JTC 2023: Healthcare of the Future

TRANSFORMING HEALTH AND CARE SYSTEMS

TransCare

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

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Introduction and main objectives

- *TransCare aims to adapt, scale, and evaluate a technology-assisted transitional care solution based on IoT, AI, and digital assistance in different healthcare systems in Europe (RO, NO, IT) as well as for various types of comorbidities*
- **Main objectives**
  - **O1. Study how the care pathways will need to be re-designed** for allowing the integration and usage of the technology in different hospital and healthcare settings providing the necessary knowledge for care relocation form hospital to home
  - **O2. Adapt, refine, improve and scale AAL projects solutions for transitional care (IoT, AI & digital assistance)** considering the specificity of the countries and different contexts in which the trials will be conducted
  - **O3. Setup and conduct longitudinal trials** to assess the potential of the technology to reduce the rate of rehospitalization relieving the pressure on health and care facilities
  - **O4. Define exploitation mechanisms for the project knowledge and technology** considering the hypothesis validation to formulate value-based propositions for healthcare providers
  - **O5. Disseminate the findings at national and international levels** through a multi-channel dissemination strategy with messages tailored for different categories of interested stakeholders

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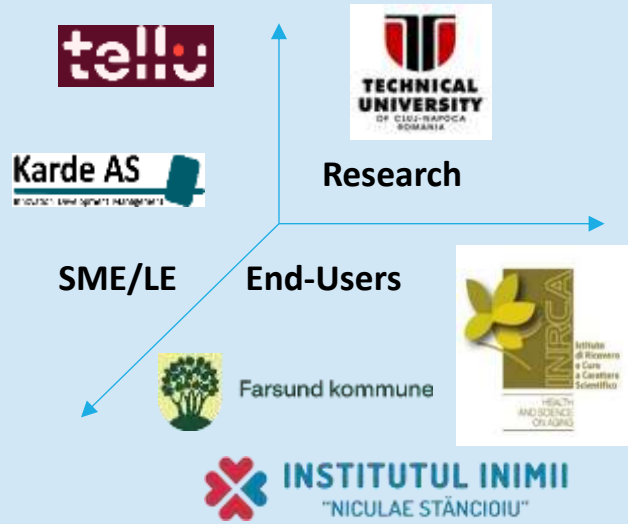
Introduction and main objectives

https://www.thcs-transcare.eu/

- TransCare consortium (countries, PIs, teams and expertise)

	Name	Gender	Country	Type of partner	Name of Organisation
Coordinator	Ionut Anghel	Male	Romania	Academic	TECHNICAL UNIVERSITY OF CLUJ-NAPOCA
Partner 1	Riitta Hellman	Female	Norway	SME/Industrial	KARDE AS
Partner 2	Arnor Solberg	Male	Norway	SME/Industrial	TELLU AS
Partner 3	Lorena Rossi	Female	Italy	Care Organization	ISTITUTO NAZIONALE DI RICOVERO E CURA PER ANZIANI
Partner 4	Ovidiu-Ionut Anchidin	Male	Romania	Clinical	HEART INSTITUTE "NICULAE STANCIOIU" CLUJ-NAPOCA
Partner 5	Camilla Gabrielsen	Female	Norway	Care Organization	FARSUND KOMMUNE



- Involvement of stakeholders

Local and regional authorities	Norway	Municipalities
Research and innovation funders	Norway, Italy and Romania	NFAs; Other EU programs
Health and care professionals	Norway, Italy and Romania	Healthcare teams; geriatricians and nurses; general practitioners and interventional cardiologists
Formal and Informal caregivers	Norway and Romania	Municipal healthcare formal caregivers; Informal caregivers/Family members
Healthcare providers (health centers or hospitals)	Norway and Romania	Care centers and hospitals
Research and innovation organizations	Norway, Italy and Romania	Research institutions, universities, research performing organisations
Health authorities	Norway, Romania	Local politicians, prime minister and research and development minister (RO); Directorate of Health at national level (NO)

