TransCare

New care pathways for supporting TRANSitional CARE from hospitals to home using AI and personalized digital assistance

D3.2 Care pathways re-design

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List of acronyms

Acronym	Description
AI	Artificial Intelligence
API	Application Programming Interface
APP	Mobile Application
CE	CE-certified medical devices- Conformité Européenne
CGA	Comprehensive geriatric assessment
EU	European Union
FAR	FARSUND KOMMUNE
GDPR	General Data Protection Regulation
GP	General Practitioner
HINS	HEART INSTITUTE “NICULAE STANCIOIU” CLUJ-NAPOCA
HL7 FHIR	Health Level Seven Fast Healthcare Interoperability Resources
INRCA	ISTITUTO NAZIONALE DI RICOVERO E CURA PER ANZIANI
IRCCS	Istituto di Ricovero e Cura a Carattere Scientifico
KRD	KARDE AS
KS	Kommunesektorens organisasjon (Norwegian Association of Local and Regional Authorities)
ML	Machine Learning
NVP	Nasjonalt velferdsteknologi Program (Norwegian welfare technology program)
RPM	Remote patient monitoring
SPOC	Single point of contact
THCS	Transforming Health and Care Systems
TLU	TELLU AS
TUC	TECHNICAL UNIVERSITY OF CLUJ-NAPOCA
WP	Work Package

Executive summary

Deliverable 3.2 of the TransCare project presents the second iteration of redesigned transitional care pathways aimed at improving the continuity and quality of care for older adults transitioning from hospital to home. Building on the findings of Deliverable 3.1, which mapped current practices and identified systemic and local challenges across three pilot sites—IRCCS INRCA (Italy), HINS (Romania), and FAR (Norway)—this report outlines the continued development and refinement of patient-centered, digitally supported care models. The second iteration of Deliverable 3.2 starts from initial design done in the first release for consistency and self-containment.

In this iteration, the redesigned pathways have been further adapted through early-stage implementation activities and initial testing in the WP4 pilot trials. The updated care pathway matrices presented in this deliverable reflect preliminary adjustments made at each pilot site to improve coordination, clarify roles and responsibilities, and enhance integration of digital technologies into existing care processes.

The redesigned pathways incorporate key technological components developed in WP2, including remote patient monitoring (RPM), AI-based decision support, and digital communication platforms. These solutions are tailored to the specific clinical, organizational, and digital contexts of each pilot site, ensuring feasibility and relevance in real-world settings.

A central aspect of this work remains in the co-design approach, involving patients, caregivers, healthcare professionals, and technology partners. Ongoing stakeholder engagement, combined with insights emerging from early pilot experiences, has informed the adjustments presented in this deliverable and will continue to guide further refinement.

As the WP4 trials are currently in their early phases, the results presented here should be understood as part of an iterative development process. The continued implementation and evaluation of the redesigned pathways will generate evidence on feasibility, usability, and impact, which will inform subsequent iterations and will be captured in next WP4 deliverables. This stepwise approach ensures that the TransCare care models evolve in response to real-world conditions, supporting long-term sustainability, scalability, and improved patient outcomes.

1 Introduction

This document is the third deliverable in the work package entitled *"Transitional Care Knowledge Building and Care Pathways Design."* Building on the comprehensive mapping of current transitional care practices presented in Deliverable 3.1, this deliverable focuses on the redesign of care pathways to improve continuity of care from hospital to home.

The purpose of Deliverable 3.2 is to translate the insights and data gathered in the initial phase into actionable, patient-centered, and digitally supported care models. These redesigned pathways aim to address the challenges identified across the pilot sites—INRCA (Italy), HINS (Romania), and FAR (Norway)—and prepare for implementation and testing in the upcoming WP4 trials.

This redesign process also incorporates the innovative technologies developed in WP2, including remote patient monitoring, AI-based decision support, and digital communication platforms. By integrating these tools into the care pathways, the project seeks to enhance coordination, reduce readmissions, and improve patient outcomes during transitions from hospital to home.

This deliverable represents the second step in the redesign process. By testing the integration of these technologies into real-world care pathways, the project will begin addressing the broader systemic and operational challenges identified in Deliverables 3.1 and 3.2.

1.1 Task description

Task 3.2 that outputs the current deliverable has a main objective to transform the mapped "now situation" care pathways from Task 3.1 into optimized, patient-centered, and digitally supported models. This redesign is based on the challenges identified in the initial mapping, including communication breakdowns, unclear responsibilities, and limited use of technology.

To achieve this, the project team analyzed the care pathway matrices developed in Deliverable 3.1, project developed and integrated digital tools, such as remote patient monitoring and AI-based decision support and developed pilot-specific care pathways tailored to local contexts and needs. As an output of the task, the findings have been reported in the first version of deliverable 3.2.

The second version of deliverable 3.2 represents the refined and enhanced care pathways using transitional care technologies developed in the project. We have focused on addressing the deeper systemic and operational challenges through iterative testing and refinement.

1.2 Relations to other activities

This deliverable builds directly on the work conducted in Tasks 3.1 and 3.2, where the current state of transitional care was mapped through stakeholder interviews, care pathway matrices, and analysis of local healthcare contexts. The insights gathered in that task form the foundation for the redesign presented here. The redesigned pathways are also closely linked to Task 2.1, which focuses on adapting transitional care technologies—such as remote patient monitoring and AI-based decision support—to national and healthcare-specific contexts. These technologies have been integrated into the new care models and tailored to the roles, responsibilities, and digital maturity of each pilot site.

Deliverable 3.2 serves as a bridge to WP4, where the redesigned pathways will be tested through a longitudinal study. This study already involves patient recruitment, deployment of digital tools, and structured follow-up. Data collected during the pilot will be used to evaluate care quality, patient

outcomes, and system efficiency. Additionally, the collected data will support the training of AI models to analyze daily life activity and vital signs, enabling proactive intervention and improved adherence to treatment plans.

The iterative testing in WP4 will also allow the project to revisit and address the deeper systemic challenges identified in Task 3.1 and the care pathways designed in Task 3.2, such as communication gaps, financing issues, and unclear transitions of responsibility between organizations. This continuous feedback loop ensures that the redesigned pathways are not only tested but also refined and adapted for long-term sustainability and scalability and reported in final WP4 deliverable.

2 Methodology

2.1 Analytical framework

The methodology for redesigning transitional care pathways in TransCare is grounded in a structured, evidence-informed framework that combines qualitative insights with process mapping. The analytical approach includes:

- **Mapping current practices** through care pathway matrices that visualize the patient journey from hospital to home.
- **Identification of systemic and local challenges** using stakeholder interviews and interdisciplinary workshops.
- **Iterative co-design** to develop improved pathways that integrate digital tools and reflect real-world constraints and opportunities.

This framework ensures that the redesigned pathways are both context-sensitive and aligned with the technological capabilities developed in WP2.

2.2 Stakeholder involvement and Co-Design Approach

The redesign process is deeply participatory, involving a wide range of stakeholders across all pilot sites:

- **Patients and caregivers** were interviewed to understand their experiences, needs, and expectations during care transitions.
- **General practitioners, hospital clinicians, and municipal care providers** contributed insights into current workflows, pain points, and coordination challenges.
- **Multidisciplinary teams** participated in workshops to collaboratively map existing pathways and propose improvements.
- **Technology partners and researchers** supported the integration of digital solutions and ensured methodological rigor.

This co-design approach fosters ownership, relevance, and feasibility of the redesigned pathways, ensuring they are grounded in the realities of each healthcare setting.

2.3 Tools and techniques used

Several tools and techniques were employed to support the mapping, analysis, and redesign of care pathways:

- **Care Pathway Matrices**: Developed for each pilot site (INRCA, HINS, FAR) to visualize the sequence of care events, roles, and information flows. These matrices serve as diagnostic tools to identify inefficiencies and fragmentation. Originally developed by PA consulting for the Norwegian welfare technology program (NVP)[1]

[1] https://nordicwelfare.org/en/welfare-policy/welfaretech/

- **KS Modell for Pasientforløp (Norway)**[2]: A structured framework used to guide patient pathway planning, emphasizing assessment, data sharing, patient engagement, and follow-up.
- **Mural Tool (InnoMed)**[3]: A digital visualization platform used to collaboratively map patient journeys and identify "pain points" in the care process. This tool supports innovation and simplification of complex transitions.
- **Workshops and Interviews**: Conducted across all sites to gather qualitative data and validate findings. These sessions ensured that the redesign process was informed by those directly involved in care delivery and receipt.
- **Integration with WP2 Technologies**: The methodology is closely linked to the digital infrastructure developed in WP2, ensuring that redesigned pathways are compatible with remote monitoring, AI-based analytics, and digital communication tools.

This multi-method approach ensures that the redesigned pathways are not only clinically sound but also operationally viable and technologically integrated.

[2] https://www.ks.no/fagomrader/helse-og-omsorg/gode-pasientforlop/
[3] https://www.mural.co/

3 Overview of current pathway challenges

During the development of the care pathway matrices in Deliverable 3.1, the project team uncovered a range of weaknesses in current transitional care practices. These included numerous “pain points” that reflect site-specific challenges across the pilot locations. Unlike broader national issues, these local challenges are rooted in the day-to-day realities of care delivery and highlight gaps in coordination, communication, and follow-up.

Deliverable 3.1 provided a comprehensive mapping of transitional care practices across the three pilot sites—INRCA (Italy), HINS (Romania), and FAR (Norway). Through interviews, workshops, and the development of care pathway matrices, the project identified a range of systemic, organizational, and operational challenges that hinder effective transitions from hospital to home.

