

APPLICATION MANUAL

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FOREWORD

The term "**Integrated Care**" is often rendered in Greek as "**Services of multidisciplinary, ongoing and patient-focused care**".

Outsiders mean care services provided by trusted, integrated networks of organisations, people and technologies, resulting both in coordination and collaboration in the delivery of care both horizontally (between the therapists involved) and vertically (between levels of care).

In practice we can describe it as "**holistic medical-social, ongoing and sustainable care, always focused on the individual needs, choices and values of each citizen/patient**".

Environment

The area of the Integrated Care paradigm is where the health and social care system is particularly challenged. It is particularly the long and chronic care of old age with its multiple co-morbidities, such as patients with:

- two or more chronic diseases (diabetes, hypertension, heart and respiratory failure, arthritis, depression, reduced mobility and social participation, etc.)
- multiple medications (more than 5 different substances)
- involvement of many formal and informal medical and paramedical practitioners and care providers.

The result is generally overuse of health and social care services, inappropriate and often harmful polypharmacy, as well as the absorption of a huge amount of resources (> 80%). The recent pandemic, with the above populations as the main victims, has threatened to exhaust the care systems of many countries, which is why it has become **both an inevitable necessity and a window of opportunity** for widespread implementation of 'Integrated Care'.

The features of Integrated Care

Two are the dominant characteristics. The collective and collaborative approach by all staff involved, focusing on the needs of each patient, as well as the "smart", personalised, use of today's digital technologies that can multiply the effectiveness of the therapists (ICT enabled Care).

More specifically:

- The adoption of the "**proactive patient and person/centered care**" model of care delivery, which puts the "**empowered**" patient at the center and removes the fragmentation of care, with its multiple horizontal and vertical barriers of the uncoordinated hospital centered system of today.
- The widespread application of new technology-enabled "**smart health**" for the transfer of multiple tertiary services **from hospital to home based care** and the application of ever-evolving Artificial Intelligence (AI) for effective collaboration, prevention, personalisation and optimisation of care (**patients' risk stratification, personalised care, data driven decision making** etc).

In practice, they mean moving away from the current model of hospital-centred, uncoordinated and intermittent care to a holistic care, constantly close to the patient, wherever and whenever they need it. This type of care will be "intelligent and dynamically adaptive", so that it focuses each time on the specific needs and choices of each patient, but at the same time mobilises and exploits the potential of the patient's therapeutic environment.

The adoption of integrated care practices is at the heart of the service delivery model in the era of the 4th industrial revolution (Health 4.0), where the main emphasis is on:

- **the implementation of web based, shared medical record systems**
- **the formally assigned responsibility for care coordination (Case Manager)**
- **a type of care that focuses on preventing disease flare-ups (tertiary prevention)**
- **changing the structure of financial incentives towards a system that rewards high quality care**

A long time ago, the Municipality of Athens first recognised the critical role and the importance of the participation of the Social Sector in the successful and effective resolution of the huge medical-social-economic problem of the elderly with their chronic co-morbidities.

For this reason, since 2014, the Municipality of Athens has:

- actively participated in the European Commission's major pan-European Alliance Initiative on Active and Healthy Ageing "**European Innovation Partnership for Active and Healthy Ageing**" (**EIP on AHA**), which brought together all stakeholders and sectors.
- secured the necessary resources and upgraded the municipal surgeries to **one-stop walk-in clinics**, with the complex range of multiple medical and paramedical specialties necessary for this purpose.

In the framework of the above European initiative, in collaboration with the University of Athens and the "Greek Network EIP on AHA", submitted in 2019 its plans for "Integrated Care" to the Reference Sites Group of the Initiative, where it received an honorary distinction (3* RS), thus ensuring top trans-European collaborations that will be used in the present project for the necessary transfer of know-how.

Thus, as a consequence of the participation of the Medical-Social Sector of the HA in the present implementation of Integrated Care in the Multi-Purpose Clinics, the followings are expected:

- **decentralised and easily accessible services close to the patient**
- **better quality of life and social participation**
- **increased sense of security with appropriate guidance at the right time and place**
- **fewer hospitalisations and visits to regular and emergency departments**
- **a significant reduction in direct, indirect and social costs for patients.**

INITIAL ADVISORY BOARDS

A. European

- **Prof. Anne Hendry:** Director IFICs Hub in Scotland, Honorary Professor, University of the West of Scotland, Honorary Secretary, British Geriatrics Society.



- **Prof. Dr. Regina Roller-Wirnsberger:** Medical University of Graz.



- **Prof. Madalena Ilario:** University of Naples Federico II, Chair, RSCN



- **Jacob Hofdijk,** Special Adviser at CQT Zorg & Gezondheid, The Hague, South Holland, Netherlands



- **Dr Toni Dedeu** Senior Advisor on Integrated Primary Health Care, WHO Regional Office for Europe at WHO European Centre for Primary Health Care



- **Prof. Josep Roca** Hospital Clinic of Barcelona



- **Dr. Albert Alonso MD** Hospital Clinic of Barcelona, Former Chair RSCN



- **Prof. Nick Guldemond** Healthcare & Public Health, The Hague



- **George Crooks OBE,** Chief Executive Officer at Digital Health and Care Institute Digital Health and Care Institute, Glasgow, =Scotland, United Kingdom



- **Prof. Jean Bousquet,** Prof. Universitaire de Montpellier, France



B. National

- **George Chrousos:** Professor Emeritus of Endocrinology, Member of the Academy of Athens
- **John Lekakis:** Professor Emeritus of Cardiology, Chair, Greek Society of Digital Medicine
- **Nikos Sifakas:** Professor Emeritus of Respiratory Medicine, Former President, European Respiratory Society
- **George Baltopoulos:** Professor Emeritus of Intensive Care, Chair, Illness Studies Greek Institute
- **Christos Savopoulos:** Prof. Of Internal Medicine, Gen. Sec., Greek Network of Innovation for Active and Healthy Ageing
- **Miltiadis Nektarios:** Prof. of Insurance Science, University of Peiraias
- **Dimitris Koutsouris:** Prof. Of Biomedical Engineering NTUA
- **Ilias Kyriopoulos:** Ass. Prof. in the Department of Health Policy at LSE
- **Dimitris Kontopidis:** Patient Advocate, Greek patients Association, social entrepreneur



Critical



INTRODUCTION

1.1 General part

The current management of the growing and highly vulnerable population of older people suffering from multimorbidities, whilst absorbing a huge proportion of health and social care resources (>80%), results in poor quality of life for patients, high congestion of services, as well as high indirect and social costs for those who care for them (1). **Kaiser Permanente**, an American integrated care management consortium, introduced the concept of stratifying and identifying the population of patients with chronic diseases according to their different health needs. Most patients with chronic conditions manage their illnesses with primary care support, as usual. This is the first tier (green). At the second level (yellow colour), a disease-specific management programme is needed, and finally in the case of complex multimorbid patients (level 3-red colour), a broader coordination of care is needed with the help of a case manager(2)

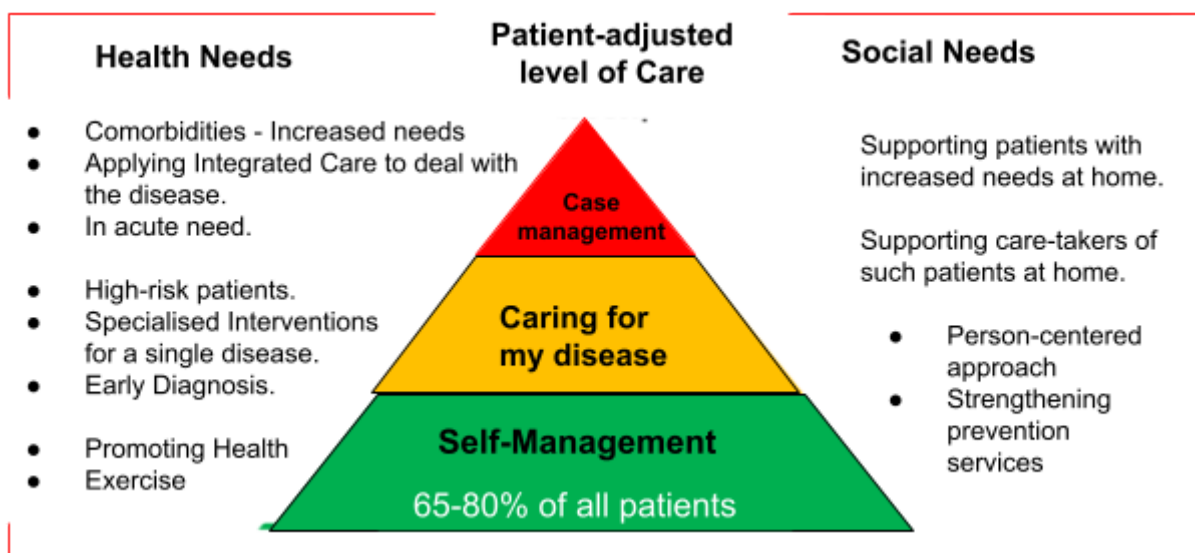


Figure 1. Strategies for implementing integrated care according to the risk level, health needs and social health needs of chronic patients (the Kaiser triangle).

A strategic role in addressing these challenges has been illustrated over the last 15-20 years by "**Integrated Care**", which is becoming applicable in clinical practice thanks to new

Information and Communication Technologies (ICT/ICT). This enables radical innovative approaches to the delivery of health and social care services, such as the following (1,3):

- **new attitudes, cultures, roles, values and partnerships**
- **changing health services from a hospital-centred approach to a primary (community and home based), person-centred care approach**
- **shift from curative to proactive preventive care**
- **horizontal and vertical coordination in health and social care services**
- **new business models and funding programmes**

The Municipality of Athens, responsibly realizing the importance and role of the participation of the Social Sector in addressing the enormous medical, social and economic problems that old age entails, has for years sought the "current" European answers. Thus, since 2014 it has been participating in the major European Initiative for Healthy and Active Ageing "**European Innovation Partnership for Active and Healthy Ageing**" (**EIP on AHA**), in collaboration (MoU) with the "Greek Network EIP on AHA", with the main objectives:

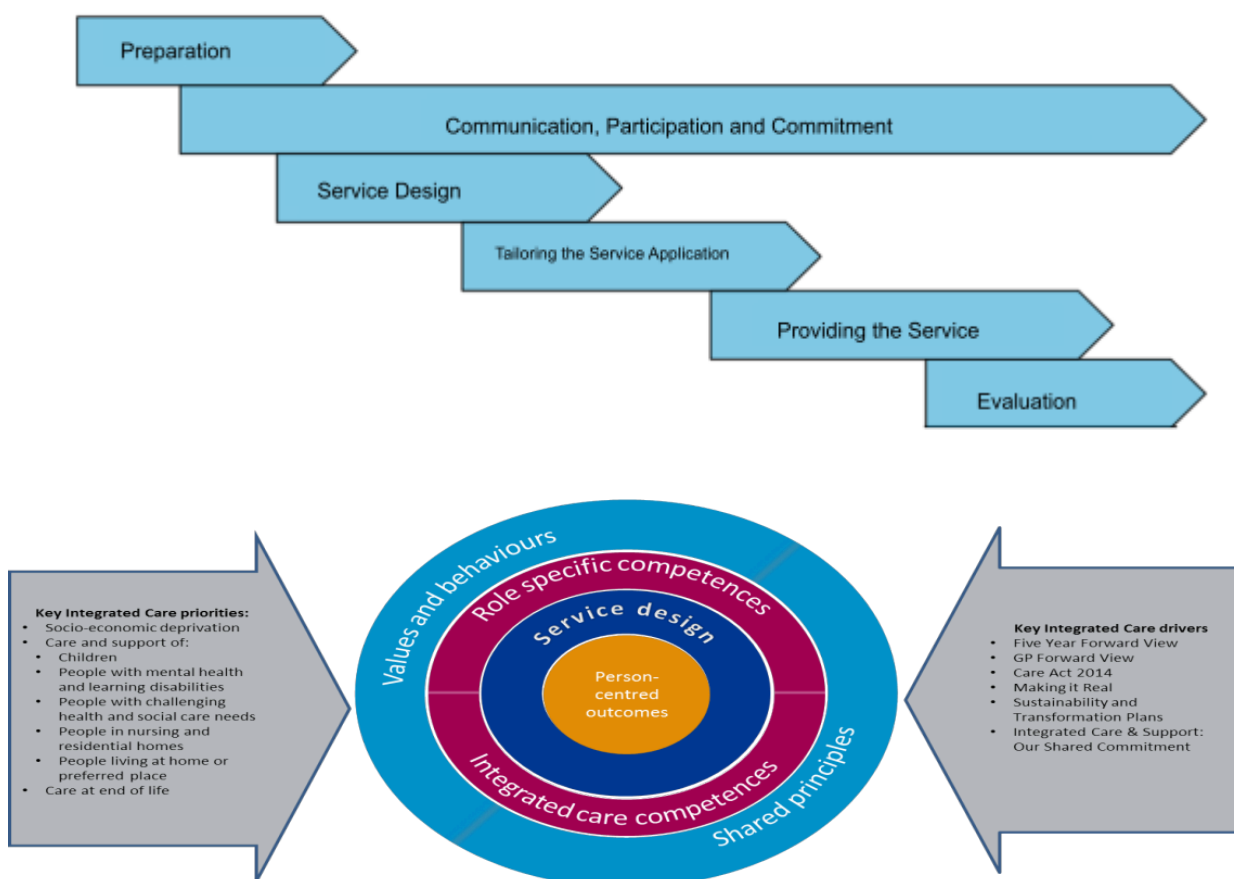
Accordingly, the planning and organization for the provision of new chronic care services by the Municipal Clinics of the Municipality of Athens will be supported by:

- **improving the health and quality of life of the elderly of the Municipality by developing new innovative services, in the context of the new modern concept and upgraded operation of the Municipal Surgeries, as multifunctional centres for the integration of health and social care**
- **optimal efficiency and sustainability of services, which is now the international demand in the field of modern health and social care.**

- 1) the "**Chronic Care Model**" and the "Framework for integrated person-centred health services" proposed by the WHO (3). Particular emphasis is placed on using ICTs to put people and communities at the centre of health systems, and to enable patients

themselves to take an active role in addressing health problems rather than passively adopting the curative care model.

- 2) **the NICE recommendations** for the management of patients with multiple morbidity (2016-17), formally recognising polymorbidity as a major clinical issue and the need to develop guidelines (4-6). These recommendations have thoroughly outlined quality standards (identification, assessment of patient values, priorities and goals, care coordination, review of medication and other treatments) and the corresponding tools to achieve them.
- 3) the socially oriented **recommendations of the NHS Integrated Care Framework (Health Education Board)** for the preparation, planning and programming of the Service, as illustrated in the figures below:



- 4) the **transfer of clinical expertise from pioneering European Centres and Organisations of the initiative (EIP on AHA)**, as well as the corresponding experience

of the Greek Network EIP on AHA, from the actions of the Initiative (7,8), and the corresponding **Joint Actions CHRODIS and CHRODIS+ - (2013 - 2020)** (9-11), which has represented our country by decisions of the Ministry of Health.

1.2 "Integrated Medical and Social Care (Integrated Care)"

1.2.1 Basic principles

Integrated Care is an approach to healthcare delivery that aims to coordinate different services to provide seamless, person-centred care across different levels and settings of the health and social care system. **It focuses on improving the quality, effectiveness and efficiency of care, ensuring that medical, mental health and social services are aligned and delivered in a coherent way.** Integrated care is particularly beneficial for people with complex health needs, such as the elderly, those with chronic conditions, and people who need both medical and social support.

Its main goal is to eliminate gaps in providing holistic care, improve communication between care providers, and ensure that "empowered" patients receive continuous, holistic care, rather than fragmented services from different providers or facilities. The approach underlines the collaboration among health care professionals, including physicians, nurses, psychologists, social workers, occupational therapists, and others, with a focus on improving patient outcomes, satisfaction, and overall well being.

The basic principles governing the Integrated Care service are as follows (12):

1. **Integrated services across the whole spectrum of care:**
 - Cooperation between health and social actors
 - Access to continuing care with multiple access points
 - Focus on wellbeing, health promotion and primary care
2. **Patient focus:**
 - Patient-centred philosophy or alternatively focus on the needs of patients
 - Participation and involvement of patients and/or their families in decision-making

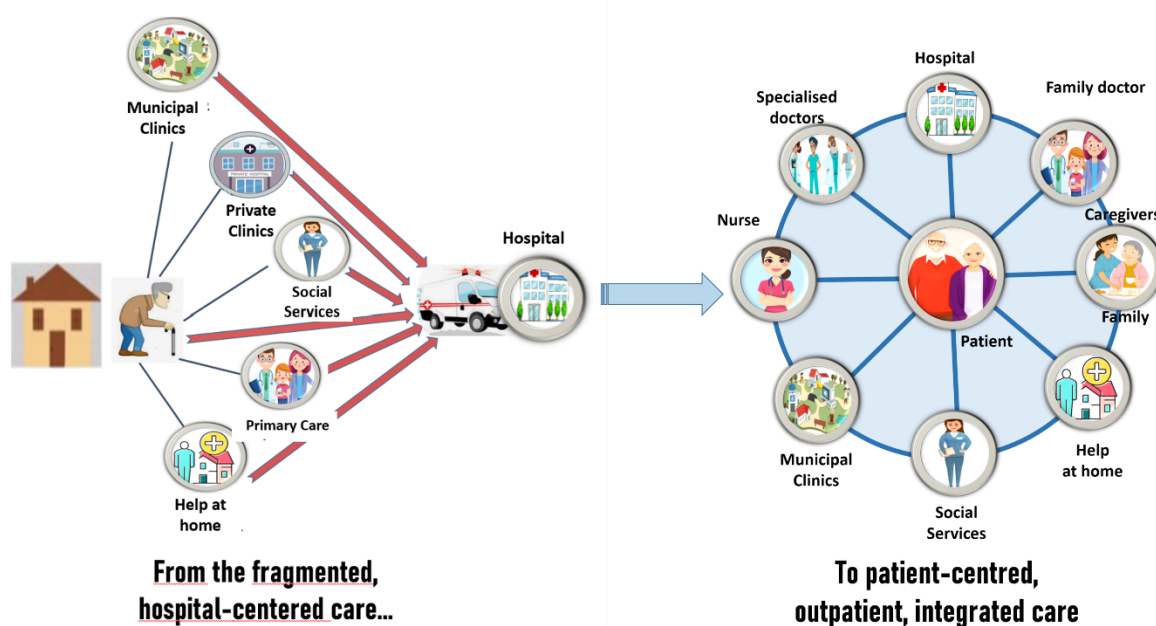
- Population-based needs assessment with a focus on specific populations
3. **Standardised care delivery through multidisciplinary teams:**
 - Interdisciplinary teams working across the whole spectrum of ongoing patient care
 - Use of clinical guidelines and protocols developed by health care providers based on current evidence-based knowledge.
 4. **Measuring the performance of the service:** evaluating the process of integration of health services and measuring the results (indicators) concerning the system of operation of the service, health professionals and patients.
 5. **Appropriate information and communication technology:** collecting data through electronic patient record systems to effectively monitor service use and outcomes.
 6. **Organisational culture and leadership:** strong leadership shares a common vision for an integrated healthcare delivery system.
 7. **Strong governance structure:** implement a strong governance structure that includes representatives of the community, patients and health professionals.

1.2.2 The vision of the New Service in the Municipal Clinics

- **Holistic multidisciplinary, preventive and continuing care**
- **Ease of accessibility of services.**
- **Individualized approach and treatment of patients based on their specific needs, personal beliefs and values.**
- **Behavioural change, engagement, education and empowerment of patients**
- **Extensive transfer of services from hospitals and/or care homes to the home and neighbourhood of the sufferer.**
- **Horizontal and vertical coordination between nodes, professionals and levels of care with early prevention and early treatment of relapses/complications, functional decline and use of care services (inpatient hospitalisations, emergency and regular clinic visits, etc.**
- **Care guided by the patient's medical data**
- **Raising awareness in society and developing new horizontal alliances**
- **Developing new competencies and skills of relevant staff**
- **Sustainability of the system with new methods and tools for financing the services provided, with an emphasis on value rather than volume.**

The current context is presented as extremely favourable for these initiatives in our country, since they focus on and implement the following generally accepted structural changes that the care system needs:

- a substantial qualitative upgrade of primary and home care, with structured roles of interface and cooperation with tertiary care and all formal and informal care providers involved.
- an upgrade to the day-to-day clinical practice of multi-specialty chronic care, with innovative, technology-enabled services that can promote prevention, accessibility, personalization and system efficiency in order to enable the **necessary changes in the current health- and socioeconomic care model**
- a chronic care service **delivery** that enables the requested **"transition"** described in the following figure.



1.2.3 Expected benefits of the New Service for the Municipality and the Citizens of Athens

- Providing state-of-the-art integrated care to patients by continuous and close collaboration of a strengthened primary and social care with tertiary care

- Improving quality of life, independence and social participation of patients
- Reduction in the number of visits to regular and emergency clinics, as well as a significant reduction in inpatient hospitalizations
- Significant reduction in the direct, indirect and social costs of caring for the highly vulnerable population of these patients/citizens
- Sustainability of the care system, especially in the post-COVID era.
- Validation in our reality of the current reform proposals for innovative care for chronic patients with multimorbidities (Integrated, continued, person and patient-centered)
- Validation of the role and practical relevance of AI and ML tools for the optimization of patient treatment (risk stratification, personalized care etc.), as well as for making "smart" decisions in the organization of care delivery.
- Improvement of the quality and coordination of the services already provided by the Municipal Surgeries or possibly by other services of the Municipality (home help etc.).
- Leverage existing partnerships with authoritative and leading EU centres to promote modern models of care and promote the Municipality as an authoritative Adoption site of the respective innovative EC policies.
- Promotion of the AO as a national node of international organizations (RSCN / Reference Sites Collaborative Network and IFIC / international Foundation of Integrated Care), with the corresponding benefits in attracting expertise and resources.

2. MUNICIPAL SURGERIES: THE PLACE WHERE THE SERVICES ARE PROVIDED



1st Municipal Surgery - "Kalfopouleio"
Solonos str. 78



2nd Municipal Surgery - Neos Kosmos
Fanosthenous and Frederick Smith str.



