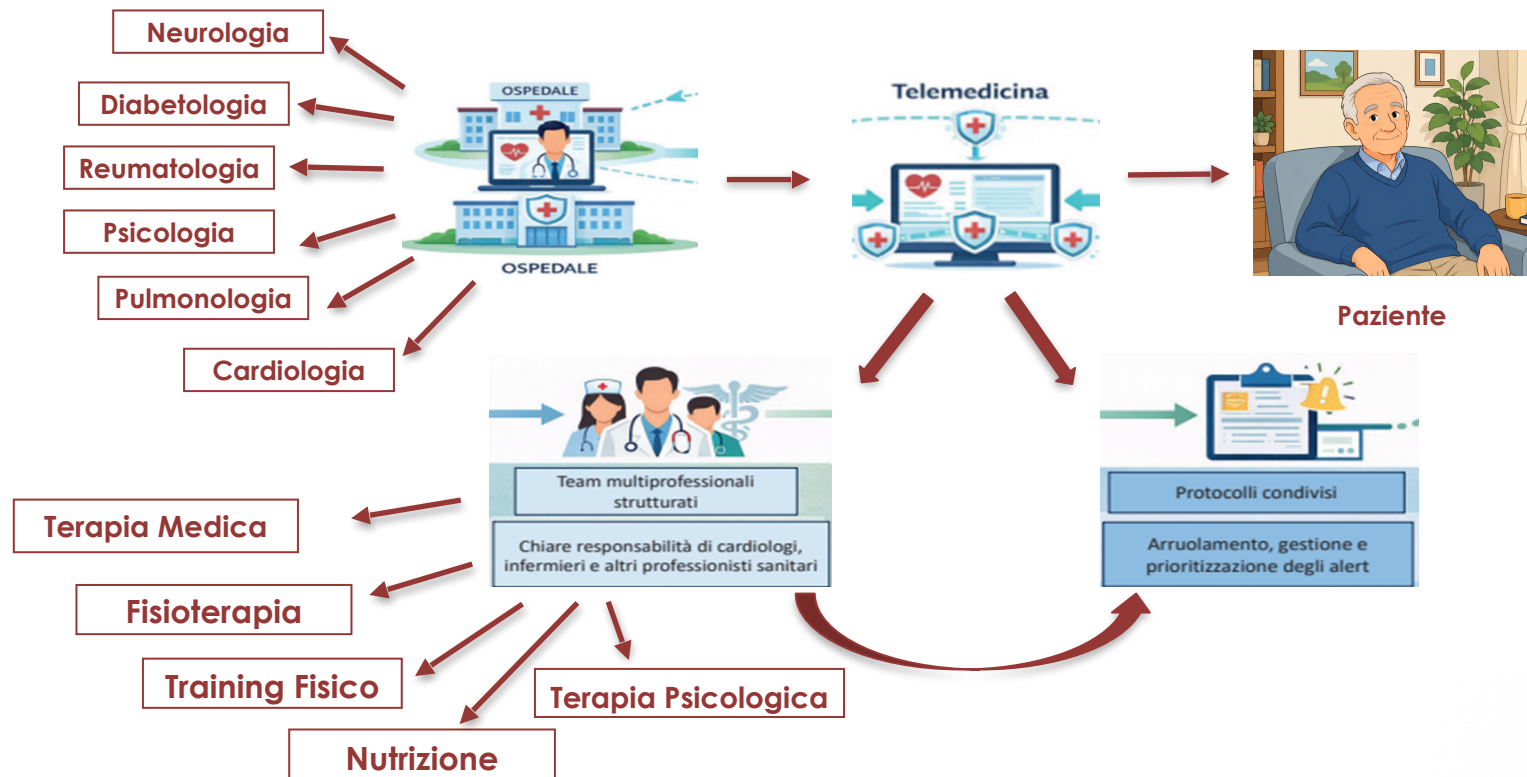


Di cosa abbiamo bisogno per gestire a lungo termine i pazienti con scompenso cardiaco cronico, multimorbilità e fragilità?

Simonetta Scalvini

Continuity Care Unit and Telemedicine Service,
ICS Maugeri S.p.A SB IRCCS Lumezzane (BS), Italy





Di linee guida

Multidisciplinary interventions recommended for the management of chronic heart failure

Recommendations	Class ^a	Level ^b
It is recommended that HF patients are enrolled in a multidisciplinary HF management programme to reduce the risk of HF hospitalization and mortality. ^{309,314,315,316}	I	A
Self-management strategies are recommended to reduce the risk of HF hospitalization and mortality. ³⁰⁹	I	A
Either home-based and/or clinic-based programmes improve outcomes and are recommended to reduce the risk of HF hospitalization and mortality. ^{310,317}	I	A

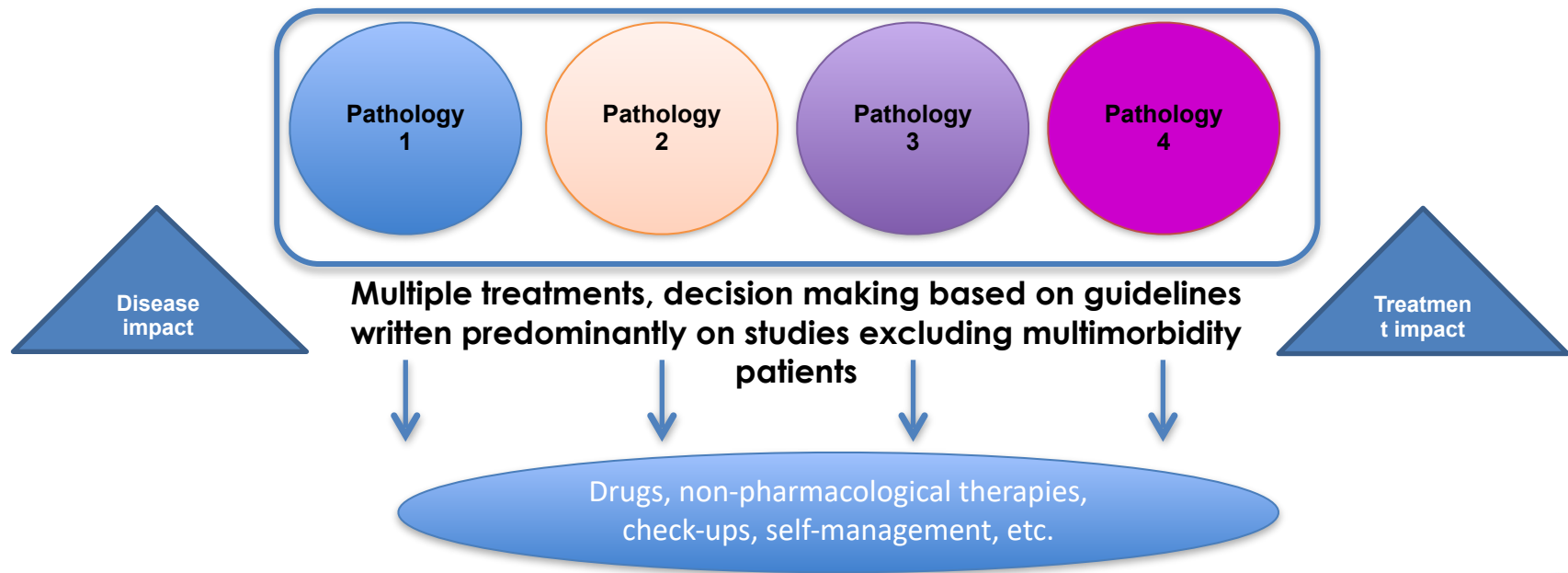


Recommendations on lifestyle management

Recommendations	Class ^a	Level ^b
Improvement of lifestyle factors in addition to appropriate pharmacological management is recommended. ^{119–122,124,148–153}	I	A
Cognitive behavioural interventions are recommended to help individuals achieve a healthy lifestyle. ^{181–183}	I	A
Exercise-based cardiac rehabilitation is recommended as an effective means for patients with CCS to achieve a healthy lifestyle and manage risk factors. ^{151–153}	I	A
Involvement of multidisciplinary healthcare professionals (e.g. cardiologists, GPs, nurses, dieticians, physiotherapists, psychologists, and pharmacists) is recommended. ^{121,123,181,184}	I	A
Psychological interventions are recommended to improve symptoms of depression in patients with CCS. ^{126,157}	I	B