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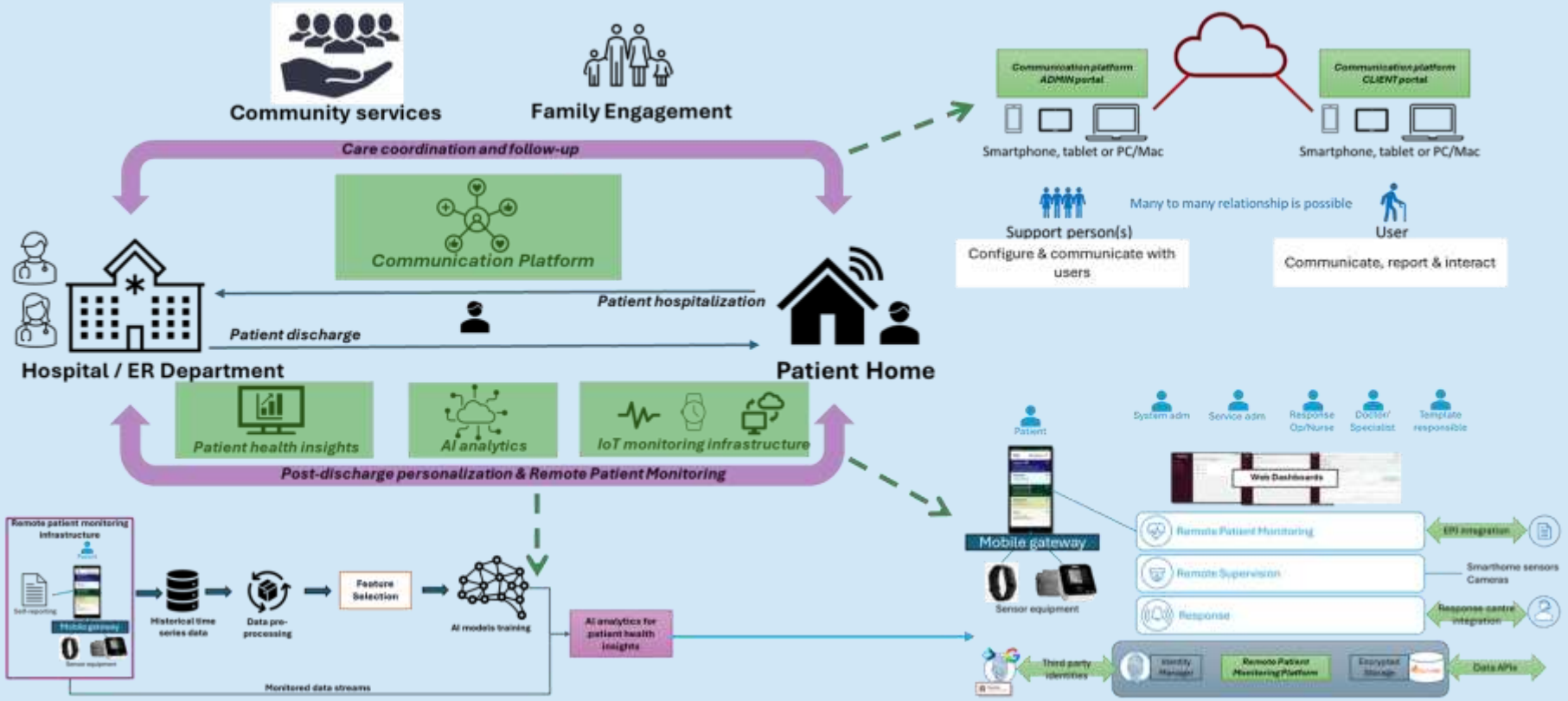
Results

- **TransCare integrated platform**



- **Relation to Proposal**:
  - O2. Integrated IoT, ML & digital assistance solution for transitional care with components from previous AAL projects; personalized for TransCare;
  - O4. Exploitation
  - O5. Dissemination
- **Maturity and Validation**: Validated; Ongoing piloting;
- **Supporting Evidence**:
  - RPM and communication platform are high maturity/TRL
  - AI component is fully integrated, validated in lab and currently tested in trials
  - **5 published articles**