Across pilot sites, several local challenges in transitional care were identified during the mapping of current practices. These include poor communication between care levels, lack of coordination and continuity, outdated or incompatible digital systems, and limited access to follow-up services and assistive technologies. Resource constraints, infrastructure limitations, and insufficient involvement of patients and families further complicate the transition from hospital to home. These site-specific “pain points” highlight the need for targeted, context-sensitive solutions—forming the basis for the redesigned care pathways presented in this deliverable.

3.1 Challenges at INRCA

In addition to the challenges encountered at national level, the main problem in transitional care at INRCA level is that, unless the patient is discharged from the acute care unit and subsequently admitted to INRCA’s post-acute intermediate care unit, the hospital has no direct connection with general practitioner, community based services or residential care facilities. These settings are managed by different teams which often lack geriatric expertise and use different methodologies and tools. This creates gaps in continuity of care frequently leading to problems in patient care and management.

At discharge, INRCA department produces a discharge letter that is shared with the general practitioner, however there is no guarantee that the prescribed therapies and recommendations are implemented, once the patient has left the hospital. Hence, in the event of a readmission, there is often insufficient information about their health status and ongoing treatments. Creating continuity and strengthening communication among involved healthcare actors is therefore crucial to prevent (re)hospitalization of frail older adults

3.2 Challenges at HINS

In addition to the challenges encountered at national level, at HINS there is another issue due to the constant bed occupancy rate of above 90%. This shortage of beds is made worse by the absence of palliative centres where patients with terminal stages of various disease could be monitored. Due to the high number of patients, it is difficult to schedule the follow-up visits, which are very important, particularly for patients who underwent interventional procedures. The emergency department is also very crowded, most likely due to the long waiting lists at GP or a cardiologist from an ambulatory department.

3.3 Challenges at FAR

Significant communication gaps exist between hospitals and municipal health services. The recent switch to a new journal platform by hospitals has exacerbated these issues, causing delays in sharing critical patient information. This can lead to inadequate preparation for patient discharge and follow-up care. Additionally, the outdated and suboptimal municipal medical journal system is time-consuming and further complicates information sharing. Coordination between different healthcare providers is often fragmented, both between hospitals and municipalities and within interdisciplinary teams in the municipality. This fragmentation results in a lack of continuity in care, where patients might not receive the necessary services promptly after discharge from the hospital. The rural placement of the community presents significant resource constraints for both hospitals and municipal health services. These include staffing shortages and limited access to necessary medical equipment and welfare technology, such as safety alarms, cameras, and door alarms. These constraints hinder the ability to provide comprehensive care to frail elderly patients. The accumulation of patients in short-term wards, who cannot be accommodated at higher service level placements, leads to quick institutionalization and an inability to return home. This is compounded by insufficient access to assistive devices, which are often not available until after hospital discharge, placing a burden on home care services. Older houses in rural areas are often not built to accommodate the needs of elderly residents, with multiple levels and no elevators. This lack of suitable housing further complicates the transition from hospital to home care. Patients and their families often feel excluded from the decision-making process. They may not receive adequate or accurate information when the hospital and municipality are not coordinated about the needs for further care. This lack of involvement can lead to unnecessary readmissions and deteriorating health outcomes.

4 Overview of the current Care pathway matrix

The project end-users group developed this model to systematically examine current practices in transitional care, with a particular focus on communication quality and discharge planning. The model maps the patient journey from home to hospital and back again, emphasizing the critical touchpoints where coordination between hospitals and municipal services is essential. It highlights common issues such as delayed or missing notifications to municipalities, unclear or inconsistent documentation, and insufficient collaboration during discharge planning. By visualizing these challenges (see Figure 1), the model serves as a tool to identify gaps and improve the continuity and quality of care across care levels.

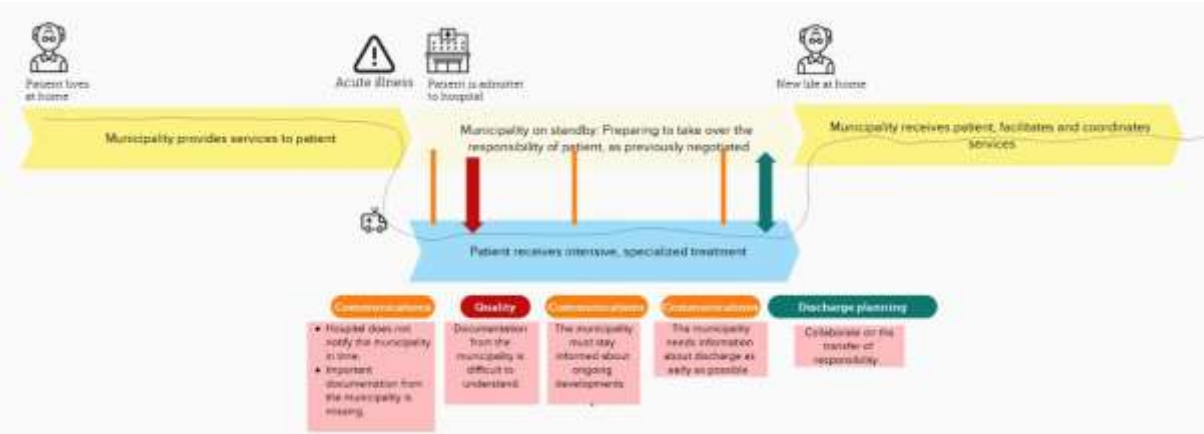

Figure 1: Transitional care pathway visualization.

4.1 Current pathway matrix INRCA

Figure 2 illustrates the current patient journey at INRCA across four main phases: (1) assessment/clarification, (2) hospital admission, (3) hospital stay, and (4) discharge.

In the **assessment and clarification** phase, the patient experiences an illness or worsening of a condition and seeks medical help, often accompanied by family members. The family engages in dialogue with healthcare professionals and assists in bringing the patient to the hospital. General practitioners evaluate the patient, potentially referring them to specialist care, while home health services report emergencies. At this stage, the hospital is primarily involved through initial consultations.

During the **admission to hospital**, the patient is formally admitted, provides a medication list if available, and family members support the process by sharing clinical history and medication information. The GP's referral is acted upon, and the hospital's emergency department completes admission protocols and a comprehensive geriatric assessment (CGA). Home health services prepare by updating records and pausing home services.

In the **hospital stay phase**, the patient undergoes comprehensive geriatric examinations, periodic evaluations of nutritional and cognitive status, and rehabilitation if needed to prevent complications. The family maintains dialogue with hospital staff, while the hospital team defines the clinical pathway through collaboration among physicians, nurses, and rehabilitation professionals. Daily reports track progress, and changes in diagnosis or discharge dates are communicated.

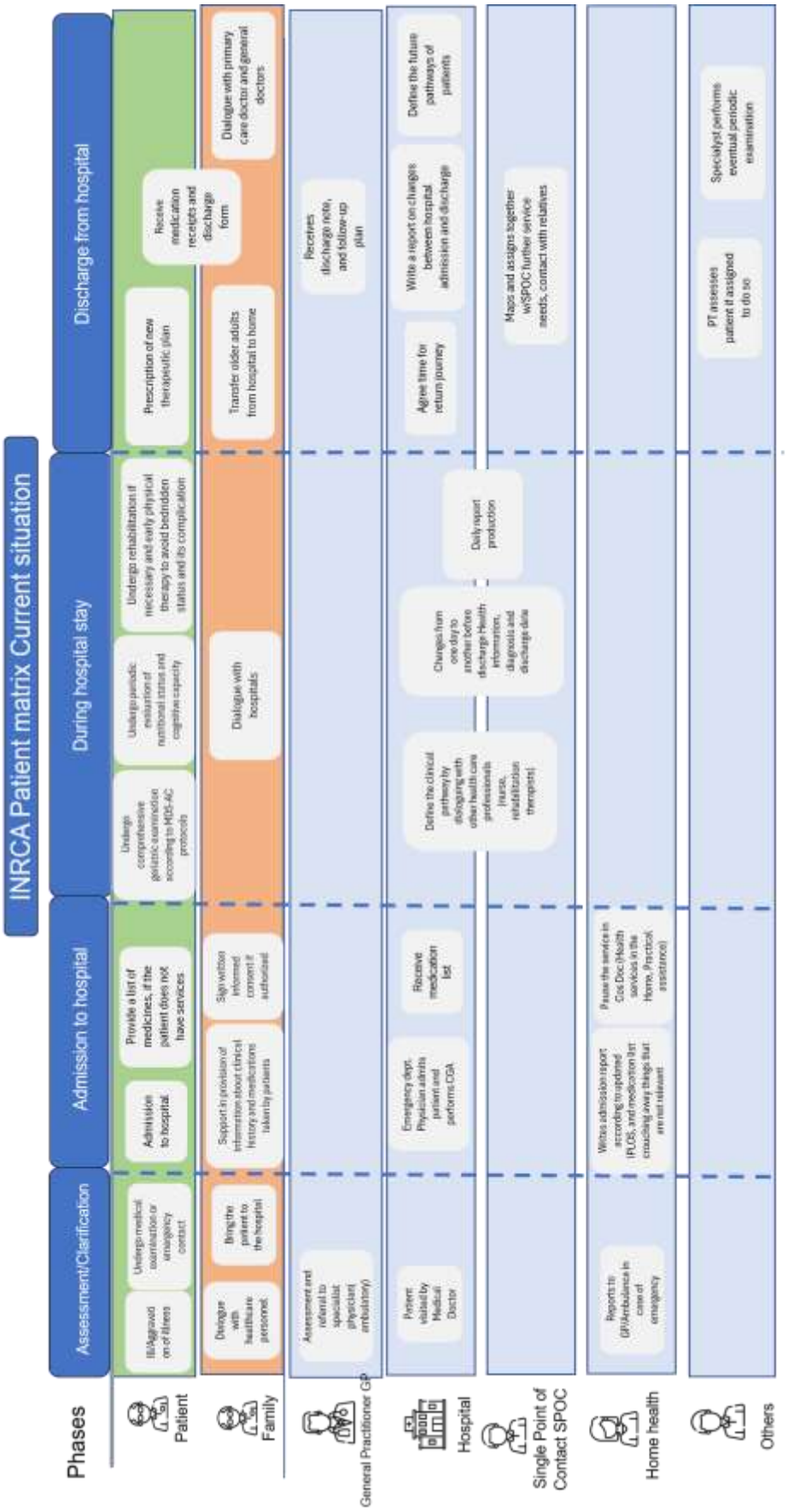

Figure 2: INRCA specific care pathway.

