

APPCARE

APPROPRIATE CARE PATHWAY

D8.1

COORDINATED CARE MODEL IMPLEMENTATION

AUTHORS: *Tamara Alhambra Borrás*
Siok Swan Tan
Elena Procaccini
Jorge Garcés Ferrer

Issue: *March 2019*



Co-funded by
the Health Programme
of the European Union

*This deliverable is part of the project / joint action '664689/APPCARE'
which has received funding from the European Union's Health Programme (2014-2020).*

TABLE OF CONTENTS

1. INTRODUCTION	3
1.1 Background.....	3
1.2 Scope of the document	4
1.3 Distribution list	4
1.4 History of changes	4
1.5 Glossary	4
2. APPCARE model for coordinated care.....	5
2.1 General requirements	5
2.2 Coordinated Care Model - Treviso adaptation.....	6
2.3 Coordinated Care Model - Valencia adaptation.....	7
2.4 Coordinated Care Model - Rotterdam adaptation.....	9
2.5 Assessment to be performed	10
3. APPCARE coordinated care model results.....	13
3.1 Treviso pilot site	13
3.2 Valencia pilot site	14
3.3 Rotterdam pilot site.....	15
4. APPCARE coordinated care preliminary findings	16

Disclaimer

The content of this deliverable represents the views of the author only and is his/her sole responsibility; it cannot be considered to reflect the views of the European Commission and/or the Consumers, Health, Agriculture and Food Executive Agency or any other body of the European Union. The European Commission and the Agency do not accept any responsibility for use that may be made of the information it contains.

1. INTRODUCTION

1.1 Background

For over two decades, life expectancy has increased globally from 64 to 71 years (WHO, 2015). In 2017, an 8,7% of the world's population were over 65 and this age group is expected to represent a 15% of the total population by 2050 (World Bank Group, 2019¹). The progressive growth of life expectancy for the oldest age groups has triggered an increase in the prevalence of specific social and health conditions.

Particularly, older patients with multiple chronic conditions are often faced with increased health care needs and subsequent higher medical costs, posing significant financial burden to patients, their caregivers, and the health care system. Chronic conditions are defined by the World Health Organization (WHO) as requiring "ongoing management over a period of years or decades" and cover a wide range of health problems that go beyond the conventional definition of chronic illness.

Frail older adults, due to the complexity of their health conditions, require a complex response over an extended time period that involves coordinated inputs from a wide range of health professionals, as well as access to essential medicines and monitoring systems. This complex response to frail older patients need to be optimally embedded within a system that promotes patient empowerment. However, the lack of coordination between services often don't allow providing care appropriately, at the right time and place. Health care services are frequently characterized by a lack of continuity and coordination that may affect health outcomes. Chronic conditions frequently go untreated or are poorly controlled until more serious and acute complications arise, which doesn't allow interventions at a stage when preventive care could slow further cognitive, psychological or physical deterioration. Therefore, timely identification of frail patients' conditions and providing coordinated care to these patients are key aspects for improving health outcomes not only at medical level but also at psychological and social levels.

The *APPCARE - Appropriate care for frail elderly patients: a comprehensive model* project is a research project granted under the 3rd Health Programme of the European Commission. The APPCARE project is aimed at creating a new model for the management of frail elderly people (+75 y/o). The objective of this new model is to demonstrate how an innovative and comprehensive management of complex and co-morbid clinical situations may maintain or improve patient's health status, and thus optimize health care systems.

¹ <https://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS>

1.2 Scope of the document

According to the Work Package 5 APPCARE model, this document will describe the Coordinated Care Model in the three pilot sites (Treviso, Italy; Valencia, Spain; Rotterdam, The Netherlands). The Coordinated Care Model is embedded as part of the APPCARE Model, which also includes a Hospital Care Module and a Preventive Care Module. Furthermore, this document will feed the overall impact assessment to be presented in the Deliverable 10.2. 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 D8.1 _V.1	6 TH February 2019	First draft
APPCARE D8.1 _V.2	25 nd February 2019	Draft to be circulated to partners
APPCARE D8.1 _V.3	26 th March 2019	Feedback received from partners
APPCARE D8.1 _V.4	27 th March 2019	Final version to be circulated to partners