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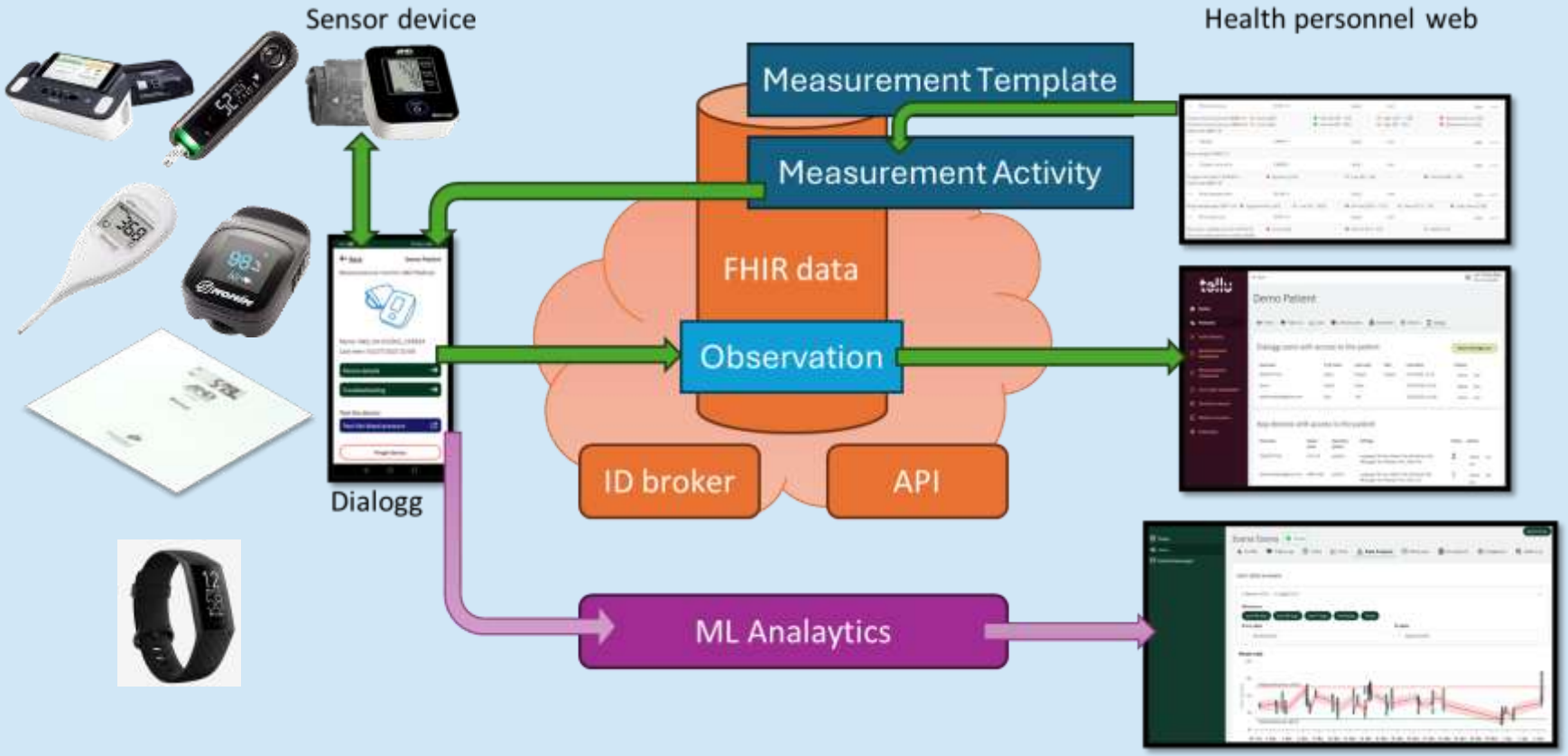
Results