During **discharge from hospital**, the hospital prescribes a new therapeutic plan and prepares the patient for return home. The patient receives medication receipts and a discharge form. The hospital agrees on the return journey timing, writes a report comparing admission and discharge status, and plans future care pathways. The SPOC and hospital coordinate to map out further services and maintain contact with relatives. Home health may resume services, perform assessments or periodic checks if assigned.

Throughout the journey, the family plays a key role by assisting with information sharing, coordinating with doctors, and supporting the transition from hospital to home, especially for non-autonomous patients, who are common in geriatric IRCCS INRCA hospital. The process ensures that the patient receives continuous, well-coordinated care across multiple actors, minimizing risks and fostering recovery.

4.2 Current pathway matrix HINS

Figure 3 presents the current patient journey at HINS, structured into five key phases: (1) assessment/clarification, (2) hospital admission, (3) hospital stay, (4) discharge from hospital, and (5) post-discharge.

In the **assessment/clarification phase**, patients who develop new symptoms or experience a deterioration of a pre-existing condition seek medical help. The patient first consults their general practitioner, who performs an initial evaluation and refers the patient to an outpatient cardiologist. The outpatient cardiologist conducts further investigations and, depending on the severity of the case, decides whether the patient should be hospitalized as an emergency or a scheduled admission. In cases where symptoms have a sudden onset, patients often go directly to the emergency department. The family is frequently involved at this stage, assisting with transportation to hospital. Upon hospital admission, a comprehensive reassessment is carried out and the family may provide relevant medical history, such as current treatment or comorbidities, particularly if the patient is unable to provide full medical information.

During **hospital stay**, further investigations are conducted to establish a final diagnosis. The patient receives specialized treatment, which may include invasive procedures. Throughout the hospital stay, the patient is monitored both clinically and para-clinically. The patient and their family are kept informed about the patient's health status and the anticipated discharge date.

At **discharge**, the patient receives a discharge summary containing treatment recommendations and a follow-up plan. This document should be submitted to the general practitioner. **After leaving the hospital** the patient is monitored by the general practitioner, who prescribes treatment according to the cardiologist's recommendations. Additionally, the patient is regularly assessed by an outpatient cardiologist at intervals established upon discharge.

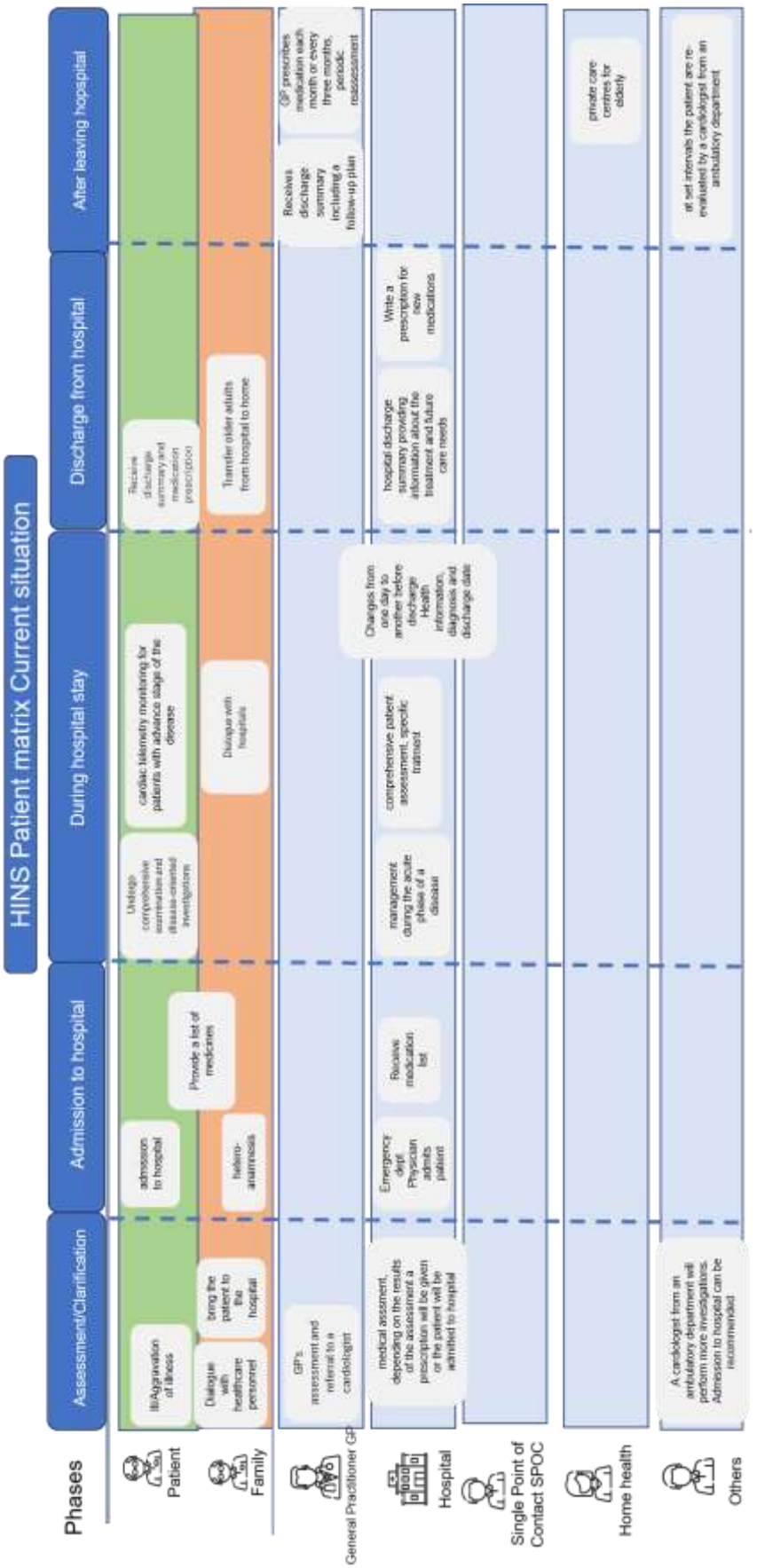

Figure 3: HINS specific care pathway.

4.3 Current pathway matrix FAR

Figure 4 presents the current patient journey at FAR structured into five key phases: (1) assessment/clarification, (2) hospital admission, (3) hospital stay, (4) discharge from hospital, and (5) post-discharge.

In the **assessment phase**, the patient recognizes symptoms and seeks help, often with support from family. The general practitioner evaluates the patient and may refer them to the hospital, while the hospital and municipal services begin coordinating care. Upon **admission**, the patient enters the hospital system, and the family provides relevant medical information. The GP's referral is processed, and the Single Point of Contact (SPOC) coordinates logistics.

During the **hospital stay**, the patient receives treatment and monitoring, including diagnostic tests and therapeutic interventions. The hospital team—comprising physicians, nurses, and allied health professionals—develops a care plan. Communication with the family is maintained to inform them of the patient's condition and anticipated discharge date. Discharge planning begins early, involving municipal services to assess home readiness and support needs.

Discharge involves coordination between hospital staff, the SPOC, and municipal care providers. The hospital provides prescriptions, a discharge summary, and instructions for continued care. The SPOC arranges transportation and ensures that necessary assistive devices and home modifications are in place. Family members help prepare the home environment and may receive training or guidance on supporting the patient's recovery.

After discharge, the patient continues treatment at home, supported by family, the GP, and municipal services. Follow-up care is coordinated to ensure a smooth recovery and prevent readmission.