Petralona Surgery
Piraeus str 108, 1st Floor



6th Municipal Surgery - Kipseli
Hanion str. 4b Complex

3. THE STAFF

3.1 The Interdisciplinary Team

In each Municipal Surgery an Interdisciplinary Team of the Programme will be appointed by the Contractor and will consist of:

- A doctor with increased and specialised experience
- A second doctor with special experience (General Practitioner, Physician, Physician)
- A nurse with higher education and specific experience (Case Manager)
- An additional paramedical associate with special experience (psychologist, social worker, physiotherapist, etc.), according to the specific needs of the patient groups, in order to ensure a holistic approach (comprehensive care)

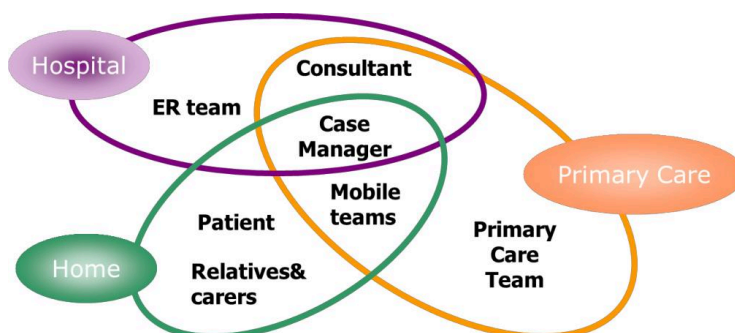
Potentially, corresponding specialties of staff already serving in the Clinics (Doctors, Nurses, Social Workers, Physiotherapists, Psychologists or Health Visitors) will have the opportunity to participate in the provision of the new Service (Hands on training) for the purpose of training them in it. This has been agreed with the Management of the Municipal Clinics during the preparatory meetings, with the main objective of transferring know-how, but also the sustainability of the Service after the completion of the Subproject.

3.2 The Case Manager (the new approach to chronic care)

The Case Manager is an innovative intervention in the system of chronic care, which meets the current great need for its organization and coordination, due to the volume of its involvement with a high number of therapists, nursing institutions, providers, insurance providers, etc. They are - in a way - the "modern substitute" of the former devoted relative, the patient's guardian-angel (usually a daughter-in-law or a son-in-law). He/she **had an objective overall view of the patient**, since he/she dealt exclusively with the patient in relation to all their therapists and medical appointments, thus coordinating and prioritising all the examinations, opinions and mutual information.

In the USA the institution dates back many years, becoming an official discipline with full professional rights, while in Europe it is mainly established in the European North. The EU has already issued guidelines, recommendations and quality criteria (qualifications) for its widespread application (9-11).

This is usually a highly qualified paramedic (nurse or other), who communicates with all those involved (people and institutions) in the treatment of the patient, always keeping in touch with him/her, making use of the great potential of



today's technologies (the modern descendant, guardian - angel of the patient, in the Health 4.0 Era of the Electronic Health Record, of constant on and off line communication with everyone and of Artificial Intelligence).

Thus, the Case Manager (Nurse) assigned to each Municipal Clinic will:

- **have the most regular and direct communication with patients, monitoring and supporting them continuously**
- **assesses all aspects and needs regarding the health-care provided to the patients, including their social needs**
- **collaborate with all doctors, nurses and other healthcare professionals who manage patients' individual chronic problems or those who are involved as caregivers during the patients' hospitalizations**
- **co - create the care plan (*see Tools*) with the patient and his/her family members in collaboration with the Doctors of the programme.**
- **use the digital - technological means that manage medical information and facilitate communication with the patient or any other necessary advisor**
- **coordinate and "empower" the care provided from both primary, secondary and tertiary health professionals and home carers, with continuous and up-to-date information**

4. THE TOOLS

4.1 Recent International/National Guidelines by Disease and for Patients with Multimorbidity

Confirmation of the diagnosis, risk stratification and the formulation of the Care Plan for each patient will be based on the most recent:

1. Greek and International Guidelines per disease such as:
 - the European Society of Cardiology (ESC) guidelines for acute and chronic heart failure of 2021 with the 2023 revision (13,14)
 - the GOLD (Global Initiative for Chronic Obstructive Lung Disease) guidelines for COPD 2024 (15)
 - the GINA (Global Initiative for Asthma) guidelines for Bronchial Asthma 2024 (16)
 - the guidelines of the Hellenic Diabetes Society for Diabetes mellitus of 2024
 - the 2024 ESC guidelines for chronic coronary syndromes (17).
2. International and national guidelines for patients with polymorbidities such as:
 - NICE (National Institute for Health and Care Excellence) (4,18)
 - of the American Geriatrics Society (19)
 - of the Italian Geriatrics Society (20)
 - **and the ESCS (2023) (21).**

4.2 The Personalised Care Plan

Care planning is the process of assessing a person, setting goals and determining how to achieve those goals. The outcome of this process is a written document-the care plan-that guides the delivery of services. The Care Plan in our case will clearly outline the following in a way that is understandable to the patient and their loved ones: (1) the health and social needs of the person with polymorbidity; (2) the support of informal caregivers to meet those needs; (3) the provision of care and services by health care professionals; (4) the allocation of tasks and responsibilities to informal caregivers and professionals; and (5) the scheduling of informal and formal caregivers. The plan will also include information regarding who is the

case manager, who is the first point of contact (the patient or a relative) among informal caregivers, and who will be the primary physician in charge. It is also important to clearly describe to the patient information for him or her and his or her caregiver to manage an emergency situation such as illness of the informal caregiver, breakdown of nursing or medical equipment, or sudden deterioration of the patient's complex condition where hospitalization may be required.

The initial plan will be set up during the patient education phase and will last from 6 weeks to 6 months depending on the stability of the patient's condition. For relatively stable patients, reassessment of the plan by the multidisciplinary team will take place at the end of 6 months, when it will be modified or left unchanged based on the achievement or not of the individualised objectives set at the beginning.

4.3 The WHO ICOPE Screening Tool

The various health conditions associated with losses in endogenous capacity interact at different levels. Hearing loss, for example, is associated with cognitive impairment. Diet enhances the effect of exercise and has a direct impact on increasing muscle mass and strength. These interactions necessitate an integrated approach to monitoring, assessing and managing falls in endogenous fitness.

WHO ICOPE SCREENING TOOL

Priority conditions associated with declines in intrinsic capacity	Tests	Assess fully any domain with a checked circle
COGNITIVE DECLINE	1. Remember three words: flower, door, rice (for example)	
	2. Orientation in time and space: What is the full date today? Where are you now (home, clinic, etc)?	<input type="radio"/> Wrong to either question or does not know
	3. Recalls the three words?	<input type="radio"/> Cannot recall all three words
LIMITED MOBILITY	Chair rise test: Rise from chair five times without using arms. Did the person complete five chair rises within 14 seconds?	<input type="radio"/> No
MALNUTRITION	1. Weight loss: Have you unintentionally lost more than 3 kg over the last three months?	<input type="radio"/> Yes
	2. Appetite loss: Have you experienced loss of appetite?	<input type="radio"/> Yes
VISUAL IMPAIRMENT	Do you have any problems with your eyes: difficulties in seeing far, reading, eye diseases or currently under medical treatment (e.g. diabetes, high blood pressure)?	<input type="radio"/> Yes
HEARING LOSS	Hears whispers (whisper test) or Screening audiometry result is 35 dB or less or Passes automated app-based digits-in-noise test	<input type="radio"/> Fail
DEPRESSIVE SYMPTOMS	Over the past two weeks, have you been bothered by - feeling down, depressed or hopeless?	<input type="radio"/> Yes
	- little interest or pleasure in doing things?	<input type="radio"/> Yes

4.4 Electronic File - Digital Platform

The chronic multimorbidity patient record is primarily a screening tool to ensure that patients seen in the DA's Municipal Clinics during the provision of the service are systematically and comprehensively clinically assessed at each visit and that appropriate scheduled laboratory tests are performed.

The digital platform that will be used is Vida24©, by VIDAVO. It enables the DA to select the functions - modules he/she wishes to have personalized solutions through an automated secure platform that is compliant with the European Directives MDR 2017/745 and EU2016/679 GDPR. Most importantly, it is a proven solution in large-scale applications for the provision of telehealth and telemonitoring services and is available for immediate use.



Through Vida24© the following services / applications will be supported, which are the fundamentals of the service:

- Management of chronic diseases
- Nutrition and physical activity management
- Compliance with medication
- Home monitoring
- Preventive medicine (Tertiary prevention)

The platform is simple and easy to use by users of every background with the main software language being Greek, and is also available in English. The modules that will be customized for the Municipality of Athens are:

- Statistics
- View treatment plans
- Manage and view exam files
- Telemetry

- Teleconferences using video/chat and file sharing
- Messaging
- Notifications
- Prescription (private and through HICC)
- Calendar with interface to google calendar
- Appointment management (closing, conducting)
- Nutrition management
- Physical activity
- Dynamic forms and questionnaires
- References
- User identification using AMKA (via interface with EDIKA)
- Rules - notifications
- Consents - Consent
- Medical history
- Interoperability with third party systems
- Ability to interface with services to identify beneficiaries and exchange data
- Ability to enter health data according to the care plan

The system supports different levels of controlled access for different types of users (physicians, nurses, family members, patients, etc.). The system is accessible via browser from mobile and PC, providing a 100% dynamic and adaptable user interface across all screens and resolutions. Vida24© uses the Role Based Access Control model. In this model a role is responsible to perform a task or has the necessary permissions to access an object. Once the roles and users are defined by the system administrator, they are identified by the use of a username and a personal secret password, which each time they are entered, provide them with secure access to the items they are authorized to access. There is uniformity in user interfaces and software quality assurance measures (CE certificate).

The project will support different user roles. The beneficiary medical record keeping service is supported through the multi-layered, Vida24© platform, which combines a mobile phone application that can be used by health professionals without geographical restrictions.

Vida24© provides a comprehensive medical record with many additional features that meet the project requirements.

Functionalities:

- Registration of demographic data
- Medical history entry (per patient - individual, hereditary, family, chronic diseases, allergies, symptoms, etc.)
- Registration of an appointment with a beneficiary
- Facilitation/automation of information entry (ICD-10 for recording diagnoses etc.)
- Show reminders, notifications
- Classified access
- Ability to interface with services for the identification of beneficiaries and the exchange of data
- Ability to enter advice and dispatch to mobile units

In addition:

- Intangible prescription (HICC)
- E-prescribing privately via personalised prescription pad and notes
- Interface with google calendar
- Video calls
- Messaging
- Appointment management
- Laboratory tests

The platform allows the management of each patient's profile: demographic data, residential data, services received by the patient, medical history (e.g. symptoms, diseases), medical measurements, medical examinations, etc.

- Teleconferences with health professionals
- Automated reminders, alerts and daily activities based on the treatment plan

The healthcare professional can access the patient's medical record where the data mentioned above will be stored. After authorization, the file can be accessed via browser in Vida24© by specific health professionals in order to provide local and remote consultation services.

Specialised software for tablet/mobile

Through the chronic disease patient monitoring application, the Program staff will be able to monitor patients on a daily basis, record their symptoms, perform medical measurements and record laboratory tests such as Blood Tests, Biochemical Tests, Urinalysis, Hormonal Cancer Markers, Imaging through the interconnected devices as well as complete questionnaires defined by the cloud platform by authorized staff and demographic data. The technical security measures ensure compliance as per the GDPR 2016/679 Data Protection Directive, also when the user logs in to the application, there will be a notification regarding the data protection policy (GDPR). The process of logging in to the application is done with username/password.