1.5 Glossary

Acronym	Definition
APPCARE	Appropriate care for frail elderly patients: a comprehensive model
AUDIT C	Alcohol Use Disorders Identification Test - Consumption
BMI	Body Mass Index
BRASS	The Blaylock Risk Assessment Screening Score
BSI-18	Brief Symptoms Inventory-18
CAM	Confusion Assessment Method
CIRS	Cumulative Illness rating Scale
COPD	Chronic Obstructive Pulmonary Disease
CVD	Cardio Vascular Disease
ER	Emergency Room
QoL	Quality of Life
MMSE	Mini Mental State Examination
SPMSQ	Short Portable Mental Status Questionnaire
WHO	World Health Organization

2. APPCARE model for coordinated care

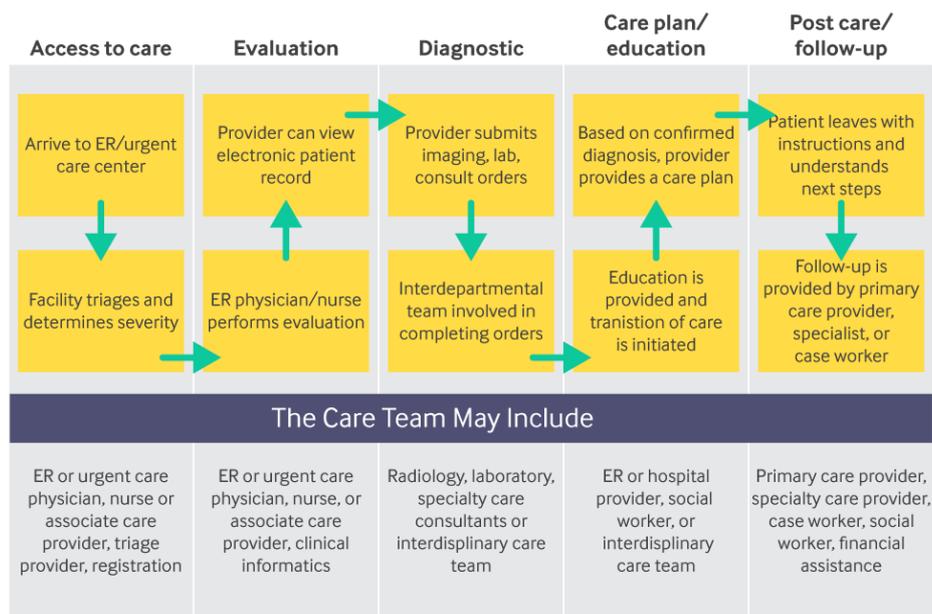
2.1 General requirements

Care coordination is “the deliberate organization of patient care activities between two or more participants involved in a patient’s care to facilitate the appropriate delivery of health care services.”² According to this definition, all care providers working with a particular patient share important clinical information, and work together to keep patients and their families informed.

In the frame of the APPCARE project, the role of care coordinator was on each pilot site leader. The professionals (partners in the APPCARE project) responsible for each pilot were also responsible for the coordination between the different care providers. This coordination was intended to ensure that each participants received the appropriate care. Moreover, pilot leaders were also in charge of the evaluation and follow up of participants which gave them a complete overview of participant’s conditions and needs.

Regarding the different aspects of Care Coordination, the following graphic shows them and the different professionals that may be involved as providers of coordinated care. In APPCARE project each pilot sites had focused on different aspects of coordinated care, involving different professionals at different level.

What Is Care Coordination?



Source: Michael Marzoug, Management Consultant
 NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society

² McDonald, K.M., Sundaram, V., Bravata, D.M., et al. (2007). Closing the Quality Gap: A Critical Analysis of Quality Improvement Strategies, Volume 7—Care Coordination. Rockville, MD: Agency for Healthcare Research and Quality, U.S. Department of Health and Human Services.