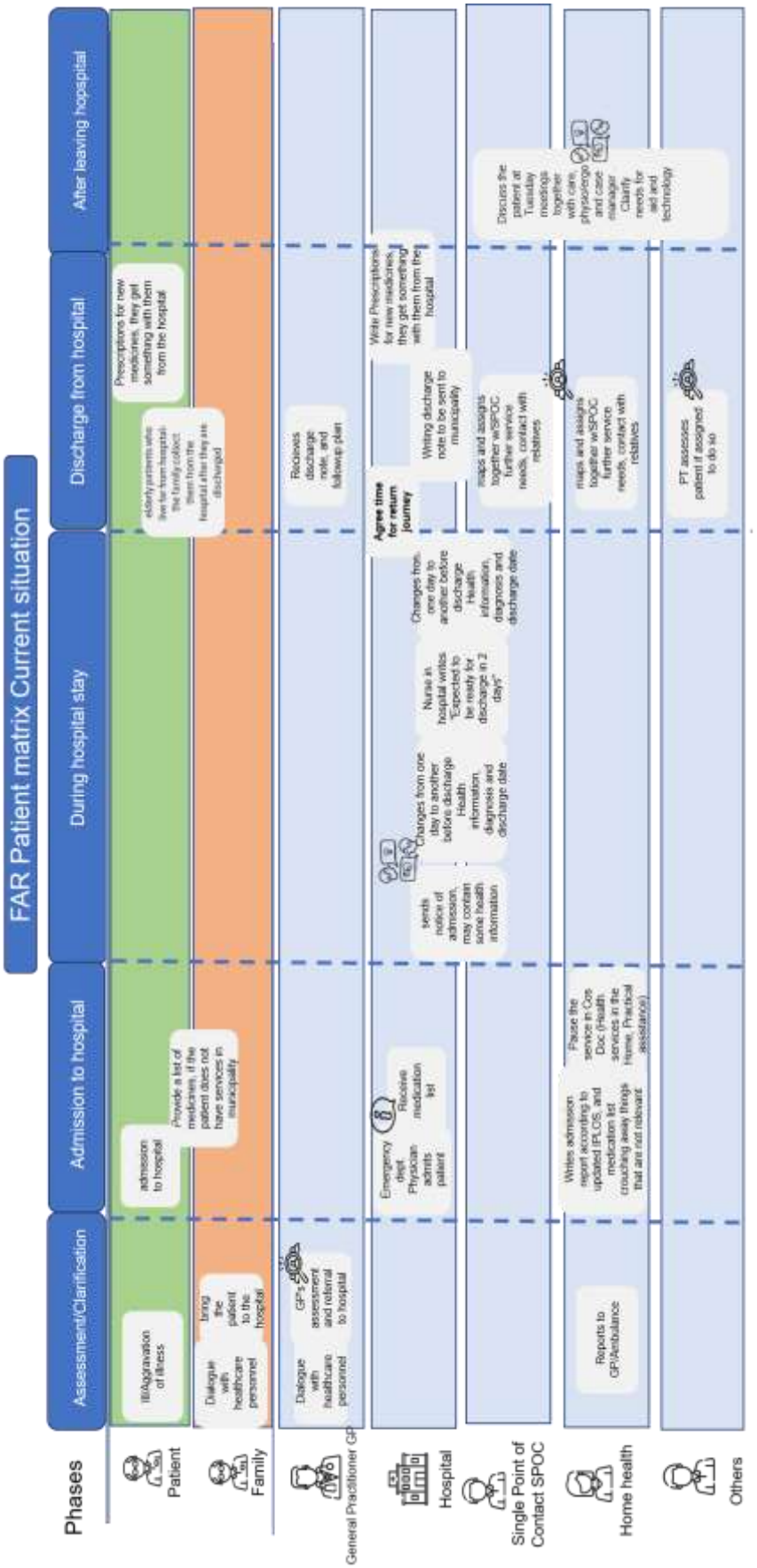

Figure 4: FAR specific care pathway.

5 Technology integration from WP2

5.1 Overview of transitional care technologies

The TransCare project will integrate several digital technologies to support older adults during the transition from hospital to home. These technologies aim to enhance patient self-management, improve communication among care providers, and reduce the risk of re-hospitalization. The core components include:

- **Remote Patient Monitoring (RPM):** Patients will be equipped with CE-certified medical devices such as smart scales, blood pressure monitors, glucometers, pulse oximeters, and thermometers. These devices will automatically transmit health data via Bluetooth to a centralized platform.
- **Activity Tracking Devices:** A wearable smart watch, Fitbit will continuously monitor physical activity, sleep patterns, heart rate, and other wellness indicators. These devices will provide longitudinal data to support behavioral insights and trend analysis.
- **Digital Platform (TelluCare):** The TelluCare platform will serve as the central hub for data aggregation, visualization, and communication. It supports HL7 FHIR standards for interoperability and includes secure APIs for integration with hospital systems and municipal care services.
- **Mobile Application (Dialogg):** Patients will use the Dialogg app to report measurements, receive reminders, and access personalized health information. The app will also facilitate asynchronous communication with care teams.
- **Digital Assistant (Memas):** Patients will receive educational content and self-assessment tools to support health literacy and engagement in their care.
- **AI-Based Analytics:** Machine learning algorithms will process collected data to detect anomalies, predict health deterioration, and support clinical decision-making. These models will operate on anonymized datasets and provide actionable insights to healthcare professionals.

5.2 Adaptation to Local contexts

Technology deployment in TransCare is carefully tailored to the specific needs, infrastructure, and digital maturity of each pilot site. At **INRCA (Italy)**, the focus is on older, frail patients with multimorbidity. The platform is configured to support caregivers and ensure accessibility for patients with mild cognitive impairment, using simplified user flows and localized educational content aligned with Italian national health standards. The correct utilization of the platform will be guaranteed by continuous training for end users. At **HINS (Romania)**, the emphasis is on cardiology patients at high risk of readmission. The remote patient monitoring (RPM) system is integrated into existing hospital workflows, with cardiologists leading recruitment, data interpretation, and patient engagement. At **FAR (Norway)**, the system is embedded within municipal home health services, extending to include modules for camera supervision and personal alarms to support patients in rural areas. Across all sites, deployments are adapted to local operational realities and comply with national regulations, language requirements, and data protection laws, including GDPR, ensuring secure and ethical handling of patient data.

5.3 Integration into redesigned pathways

The redesigned care pathways in TransCare embed digital technologies (more details in WP2 deliverables) at multiple stages of the patient journey to enable proactive, coordinated, and data-driven care. Technology is a core component of the new care model, supporting communication, monitoring, and decision-making from hospital to home.

Before discharge, patients are screened for eligibility and those selected for the intervention are introduced to TransCare technology including medical and non-medical monitoring equipment. They receive training on how to use the devices and the Dialogg mobile application, which serves as the interface for daily reporting and communication. Care plans are configured in the TelluCare platform, linking the patient's monitoring schedule with clinical oversight.

Once discharged, patients begin using the devices at home. These tools continuously collect and transmit health data, such as vital signs and activity levels, to the platform. The system visualizes trends and triggers alerts based on predefined thresholds. Healthcare professionals access dashboards to monitor patient status, adjust care plans, with the possibility to respond to alerts as needed.

AI - based post discharge analytics processes the collected monitored data (daily life activity and vital signs) to determine insights that can be used by medical professionals to address the problems that require proactive intervention. The current version of the platform integrates a deep-learning architecture for predicting heart rate during physical activities like running, walking, swimming or cycling, for a specific patient. The following monitored data is captured through the Tellu Dialogg application: (i) intraday Fitbit timeseries data, (ii) daily summary information and (iii) data from other sensors or devices integrated into the remote monitoring platform (e.g. smart blood pressure meter, etc.). The AI model outputs predictions of heart rate during specific activities allowing to compare them with the actual values.

By embedding technology into the redesigned pathways, TransCare ensures an improved transition from hospital to home, improve care coordination, and empowers patients and providers with real-time insights.

6 Description of the pilots and WP4 Testing

The three pilot sites have been described in detail in Deliverable 4.1 "Ethical pilots' methodology and protocols' definition" had and are only briefly present in the next sub-sections.

6.1 INRCA (Italy)

In Italy, the trial in conducted in IRCCS INRCA geriatric hospital. According to the project plan the main involved ward is the Geriatrics Operating Unit. Due to the intrinsic characteristics of inpatient in the Hospital (79, 9 years in average age in medical wards and 86,49 in geriatric department), it is difficult to find patients that meet the inclusion criteria due to their frailty. For this reason, the INRCA team has decided to broaden the patient pool by extending it to other medical hospital departments. The research team includes multidisciplinary professionals with complementary expertise. Experienced clinicians with a strong research background will be responsible for identifying and selecting eligible participants according to the clinical, physical, and cognitive inclusion criteria. Experts in user engagement will meet with end-users and their families to present the project, explain the participation procedures, and support recruitment. In addition, technical staff will provide users with assistance in using the TransCare technological ecosystem and will manage the technical aspects of data collection. The research team will also monitor the clinical data flow from each participant, ensuring that data are correctly recorded, archived, and subsequently analysed. The typical inpatient admitted to the IRCCS INRCA Geriatrics Department is a frail older adult, often affected by multimorbidity and a high burden of chronic conditions. Hospitalization frequently occurs because of acute clinical events, such as infectious diseases involving the urinary or biliary tract, or due to the worsening and decompensation of pre-existing chronic conditions, particularly in the cardiovascular domain, such as chronic heart failure.

6.2 HINS (Romania)

In Romania the patients are recruited from the Cardiology Department of the Niculae Stancioiu Heart Institute. The research team includes cardiologists and technical staff. The cardiologist screen hospitalized patients to evaluate the clinical, physical and cognitive inclusion criteria and eventual recruitment for the TransCare project. They meet with the patient and their family to present the project and the modalities of possible participation. The technical specialists provide support in utilizing the TransCare technological ecosystem, take track of clinical data flow from each participant, and ensure that the data is properly archived for subsequent analysis. The typical inpatient that is hospitalized in the HINS, Cardiology Department presents heart failure caused by medical conditions such as: chronic coronary syndromes, acute coronary syndromes, or valvular heart disease. Another category of patients is represented by those with arrhythmias, conduction disturbance or peripheral vascular diseases.

6.3 FAR (Norway)

In Norway, patients will be recruited from the municipal care services in collaboration with the local hospital (Sørlandet sykehus avd. Flekkefjord). The municipal services office serves as the single point of contact for all patients and is notified by the hospital of all potential new patients shortly after admission. The project multidisciplinary team will work closely with the municipal services office to identify and recruit patients. When a potential patient is identified, the project multidisciplinary team will meet the patient and their family to present the project. Screening for cognitive and physical

inclusion criteria will be a shared responsibility between the hospital and municipal multidisciplinary teams. Home health services will provide technical training on the equipment to the patient and will also be responsible for the daily follow-up. Home health will respond to measurements and forms that trigger alarms. The typical patient receiving care in the FAR municipality is an older, frail patient with chronic illness, infections, or those requiring postoperative rehabilitation.