- **Adapted and enhanced Tellu RPM platform**



- **Relation to Proposal**:
  - O2. Integrated IoT, ML & digital assistance solution for transitional care with components from previous AAL projects; personalized for TransCare;
  - O4. Exploitation
  - O5. Dissemination
- **Maturity and Validation**: Validated; Ongoing piloting;
- **Supporting Evidence**:
  - Baseline platform is commercial
  - **Nature Scientific Reports (WoS Q1)** https://www.nature.com/articles/s41598-025-03332-w

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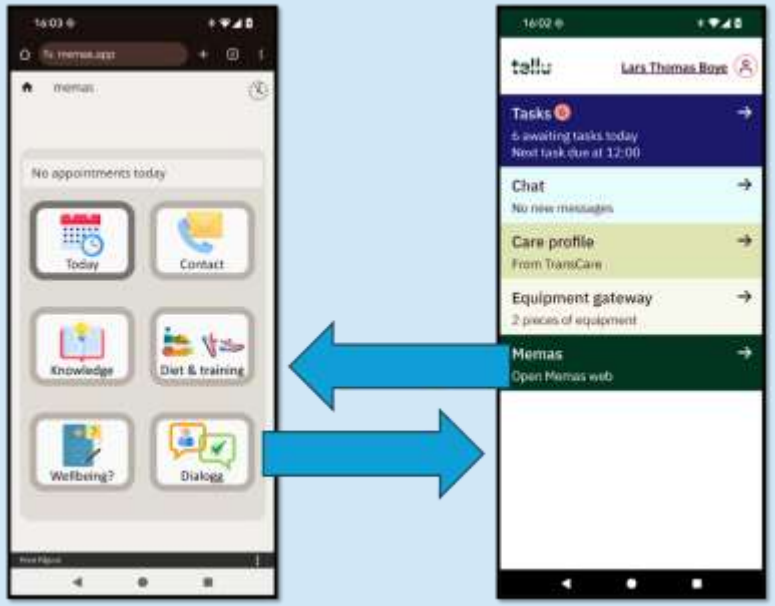
Results

- **Personalized Memas communication platform**



Memas Adminweb for personalisation of the Memas client app

Memas client app

- **Relation to Proposal**:
  - O2. Integrated IoT, ML & digital assistance solution for transitional care with components from previous AAL projects; personalized for TransCare;
  - O4. Exploitation
  - O5. Dissemination
- **Maturity and Validation**: Validated; Ongoing piloting;
- **Supporting Evidence**:
  - Baseline platform is commercial
  - **Nature Scientific Reports (WoS Q1)** https://www.nature.com/articles/s41598-025-03332-w