2.2 Coordinated Care Model - Treviso adaptation

In Treviso, the coordinated care model was conceived according to the following pathway:

CONTINUITY OF CARE

Patients requiring a new setting according to the health status after hospitalization:

- **Activation of social services**
- **Activation of territorial care services** for discharged patients with complex needs (i.e. wound medications, enteral nutrition)
- **Patient will be taken in charge by the territorial services (GP and nurses) within 48 hours after discharge**
- TERRITORIAL CASE MANAGER (specialized nurse):
 - Management of follow up
 - Monitoring of achievements obtained (diagnostic/therapeutic)
 - Supports adaptation of care pathway, when needed
- PERSONALIZED FOLLOW UP AFTER HOSPITAL DISCHARGE
 - Within 48hs (complex situations: wound medications, catheters...)
 - 1 month
 - 3 months
- DISEASE CENTERED PATHWAYS -> shared between hospital and territorial care (i.e. CHF pathway)

All patients assessed according to the APPCARE hospital care, regardless the extra-hospital settings after discharge: a follow up will be granted at 1 AND 3 MONTHS:

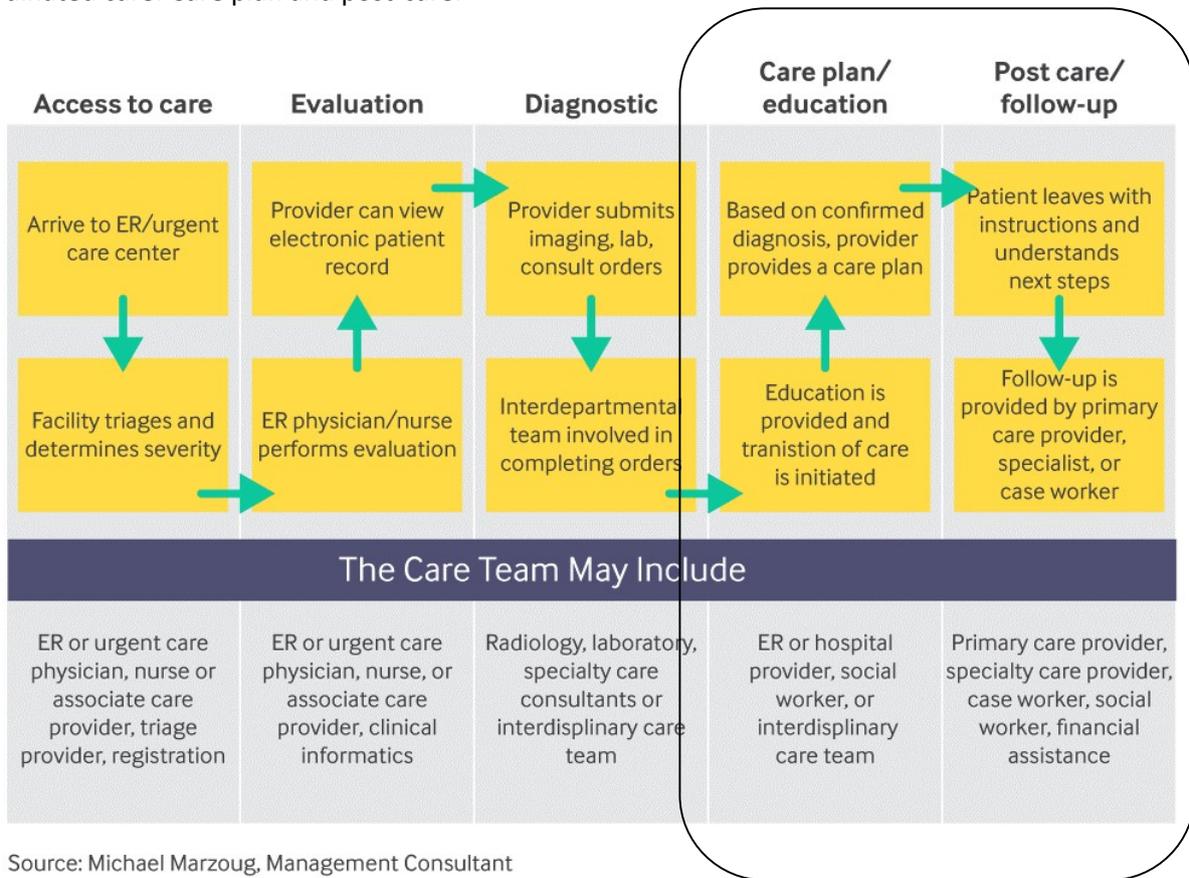
- **with an outpatient visit for autonomous patients;**
- **with home visit for non-autonomous patients (homecare patients).**