2019



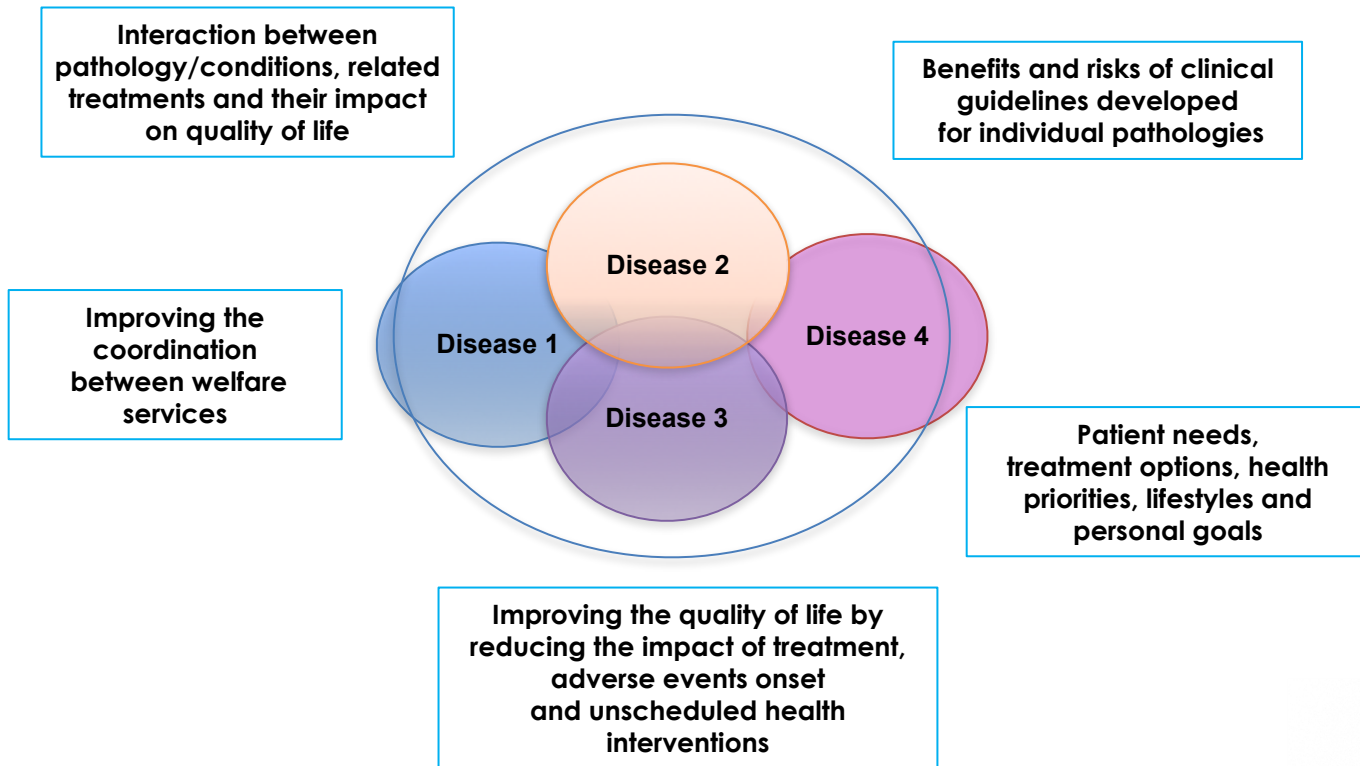


Single Disease/Condition oriented approach

Modified from Cartabellotta A et al. Evidence, 2016; 8 (10): e1000154



Approccio orientato alla multimorbidità



Modified from Cartabellotta A et al. Evidence, 2016; 8 (10): e1000154



Approccio multidisciplinare e proattivo

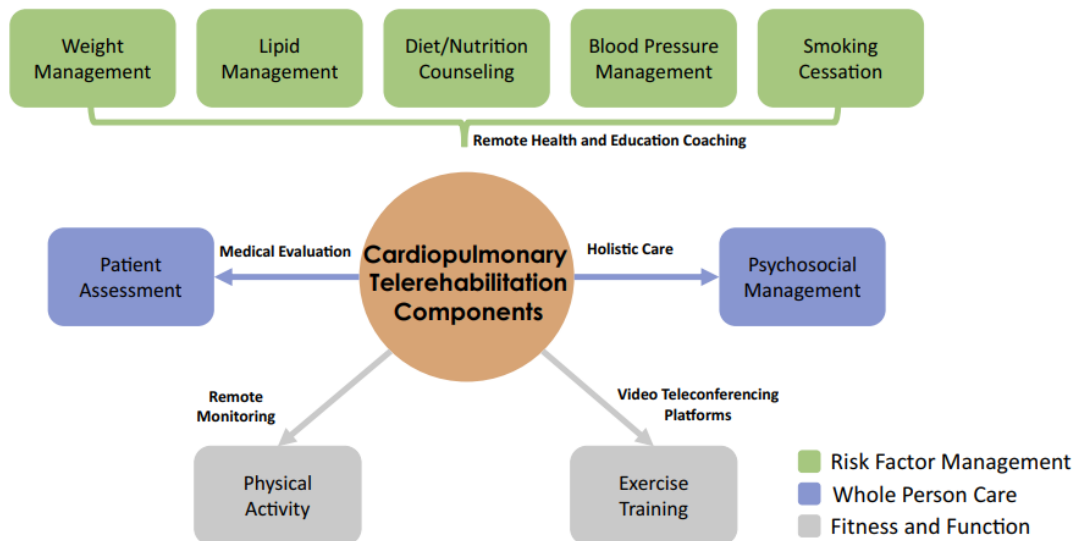


Fig. 2. Key components of cardiopulmonary rehabilitation are vital to center-based and home-based programs. These secondary prevention strategies incorporate elements from risk factor management to whole person care to fitness and function. These interventions are achieved remotely through use of information and communication technology.

Phys Med Rehabil Clin N Am 32 (2021) 263–276
<https://doi.org/10.1016/j.pmr.2021.01.004>
 1047-9651/21/Published by Elsevier Inc.