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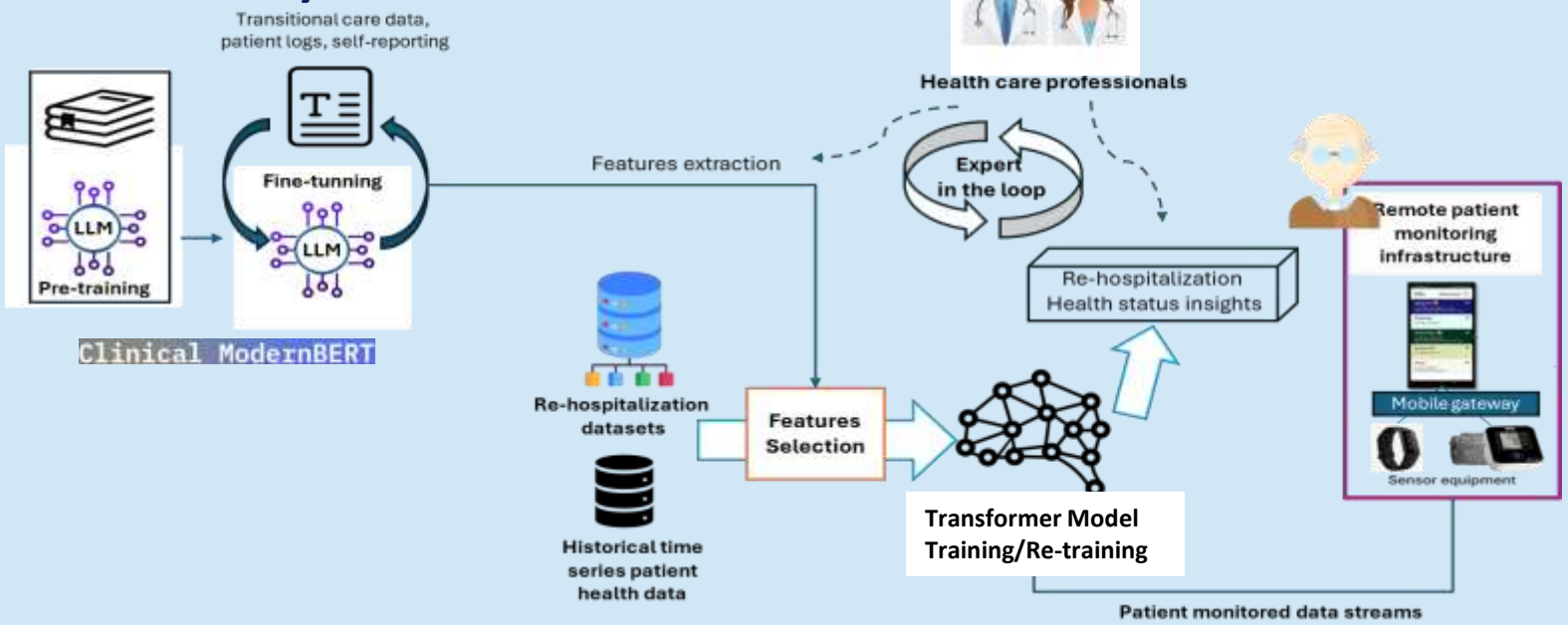
Results