PATHWAYS FOR MOST COMMON CHRONIC DISEASES: At patient's discharge:

- REPORT TO TERRITORIAL SERVICES:
 - Final diagnosis, comorbidities, medications
 - Clinical measurements (Blood Pressure, Heart Rate, Oxygen saturation (Oximetry), Body weight)
- HOME VISIT (doctor/ nurse) within 48 hours.
- 1 and 3 months follow up granted

2.3 Coordinated Care Model - Valencia adaptation

The APPCARE Coordinated Care Model in the Valencia pilot site has focused on the following aspects of coordinated care: Care plan and post-care.

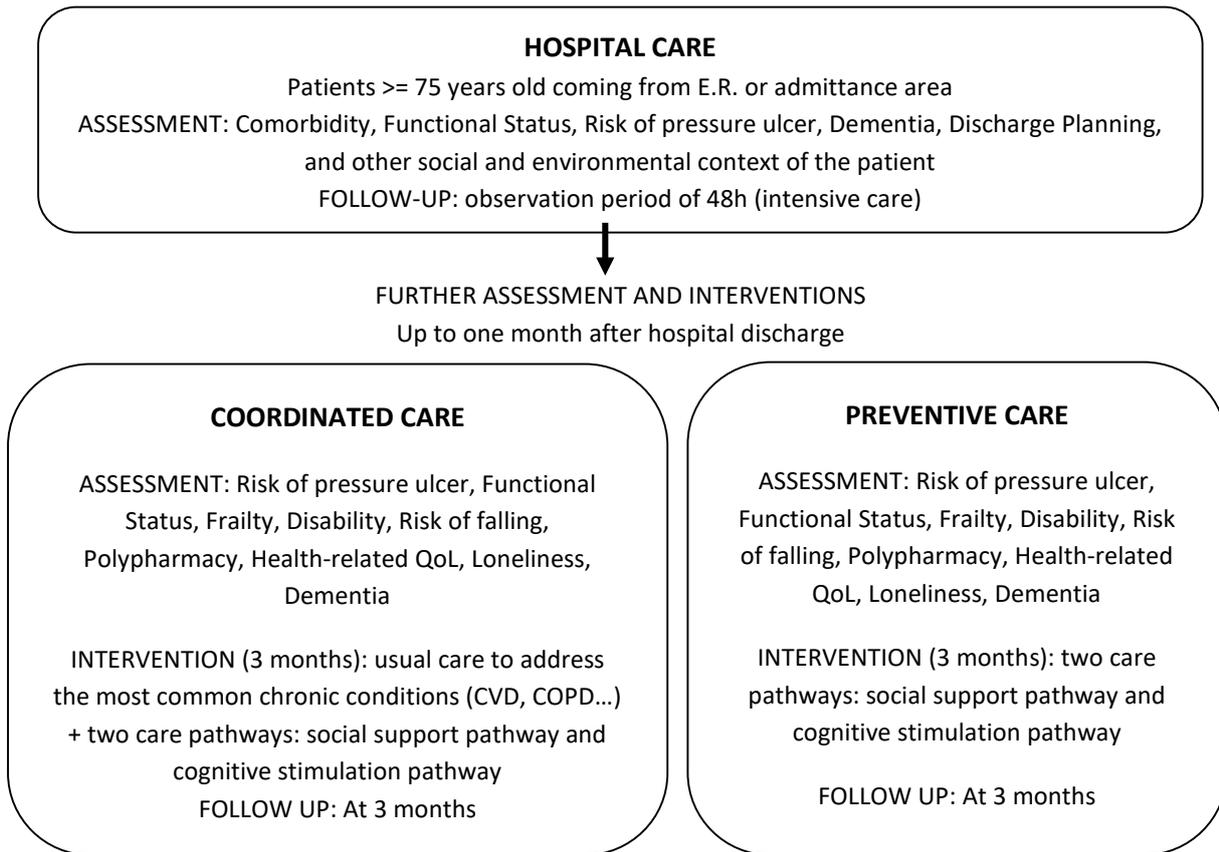


Source: Michael Marzoug, Management Consultant
 NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society

The first three aspects of coordinated care –access to care, evaluation and diagnostic– are provided as part of the APPCARE Hospital Care Model (explained in D7.1).