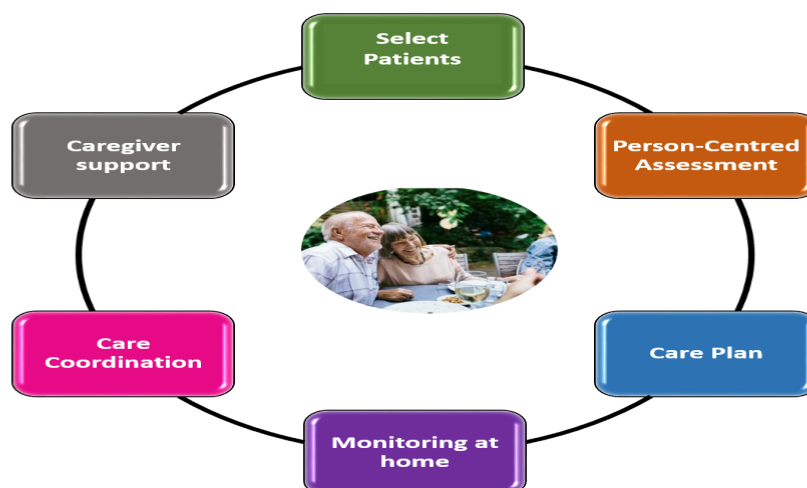
The entry of medical measurements can also be carried out manually, so that there is the possibility of viewing all tests in history form as well as viewing an individual souvenir, the possibility of displaying notifications and information when the values of medical tests are outside the predefined limits. These data can be provided for the possibility of obtaining advice from a medical specialist. As well as the possibility of displaying a treatment plan and goals.

In case the application is offline, data can be stored locally, so that synchronization to the cloud can be performed later when the internet connection is restored.

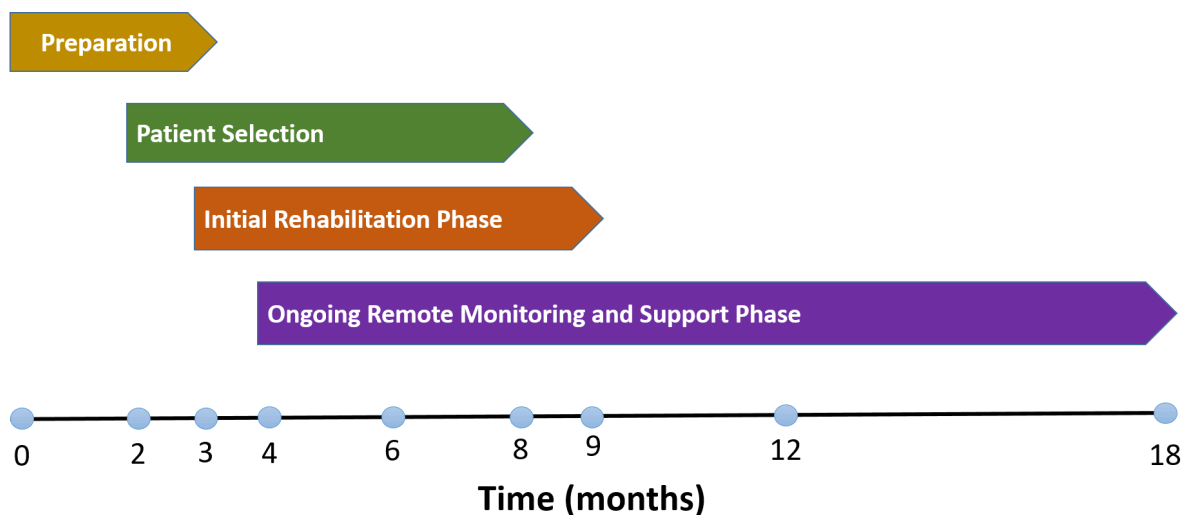
The application offers the ability to view examination history in the form of graphs, view prescriptions with automatic interface with the electronic prescription system EDIKA, the ability to communicate with predefined users using telesession and the ability to share data and Chat.

The application is simple and easy to use for all categories of users with the main software language being Greek, and is also available in English.

5. THE PATIENT CARE PATHWAY (CARE PATHWAY)

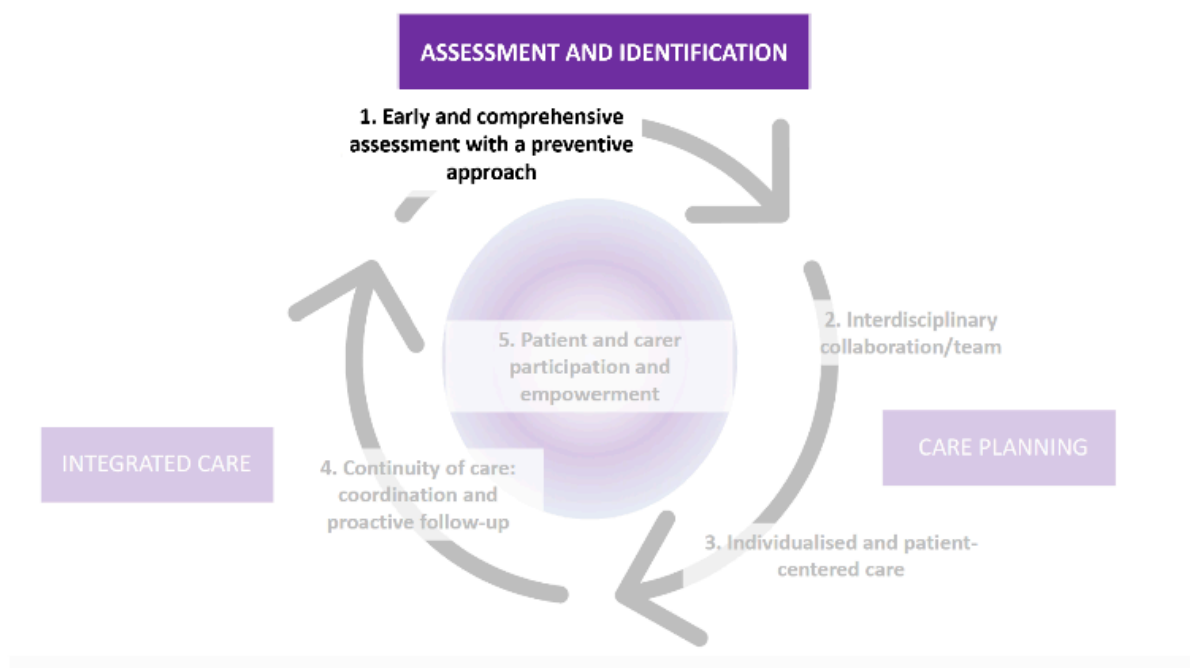


The Model on which our Service will be based will follow the following three overlapping phases:



1. Selection of patients
2. Initial Patient Rehabilitation Phase 30 hours (10 three-hour sessions)
3. Phase of ongoing remote monitoring, support and coordination of care at home and in the patient's community, with the help of new technologies and qualified staff.

For the detailed description we will use the schematic illustration of the European CAREMATRIX (23,24) building model with the corresponding steps:



5.1 Patient selection

5.1.1 Procedure

The candidate population for selection will be patients with polymorbidities who are already being treated for a long time at the 4 Municipal Medical Surgeries (M.M.S.) of the Municipality of Athens (M.M.A.) or will be referred to them through the telephone service after the publicity actions of the new service by the services of the M.M.A.

Procedure for admission to the Programme

- Initial briefing by the reception and service advisors of the clinics, if they are not already informed by a referring doctor, handing out the patient information leaflet and then making an appointment for a session with the medical specialists of the Programme.
- Medical screening and assessment for program participation, information on the consent form and setting a date to begin participation in the program.

5.1.2 Selection criteria

- Elderly patients (>60 years old as a rule) with two or more chronic diseases with the accompanying polypharmacy (taking >5 medications). Priority will be given to diseases such

as: arterial hypertension, heart failure, diabetes mellitus, chronic obstructive pulmonary disease, bronchial asthma, rheumatoid arthritis, etc.

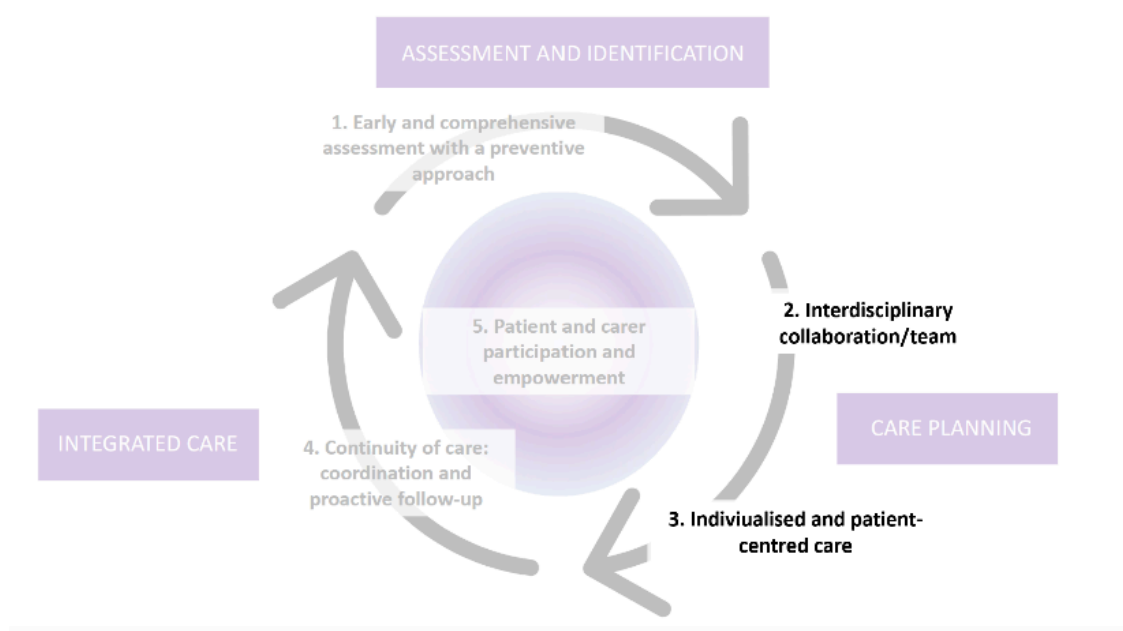
- Patients in stable clinical condition in the last 6-8 weeks
- Very high use of health services (at least 1-2 hospital admissions in the past year and/or multiple emergency department visits)
- Minimum acceptable level of educability of the patient and his/her family members
- Written consent to participate
- Patients meeting social criteria or belonging to socially vulnerable populations - vulnerable groups (e.g. poor, migrants) will be given priority, without excluding other categories of multimorbid patients

5.1.3 Exclusion criteria

- End-stage organic failure
- Alcoholism, Addictive drug use
- Major psychiatric disease
- Poor functional status of the patient according to WHO (PS: 3-4)

5.2 Initial Phase of Patient Rehabilitation

It includes a holistic and collaborative approach by all the required specialties and professionals (doctor, nurse, physiotherapist, social worker, psychologist, etc.), definition of an individualized tailor made design, definition of short and long term goals for each patient, special education and psychosocial support for patients and their relatives, as well as functional control with the corresponding program of special and individualized exercises.