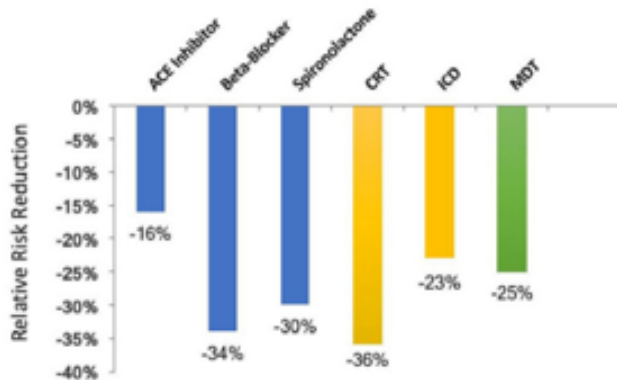


Education in Heart

HEART FAILURE

Multidisciplinary team approach to heart failure management

Impact of Interventions on All Cause Mortality in Heart Failure

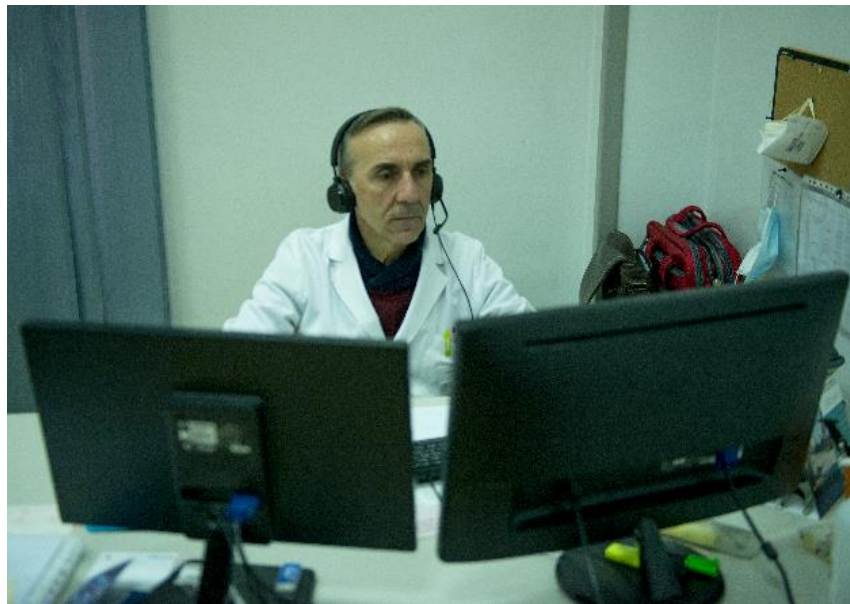


Page 3

1/10/17

Morton G, et al. Heart 2018;104:1376–1382





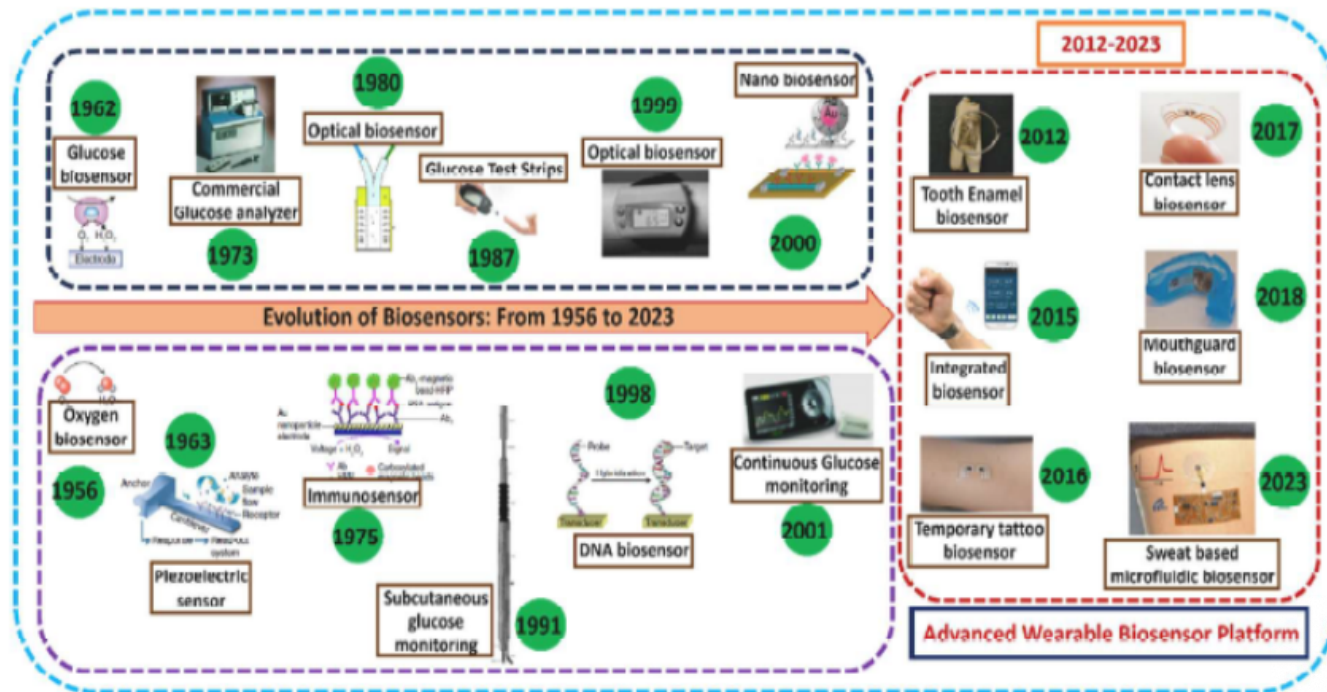


Fig. 3. Evolution of development of smart wearable biosensors from 1956 to 2023.

Tecnologia

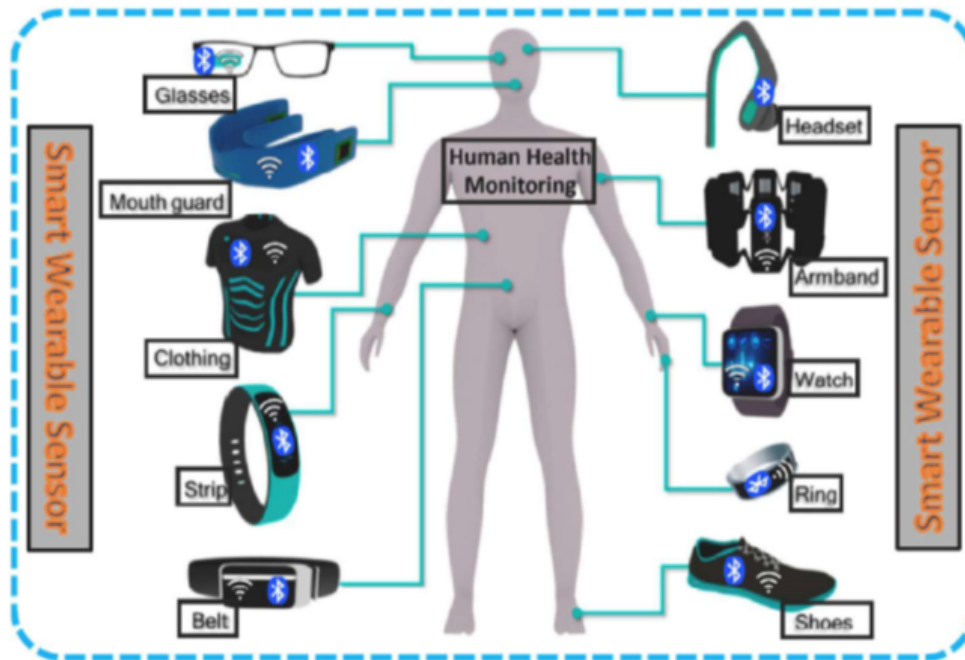


Fig. 5. Several types of smart wearable sensors are applied to the human body for continuous health monitoring of various physiological parameters.

Combinazione di algoritmi ed intelligenza artificiale

Combining home monitoring temporal trends from implanted defibrillators and baseline patient risk profile to predict heart failure hospitalizations: results from the SELENE HF study

What's new?

- In 918 patients with implantable defibrillators, we developed and validated an algorithm to predict heart failure (HF) hospitalizations using automatic, daily remote monitoring without patient interaction.
- Seven temporal trends contributed to the algorithm: diurnal and nocturnal heart rates, ventricular extrasystoles, atrial tachyarrhythmia burden, heart rate variability, physical activity, and thoracic impedance.
- To individualize predictive power of the algorithm, we tested the combination of the temporal trends with a baseline risk-stratifier (Seattle HF Model).
- The sensitivity of the algorithm (including baseline risk-stratifier) in predicting first HF hospitalizations was 65.5% with a median alerting time of 42 days.
- False alert rate (0.69 per patient-year) and unexplained alert rate (0.63 per patient-year) were remarkably lower than in other published algorithms, which may increase actionability of alerts and reduce workload for the attending physicians.