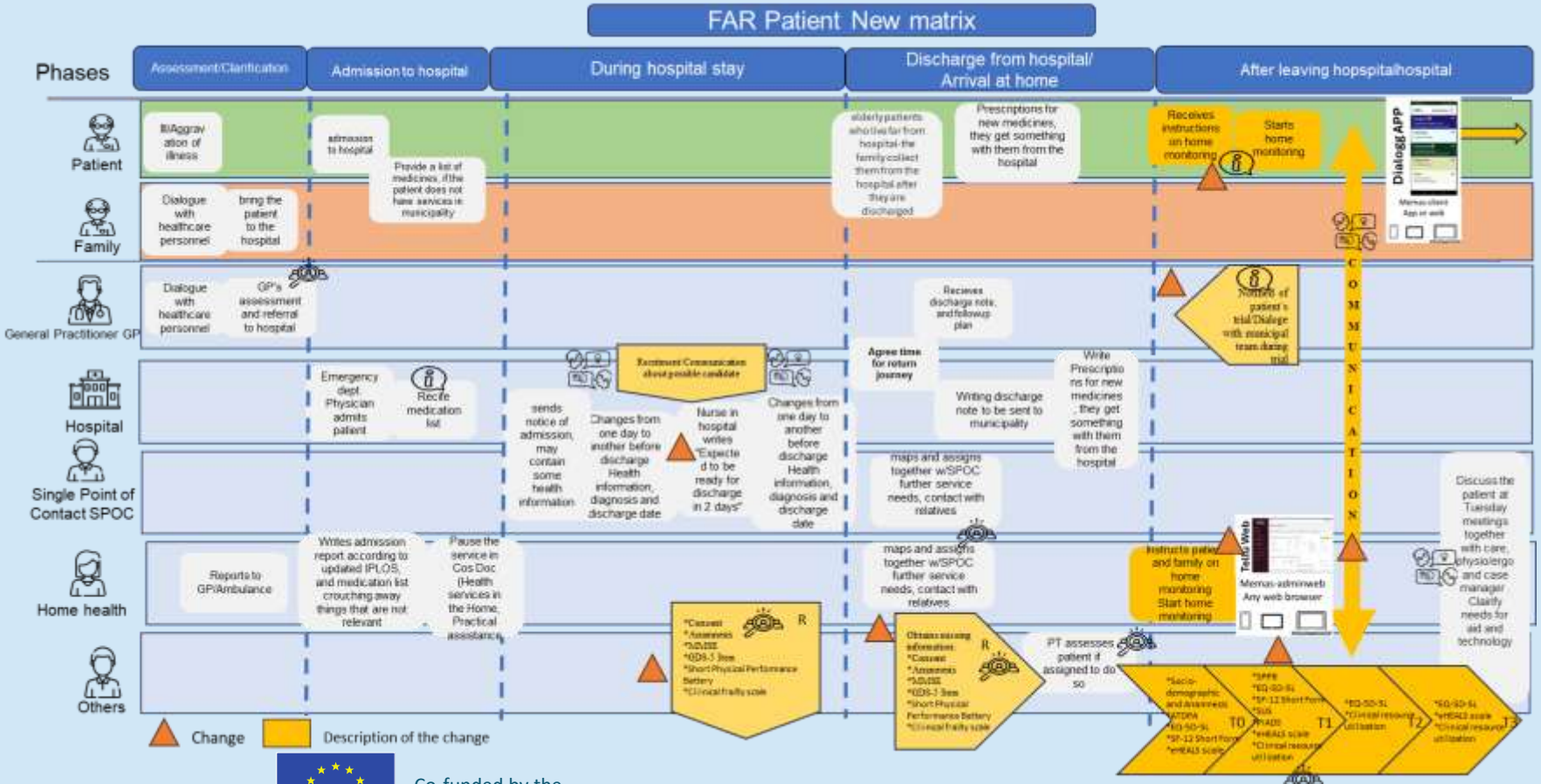
- **AI-based analytics**



- **Relation to Proposal**: O2. Integrated IoT, ML & digital assistance solution for transitional care with components from previous AAL projects; personalized for TransCare; Exploitation (O4) & Dissemination (O5)
- **Maturity and Validation**: Validated; Ongoing piloting;
- **Supporting Evidence**:
  - **Elsevier Machine Learning with Applications, (WoS Q1)** https://doi.org/10.1016/j.mlwa.2025.100746
  - **Nature Scientific Reports (WoS Q1)** https://www.nature.com/articles/s41598-025-03332-w
  - **LLM-augmented feature engineering, IEEE Conference on Artificial Intelligence 2026, Granada, Spain** https://www.ieeesmc.org/cai-2026/detailed-schedule/

Results

- **Enhanced Transitional Care pathways (example for Norway)**



- **Relation to Proposal**:
  - O1. Re-design care pathways;
  - O4. Exploitation
  - O5. Dissemination
- **Maturity and Validation**: Validated; Ongoing piloting;
- **Supporting Evidence**:
  - *Public deliverable: D3.1 Transition care challenges analysis and knowledge (M10)*
  - *Public deliverable: D3.2 Care pathways re-design (M15)*
  - *A Multi-Layered AI Pipeline for Process Model Generation from Text* ***[under review OA Q2 Journal]***
  - *Open access journal article with care pathways redesign under development.*

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Results

- **PRIMARY**
  - **Older adults' frailty patients with increased vulnerability to adverse events that may lead to frequent re-hospitalizations**
- **SECONDARY**
  - **Doctors**
  - **Informal / Formal caregivers**
- **TERTIARY**
  - **Healthcare organizations**: care centers, hospitals, etc.
- **Trials participants:**
  - Older patients aged 65+ in **3 pilot sites**

Farsund Kommune Norway (*Community-based care organization*)

Istituto Nazionale di Ricovero e Cura per Anziani Italy (*Care and recovery institution*)

Heart Institute Niculae Stăncioiu Romania (*Hospital & leading center for cardiovascular care*)