7 Pilot-Specific Enhanced Care Pathway Designs

The study protocol developed in WP4 is fully embedded into the redesigned care pathways, ensuring that technology-supported care is delivered in a structured and consistent way. Participants are randomized into intervention and control groups as shown in Figure 5, study flow diagram below. Those in the intervention group follow a digitally supported care pathway that includes onboarding, device training, and configuration of personalized care plans at discharge. Post-discharge, remote monitoring and structured follow-up at 30, 60, and 90 days enable proactive care, real-time coordination, and continuous refinement of the pathway.

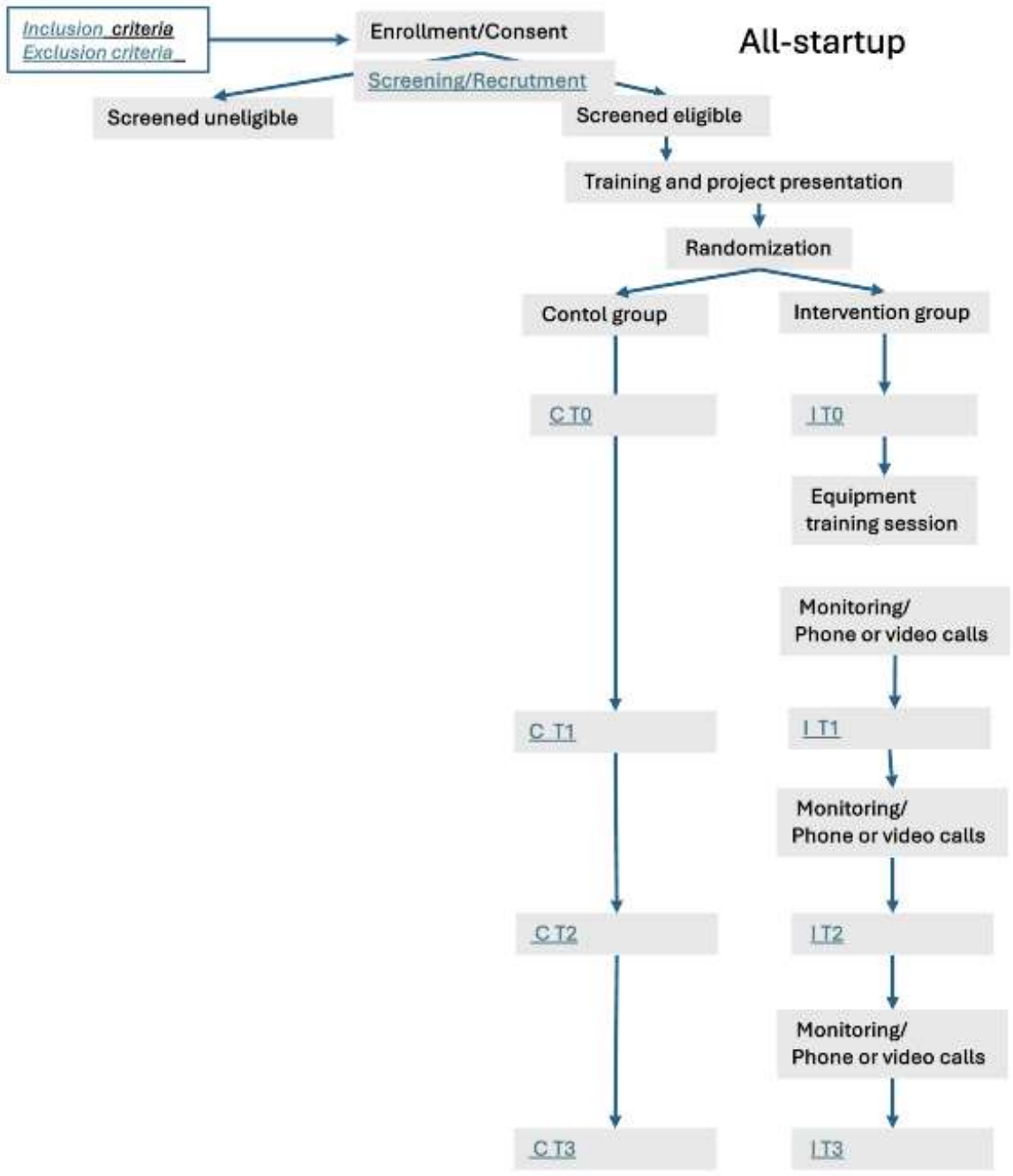

Figure 5: Study flow diagram

7.1 Redesigned Care Pathway Matrix – INRCA (v1)

The redesigned matrix from Figure 6 illustrates the updated patient care pathway matrix at IRCCS INRCA, reflecting the integration of technological solutions and tailored improvements in transitional care. The main key phases are the same as the one reported in the above section, spanning among assessment/clarification, admission to hospital, hospital stay, discharge from hospital, and after leaving the hospital.

This matrix outlines again the roles and actions of all main stakeholders, including the patient, family, general practitioner, hospital, home health services, and others—highlighting how coordination and communication are strengthened across all stages.

Notably, during the hospital stay, there is an explicit step for recruitment and communication about possible candidates for TransCare intervention. The discharge phase includes structured use of clinical assessment scales and systematic data collection (anamnesis, functional and cognitive assessments). After discharge, a significant innovation is the introduction of remote monitoring, supported by the Dialog APP and Memas-client or TelluWeb platforms, enabling patients and families to actively participate in home self-monitoring. This is accompanied by instructions and training before leaving the hospital to ensure effective use of these tools.

Yellow boxes and arrows in the matrix indicate areas where project interventions have been implemented—such as improved data collection, recruitment procedures, and the embedding of telemonitoring technology. The matrix serves as a detailed blueprint for enhancing continuity of care through better communication flows, structured planning, and the integration of digital solutions, ultimately aiming to ensure a smoother, safer transition from hospital to home and ongoing follow-up during the first 90 days post-discharge.

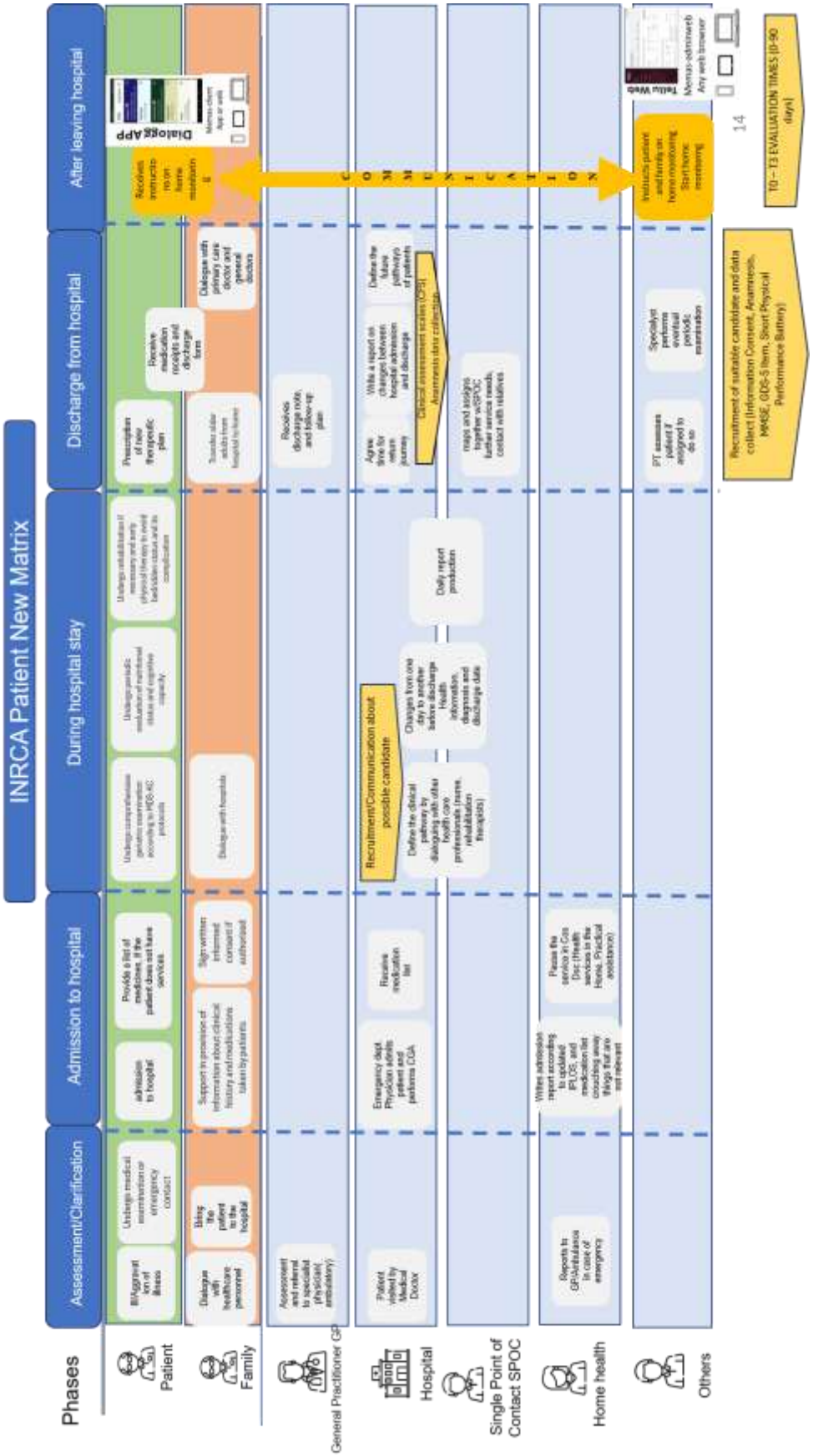

Figure 6: INRCA Patient New Matrix.