ESC

European Society
of Cardiology

Europace (2022) 24, 234–244
doi:10.1093/europace/euab170



The All of Us Research Program's warables dataset

Digital health technologies (DHTs) are revolutionizing medical research, offering unprecedented insights into health monitoring and disease detection through continuous, real-world data collection. Here we characterize the data in one of the largest and most demographically rich DHT datasets as part of the All of Us Research Program. Through a historic device distribution effort, the program reached a broad range of participants nationwide, yielding a DHT dataset with an expanded a large demographic scope. **This dataset contains Fitbit data from more than 59,000 participants spanning 14 years** with more than 39 million step observations and 31 million sleep observations. Nearly half (46%) of participants with Fitbit data also contributed electronic health records, physical measurements, genomics and survey data. This resource enables researchers to study relationships between digital health metrics and clinical outcomes, advancing DHT methodologies through its large size, broad representation and multi-modal data linkage.



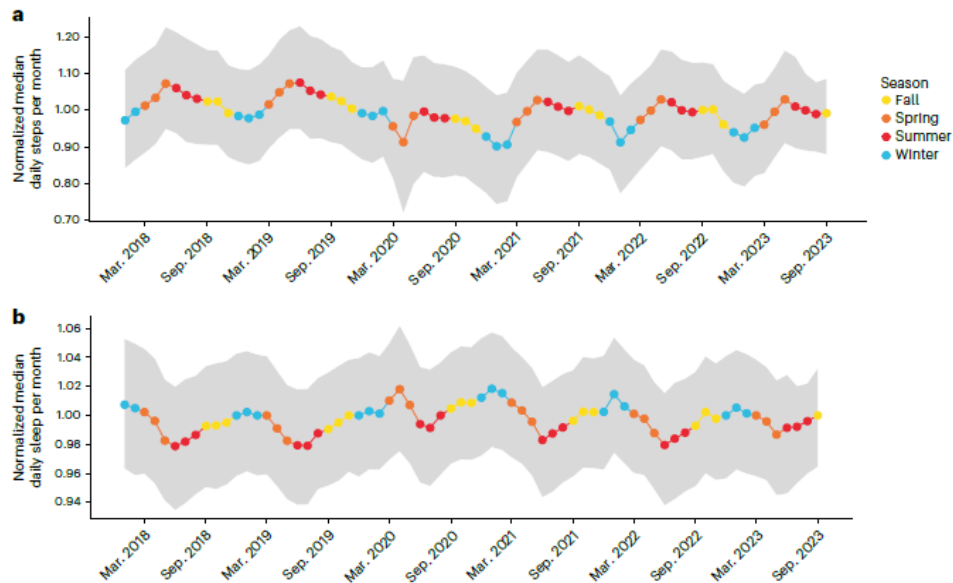
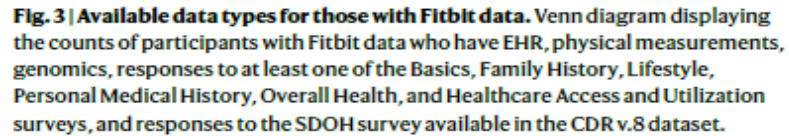


Fig. 2 | Seasonal variation in physical activity and sleep. a, Seasonal variation in normalized median daily steps of All of Us Research Program participants in the seasonal activity cohort ($n = 53,295$). Each participant's monthly median daily steps were normalized to their overall median daily step count over the entire observation period (3 October 2009 to 30 September 2023). **b,** Seasonal variation in normalized median daily sleep duration of All of Us Research

Program participants in the seasonal sleep cohort ($n = 33,471$). Each participant's monthly median sleep durations were normalized to their overall median sleep duration over the entire observation period (6 October 2009 to 30 September 2023). For both **a** and **b**, normalized data from 1 January 2018 to 30 September 2023 are shown and the shaded area represents the IQR of normalized median daily steps or sleep duration for each month, respectively.





Istituti
Clinici
Scientifici
Maugeri

Diversi setting di applicazione



 **Ministero della salute**

 **agenas** AGENZIA NAZIONALE PER I SERVIZI SANITARI REGIONALI

HOME

 **PNT** | Piattaforma Nazionale Telemedicina **Accedi**[Gestore Soluzioni Telemedicina](#) [Business Glossary](#) [Linee di indirizzo, PDTA e Protocolli](#) [Monitoraggio e Reportistica](#) [Service Management](#)

Benvenuto nella Piattaforma Nazionale di Telemedicina

La Piattaforma Nazionale di Telemedicina (PNT) crea un livello fondamentale di interoperabilità che garantisce standard





Tipologia di servizio	Finalità	Richiedente/ prescrittore	UVM	PAI	Attivatore	Erogatore	Soggetti Coinvolti	Supporti Tecnici e Set di informazioni disponibili	Documentazione a corredo
Televisita <i>Atto medico con interazione con il paziente in tempo reale</i>	<i>Follow up, Aggiustamento terapia in corso, Prescrizione di esami, Verifica degli esiti di esami e/o terapia</i>	Medico del Distretto, MMG/PLS/ MCA/ Specialista	Non necessario	Non necessario	COT Centrale operativa ADI MMG/PLS/ Specialista	MMG/PLS/ Specialista	Pazienti e caregiver Eventuale infermiere a domicilio o altro professionista sanitario Centrale di servizi per la telemedicina	Videochiamata +Chat (per scambio messaggi) APP/servizi applicativi che consentano la consultazione di referti, immagini, altre informazioni clinico-sanitarie (FSE) Ricetta dematerializzata	Adesione al trattamento domiciliare Cartella domiciliare Esita in un referto strutturato della televisita qualora sia erogata dallo specialista





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DI RIPARAZIONE E RESILIENZA



Ministero della Sanità

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PNRR
MISSIONE 6 - SALUTE

Tipologia di servizio	Finalità	Richiedente/ prescrittore	UVM	PAI	Attivatore	Erogatore	Soggetti Coinvolti	Supporti Tecnici e Set di informazioni disponibili	Documentazione a corredo
Tele consulto medico <i>Atto medico, anche asincrono</i>	Dialogo tra medici riguardo la situazione clinica del paziente	Medico del Distretto MMG/PLS/ MCA/ Specialista	Non necessario	Non necessario	COT, Centrale operativa ADI, Medico direttamente tramite agende di disponibilità condivise tra professionisti	MMG/PLS/ MCA/ specialista Medico del Distretto	Interazione tra più medici Possibile presenza del paziente Centrale di servizi per la telemedicina	Videochiamata + eventuale <i>Chat</i> APP/servizi applicativi che consentano la consultazione di referti, immagini, altre informazioni clinico-sanitarie (FSE)	Adesione al trattamento domiciliare o fare riferimento a quanto previsto nel paragrafo 2.1.1 Quesito diagnostico Esita in una "Relazione collaborativa" o in annotazioni riportate in cartella domiciliare.





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FONDO NAZIONALE
DI INVESTIMENTI



agens.s.