After patient dismissal and based on the hospital care assessment, professionals suggest which intervention –Coordinated Care or Preventive Care – is the most convenient for each participant. Both coordinated and preventive care include care plans/education and post-care/follow-up as key aspects.

The following chart depicts the context-adaptation of the APPCARE Model, including Hospital, Coordinated and Preventive Care.



After hospital discharge, a further comprehensive assessment was conducted to all participants in order to identify other care needs, apart from the medical ones assessed at the Hospital Care phase. These other care needs included: frailty, disability, risk of falling, polypharmacy, health-related quality of life, loneliness and dementia.

INCLUSION CRITERIA: According to the results of the comprehensive assessment, participants were referred to the Coordinated Care Model when score high in:

- Loneliness → De Jong Gierveld loneliness scale > 2
- Moderate cognitive impairment → SPMSQ 5-7 errors

The Coordinated Care Model was intended to coordinate the usual medical care provided to each participant in order to address their chronic conditions and other medical needs with other care pathways based on psychological and social aspects of care. The coordination between medical and psychosocial aspects ensures a holistic care.

The care pathways that composed the Coordinated Care Model in the Valencia pilot were: the social support pathway and the cognitive stimulation pathway. Both care pathways were designed by experts in the frame of the APPCARE project. Both Coordinated Care Model pathways had a duration of 3 months; after which participants were follow-up using the same comprehensive assessment as after hospital discharge.

Social Support Pathway

The Social Support Pathway was designed with the objective to improve APPCARE participants’ social needs and loneliness feelings. The professionals in charge of this pathway were social workers.

The objective of the Social Support pathway was to promote social participation among those participants assessed as having unmet social needs and/or loneliness. To this aim a motivational approach (Prochaska and DiClemente, 1984³) was followed. The motivational approach consisted of an initial motivational interview with the participant in which a change plan was negotiated in a collaborative way between the professional and the participant. 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 participants 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 participant 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 participant 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 participant 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.

Cognitive Stimulation Pathway

The Cognitive Stimulation Pathway was designed with the objective to enhance participants' cognitive function through attention and memory training. Participants assessed as suffering moderate cognitive impairment were referred to this pathway. A person living with dementia will require more and more care as their condition progresses and worsens. However, 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 middle stage moderate symptoms for a little longer.

To this aim, a specific workbook was designed including different types exercise: brain games, mandala coloring, 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.

The professionals in charge of this pathway were psychologists, who also conducted an extra assessment to those participants included in this pathway: The Mini Mental State Examination (MMSE) at the beginning and after the intervention.

2.4 Coordinated Care Model - Rotterdam adaptation

The coordinated 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

³ Prochaska, J.O. & DiClemente, C.C. (1984). *The Transtheoretical Approach: Crossing Traditional Boundaries of Therapy*. Dow Jones Irwin, Homewood, IL.

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.

INCLUSION CRITERIA: Patients \geq 70 years already assessed according to the APPCARE hospital care model.

The care pathways that composed the Coordinated Care Model in the Rotterdam pilot were:

- **Follow-up by primary health care centers**
- Clinical pathways targeted at fall risk, appropriate medication use, loneliness and/or frailty which have been developed in agreement to existing guidelines:
 - **fall prevention actions**; recommended evidence-based interventions were home-based exercise programmes, group exercise programmes and multifactorial assessment and intervention programmes,
 - **actions addressing polypharmacy** (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,
 - **actions addressing loneliness**; recommended evidence-based interventions were social activities and/or support within a group format, and
- **Geriatric clinical follow up in the hospital** between 1 and 6 months on indication and in accordance with the existing guidelines.