7.1.1 Enhancement of the redesigned Care Pathway Matrix – INRCA (v2)

The redesigned matrix (Figure 7) in this new version visually simplifies the care pathway developed at the IRCCS INRCA, which aims to strengthen continuity of care and improve coordination between hospital services, patients and home-based follow-up activities. The matrix retains the same macro-phases already described in the previous version, enhanced by the interventions of the TransCare project. The matrix clearly defines the interactions between the main stakeholders involved in the care process, including the patient, hospital professionals and the healthcare services supporting post-discharge management.

Patients and caregivers are instructed and supported in monitoring activities during the first 90 days after discharge, including through weekly phone calls from TransCare project operators, in order to ensure continuous monitoring and encourage participation in the use of home-monitoring devices.

Overall, the redesigned framework serves as an operational framework for improving transition care at the IRCCS INRCA through enhanced communication, structured assessments, patient empowerment and the integration of home monitoring practices into the post-discharge follow-up process.

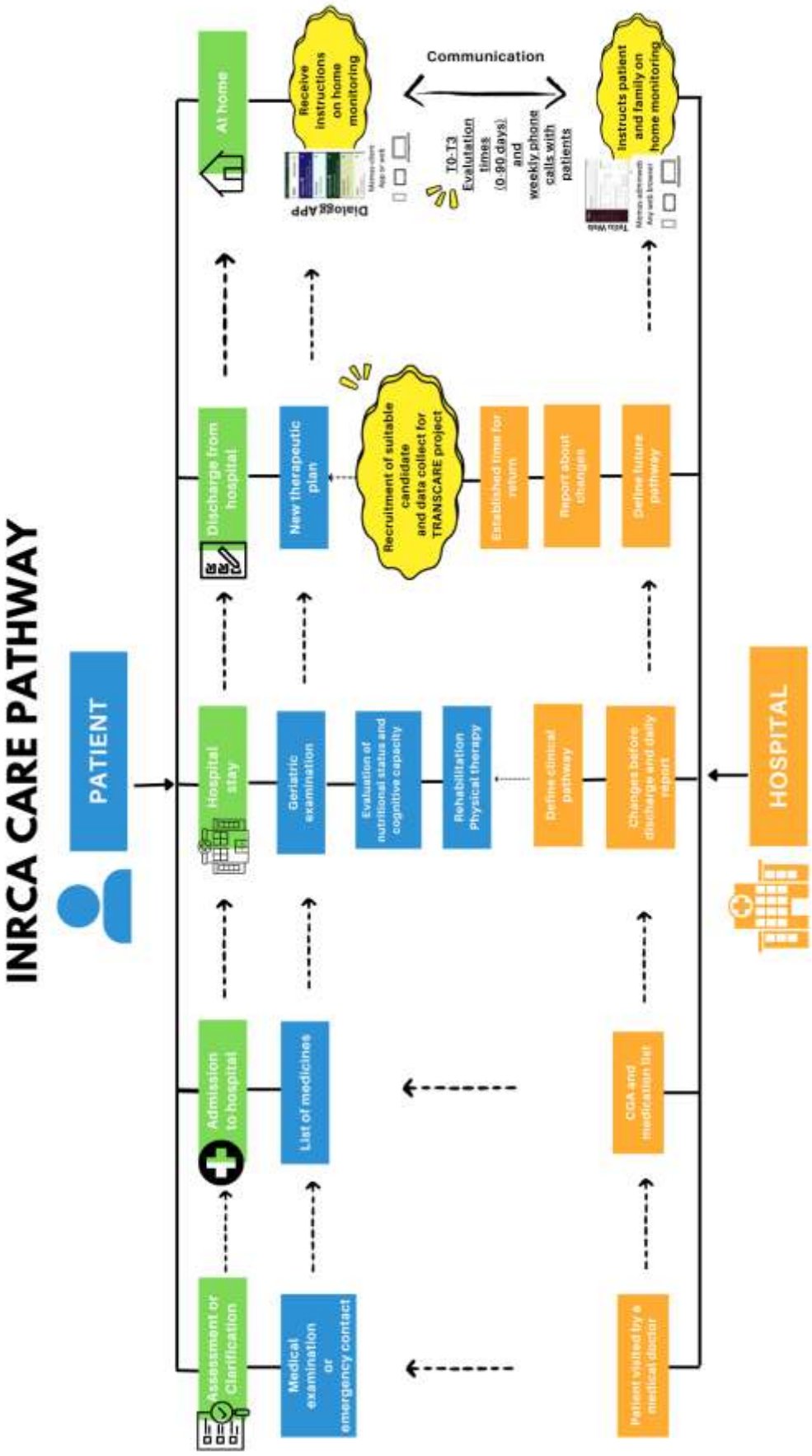

Figure 7: Adjustments of the INRCA redesigned Care Pathway Matrix

7.2 Redesigned Care Pathway Matrix – HINS (v1)

The redesigned matrix in Figure 8 presents the updated version of the previously reported patient care pathway highlighting the integration of digital health tools to support remote monitoring and improve care continuity. It maintains the same five key phases: assessment/clarification, hospital admission, hospital stay, discharge from hospital and post-discharge follow-up. The matrix defines the roles and responsibilities of all parties involved and emphasizes how communication, care planning and coordination are managed across these phases to ensure continuity and integration of care.

In the updated matrix, remote patient monitoring is integrated as part of the patient pathway with recruitment taking place during hospitalization. At the point of discharge, patients receive clear instructions on how to use digital platforms and monitoring devices to share health data collected at home with the care team.

Key changes introduced by the project are highlighted with yellow boxes and arrows reflecting improvements in communication and enhanced follow-up processes. This updated matrix represents a strategic blueprint for integrating technology and an information-sharing model into the transitional care pathway to ensure a safe and efficient transition from hospital to home.

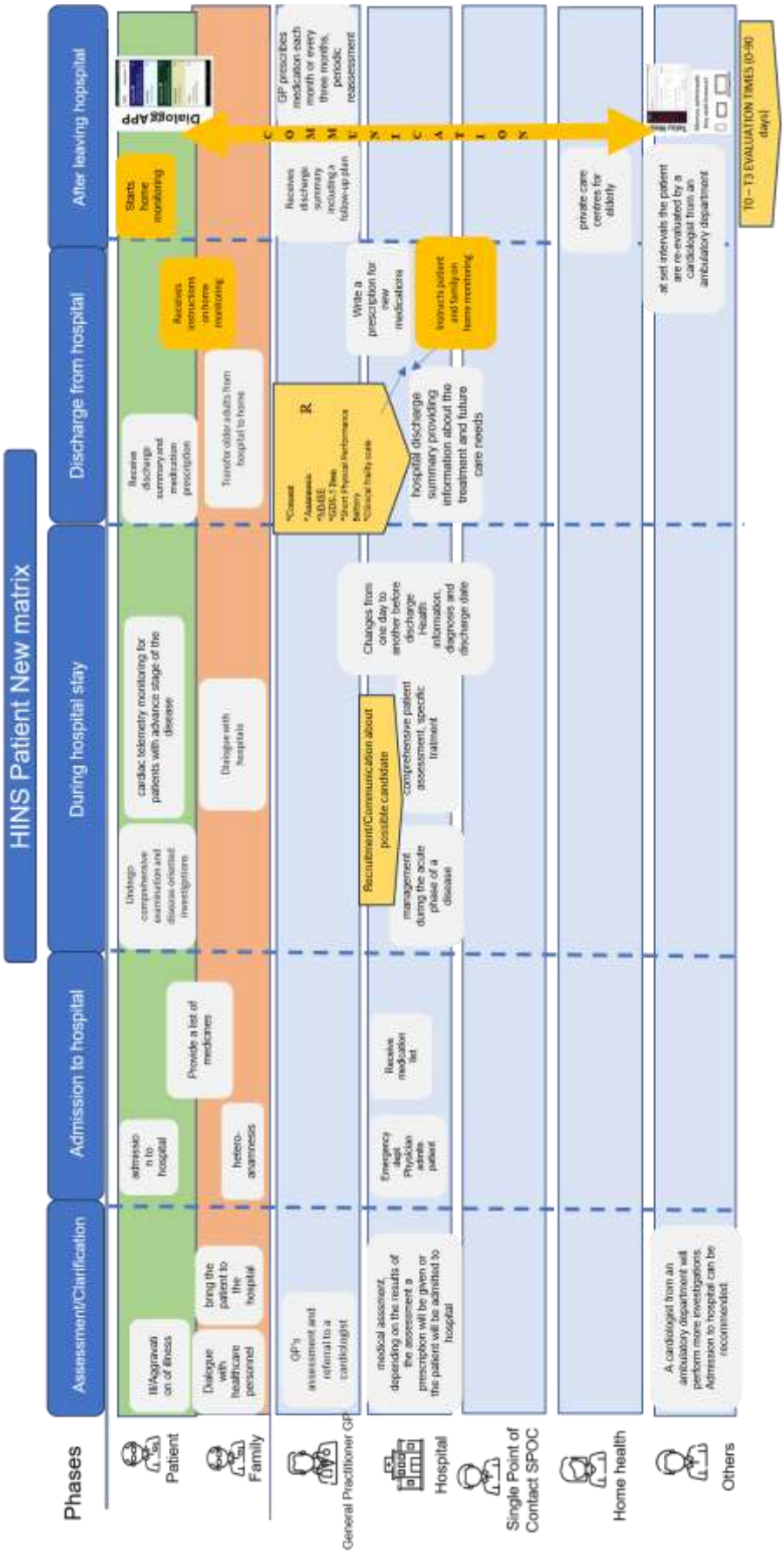

Figure 8: HINS Patient New Matrix.