Individual Actions/Tasks:

- **Reception/information of beneficiaries about the service and the expected results.**
- **Clinical Examination of patients on an individual basis by each member of the multi-purpose team, holistic and individualized approach.**
- **Behavioral Change of patients and their relatives towards the disease(s), treatment and care system. It will be achieved through their active participation (Collaborative Care) in the analysis of the data and the options available.**
- **Development of an individualised treatment plan of care with the definition of short- and long-term goals for each patient by the multidisciplinary team (personalised care).**
- **Provision of educational sessions to patients and caregivers, individually or in groups, regarding the required knowledge, skills towards their disease(s), self-management of their overall condition, prevention of complications, utilization and use of care services, etc.**
- **Appointment of a specific "case manager" for each patient and development of their respective personal relationship, both for this and the next phase of the Programme (the case manager will conduct the remote visits with the support of any other specialist from the multidisciplinary team)**
- **Creation of a Web-based medical record (EMR) for each patient, with the corresponding treatment plan integrated, which during the next phase will be managed by the "Case Manager" for each patient.**

In more detail, during this phase, particular attention will be paid to the following critical medical-social parameters, which essentially determine the outcome of the patient's course in the care system and which are generally neglected in today's fragmented care:

5.2.1 Person-Centered Interdisciplinary Approach (Person-Centered Care)

The aim is for the health professional in the Interdisciplinary Team to work with the patient to understand the patient's life circumstances and perspective, in order to build a common

understanding of the patient's situation, values, priorities and needs (what is most important to the patient), as well as the process of adaptation. From this process we can extract important information concerning the patient's daily life such as:

- i) the place of physical exercise/sport in his/her life
- ii) whether the close family and social environment is supportive
- iii) the extent to which he or she is aware of his or her health status in relation to each disease individually and collectively (e.g. possible complications from the disease or treatment)
- iv) his/her emotional state
- v) the level of his or her health education.



The assessment of several of the above parameters related to the patient's daily life can have a positive or negative impact on the definition of the goals of care and the creation and implementation of the Care Plan (see below)

5.2.2 Assessment of the autonomy - functional/intrinsic capacity of each patient (patient centered care)

The WHO defines "intrinsic ability" as the combination of a person's physical and mental, including psychological, capacities. 'Functional capacity' is the combination and interaction of intrinsic capacity with the living environment. Differences in endogenous capacity between individuals are more pronounced in old age than in younger groups. These differences or changes over time are one of the hallmarks of aging. An individual may have an age difference of 10 years or more compared to another individual, but have similar endogenous

capacity and/or functional capacity. Therefore, chronological age is not a reliable indicator of health status.

Within the framework of the Integrated Care Service of the D.A., the multilevel WHO ICOPE Screening Tool (*see Tools*) will be used in paper or electronic form through an online platform, both during the initial assessment of the patient and during the remote monitoring of home care. If the use of the tool reveals that there is an impairment in any of its functions, further specialised tools will be used:

1. **Depression of Mental Functions:** The MMSE (mini mental state examination) tool available on the online platform will confirm the initial screening. In case we have confirmation from the MMSE as well, we try to intervene in potentially modifiable conditions such as inadequate nutrition, medication (e.g. sedatives, hypnotics) that may be contributing to the decline in Mental Functions, cardiovascular risk factors (e.g. smoking, diabetes mellitus, hypertension, obesity) or history of vascular stroke, co-existing depression, explore the possibilities for social support at home from the patient's relatives or "Help at Home" and possibly referral to a specialist Neurological Clinic to investigate possible Dementia or more complex cases.
2. **Loss of mobility:** the SPPB (short physical performance battery: SPPB) score (see Appendix) is confirmatory if the value is between 0 and 9. The patient will be offered supervised multimodal exercise and, where appropriate, referral to a physiotherapist/rehabilitation centre, recommendation for dietary modification (increase in albumin intake), use of aids to facilitate mobility and optimisation of space and lifestyle to avoid falls. At the same time, medications implicated in limiting mobility (e.g. antiepileptics, hypnotics, antidepressants, opioids), comorbidities such as osteoarthritis, rheumatoid arthritis, osteopenia-osteoporosis, sarcopenia and chronic bone/joint pain should be considered.
3. **Poor nutrition:** the MNA score can tell us whether a patient is adequately nourished (24-30 points), at risk of malnutrition (17-23.5 points) or undernourished (<17 points). In patients in the 2nd and 3rd categories, regular monitoring of body weight, size and strength of major muscle groups in the upper and lower limbs, a balanced classical oral diet and/or nutritional supplements that adequately restore daily intake of

calories (e.g., via carbohydrates), protein (1-1.5 g/kg body weight per day) and vitamin D (in case of deficiency), and daily exercise are recommended.

4. **Disturbances of distant - near vision, hearing:** Referral will be made for further special diagnostic testing (visual acuity measurement, audiometry) at the respective specialized clinics.
5. **Symptoms of depression:** Patients with at least one symptom of depression should be assessed by the psychologist/psychiatrist and additionally investigate the coexistence of some of the above mentioned aggravating factors such as impairment of cognitive functions, reduced mobility, poor nutrition, hearing-vision impairment, medications (e.g.e.g. antipsychotics, antihistamines), anaemia due to lack of factors such as iron or vitamin B12, hypothyroidism or time pain.

5.2.3 Evaluation of underlying diseases - Polypharmacy

'Polypharmacy' is usually described as the simultaneous use of five or more drugs and is often associated with adverse effects. Polypharmacy is classified as 'inappropriate' when the therapeutic benefit of adding a new drug is relatively small compared to the risk of side effects. Elderly patients with multiple morbidities and/or frequent and recent hospitalisations are very likely to receive multiple medications. The biological effects of aging on the kinetics and drug activity combined with polypharmacy, place elderly patients at higher risk for medication complications and associated hospitalisations. Therefore, proper medicating with the ultimate goal of reducing iatrogenic complications should include:

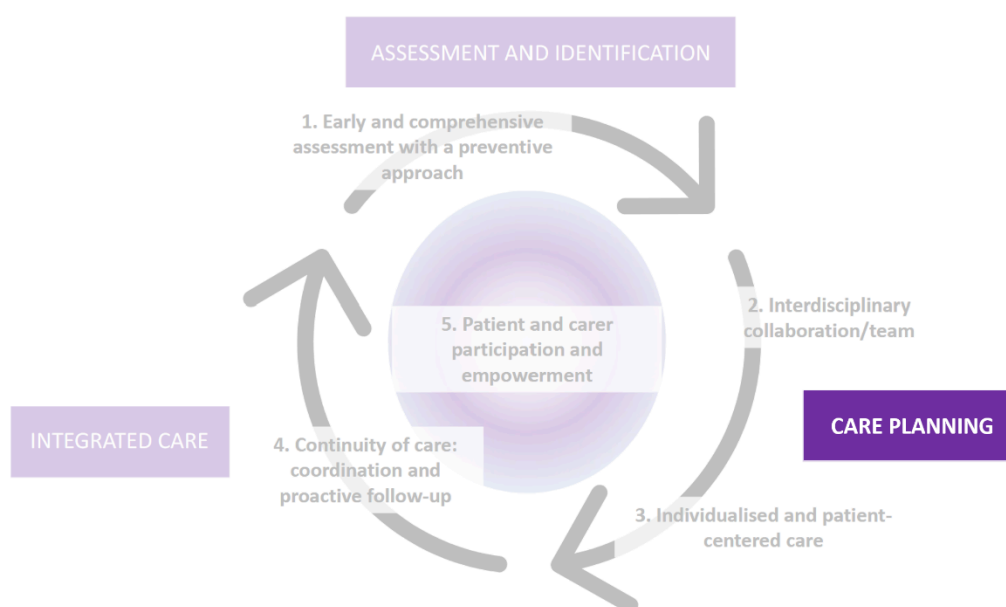
- Taking a complete medication history.
- Prescribing after there is a clear diagnosis, except in urgent cases
- Clear knowledge of the actions, interactions, adverse-toxic actions and how to alert and monitor patients to them
- The search for medications the patient is already taking that may affect cognitive functions (e.g. antiepileptics, antipsychotics, hypnotics)
- The re-examination of the list of medicines taken when a new medicine is to be prescribed
- Prescribing one medicine to treat two or more conditions, if medically possible

- Providing clear written instructions to the patient on how and when to take his/her medication
- Educating the patient and caregiver about any of the above in relation to any medication that concerns them (e.g. side effects, correct dosing regimen, interactions with other medications or diet).

5.2.4 Assessment of social - natural environment - social care and support needs.

Social care plays a central role in ensuring a dignified and meaningful life, especially for people with significant losses of endogenous capacity, where the contribution of the social and family environment is often necessary. Social care and support includes not only assistance with activities of daily living (ADLs) and personal care, but also facilitating access to community facilities and public services, reducing isolation and loneliness, assisting with financial security, providing appropriate housing, protecting against harassment and abuse, and participating in life-meaningful activities.

In the first phase, the patient will be asked in a discreet way about the need for support in simple daily activities such as walking comfort in the home, the ability to care for oneself (clothing, feeding, personal hygiene) and whether the living conditions at home can be changed for the better, to strengthen the skills of carers/home carers in providing direct support to the patient in relation to daily living or to request further support from services of the Municipality of Athens such as "Help at Home". Also important are questions regarding the patient's living situation, his/her general financial situation and the circle of people he/she communicates with or would like to communicate with on a daily basis (e.g. relatives, people from friendship clubs of the Municipality of Athens).



5.2.5. Organisation of the Care Plan

The initial Plan will be organized and drafted in electronic (online platform) and paper form by the Interdisciplinary Team, in the presence of the case manager, during the patient education phase and will be valid from 6 weeks to 6 months depending on the stability of the patient's condition (see Tools chapter). The steps on which the writing of a Care Plan is based on are:

- 1) **The *identification of the patient's needs/problems***: Each member of the Interdisciplinary Team will collect information by disease/condition during the initial contact phase with the patient and their family members at the Municipal Clinic site, possibly from the attending physician(s) in the community and from electronic or paper forms relating to previous hospitalizations at the hospital. Team members jointly discuss the findings and prioritize issues with a direct impact on the patient's current health status.
- 2) **Setting measurable goals for each problem**: The quality of the goals is the key to developing a solid Care Plan. The members of the Interdisciplinary Team, despite possible disagreements, should, after consensus, jointly arrive at **SMART Goals** that ideally should be:
 - Specific
 - Measurable, e.g. specific values of blood pressure, cholesterol, blood sugar or walking distance
 - Achievable, e.g. the goal of blood pressure control may not be achievable in a patient who is reluctant to take antihypertensive medication or to take regular blood pressure measurements
 - Realistic, e.g. weight loss reduces the risk of coronary heart attack, without eliminating it
 - Carried out within a clear period of time (Timely).
- 3) **Determining how to achieve the objectives**: the Interdisciplinary Team should determine the level of Health Services required to meet the needs of each patient (e.g., Municipal Clinic, Health Centre, Tertiary Hospital), the type of care (e.g.,

pharmaceutical, social, counselling, other medical procedures) and possible referrals to be made to other professionals or health facilities.

- 4) **Determining who will be responsible for each step:** More than one health professional or specialty may be responsible for each patient's problem or, conversely, a health professional may be responsible for more than one problem.
- 5) **The definition of the time interval within which each goal should be achieved:** for more stable patients this time is the same as the planned time (e.g. 6 months) for the Plan review, while for some patients with increased needs or recent hospitalisation this interval is individualised.
- 6) **The review of the Plan by the patient with their caregiver:** The purpose is to ensure that the patient and family caregivers are in agreement with the Care Plan, that any concerns, needs, preferences of the patient are taken into account and that the Plan is compatible with the patient's physical and social environment.\

Example of an Action Plan for a patient with Chronic Obstructive Pulmonary Disease	
Daily Management	
1. Medication:	<ol style="list-style-type: none"> 1. Take your daily medications according to your doctor's instructions (e.g., bronchodilators A, inhaled corticosteroids B). 2. Make sure you use your inhaler correctly.
2. Exercise:	<ol style="list-style-type: none"> 1. Exercise regularly with a mild intensity (e.g., walking, cycling) to improve your respiratory function and physical condition. 2. Rest when you feel tired, but avoid prolonged inactivity
3. Nutrition and Fluids:	<ol style="list-style-type: none"> 1. Eat balanced meals and stay well hydrated to avoid phlegm build-up.
4. Avoiding Irritants:	<ol style="list-style-type: none"> 1. Avoid smoking and passive smoking. 2. Reduce exposure to pollutants and chemical irritants in your environment
5. Avoiding Irritants:	<ol style="list-style-type: none"> 1. Avoid smoking and passive smoking. 2. Reduce exposure to pollutants and chemical irritants in your environment
Management of Compulsions (Worsening of Symptoms)	
● Increased difficulty breathing or wheezing:	<ul style="list-style-type: none"> ○ Use inhaled medicine A according to the instructions. ○ If there is no improvement, contact your doctor.
● Increase in mucus secretions or change in color:	<ul style="list-style-type: none"> ○ Drink more fluids to help liquefy the secretions. ○ Consult your doctor for possible need for antibiotics.

