follow up in the hospital between 1 and 6 months on indication and in accordance with the existing guidelines (missings: n=8)

In addition to the follow up by the general practitioner, 60.7% of the patients received a geriatric clinical follow up at the hospital between 1 and 6 months. These patients generally concern older patients with complex conditions or circumstances. The medical specialists nurses and geriatric health professionals in the hospitals closely collaborate with the team of the general practitioner to prepare for dismissal; or with a nursing home or revalidation facility when this is needed.

	Total Patients assessed (Hospital Care Model)	Patients meeting inclusion criteria	Patients included in the follow up
N	137	137	79
%	100.0	100.0	57.7
	Total Patients assessed (community sample)	Patients meeting inclusion criteria	Patients included in the follow up
N	865	149	128
%	100.0	17.2	85.9

The enrolment of patient in the Hospital Care Model had been complicated due to the following aspects:

- Complexity of patients: especially the patients recruited from the geriatric ward of the Erasmus Medical Center (Rotterdam) often have multiple diagnoses and are clinical and functional compromised.
- Academic status: owing to its academic status, the Erasmus Medical Center is involved in many scientific studies, each requiring the enrolment of the same vulnerable patients.

In order to increase the recruitment of patients from the geriatric ward of 4 hospitals, we additionally invited a community sample of 3,000 non-institutionalized citizens ≥70 years who live in the municipality of Rotterdam. We sent out a mailing obtained from the Municipal Personal Records Database (Gemeentelijke basisadministratie persoonsgegevens; GBP). In total, 865 citizens agreed to participate, of which 149 (17.2%) had been hospitalised in the past 6 months. Of these 149 citizens, 128 completed a follow up questionnaire. Among them:

- 90.2 % (83/92) received follow-up by primary health care centers (missings: n=36)
- 29.6% (37/125) received a geriatric clinical follow up in the hospital between 1 and 6 months on indication and in accordance with the existing guidelines (missings: n=3)

The citizens in the community sample completed the same questionnaire as the patients recruited from hospitals at baseline and 6 months later.

The Preventive Care Model in the Netherlands concerns usual primary care; 21.6% receives the Fall Prevention pathway, 88.3% the Polypharmacy Intervention and 16.9% the Social Support pathway. Preventive pathways were discussed with the patient and his/her family at discharge. Provided permission by the patient, the pathways were shared with the patient's general physician. Approximately 50% of the patients admitted to the geriatric ward is discharged to go home. Some may qualify for a general housing facility (e.g. apartment buildings) that focus on 55+ citizens. The current policy is that as long as a citizen is not eligible for hospital or nursing home admission, s/he receives all social and medical care needed at home by law. The remaining patients are indicated to receive support at an inpatient or out-patient rehabilitation center or may be admitted to a medical or psychogeriatric nursing home.

4. APPCARE Preventive Care preliminary findings

The APPCARE Preventive Care Model has been implemented in the three pilot sites: Treviso, Valencia and Rotterdam. Each pilot site had focused on different aspects of Preventive Care, involving different professionals at different levels. Thus, the Preventive Care Model was adapted to each particular context and to its population characteristics.

	Total Patients assessed	Patients meeting inclusion criteria	Patients included in the follow up
N Treviso	2.498	1.130	766
N Valencia	152	61	33
N Rotterdam	1.002	286	207
N total	3.652	1.477	1.006
% total		40,4	68,1

The greatest challenge shared by each of the pilot sites concerned the enrolment of patients at baseline as well as the monitoring them at follow up assessments, due to the complexity of those peculiar category of patients, which arrives at the hospital often already compromised and with multimorbid conditions.