PNRR
MISSIONE 6 - SALUTE

Tipologia di servizio	Finalità	Richiedente/ prescrittore	UVM	PAI	Attivatore	Erogatore	Soggetti Coinvolti	Supporti Tecnici e Set di informazioni disponibili	Documentazione a corredo
Teleassistenza <i>Prevede l'interazione con il paziente in tempo reale</i>	Interazione a distanza per agevolare il corretto svolgimento di attività assistenziali	Professionisti sanitarie	Possibile, non necessario	Possibile, non necessario	COT, Centrale operativa ADI, Professionisti Sanitari direttamente tramite agende di disponibilità condivise tra professionisti	Professionisti sanitari	Pazienti e <i>caregiver</i> Centrale di servizi per la telemedicina	Videochiamata +Chai (per scambio messaggi) APP/servizi applicativi che consentano la consultazione di referti, immagini, altre informazioni clinico-sanitarie (FSE) APP di condivisione con il paziente di strumenti (es. test, questionari, ecc.)	Adesione al trattamento domiciliare Cartella domiciliare Esita in una relazione o annotazioni riportate nella cartella domiciliare





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GIUNGO INAVVENTURA
DI NECESSITÀ E INCHIESTA



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Ministero della Salute



ASAPNA
AGENZIA DI SUPPORTO E COORDINAMENTO
PER I SERVIZI DI DIAGNOSTICA E PREVENZIONE

PNRR

MISSIONE 6 - SALUTE

Tipologia di servizio	Finalità	Richiedente/ prescrittore	UVM	PAI	Attivatore	Erogatore	Soggetti Coinvolti	Supporti Tecnici e Set di informazioni disponibili	Documentazione a corredo
Tele monitoraggio	Rilevamento e trasmissione automatizzati continuativi di parametri clinici a domicilio	Medico del Distretto MMG/PLS/MCA/ specialista	Possibile, non necessario	Necessario	COT Centrale operativa ADI	Medico Infermiere	Pazienti e caregiver Centrale di servizi per la telemedicina	Set di tecnologie collegate ad una centrale Piattaforma di rilevazione dei dati, consultabile, eventualmente integrabile nella cartella	Adesione al trattamento domiciliare PDTA e Protocollo in cui siano esplicitati criteri di eleggibilità, percorso per la gestione degli allarmi Esita in una relazione o annotazioni riportate nella cartella domiciliare





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PUNTO NAZIONALE
DI RIFERIMENTO E ASSISTENZA



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AGENZIA NAZIONALE
PER I SERVIZI SANITARI REGIONALI

AGENZIA NAZIONALE
PER I SERVIZI SANITARI REGIONALI

PNRR
MISSIONE 6 - SALUTE

Tipologia di servizio	Finalità	Richiedente/ prescrittore	UVM	PAI	Attivatore	Erogatore	Soggetti Coinvolti	Supporti Tecnici e Set di informazioni disponibili	Documentazione a corredo
Tele riabilitazione <i>Prevede l'interazione con il paziente in tempo reale</i> <i>Può avere carattere multi disciplinare</i>	Servizi intesi ad abilitare, ripristinare il funzionamento psicofisico Valutazione a distanza del corretto utilizzo di ausili, ortesi e protesi all'interno del PRI	Professionista sanitario	Necessaria UVM in presenza del paziente per le opportune valutazioni	Necessario PRI/PAI	COT Centrale operativa ADI Professionisti Sanitari direttamente tramite agende condivise	Professionista singolo équipe multi professionale	Pazienti e <i>caregiver</i> Centrale di servizi per la Telemedicina	Dispositivi per la gestione e lo scambio di dati e immagini, dispositivi mobili, dispositivi medici, anche indossabili, sensori, robotica, <i>serious games</i> ³	Adesione al trattamento domiciliare Cartella domiciliare Esita in una relazione o annotazioni riportate nella cartella domiciliare



Un sistema di tariffazione

A

Prestazioni di specialistica ambulatoriale già presenti o riconducibili ad una prestazione del nomenclatore regionale e nazionale, erogabili anche nella modalità Telemedicina, attraverso i servizi di Televisita, Teleassistenza e Telemonitoraggio*

- Per questa tipologia di prestazioni si applicano la medesima codifica e tariffa previste per la corrispondente prestazione erogata in presenza;
- Rientrano le visite di controllo di diverse specialità, le visite multidisciplinari anche erogate come prima visita, le prestazioni erogabili da remoto da professionisti sociosanitari;
- Sono comprese anche le prestazioni relative al controllo in remoto dei dispositivi cardiaci elettrici impiantabili.

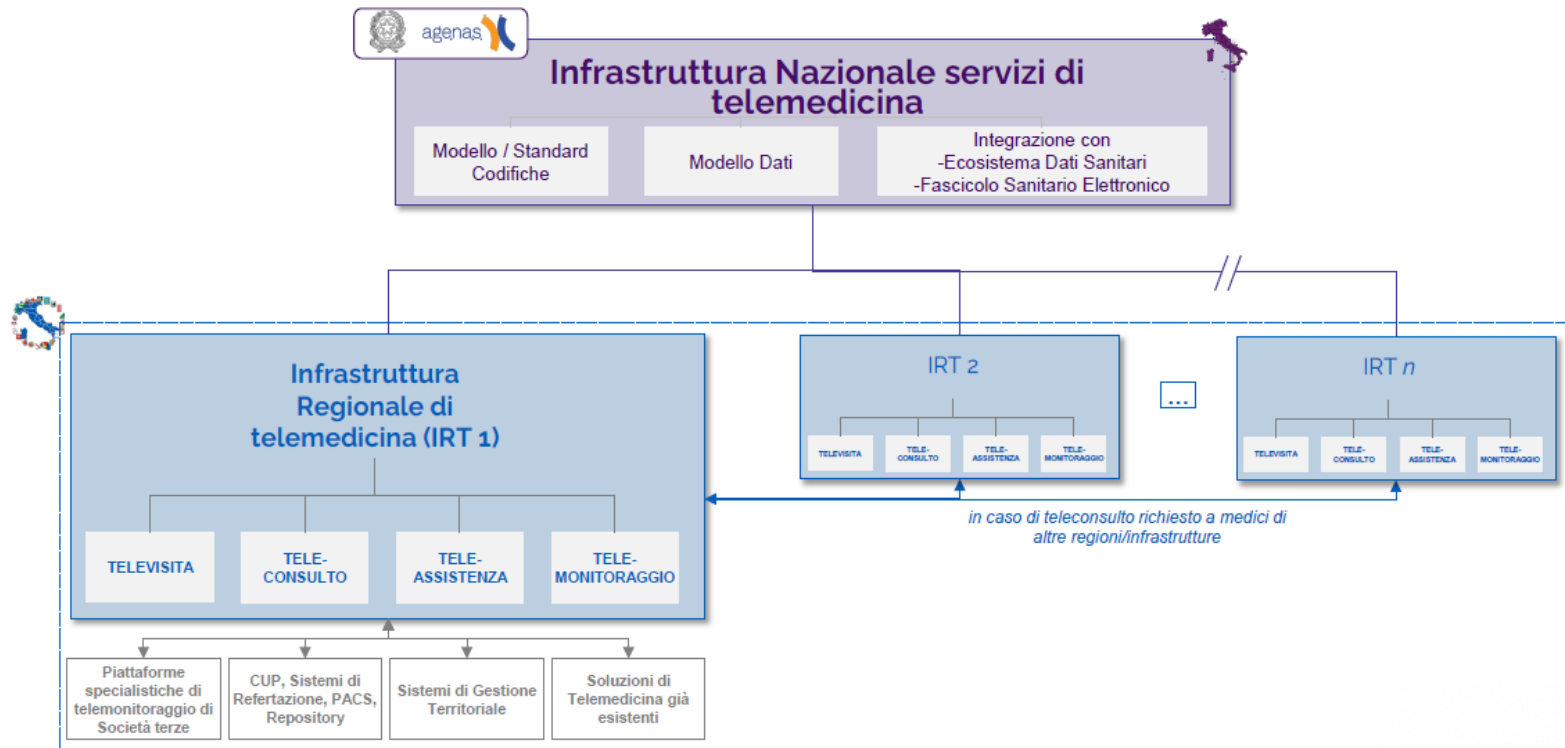
B

Prestazioni specialistiche e percorsi clinico-assistenziali erogati in telemedicina non presenti né riconducibili a prestazioni incluse nel nomenclatore regionale e nazionale, attraverso i servizi di Teleconsulto, Teleassistenza e Telemonitoraggio*