- **Appearance of Fever or Symptoms of Infection:**
 - Take your temperature regularly.
 - If you notice fever or other symptoms of infection, contact your physician immediately
- **Unsuccessful Relief after Medication:**
 - Call your doctor or visit the nearest hospital if symptoms worsen and do not respond to treatment.

Emergency Need

If you experience any of the following symptoms, call 911 (emergency services) or go to the nearest hospital immediately:

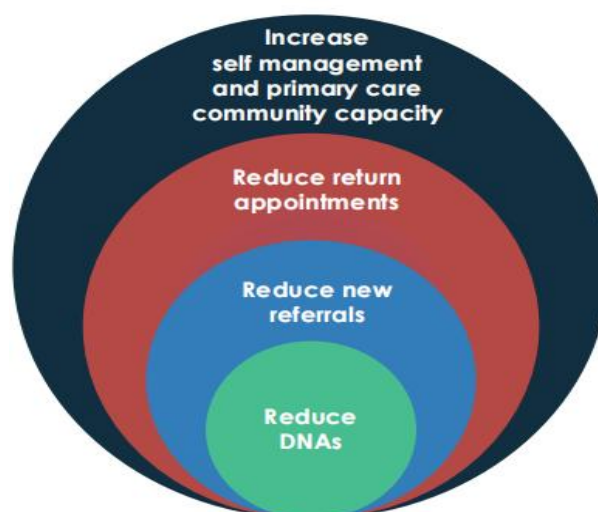
- Difficulty breathing that worsens quickly.
- Severe confusion or difficulty speaking.
- Cyanosis (blue tint on the lips or nails).
- Severe chest pain.

For relatively stable patients, the reassessment of the Plan by the multidisciplinary team at the initiative of the case manager will take place at the end of 6 months, when it will be modified or left unchanged based on the achievement or not of the individualised goals set at the beginning. Pillar modifications of the Plan will take place at short intervals following changes in the patient's overall or systemic situation (e.g., change in the patient's social environment, emergency hospitalization or visit to a tertiary hospital ICU), as indicated by the case manager, a member of the Municipal Clinic staff who will inform the case manager, and will have the agreement of the Interdisciplinary Team, the patient and the caregiver(s) in the patient's home. Each time a Care Plan is reassessed or revised the 6 steps outlined above are followed. The amended version of the Plan will also be permanently on the patient's Electronic Health Record.

Beyond the initial intensive phase of training and preparation of the individual Care Plan for each beneficiary, the Team will then have scheduled meetings that will take place once a week. Their purpose will be for all participating disciplines to exchange information on the progress of the situation of the beneficiaries in remote monitoring and to jointly decide on the necessary changes to the care plans. The Case Manager will have a central coordinating role in these meetings.

5.2.6 Value-based care

During the training sessions, the multidisciplinary team of the Programme will have the opportunity to analyse for patients how the improvement of the organisation of care (optimisation of prevention, early diagnosis, intervention, self-management) is related to the quality of life of patients (22), but also to the simplification and decongestion of the care system, a factor that should be taken into account in the context of behavioural change.



5.3 Detailed Description of the In-Person Sessions

5.3.1 Procedure

The Patient Education Sessions will be 3 hours, a total of 10 for each patient over a period of 1 month, and will take place during the evening hours (14:30-20:30) of the 4 Municipal Clinics. Each session will involve 5 patients. Therefore, 1 Training Session will take place daily (14:00-17:00 or 17:00-20:00 hours) at each Municipal Clinic for a total of 5-6 beneficiaries (see Table below).

Indicative 15-day Programme of Training Sessions

	Day	IC	TP	TE	IP	PAR	CP	IC	TP	TE	IP	PAR	CP
Clinic	Opening hours												
1°	14:00-17:00	O1A	O1B	O1A	O1B	O1A		O1B	O1A	O1B	O1A	O1B	
<i>Solonos</i>	17:00 - 20:00												
6°	14:00-17:00												
<i>Kipseli</i>	17:00 - 20:00	O6A	O6B	O6A	O6B	O6A		O6B	O6A	O6B	O6A	O6B	

2°	14:30-17:00	O2A	O2B	O2A	O2B	O2A		O2B	O2A	O2B	O2A	O2B	
<i>N. Kosmos</i>	17:00 - 20:00												
3°	14:00-17:00												
<i>Petralona</i>	17:00 - 20:00	O3A	O3B	O3A	O3B	O3A		O3B	O3A	O3B	O3A	O3B	

- Number of beneficiary groups: 8 (O1A, 1B, 2A, 2B, 3A, 3B, 6A, 6B)
- Total beneficiaries: 40
- Number of 15-day sessions per group: 5

Each Training Session will be conducted by the 3-member Programme Team. In each Training Session there will be an initial short presentation (up to 30 - 45 minutes) of the training object by the Doctor/Nurse or Case Manager for all 5-7 beneficiaries with their caregivers and then followed by a focused Hands-on training of the patients, through open discussion or computer use, in case it concerns the acquisition of skills in the use of the digital platform.

5.3.2 Content (10 3-hour sessions)

1st Session	
Time	Content
45 minutes	<i>Subject: "Integrated Care in Municipal Clinics"</i>
	There will be a 20-30 minute presentation on the basic principles of Integrated Care, how they will be implemented in the context of the upgraded operation of the Multipurpose Municipal Clinics and what are the expected benefits for the patient, society, the Athens Municipality and the Health System. A 15-minute discussion will follow.
15 minutes	<i>Break</i>
90 minutes	<i>Hands-on</i>
	In each session, 2 groups of health professionals (2-3 people) will be appointed, each of which will be led by a Doctor, with the aim, in a time corresponding to approximately 30 minutes for each patient, to: <ul style="list-style-type: none"> • Informing and obtaining written consent • Obtaining the medical history • Completion of the "Patient Summary" on the online platform
15 minutes	<i>Discussion - Questions</i>

2nd Session	
Time	Content
45 minutes	<i>Subject: "Polydipsia - Polypharmacy"</i>
	<p>There will be a 20-30 minute presentation on patients with polymorbidities and the polypharmacy that results from them. The aim is to make them understandable:</p> <ul style="list-style-type: none"> • the interactions between diseases and different medicines when taken by the same patient • the short- and long-term effects of the interactions on the patient's life and daily routine • how to improve the management of interactions and complications of complex medication based on International Practices and what can be done in the context of the operation of Municipal Clinics. <p>A 15-minute discussion will follow.</p>
15 minutes	<i>Break</i>
90 minutes	<i>Hands-on</i>
	<p>In each session, 2 groups of health professionals (2-3 people) will be appointed, each of which will be led by a Doctor, with the aim, in a time corresponding to approximately 30 minutes for each patient, to:</p> <ul style="list-style-type: none"> • Targeted clinical examination by systems • Updating the electronic platform with data related to the clinical examination - Completion of Patient Summary
15 minutes	<i>Discussion - Questions</i>

3th Session	
Time	Content
40 minutes	<i>Subject: "Introduction to Coronary Heart Disease (CHD) and Heart Failure (HF)"</i>
	<p>The purpose of the presentation (20-30 minutes) is to make them understandable in a simple way:</p> <ul style="list-style-type: none"> • the process by which atherosclerosis causes CHD and how it ends up causing angina or heart attacks, the main symptoms and signs of CHD and the role of risk factors (e.g. smoking, hypercholesterolemia, family history) • how the reduced ability of the heart to function as a pump leads to the symptoms of CAD and how they progress as the stages of the disease worsen <p>A 10-minute discussion will follow.</p>
30 minutes	<i>Subject: "Medication in CHF and CVD"</i>
	<p>The purpose of the 20-minute presentation is to inform patients about:</p> <ul style="list-style-type: none"> • the main classes of drugs and their rough mechanism of action in DM and CVD • why it is important to take the treatment to avoid worsening symptoms or hospital visits. • the management of common side effects of medicines. <p>A 10-minute discussion will follow.</p>
15 minutes	<i>Break</i>
30 minutes	<i>Subject: "Lifestyle change for a healthy heart"</i>
	<p>The purpose of the 20-minute presentation is to educate patients on lifestyle changes that promote cardiovascular health and reduce the risk of CVD, focusing on diet, physical activity (exercise), smoking cessation and stress management.</p> <p>A 10-minute discussion will follow.</p>

20 minutes	<i>Subject: "How to recognise my symptoms - What is urgent?"</i>
	The purpose of the 20-minute presentation is to train patients to recognise the deterioration of SN or CAD through changes in daily symptoms and to become aware of situations that are "urgent".
30 minutes	<i>Hands-on</i>
	Familiarising patients with the use of personalised care plans for PD and CVD
15 minutes	<i>Discussion - Questions</i>

4th Session	
Time	Content
40 minutes	<i>Subject: "Introduction to Chronic Obstructive Pulmonary Disease (COPD) and Bronchial Asthma (BA)"</i>
	The purpose of the presentation (20-30 minutes) is to make them understandable in a simple way: <ul style="list-style-type: none"> • how COPD and BA cause airway obstruction and the main symptoms of these diseases • the causal association of obstructive lung diseases (COPD and AD) with factors such as smoking or allergens A 10-minute discussion will follow.
30 minutes	<i>Subject: "Medication in COPD and BA"</i>
	The purpose of the 20-minute presentation is to inform patients about: <ul style="list-style-type: none"> • the main categories of inhaled medicinal products • how inhalants are used and what are the common mistakes when administering them • the management of common side effects of medicines. A 10-minute discussion will follow.
15 minutes	<i>Break</i>
30 minutes	<i>Subject: "Ways of breathing - breathing exercises"</i>
	The purpose of the 20-minute presentation is to educate patients on breathing exercises, management of acute dyspnoea and avoidance of triggers and to introduce the concept of pulmonary rehabilitation. A 10-minute discussion will follow.
20 minutes	<i>Subject: "How to recognise my symptoms - What is urgent?"</i>
	The purpose of the 20-minute presentation is to train patients to recognise the exacerbation of COPD or BA through changes in daily symptoms and to become aware of the situations that are "urgent".
30 minutes	<i>Hands-on</i>
	Familiarising patients with the use of personalised care plans for COPD and BA
15 minutes	<i>Discussion - Questions</i>

5th Session	
Time	Content
30 minutes	<i>Subject: "Introduction to Diabetes Mellitus (DM) and the concept of Cardiovascular Risk (CVD)"</i>