A patient may have completed one or more pathways simultaneously. The care pathways were based on existing care pathways and each pathway had a duration of 6 months.

2.5 Assessment to be performed

TREVISO - COORDINATED CARE MODEL ASSESSMENT

In Treviso pilot site, those participants included in the Coordinated Care Model were followed up for dementia, functional status and pressure ulcer, as shows the following table. These variables were assessed at 1 month and 3 months after Hospital Care, and they were measured at outpatient clinics or at home care settings.

VARIABLE	MEASURE
Dementia	SPMSQ
Functional Status	BARTHEL INDEX
Pressure ulcer	BRADEN

VALENCIA - COORDINATED CARE MODEL ASSESSMENT

In the Valencia pilot site, those participants included in the Coordinated Care Model were followed up with the medical variables included in the following table. These medical variables were also assessed as part of the Hospital Care Model together with other medical variables that composed the Comprehensive Geriatric Assessment.

MEDICAL VARIABLE	MEASURE
Functional Status	Barthel Index
Risk of pressure ulcer	Braden Scale

Dementia	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)

EXTRA VARIABLES	MEASURE
Received care	<ul style="list-style-type: none"> - Professional help in household work (Yes/No); N° of weeks - Professional help in personal care (Yes/No); N° of weeks - N° visits to healthcare professionals (GP or specialist) - N° visits to emergency room - Hospitalization (Yes/No); N° of days
Polypharmacy	Medication Risk Questionnaire (MRQ-10)
Frailty	Tilburg Frailty Index
Fear and Risk of falling	Falls Self-efficacy Scale (FES-I)
	Questions: <ul style="list-style-type: none"> - Did you fall in the past 12 months? - Are you afraid of falling?
Disability	Groningen Activity Restriction Scale (GARS)
Health-related QoL	SF-12v2 Health Survey
Loneliness	Jong Giervel (6 item)
Distress	BSI-18
Social support	Community Support Questionnaire (Gracia & Herrero, 2006)
Living Standards	Living Standards Capabilities for Elders (LSCAPE)
Other personal details	<ul style="list-style-type: none"> - Born country; Parents born country - Educational attainment - Marital status - Household composition - Source of income and approx. Income - Religion

ROTTERDAM - COORDINATED CARE MODEL ASSESSMENT

The Rotterdam pilot site, included as part of the Coordinated Care Model assessment those routine medical measurements integrated in the routine care:

MEDICAL VARIABLE	MEASURES
Severity of disease	HALM's CRITERIA
Comorbidity	CIRS
Delirium	Clinical judgement (using CAM)
Functional Status	BARTHEL INDEX
Dementia	MMSE
Risk of pressure ulcer	BRADEN
Dementia	SPMSQ

At 6 months after discharge a Patient Questionnaire was provided to monitor whether the coordinated and preventive care models were applied as intended and to monitor how the patient was doing. The same follow-up questionnaire was used in the case of the coordinated and preventive care modules. The questionnaire concerns bio-psycho-social and environmental context after 6 months:

VARIABLES in Patient Questionnaire (follow-up)	MEASURES in Patient Questionnaire (follow-up)
Living condition after 6 months	Alone, home-assisted by relatives or informal caregivers, homecare assistance with formal care givers, nursing home
Demographic and socio-cultural context	Only regarding changes
Frailty	Tilburg Frailty Index (TFI); and SHARE study 4 items
Disability via IADL and ADL	Groningen Activity Restriction Scale (GARS)
Use of aids	Question: Do you use any of the following? <ul style="list-style-type: none"> - A cane or walking stick - A Zimmer frame or walker - A manual wheelchair - A buggy or scooter - Special eating utensils - A personal emergency alarm - A hearing device - A pair of glasses
Physical activity and limitations	SHARE study FI and ES question: How often do you engage in activities that require a low or moderate level of energy such as gardening, cleaning the car, or doing a walk? GALI single item: For the past six months at least, to what extent have you been limited because of a health problem in activities people usually do?
Fear and Risk of falling	Falls Self-efficacy Scale (FES-I) Questions: <ul style="list-style-type: none"> - Did you fall in the past 12 months? - Are you afraid of falling?
Co-morbid health conditions	Question: Has a doctor ever told you that you had one or more of these conditions? <ul style="list-style-type: none"> - A heart attack including myocardial infarction or coronary. Thrombosis or any other heart problem including congestive heart failure - High blood pressure or hypertension - High blood cholesterol - A stroke or cerebral vascular disease - Diabetes or high blood sugar - Chronic lung disease such as chronic bronchitis or emphysema - Asthma - Arthritis, including osteoarthritis, or rheumatism - Osteoporosis - Cancer or malignant tumor, including leukemia or lymphoma, but excluding minor skin cancers - Stomach or duodenal ulcer, peptic ulcer - Parkinson disease - Cataracts - Hip fracture or femoral fracture - Other conditions, not yet mentioned