Prestazione	Tariffa	Codice
Teleconsulto	Riconducibile a 89.01 (visita multidisciplinare)	TC.01 / TC.02
Telemonitoraggio liv.1 a gestione ospedaliera	360 euro	TM.01
Telemonitoraggio liv.1 a gestione integrata	240 euro	TM.02
Telemonitoraggio liv.1 a gestione territoriale	120 euro	TM.03
Teleassistenza	30,8 euro	TA.01 / TA.02

Fase di Sperimentazione nel corso del 2025





INT=Infrastruttura Nazionale servizi di telemedicina IRT=Infrastruttura Regionale di telemedicina



Maugeri Centre for Telehealth and Telecare: A real-life integrated experience in chronic patients

Simonetta Scalvini MD^{1,2}, Palmira Bernocchi¹, Emanuela Zanelli², Laura Comini³ and Michele Vitacca⁴; on behalf of the Maugeri Centre for Telehealth and Telecare (MCTT)



Journal of Telemedicine and Telecare
0(0) 1–8
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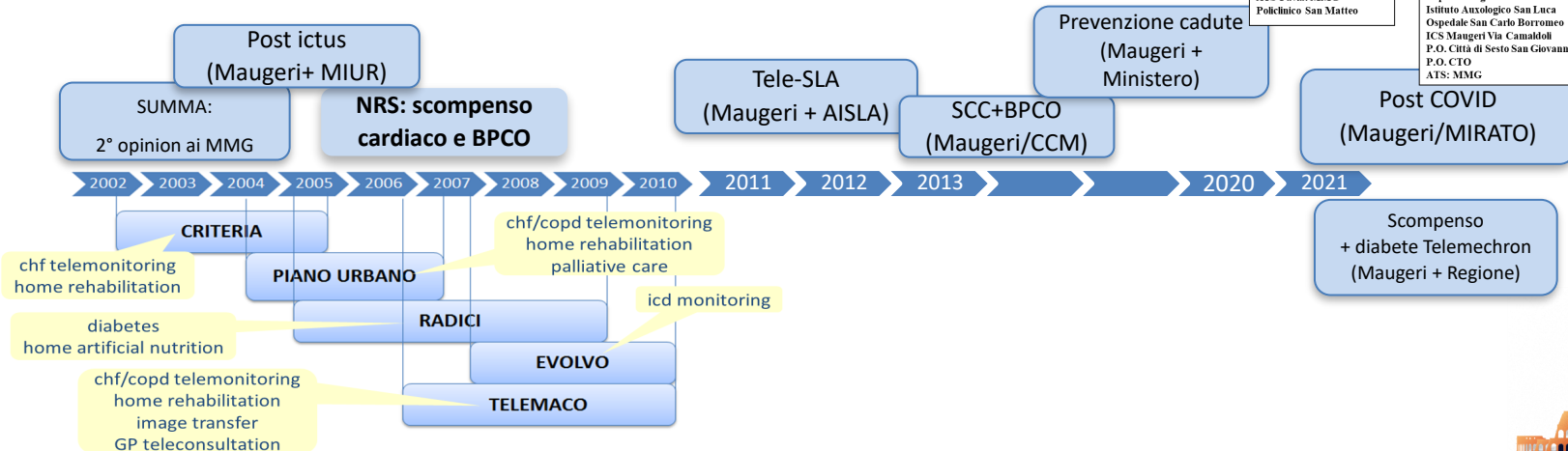
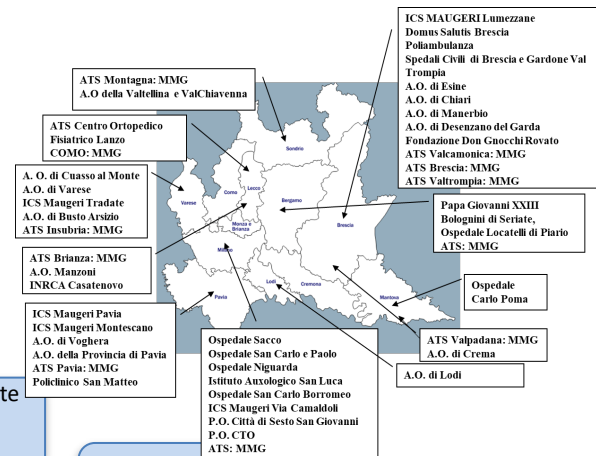




9,8 Million Inhabitants - 17b€ healthcare expenditure - 17% of the Italian total spending

Regional Social-Health Plan

- Gradual shift from Hospital to Home through the deployment of some **experimental projects supported by telemedicine**



9,8 Million Inhabitants - 17b€ healthcare expenditure - 17% of the Italian total spending



Regional Social-Health Plan

- Gradual shift from Hospital to Home through the deployment of some **experimental projects supported by telemedicine**



JACARDI
ISS-Regione Lombardia
Maugeri

Post COVID
(Maugeri/MIRATO)

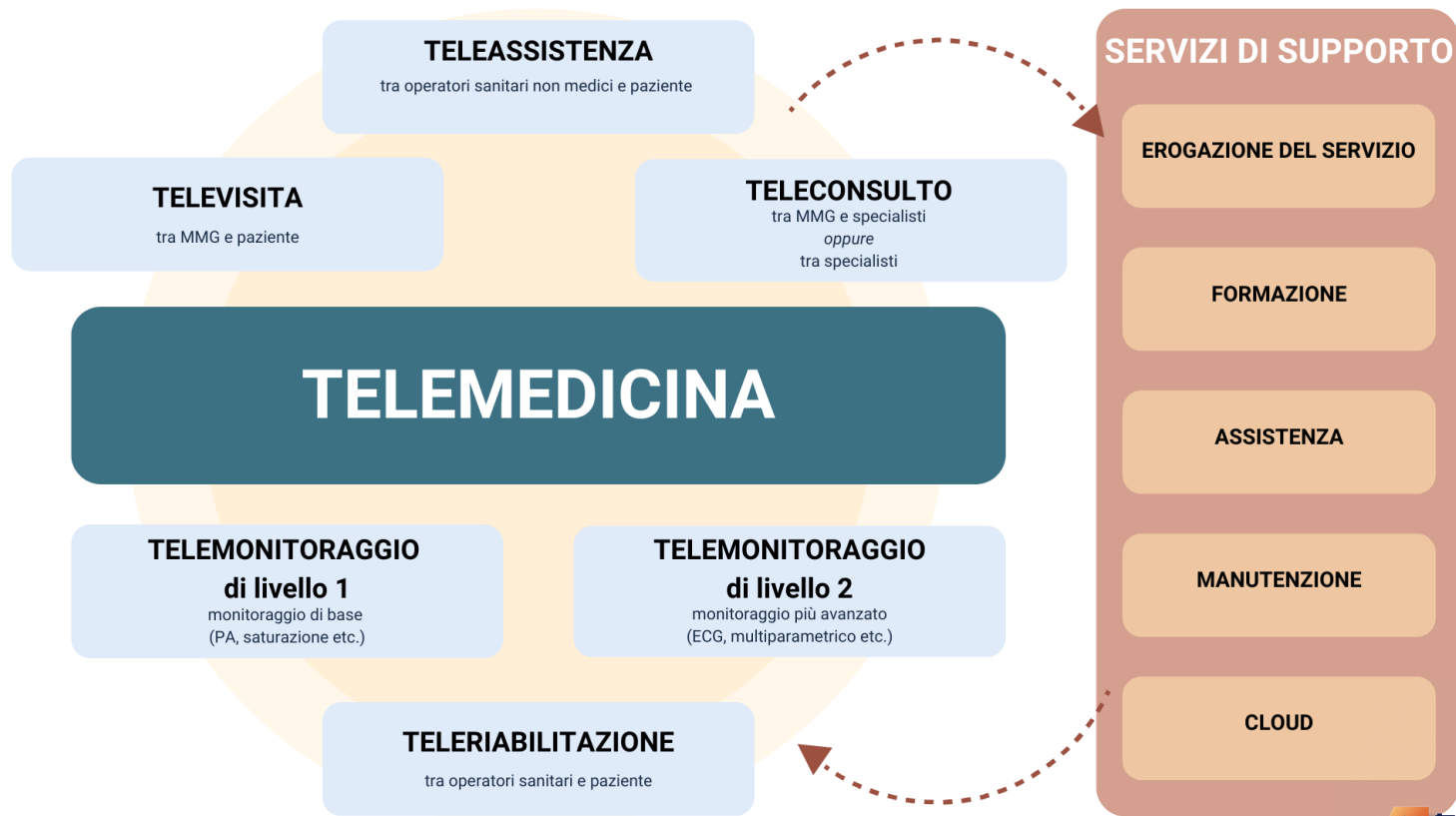
PERSonAID
Cplabora ed Innova

Telemechron
(Maugeri + Regione)