	<p>The purpose of the presentation (20 minutes) is to make them understandable:</p> <ul style="list-style-type: none"> • The main symptoms associated with type I and type II DM • The association of DM and other factors such as hypertension, smoking or obesity with increased CV <p>A 10-minute discussion will follow.</p>
40 minutes	<i>Subject: "Regulation of SD and other factors of CS"</i>
	<p>The purpose of the 30-minute presentation is to inform patients about:</p> <ul style="list-style-type: none"> • Proper measurement and monitoring of blood sugar levels • Anti-diabetic treatment (insulin and tablets) • How are Hypertension and Hypercholesterolemia monitored and what is the purpose of their drug treatment? <p>A 10-minute discussion will follow.</p>
15 minutes	<i>Break</i>
30 minutes	<i>Subject: "Healthy diet - Exercise in patients with DM or increased CH"</i>
	<p>The purpose of the 20-minute presentation is to inform patients about the importance of a balanced diet in DM, the recommended diet in patients with increased DM, the importance of weight control and the recommended form of exercise to modify DM.</p> <p>A 10-minute discussion will follow.</p>
20 minutes	<i>Subject: "How to recognise my symptoms - What is urgent?"</i>
	<p>The purpose of the 20-minute presentation is to train patients with DM to recognise and treat the symptoms of hyperglycaemia or hypoglycaemia in time and to raise awareness of situations that are "urgent".</p>
30 minutes	<i>Hands-on</i>
	Familiarising patients with the use of personalised care plans for DM
15 minutes	<i>Discussion - Questions</i>

6th Session	
Time	Content
30 minutes	<i>Subject: "Polymorbidities and Psychosocial Needs"</i>
	<p>The purpose of the presentation (20 minutes) is to understand how comorbidities affect:</p> <ul style="list-style-type: none"> • The emotional and psychological state of the individual: increase in stress, depression, grief due to loss of independence, mechanisms for managing these • On Social status: social isolation, interactions with family and caregivers at home, financial burden • On Cognitive Functions and Patient Behaviour: management of cognitive decline, lifestyle and "compliance" with medication • On overall Quality of Life <p>A 10-minute discussion will follow.</p>
30 minutes	<i>Subject: "How to manage my stress, anxiety and emotions? "</i>
	<p>The purpose of the 15-minute presentation is to inform patients about methods of managing anxiety, depression, health expectations and health-related</p> <p>This will be followed by a 15-minute discussion with the psychologist.</p>
15 minutes	<i>Break</i>
30 minutes	<i>Subject: "How to manage social relationships and overcome isolation?"</i>

	The purpose of the 15-minute presentation is to inform patients about the importance of social support, the recognition of barriers to social interaction and how new technologies can contribute to participation in wider social groups of patients. This will be followed by a 15-minute discussion with the social worker.
75 minutes	<i>Hands-on</i>
	In each session, 2 groups of health professionals (2-3 people) will be appointed, each of which will include a Doctor, a Psychologist or a Social Worker with the aim, in a time corresponding to approximately 25 minutes for each person, to: <ul style="list-style-type: none"> ● Record the patient's needs and the family's capabilities in the provision of Social Care ● Giving patients flexibility and adaptability to their diseases ● Create a realistic self-care plan in order to enhance well-being

7th Session	
Time	Content
30 minutes	<i>Subject: "The Personalised Care Plan"</i>
	The purpose of the presentation (20 minutes) is to make them understandable: <ul style="list-style-type: none"> ● How a Care Plan is created: structure, purposes, benefits ● The role of cooperation between doctor, patient and relative in the formulation of the Plan A 10-minute discussion will follow.
15 minutes	<i>Break</i>
120 minutes	<i>Hands-on</i>
	In each session, 2 groups of health professionals (2-3 people) will be appointed, each of which will be led by a Doctor, with the aim, in a time corresponding to approximately 40 minutes for each person, to: <ul style="list-style-type: none"> ● Step-by-step creation of the Care Plan for each patient: setting goals, identifying conditions that aggravate the disease, defining the necessary actions to solve the problems, ways of monitoring and communication with the team of each Municipal Clinic ● Thoroughly explain the implementation, dynamic monitoring and adaptation of the Care Plan
15 minutes	<i>Discussion - questions</i>

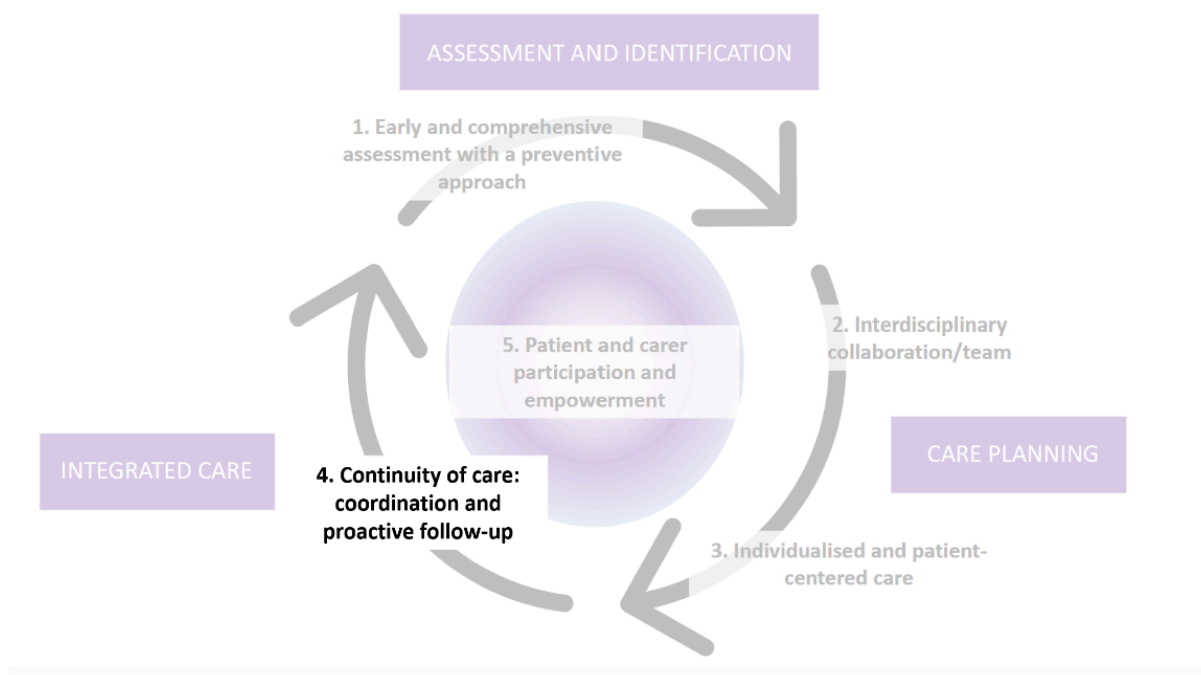
8th Session	
Time	Content
60 minutes	<i>Hands-on</i>
	In each session the 2 teams of health professionals (2-3 persons) appointed in the 7 th session will spend about 20 minutes for each person to finalize the details of the individual Care Plans and to adjust them after discussion with the patient and his/her family members.
15 minutes	<i>Break</i>
90 minutes	<i>Simulation scenarios</i>
	Two groups of health professionals (2-3 people) will be appointed, each of which will be led by a Doctor, where as a pair or group the patients will practice applying the Care Plan in real life scenarios. It will thus become apparent to the trainers how much the patient has understood all the

	instructions in the Plan, whether there are aspects of daily life that are not covered by the current Plan and, therefore, whether corrections need to be made for better application in practice.
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9th Session	
Time	Content
30 minutes	<i>Subject: "Demonstration of the Electronic Platform"</i>
	The purpose of the presentation is to make them understandable to the patient: <ul style="list-style-type: none"> • The content and scope of the medical information to be managed by the Electronic Platform • The basic functions and features of the Platform • The ways of patient-Platform interaction
15 minutes	<i>Break</i>
	<i>Hands-on</i>
60 minutes	Each patient with a health professional of the team will be trained by their smartphone or tablet staff on the basic functionalities of the Platform (entering medical data, filling in simple questionnaires concerning chronic symptoms or quality of life indicators, accessing the Care Plan)
15 minutes	<i>Break</i>
60 minutes	<i>Hands-on</i>
	Each patient with a health professional of the team will be trained by a Smartphone or tablet staff on the functionalities of the platform regarding remote visits

10th Session	
Time	Content
60 minutes	<i>Summary of Knowledge</i>
	All patients will be examined as a group, in the form of a discussion, as to whether they have assimilated basic knowledge of their diseases, treatment, self-management methods and individual Care Plans.
15 minutes	<i>Break</i>
	<i>Hands-on</i>
60 minutes	Patients will be tested as a group, in the form of a discussion, to acquire the necessary skills to use the platform and the remote monitoring service
15 minutes	<i>Final discussion - Questions</i>

5.4 Phase of ongoing remote monitoring, support and care coordination



The remote monitoring phase will follow each patient immediately after the completion of the monthly training of the previous phase. After consultation with the Program's Case Managers, scheduled remote visits will take place at hours equivalent to those of the Initial Rehabilitation Phase (14:00-17:00 or 17:00-20:00) of the patients, through the Program's digital platform.

For stable patients, visits will be weekly for the first 3 months, every 15 days for the next 3 months and monthly for the remainder of the follow-up (24 total scheduled visits per patient). For patients with greater needs, the frequency of visits will be increased.

5.4.1 Continuing care at a distance (Remote Visits)

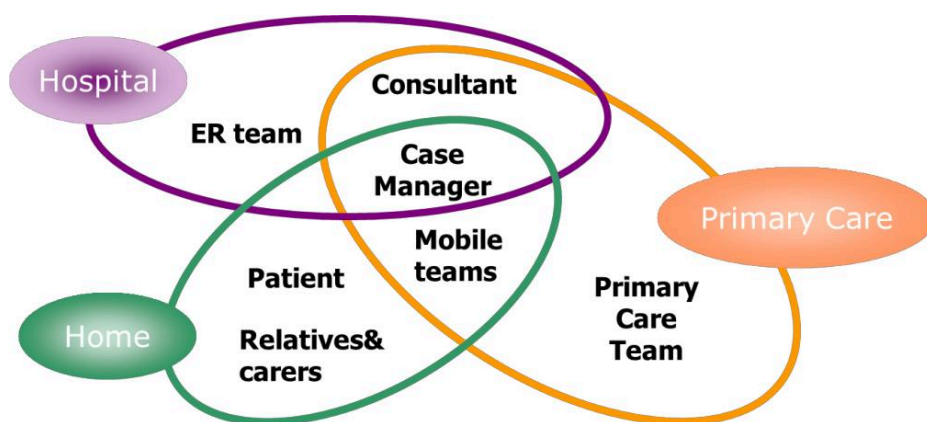
Each visit will last 15-20 minutes and will be carried out from the patient's smartphone or tablet and the Call Center with the Case Manager, where the Case Manager is located:

- will assess the general condition of the patient and the extent to which the individual Care Plan is being implemented.
- will record deviations from the Plan, the need for any modification of the treatment,

- will provide guidelines for chronic disease management, such as monitoring compliance with medications and other treatments, ongoing education, encouragement and psycho-social support, implementation of exercise programs, etc.
- will recommend smart, evidence-based lifestyle interventions and highlight important risk factors for the patient.
- **will also recall symptoms and alarm signs of worsening disease, as the patient will have been taught during the previous phase.**
- will detect in time any exacerbation or complication of the disease(s), and therefore the need for escalation of treatment, in order to avoid the need for a visit to the hospital wards or inpatient hospitalization. In these cases (and any others where appropriate), **they** will inform the appropriate clinicians as agreed from the previous phase.