7.2.1 Enhancements of the redesigned Care Pathway Matrix-HINS (v2)

The redesigned matrix for HINS in Figure 9 illustrates the simplified patient pathway, from the onset of symptoms and initial assessment to hospital admission, discharge, and return home.

Remote monitoring is integrated into the care pathway. Patients are recruited during hospitalization, when they are considered clinically ready for discharge. At this stage, both patients and families receive training on the use of home-monitoring tools and on the correct transmission of medical data.

The most important benefit of this model is the maintenance of continuous communication between the patient and the medical staff after discharge. Patients transmit daily clinical data collected at home, which are reviewed daily by the medical team, and when necessary and feasible, treatment plans are adjusted remotely. This approach reduces fragmentation in patient care by ensuring a continuous and coordinated follow-up process after discharge.

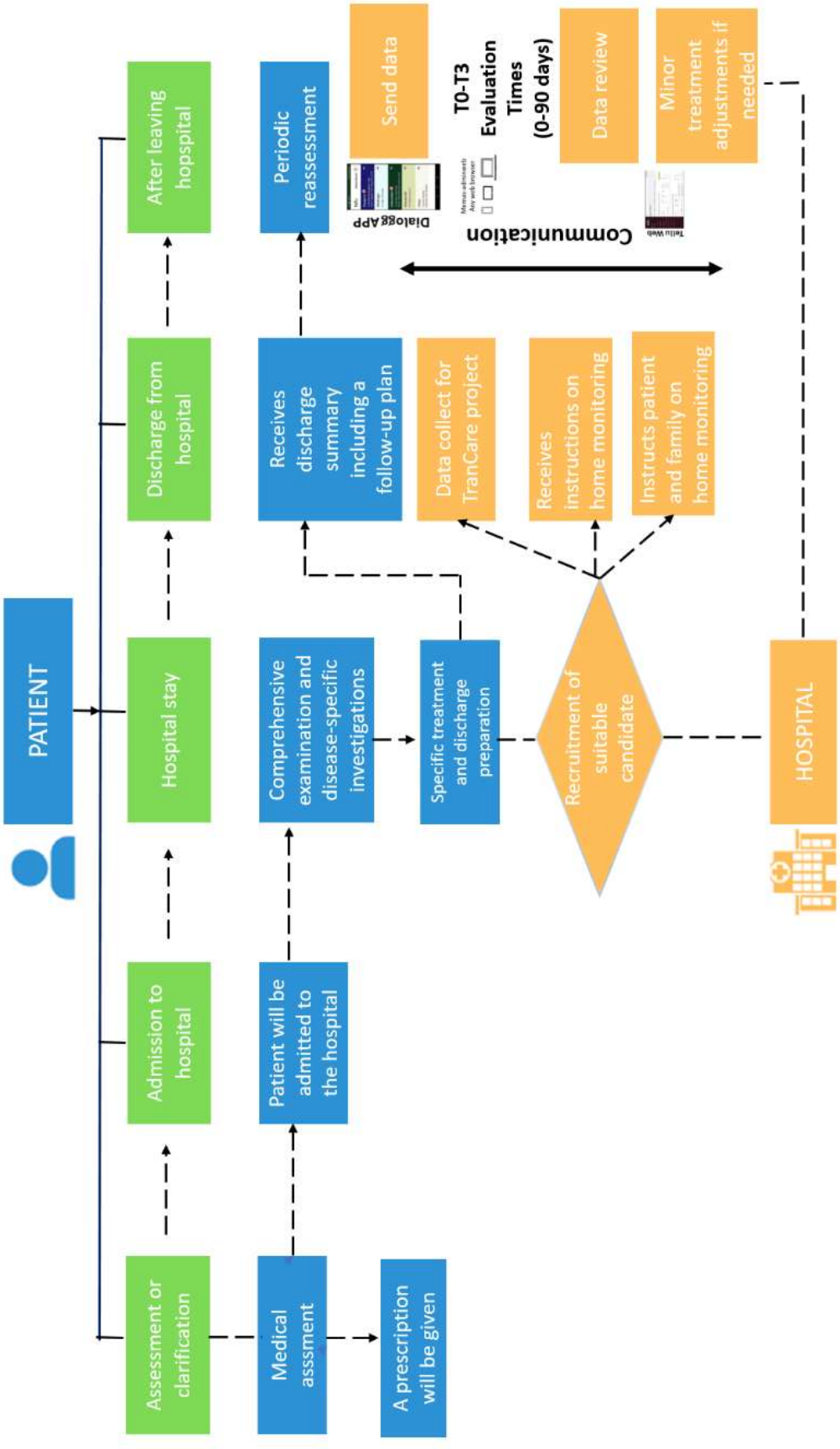

Figure 9: Adjustments of the HINS redesigned Care Pathway Matrix

7.3 Redesigned Care Pathway Matrix – FAR (v1)

The redesigned matrix from Figure 10 presents an updated and structured view of the patient journey through the healthcare system, emphasizing improved coordination and integration of services. It spans five key phases: assessment and clarification, hospital admission, hospital stay, discharge and arrival at home, and post-discharge follow-up.

Each phase outlines the roles and responsibilities of key stakeholders, including the patient, general practitioner, hospital, Single Point of Contact (SPOC), home health services, and others. The matrix highlights how communication, planning, and coordination are done across these phases. For example, the assessment phase includes a clearer agreement between the patient, SPOC and GP.

After discharge, the patient resumes care at home, supported by municipal health services, the GP, and family. Follow-up visits are scheduled, and home health services monitor the patient's condition. Remote monitoring technologies are introduced, including wearable devices and the Dialogg app, enabling real-time data sharing and alerts.

Notable changes are marked with orange triangles and explained in yellow boxes, indicating where project interventions have been made—such as enhanced communication, better-defined responsibilities, and more structured follow-up. This redesigned matrix serves as a blueprint for embedding technology and collaborative practices into the transitional care pathway, ensuring a smooth and safer transition from hospital to home.

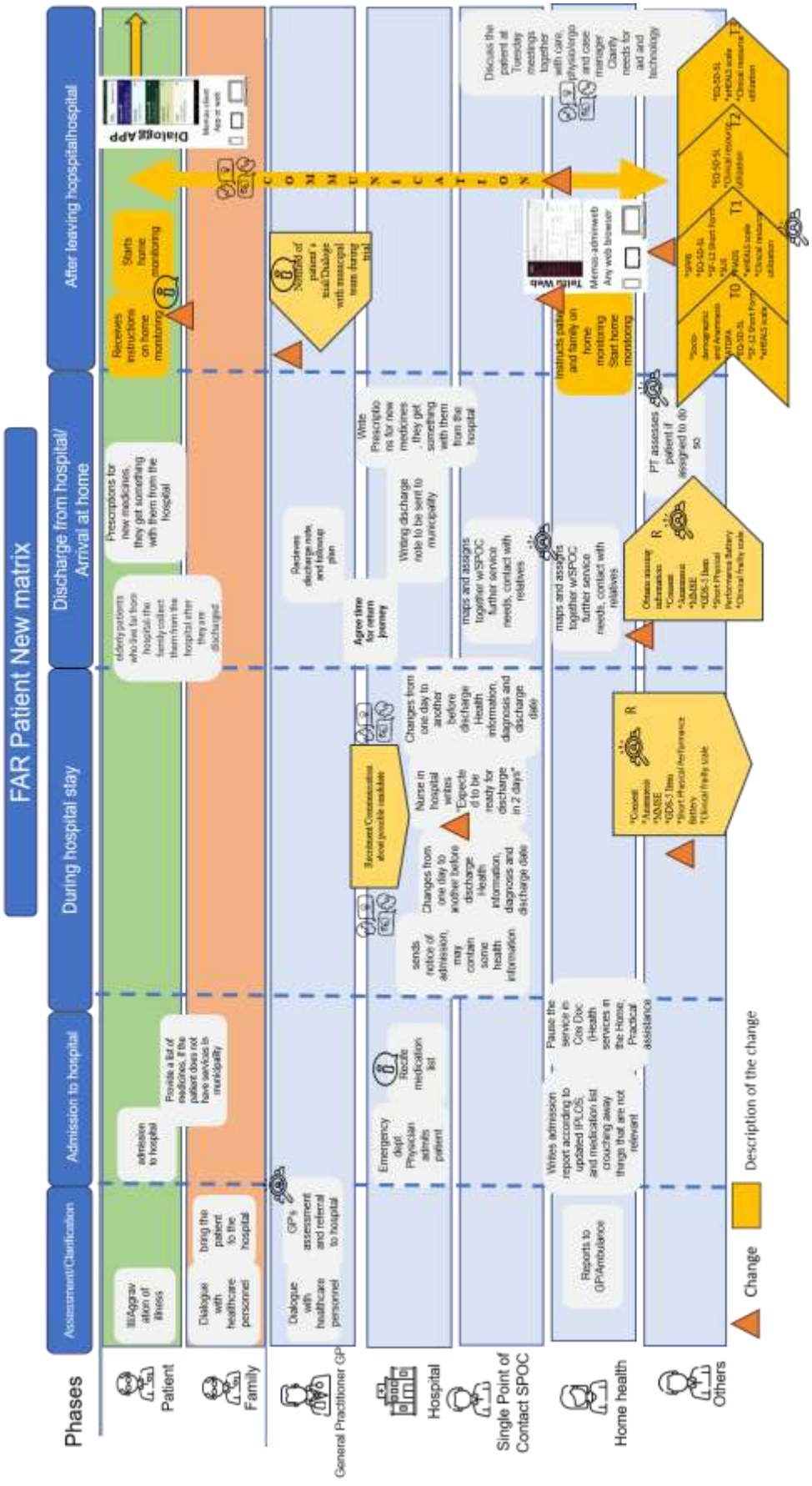

Figure 10: FAR Patient New Matrix.