COMPASS
THCS

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031







Article

Six-Month Home-Based Telemedicine Program for Heart Failure and Type 2 Diabetes Patients: Applicability, Usability of Telemonitoring Devices and Apps, and Patient Satisfaction

Palmira Bernocchi ^{1,*}, Gloria Fiorini Aloisi ¹, Marilisa Serlini ¹, Elisa Pasotti ¹, Laura Comini ² and Simonetta Scalvini ¹

Bernocchi et al. *Trials* (2024) 25:333
<https://doi.org/10.1186/s13063-024-08171-0>

Trials

STUDY PROTOCOL

Open Access

Telemedicine home-based management in patients with chronic heart failure and diabetes type II: study protocol for a randomized controlled trial

Palmira Bernocchi ^{1,*}, Vittorio Giudici ², Gabriella Borghi ¹, Patrizia Bertolaia ³, Salvatore D'Isa ⁴, Roberto Trevisan ⁵ and Simonetta Scalvini ^{1,6}



Article

Association Between Physical Activity and Fitness in Patients with Heart Failure and Type 2 Diabetes Mellitus: Influence of a Telemedicine Program

Mara Paneroni ^{1,*}, Palmira Bernocchi ², Beatrice Salvi ¹, Carla Simonelli ¹, Gloria Fiorini Aloisi ², Luigina Viscardi ³, Salvatore D'Isa ⁴ and Simonetta Scalvini ²

ARTICLE IN PRESS

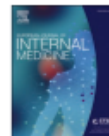
European Journal of Internal Medicine xxx (xxxx) xxx

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)



European Journal of Internal Medicine

journal homepage: www.elsevier.com/locate/ejim



Original Article

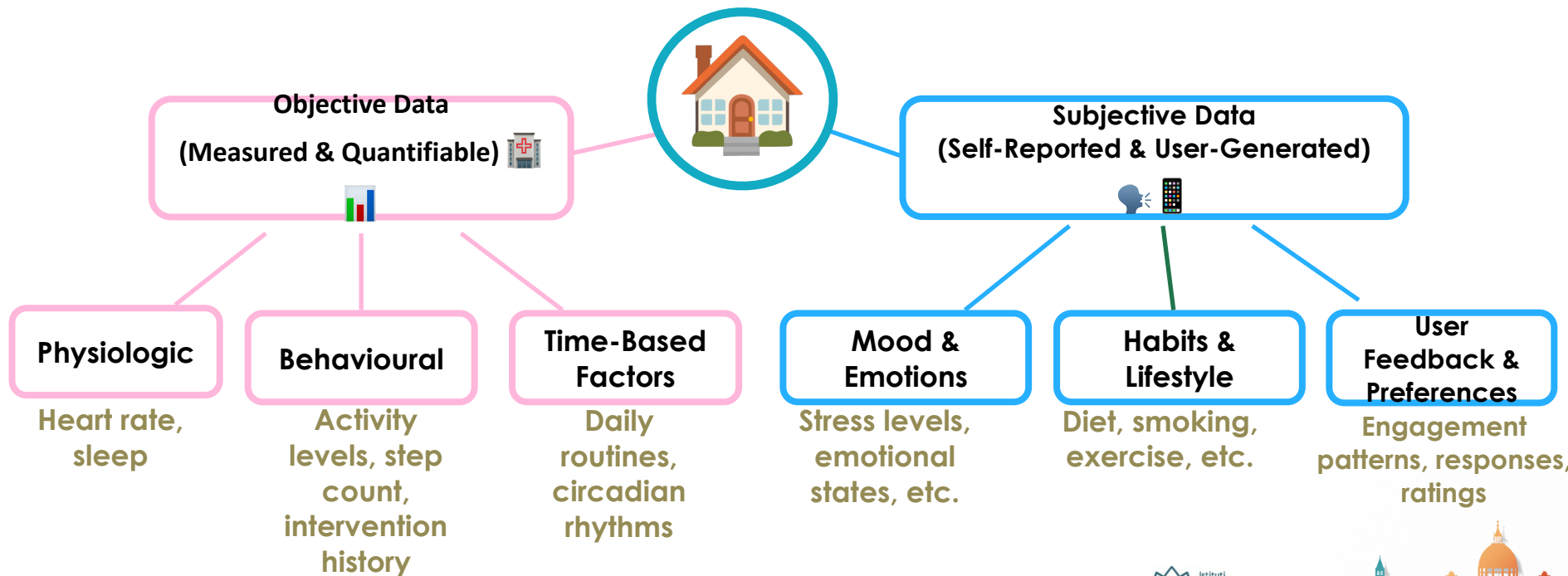
Phase III maintenance telerehabilitation in elderly patients with chronic heart failure and type 2 diabetes (TELEMECHRON study)

Simonetta Scalvini ^{a,b,*}, Veronica Donati ^a, Emanuela Zanelli ^b, Vittorio Giudici ^c, Luigina Viscardi ^c, Salvatore D'Isa ^d, Roberto Trevisan ^e, Palmira Bernocchi ^a

**CrOss-cultural Model for Postdischarge Assistance and Sustainable
digital Solutions in cardiac rehabilitation, through
multidimensional validation approach**
The COMPASS project

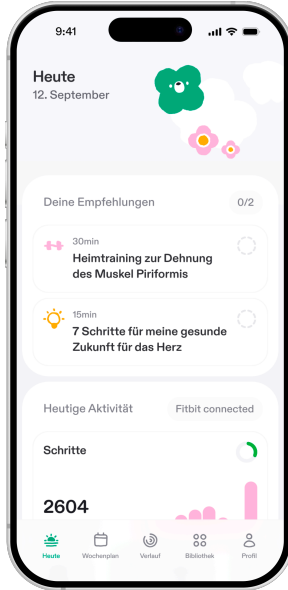
The project has received funding from the Italian Ministry of Health under the framework the co-fund partnership of Transforming Health and Care Systems, THCS, (GA N° 101095654 of the EU Horizon Europe Research and Innovation Programme).