Polypharmacy	Medication Risk Questionnaire (MRQ-10)
Healthy life styles (smoking; alcohol use; BMI)	AUDIT C (alcohol)
	Questions on smoking: - Do you smoke at the present time? - On average, how many cigarettes, cigars, cigarillos or pipes do you smoke?
	Questions on BMI: - How tall are you? - Approximately how much do you weigh?
Loneliness	Jong Gierveld 6 item
Health-related QoL	SF-12v2 Health Survey
Adherence to proposed care/prevention pathway and user experiences	Questions: - What is your satisfaction with the care during the past 6 months? - What is your satisfaction with the health questionnaire and assessment (check-up)? - On a scale from 0-10 how satisfied were you with the assessment and/or care you received?

3. APPCARE coordinated care model results

3.1 Treviso pilot site

In the Treviso area, the planning of taking charge of the post-hospital path began during the hospital stay, starting from the variation shown between the premorbid state (2 weeks before admission) and the state at the time of discharge and therefore from the changes induced by the pathological condition which led to hospitalization. The variation of the functional status and the surveys of socio-environmental data guide a hospital team in close combination with geriatric specialist to plan discharge and to place the patient in the setting most appropriate to the new condition according to CGA assessment, as required by APPCARE, regarding the premorbid state. This activity is also carried out through interviews with the patient's caregiver and in compliance, if possible, with the patient's wishes. We consider the results of this activity the resignation:

- Activation of integrated home care for different clinical and functional conditions compared to premorbid.
- Activation of first entry into Assisted Living Facilities (RSA) - nursing homes.
- Activation of the Municipal Social Services both for home management or for access to the RSA/nursing homes with the financial support of the Municipality.
- Activation of temporary accesses to Intermediate Structures with planning of the planned route after discharge from the Intermediate Structure (return to one's home or definitive institutionalization).
- Activation of Hospice or Palliative Care pathways.

This activity of identifying the needs takes place on the totality of the patients and the paths after discharge are activated by the dedicated team for patients (26%) that require a destination or mode different from those in place before hospitalization.

	Total Participants assessed (hospital and coordinated care)	Participants with criteria for modifying the care setting inclusion criteria	Participants included
N	2500	660	660
%		26,40% of the total sample	100% of those meeting inclusion criteria

At discharge, the patient is assigned to the intended setting. The extra-hospital structures work with the usual protocols in place in the care setting identified for the individual patient but based on the findings provided by the Geriatric Team at the time of discharge, according to the APPCARE model.

The APPCARE follow up assessment at 1 months was offered to all recruited patients (2.500,00), with the exception of end-life patients addressed to hospice and palliative care (1% of the total sample) for ethical reasons. Almost the totality of the remaining patients agreed to participate and had been assessed. Unfortunately, the foreseen assessment at month 3 was not activated due to the following reasons:

- Complexity of patients: although selected, +75 patients are very fragile patients with clinical and functional conditions that might change very quickly and sometimes unexpectedly, and with a significant mortality rate at 6 months. In case of worsening of clinical status, it happened quite often that patients did not attend scheduled outpatients visits.
- 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 assessments and was particularly true for homecare patients, where the collaboration among different services is essential.