5.4.2 Care Coordination

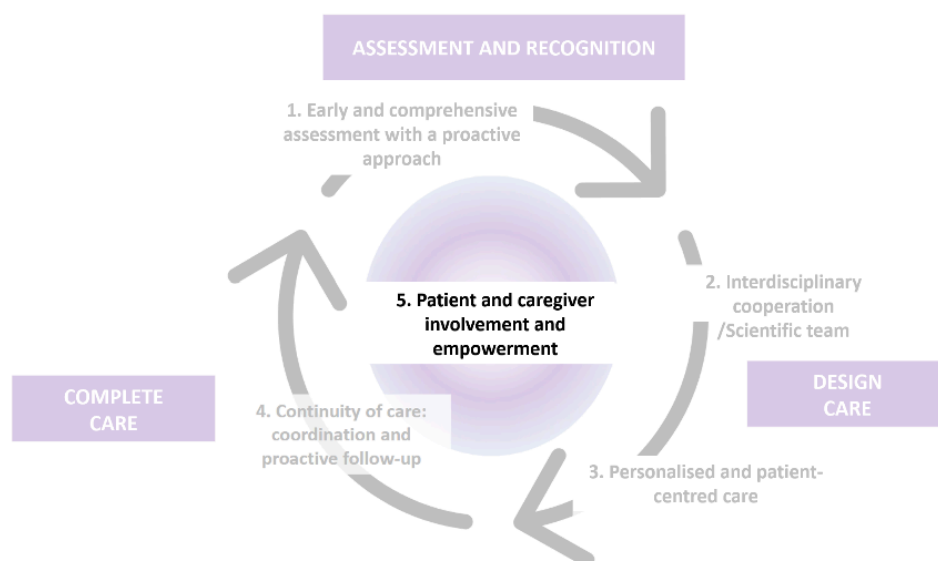
In addition to the direct communication with the patient, the case manager will be in charge of "Care Coordination" with all the therapists and agencies involved (see Figure).



With the ability to manipulate the Electronic Case File and decision support tools, he/she will be able to provide the valuable information, recommendations and instructions, at the appropriate place and time, to empower all involved with the "informed action " that he/she will provide.

5.4.3 Ongoing Carer Support

The support of the patient's caregivers belonging to the immediate family or community (e.g. neighbourhood) will focus on:



- 1) Recognizing the problems related to the caregiver's mood or ability to provide assistance (e.g., depressive feelings, caregiver health problems), factors that may lead to abusive behavior toward the patient, or potential additional financial burden of caring for the patient.
- 2) Training and empowering the caregivers on issues related to the provision of Care at Home.
- 3) Possibly looking for other social - financial resources or home services (see "Help at Home") that could reduce the daily burden of caregivers in the patient's home.
- 4) Providing psychological support for carers.

A strategic tool for achieving the above objectives will be the use of the digital platform described above, which includes the Electronic Health Record (EMR, Web-based patient record), multiple technologies for remote monitoring (videoconference, vital signs transmission), as well as the extensive use of AI-based decision support and clinical pathways tools with the support of artificial intelligence (AI).

6. EVALUATION OF THE SERVICE

The prevalence of multimorbidity that has long plagued the health and social care systems of the Western world, and that recently caused by the Covid pandemic and Post-Covid Syndrome, has raised a major new challenge for all European systems, considering that these

individuals in the majority of circumstances, and even the most severe in terms of severity, need coordinated care from multiple care providers at the same time (23). However, these providers were (and still are) accustomed to focusing on specific needs and issues, depending on the specialty of each, resulting in fragmented and suboptimal care (24,25). Thus, many countries have realised at this juncture that immediate reforms to their health and social care systems are now urgent in order to respond in a timely, effective and sustainable manner to the changing health and care needs of their populations. For this reason, multiple collaborations with innovative researchers have been initiated to develop and implement newer, but mature models or programmes such as those of person-centred integrated care (26).

However, evaluating the effectiveness of integrated care models is a very important and complex challenge due to the inherent complexity of these interventions. Existing evaluation methods together with their corresponding gold standards (e.g. RCTs) may not be adequate to capture the multifaceted nature of integrated care for multi-patient populations. Multimorbidity, the simultaneous presence of multiple health conditions in an individual, is an increasingly common phenomenon globally. The systematic assessment of the quality of care delivered to people with multimorbidity will be key to informing the organization of services for meeting their complex needs. Yet, current assessments tend to focus on single conditions and do not capture the complex processes that are required for providing care for people with multimorbidity. We conducted a scoping review on quality of care and multimorbidity in selected databases in June 2018 and identified 87 documents as eligible for review, predominantly original research and reviews from North America, Europe and Australasia and mostly frequently related to primary care settings. We synthesized data qualitatively in terms of perceived challenges, evidence and proposed metrics. Findings reveal that the association between quality of care and multimorbidity is complex and depends on the conditions involved (quality appears to be higher for those with concordant conditions, and lower in the presence of discordant conditions) and the approach used for measuring quality (quality appears to be higher in people with multimorbidity when measured using condition/drug-specific process or intermediate outcome indicators, and worse when using patient-centred reports of experiences of care). People with discordant multimorbidity may be disadvantaged by current approaches to quality assessment, particularly when they are linked to financial incentives. A better understanding of models of care that best meet the needs of this group is needed for developing appropriate quality assessment frameworks. Capturing patient preferences and values and incorporate patients' voices in the form of patient-reported experiences and outcomes of care will be critical towards the achievement of high-performing health systems that are responsive to the needs of people with multimorbidity. This lack of evidence in multi-patient populations hinders informed decision-making for both policy and practice in this area. However, the key challenge on how to obtain such evidence and how to translate it into day-to-day clinical practice, as well as making effective policy decisions, remains

For the above reason, for the optimal care of the above patients with the implementation of integrated care in the Municipal Clinics, we will adopt the following evaluation parameters, based on the most recent literature, in order to be informed in our actions, in our communication with the staff, as well as in our conclusions.

Evaluation approach

The European Commission has (co-)funded several actions to support health authorities and stakeholders in the development and implementation of person-centred integrated care models. For this reason, patients with polymorbidities have been identified and analysed in several EU-funded actions (e.g. ICARE4EU, JA-CHRODIS, Selfie2020, SUSTAIN), but also other EU-supported actions (e.g. SCIROCCO, CHRODIS+, SCIROCCO exchange, JADECARE, VIGOUR). Despite the many initiatives, there is still a lack of concrete and universally accepted evidence and pitfalls for an accurate evaluation of person-centred integrated care for multi-patient populations in Europe, for the following reasons:

- **Few integrated care initiatives include an evaluation of clinical outcome.**

The ICARE4EU project identified 101 integrated care initiatives targeting vulnerable populations in 24 European countries. Only eight of these initiatives included an evaluation of outcomes that had (already) published their results (29). Also, systematic reviews of evidence of integrated care for multi-patient populations (30-32) could only include a few studies from European countries. Therefore, the available data are mainly from countries outside Europe.

- **Initiatives with outcome evaluations do not take into account all co-morbid factors of the clinical outcome.**

It is crucial that integrated care actions for patients with poly morbidities are evaluated comprehensively and in line with the interests of all stakeholders and where the results of the intervention can be reasonably expected within a certain period of time. The Triple Aim framework (33) introduced the **multi-stakeholder perspective** and emphasises the importance of evaluating outcomes in three domains (patient care experiences, health and costs) together, as well as balancing the importance of these individual outcomes.

In the case of large populations, it is not self-evident what this balance should be. For example, is there sufficient value in an integrated care practice that neither impacts the health of the population nor is costly, but improves the care experiences of multi-patients and their caregivers? The answer may depend on the perspective of stakeholders, as well as the goals set for the intervention.

Over the years, the Triple Aim has been expanded with a fourth outcome area: the experiences and well-being of care professionals (34). Including this outcome area in evaluation frameworks is extremely important, given the increasing needs of the population in the context of a shrinking health workforce, resulting in high work pressure and overburdened care professionals. A fifth area has recently been proposed: health equity (35), arguing that despite policies implemented to improve the health care and health of the population, health inequalities have increased rather than decreased. By including this fifth objective, it is recognised that reducing health inequalities should be an integral part of improving the quality of healthcare. So far, the impact of integrated multimorbidity care in the fourth and fifth domains has hardly been studied at all.

- **The data currently available are not sufficiently adequate** (30,36-38).

These show that integrated care for multimorbid (older) patients has positive outcomes in terms of the care experiences of patients and their carers, but show mixed results in terms of health, quality of life, well-being and use of care services, and almost no evidence of cost containment or cost-effectiveness. This may mean that integrated care is potentially less effective than expected or that systematic reviews are flawed. There is much that could be cited for this latter explanation:

- o Systematic reviews aim to include studies that meet certain quality criteria that apply to clinical trials (strict inclusion and exclusion criteria, randomisation, controlled conditions, etc.). However, integrated care initiatives cannot - and should not - meet such strict criteria, as these are complex interventions (polysystemic interventions), with multiple actors within and outside the healthcare system, as well as organisational and management processes implemented in the current real-life implementation environment

- o Many evaluation studies apply a post-test measurement one or at most two years after the trial. It can be argued that this time frame is too short to detect changes with rather remote effects. Longer evaluation time frames are needed to allow valid conclusions to be drawn about the cost and effectiveness of integrated multimorbidity care.

For all of the above reasons, the following design aims to avoid the pitfalls identified in the above literature and to evaluate integrated care based on its real advantages in the place, time conditions and socio-economic background to be implemented in primary care

Patient care experiences (PREMS):

practices. Accordingly, the following parameters will be evaluated in order:

Measures of experiences as reported by patients are provided, covering all aspects related to their problems e.g. continuity of care, coordination of care, alignment with patients' needs, alignment of professional care and informal care, etc. These will be carried out with the specific questionnaires on quality of life, patient acceptance and satisfaction with the new services.

Health, quality of life or well-being outcomes (PROMS):

These will take into account:

- o The study of clinical outcomes in terms of long-term health, which may be of little use in this context, as it seems unlikely that improvements can be achieved among patients as a result of the integrated care effort, but less or delayed disease progression can be achieved and calculated from the comparative results of the corresponding functional control of patients.
- o Use of health and social care services (number and duration of inpatient hospitalizations, number of visits to regular and emergency departments or clinics, adoption of appropriate or inappropriate polypharmacy or use of other therapeutic devices, etc.)

- o Patients' perspective on their ability to live independently, their perceived autonomy, achievement of personal goals, self-determination or social participation, etc.

Care experiences and wellbeing of professionals:

Given the lack of valid generic parameters that can be applied to assess the experiences of care and wellbeing in integrated multimorbidity care professionals, ongoing discussions and exchanges are planned with the relevant professionals in the Programme, as well as those in the community practices that wish to participate.

Equality of access: (in-equity)

It is about ensuring that integrated care services are accessible to everyone who needs them, regardless of the person's characteristics, such as cultural, background, gender, socio-economic status, living area and living situation.

AI / Machine Learning technologies and data

From the beginning of the project there will be the support of the staff with the mature and specialized platform for monitoring chronic patients. The receptiveness and effectiveness of the use of these new technologies by all stakeholders will be examined. At the same time, the role and practical relevance of AI and ML tools will be validated to optimize the treatment of patients in real life situations (risk stratification, personalised care etc.) and to make "smart" decisions in the organisation of care delivery.

Cost

The evaluation of the cost impact on the use of health and social care services will be carried out in conjunction with the individual-level patient data set from multiple sources, and indeed across health and social care boundaries. This is because most economic evaluations consider only the direct costs of health service use, whereas estimating indirect costs and associated costs and liabilities from a social perspective is particularly important. In the cost/utility analysis, the added quality of life as a result of the intervention will be assessed

with the corresponding appropriate evaluation measures. Confidentiality issues will also be taken into account, which may potentially prove to be a significant obstacle, at least in some cases.

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