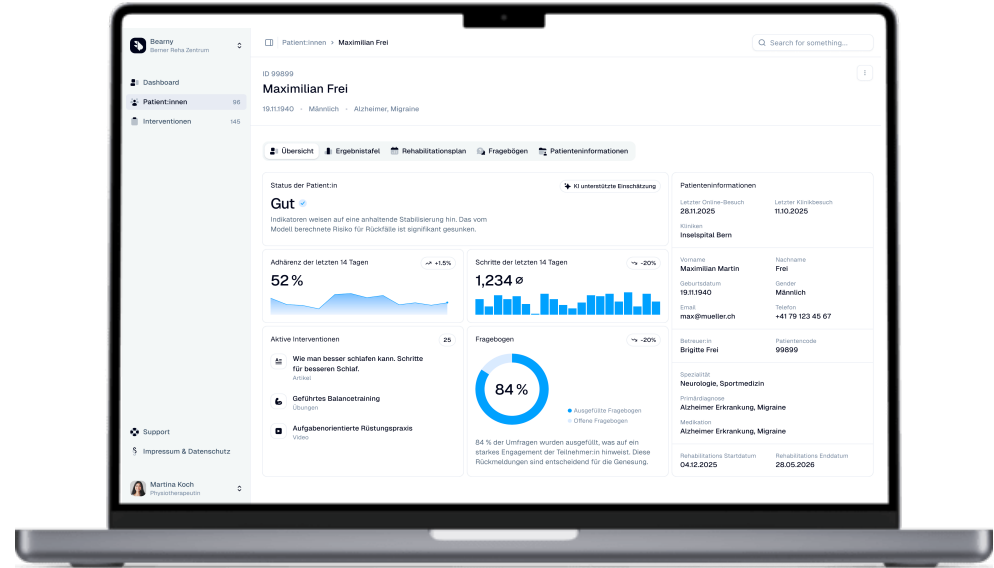


Co-Creating Educative Futures of Continuous Care





Patient Interface



Therapist Interface

Co-Creating Educative Futures of Continuous Care



Recruitment: 8 weeks post-operation, at the BRZ

- medically stable
- Smartphone accessible (daughter endorses)
- Granted consent
- driven but overwhelmed
- intense fear of falling



Frau Meier, 82

Schenkelhalsfraktur, allein lebend
mit Osteoporose & hohem Sturzrisiko



Herr Keller, 68

Petiochontäre Femurfraktur, lebt mit
Typ-2-Diabetes & Übergewicht

Introductory date:

- ICF Assessment
- Questionnaires
- Establish objectives
- Explain platform
- Configuring a pedometer



FitBit Installation



Questionnaires

eHEALS

Mobile Proficiency
Questionnaire (MDPQ)

GAD - 7



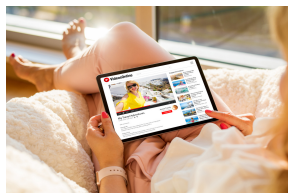
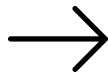
Co-Creating Educative Futures of Continuous Care



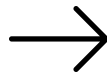
Intervention



Notification of Content



Engage with content
through viewing, listening,
or performing.



Feedback



1. How did you like the content?
1. The content/exercise felt...
too easy / just right / too heavy
1. Open Feedback (optional)

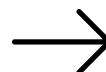
Program Modification



HCP -Team

Analysis of preferences and trends

Modification of intensity, duration, and format
(in future done by an AI-Algorithm)



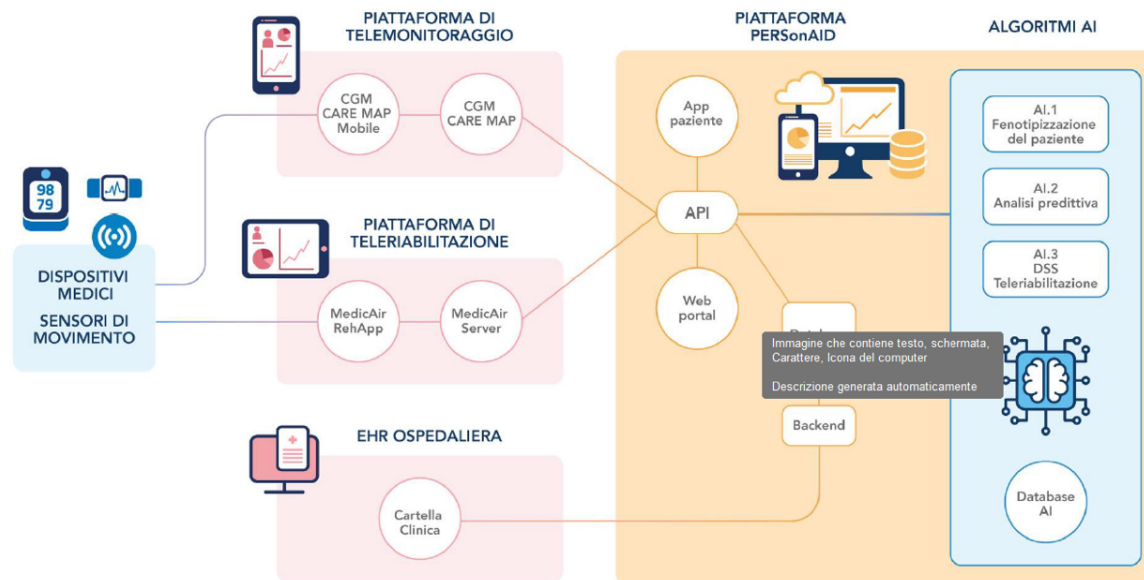
Planning for the
upcoming 2 to 4 weeks



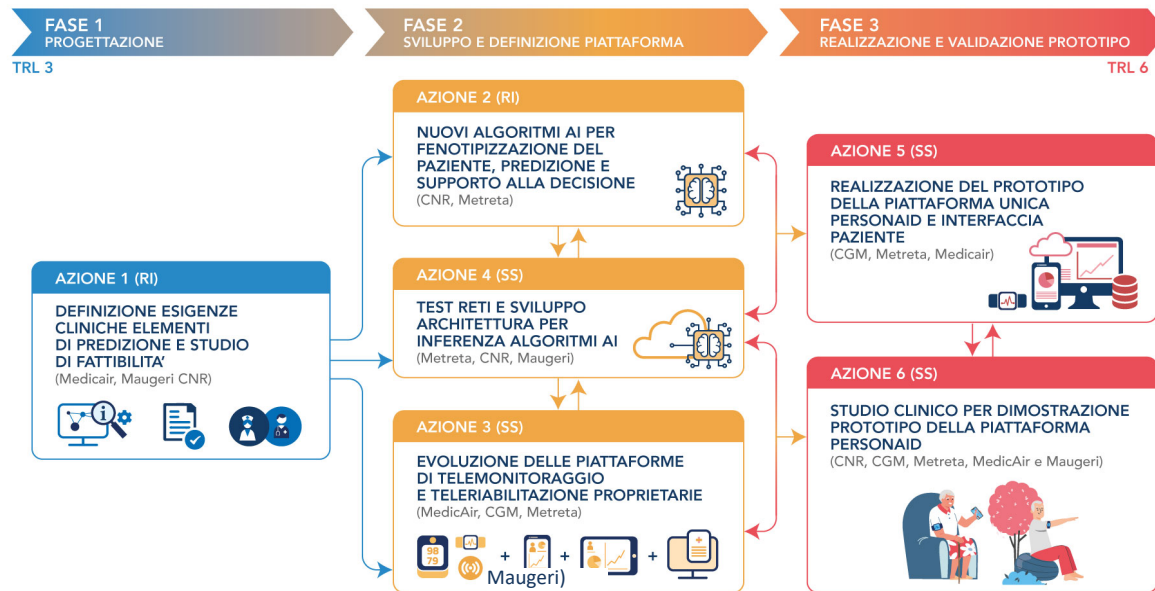
Person Aid

(Collabora ed Innova-Regione Lombardia)

ARCHITETTURA PIATTAFORMA – ALLEGATO 2



ALLEGATO 3 – PERT AZIONI



HEART FAILURE

Optimal postdischarge management of chronic HF

- A personalized hospital-discharge programme, founded on individuals' needs and risk profiles, might be the best approach to plan the follow-up care of patients with chronic HF.
- Information and communication technologies will be helpful to disseminate clinical information to all health-care professionals in real time, and thus reduce the time and duplication of procedures and improve the overall care and health of patients.
- Telemedicine has been used to support integrated care in the management of chronic diseases and, in particular, to provide education to improve self-management, enable information transfer (such as by telemonitoring), facilitate contact with health-care professionals (such as via telephone support and follow-up), and improve electronic records.

Scalvini, S. & Giordano, A. *Nat. Rev. Cardiol.* advance online publication 20 November 2012;
[doi:10.1038/nrcardio.2012.161](https://doi.org/10.1038/nrcardio.2012.161)