Generally speaking, the APPCARE continuity of care experimentation helped professionals to focus on weaknesses in the integrated care existing pathways and enhance their collaboration to find out patient-centered solutions to overcome them. It also smoothed the communication flow on health status and needs of patients.

3.2 Valencia pilot site

Social Support Pathway

A total of 61 participants 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 Participants assessed (hospital + coordinated care)	Participants meeting inclusion criteria	Participants included
N	152	61	33
%		40.4% of the total sample	50.8% of those meeting inclusion criteria

Cognitive Stimulation Pathway

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

	Total Participants assessed (hospital + coordinated care)	Participants meeting inclusion criteria	Participants included
N	152	56	31
%		36.8% of the total sample	55.4% of those meeting inclusion criteria

3.3 Rotterdam pilot site

The coordinated care model was offered to all patients included in the hospital care model, but only 57,1% agreed to participate. Of those:

- 94.7% received follow-up by primary health care centers.
- 21.6% entered the clinical pathway targeted at fall risk, 88.3% the clinical pathway targeted at appropriate medication use and 16.9% the pathway targeted at loneliness.
- 73.6% received a geriatric clinical follow up in the hospital between 1 and 6 months on indication and in accordance with the existing guidelines.

	Total Participants assessed (hospital care)	Participants meeting inclusion criteria	Participants included
N	137	137	79
%		100% of the total sample	57,7% agreed to participate

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).

At discharge, clinical pathways which have been developed in agreement to existing guidelines by experts in the frame of the APPCARE project were discussed with the patient and his/her family and informal care givers and (provided permission by the patient) shared with the patient's general physician. The share of patients enrolling in at least one clinical pathway was relatively low. This may be because the routine care in the Netherlands is perceived to be high. After hospital admission, a patient may be indicated to receive support at a revalidation center (inpatient or out-patient) or may be admitted to a nursing home (medical or psychogeriatric). Approximately 50% of the patients admitted to the ward of Geriatric Medicine 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.

In addition to the follow up by the general practitioner, 73.6% 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.

The original research protocol did not regard a comparative group. In addition to the patients recruited from the geriatric ward of 4, we recruited a control group from a random 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). Similar to the patients receiving the Hospital Care Model, the bio-psycho-social and environmental context of the citizens in the control group were assessed by a questionnaire at baseline and 6 months later. This way, demographic, social, psychological and care characteristics may be compared between both groups, as well as perceptions and satisfaction with existing care (coordinated and preventive). This comparison provides valuable information about the medical, psychological and social predictors of hospitalization.

	Total Participants assessed (control group)	Participants meeting inclusion criteria	Participants included
N	865	865	762
%	100.0	100.0 of the total sample	88.1 agreed to participate

The Coordinated and Preventive Care Models were offered to all patients included in the control group, but only 88.1% (n=762) agreed to participate. Of those, 77.8% received follow-up by primary health care centers and 12.9% received a geriatric clinical follow up in the hospital between 1 and 6 months on indication and in accordance with the existing guidelines. The clinical pathways were not offered to participants in the control sample.

4. APPCARE coordinated care preliminary findings

The APPCCARE Coordinated Care Model has been satisfactorily implemented in the three pilot sites: Treviso, Valencia and Rotterdam. The Coordinated Care Model was embedded as part of the APPCARE Model and offered a coordination model for those care provides involved in some extent in the APPCARE project. This coordination was intended to ensure that each APPCARE project participant received the appropriate care.

In the APPCARE project each pilot site had focused on different aspects of coordinated care, involving different professionals at different level. Thus, the Coordination Care Model was adapted to each particular context and to its population characteristics. In each pilot site, after Hospital Care, participants were referred to Coordinated Care Model or to the Preventive Care Model. In APPCARE project a total of 2789 participants

were assessed as part of the Coordinated Care Model. Of those, 858 met the inclusion criteria to be included in the coordinated care phase. And a total of 772 were included.

	Total Participants assessed (hospital and coordinated care)	Participants meeting inclusion criteria	Participants included
N Treviso	2500	660	660
N Valencia	152	61	33
N Rotterdam	137	137	79
N total	2789	858	772
%		30.8% of the total sample	90.0% of those meeting inclusion criteria