7.3.1 Enhancements of the redesigned Care Pathway Matrix-FAR (v2)

The redesigned matrix (Figure 11) presents a simplified and more structured representation of the care pathway developed at FAR. The adjustments aim to further visualize coordination between hospital and municipal services, clarify roles and responsibilities, and enhance continuity of care throughout the transition from hospital to home.

The revised pathway retains the same key phases—assessment and clarification, hospital admission, hospital stay, discharge and return home, and post-discharge follow-up—but introduces clearer interaction points between stakeholders. In particular, the role of the Single Point of Contact (SPOC) is further emphasized as a central coordinator, ensuring timely information exchange and smoother transitions between care levels.

A key improvement in this version is the more systematic integration of digital and welfare technologies into the pathway. Patients selected for the TransCare intervention are introduced to remote monitoring solutions prior to discharge or right after arrival to home and receive practical training in the use of devices and the Dialogg application. This ensures that patients and caregivers are better prepared to manage health monitoring independently after returning home.

In the post-discharge phase, the pathway visualizes the structured follow-up through a combination of remote monitoring, scheduled check-ins, and proactive response to alerts generated by the system. Home health services play a central role in monitoring incoming data, responding to deviations, and maintaining regular contact with the patient. This approach supports earlier detection of deterioration and reduces the risk of readmission.

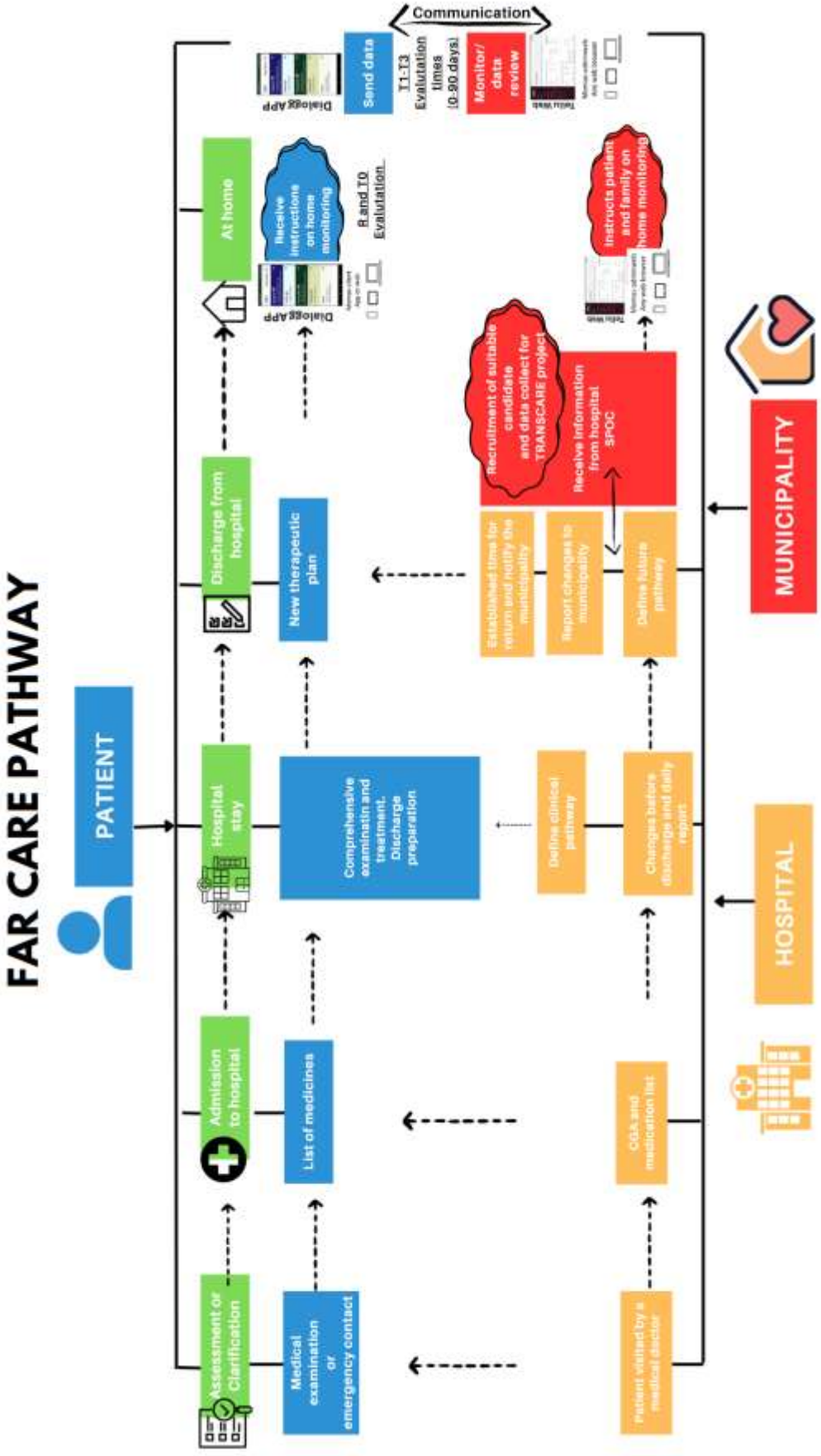

Figure 11: Adjustments of the FAR redesigned Care Pathway Matrix

8 Challenges and lessons learned

The development and early implementation of the redesigned transitional care pathways across the three pilot sites (INRCA, HINS, and FAR) provide valuable insights into both shared challenges and context-specific differences. Building on the findings from Deliverable 3.1 and the iterative refinements presented in this deliverable, the results confirm that improving transitional care requires a combination of organizational change, technological integration, and continuous stakeholder engagement.

A key common finding across all sites is the presence of fragmentation in communication and coordination between care levels, particularly at the point of discharge and during the post-discharge follow-up phase. While the specific causes vary — from lack of direct links between hospital and community services (INRCA), to resource constraints and overcrowding (HINS), to interoperability and coordination issues across municipal services (FAR) — the consequence is similar: reduced continuity of care and increased risk for adverse outcomes, including readmissions. These shared challenges highlight the importance of designing pathways that not only define clinical steps but also explicitly structure information flows, responsibilities, and follow-up mechanisms.

At the same time, important differences between the pilot sites have shaped how the redesigned pathways were adapted and implemented. INRCA operates within a geriatric context with highly frail, multimorbid patients and limited integration with community care, emphasizing the need for strengthened post-discharge coordination and caregiver involvement. HINS, as a high-capacity cardiology center, faces pressure from high patient volumes and limited resources for follow-up, making efficiency, prioritization, and remote monitoring particularly relevant. In contrast, FAR represents a decentralized, municipal-based system where coordination across services and geographical constraints are central challenges, and where the role of a Single Point of Contact (SPOC) becomes essential. These differences confirm that transitional care models must be flexible and adaptable, rather than standardized, to ensure relevance and feasibility in diverse healthcare systems.

A major lesson learned is that the integration of digital technologies—such as remote patient monitoring, digital communication platforms, and AI-based analytics—can significantly strengthen continuity of care, but only when accompanied by clear workflows, role definitions, and adequate training. Technology alone does not resolve coordination issues; rather, it acts as an enabler within a well-structured care pathway. Early pilot experiences underline the importance of preparing patients and caregivers before discharge, supporting healthcare professionals in adopting new tools, and ensuring that digital solutions are aligned with existing practices and capacities.

Another important insight is the value of the co-design approach used throughout the project. Active involvement of patients, caregivers, clinicians, and technical partners has contributed to pathways that are more realistic, acceptable, and user centered. This approach has facilitated the identification of practical barriers, increased stakeholder ownership, and supported the iterative refinement of both care models and technologies. It also highlights that successful implementation depends not only on technical or clinical validity, but also on user engagement and organizational readiness.

Positive aspects emerging from the redesign include improved clarity of roles and responsibilities, more structured discharge planning, and enhanced follow-up supported by remote monitoring and proactive communication. The introduction of continuous monitoring and data-driven insights creates new opportunities for early detection of deterioration, timely intervention, and more personalized

care. In addition, the strengthened involvement of patients and families contributes to empowerment and better adherence to care plans.

However, the work also confirms that transitional care redesign is inherently complex and non-linear. The early-stage nature of the WP4 trials means that many findings remain preliminary, and further evaluation is needed to assess long-term impact, scalability, and sustainability. Organizational constraints, resource limitations, and varying levels of digital maturity continue to influence implementation and require ongoing adaptation.

In summary, the TransCare experience demonstrates that effective transitional care improvement depends on a balanced integration of process redesign, technology, and stakeholder collaboration. The iterative and context-sensitive approach adopted in this project provides a robust foundation for continued refinement and offers transferable lessons for other healthcare systems aiming to strengthen care transitions from hospital to home.