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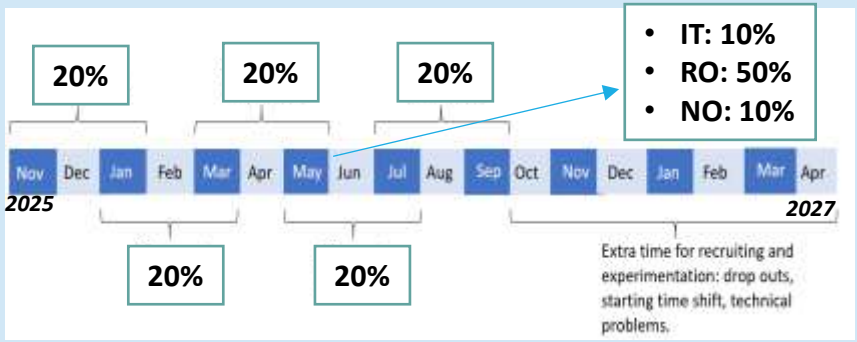
Results

• Trial protocol, recruitment, training materials and trials

Inclusion criteria

- Age ≥ 65 years;
- Able to give informed consent;
- Able to maintain an upright posture and walk, even with aids;
- MMSE ≥ 18;
- CFS score 2-7;

- **IT:** older adults, frail and multi-morbid
- **NO:** older adults, frail with chronic illness, infections, or requiring postoperative rehabilitation
- **RO:** CVD patients



			30d	60d	90d
Scale(s)	R	T0	T1	T2	T3
Socio-demographic and Anamnesis (Check-list)	✔				
MMSE (cognitive)	✔				
Short Physical Performance Battery (physical)	✔		✔	✔	✔
Clinical Frailty Scale (Frailty)	✔				
30-days Rehospitalization rate (y/n)			✔		
60-days Rehospitalization rate (y/n)				✔	
90-days Rehospitalization rate (y/n)					✔
ATDPA – C (Technology attitude)		✔			
EQ-5D-5L (only VAS scale) (quality of life)		✔	✔	✔	✔
SF-12 short form (4 weeks recall period) (impact of health in everyday life)		✔	✔		✔
Clinical resource utilization			✔	✔	✔
SUS (Usability of dashboard)			✔		✔
eHEALS scale (ehealth literacy)		✔	✔		✔
Semi-structured interview on self-management improvement, usability and effectiveness of the system			✔		✔

- **Relation to Proposal**:
  - O3. Setup and conduct longitudinal trials;
  - O4. Exploitation
  - O5. Dissemination
- **Maturity and Validation**: Ongoing piloting;
- **Supporting Evidence**:
  - *Public deliverable: D3.3 Ethical standards and data management plan (M12)*
  - *Public deliverable: D4.1 Ethical pilots methodology and protocols (M12)*

The participants will be recruited by professional healthcare staff working in geriatric ward at IRCCS INRCA supported by external psychologists, researcher and communication experts. The staff involved will be composed of:

- Healthcare personnel in ward included geriatricians and nurses
- 1 psychologist
- 1 researcher
- 1 support technician

The participants will be recruited by municipal healthservices office and hospital discharge services The staff involved will be composed of:

- Hospital nurses
- Municipal health services personnel
- Physical therapists
- Home health nurses
- 2 support technicians

Participants will be recruited by cardiologists working in the cardiology ward at the Institute of the Heart.
The staff involved will be composed of:

•Cardiologists
•Technical staff

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Obstacles and solutions

Scientific obstacles/bottlenecks

- **Nature of the obstacle:** Difficulties in recruiting eligible patients for the study
- **Description:**
  - In **Italy** patients discharged from the geriatric ward present typically severe clinical conditions and limited autonomy, which prevents them from independently using the devices
  - In **Norway**, patients need to use their own mobile phones and an electronic identification for secure authentication; difficulties recruiting patients so soon after discharge; patients often need help from family
  - In **Romania**, patients are required to use their own mobile phones for participation in the pilot, and not all eligible patients have access to a smartphone
- **Impact on the project**: There are some delays in recruitment activities compared to the planned targets
- **Mitigation measures / Solutions implemented**: recruitment strategy has been revised
  - Expanding the recruitment pool among the hospitals / hospital / care centres departments
  - Involving additional healthcare professionals to support patient identification and recruitment activities
  - Use mock-up accounts / pre-configured devices for patients
  - Specific training activities for patients and their caregivers to address digital literacy
  - The recruitment timeline has been defined to include additional time to address delays, drop-outs, and technical issues
- **Current status**: ☐ Resolved ☐ Ongoing ☒ Partially resolved

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Impact and achievements

Main outcomes of the consortium

- **Scientific Impact**:
  - Redesign of transitional care pathways to improve the continuity and quality of care for older adults transitioning from hospital to home
  - AI-enabled post discharge method based on the Transformer deep-learning architecture for predicting heart rate during physical activities and for determining insights that can be used by medical professionals to address the problems that require proactive intervention.
  - 3 WoS journal articles & 2 IEEE proceedings papers; 1 WoS journal article in review

- **Societal / Health System Relevance**:
  - Reduce
    - hospitalization rate
    - costs for better allocation of healthcare resources
  - Improve
    - the effectiveness of transitional care processes
    - coordination of care transition from hospital to home
    - the wellbeing of both patient and caregiver
  - Allow for proactive and personalized interventions

- **Exploitability**:
  - Exploitable assets:
    - Transitional care pathways matrix: guidelines and replication roadmaps to be released for EU adaptation and policy making
    - TelluCare enhanced RPM platform: expand TelluCare to other municipalities and private/home-care providers in Norway and EU
    - MEMAS communication platform: scaling to other Norwegian municipalities starting from Farsund trials
    - AI-enabled analytics: technological transfer; support for integration into commercial Tellu RPM platform
  - **Joint exploitation**: new projects proposals at future EU calls to extend the platform; potential use-case: GenAI integration.

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Impact and achievements

Publication list

1. Anghel, I., Cioara, T., Bevilacqua, R., Barbarossa, F., Grimstad, T., Hellman, R., Solberg, A., Boye, L. T., Anchidin, O., Nemes, A., & Gabrielsen, C. (2025). New care pathways for supporting transitional care from hospitals to home using AI and personalized digital assistance. Scientific Reports, 15, 18247. **(WoS Q1)** https://www.nature.com/articles/s41598-025-03332-w
2. Mateescu, A., Hadarau, I., Anghel, I., Cioara, T., Anchidin, O., & Nemes, A. (2025). A Laplace diffusion-based transformer model for heart rate forecasting within daily activity context. Machine Learning with Applications, 22, 100746. **(WoS Q1)** https://doi.org/10.1016/j.mlwa.2025.100746
3. Rancea, A., Anghel, I., & Cioara, T. (2024). Edge computing in healthcare: Innovations, opportunities, and challenges. Future Internet, 16, 329. **(WoS Q2)** https://doi.org/10.3390/fi16090329
4. Rancea, A., Anghel, I., & Cioara, T. (2026, May 8–10). LLM-augmented feature engineering for machine learning pipelines. **IEEE** Conference on Artificial Intelligence 2026, Granada, Spain. https://www.ieeesmc.org/cai-2026/detailed-schedule/
5. Burlacu, M., & Anghel, I. (2024). A platform for enhanced remote care and support for older adults. 2024 **IEEE** 20th International Conference on Intelligent Computer Communication and Processing (ICCP), Cluj-Napoca, Romania. https://doi.org/10.1109/ICCP63557.2024.10793004
6. Rancea, A., Anghel, I., Cioara, T., Anchidin, O. & Nemes, A. A Multi-Layered AI Pipeline for Process Model Generation from Text, *In review in WoS Q2 OA journal*

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Next steps

Planned timeline and work plan for project completion

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Thank you!

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