Health Circuit

Adaptive Case Management for Digital Scaling of Surgical Prehabilitation

Isaac Cano

Researcher at IDIBAPS

iscano@clinic.cat

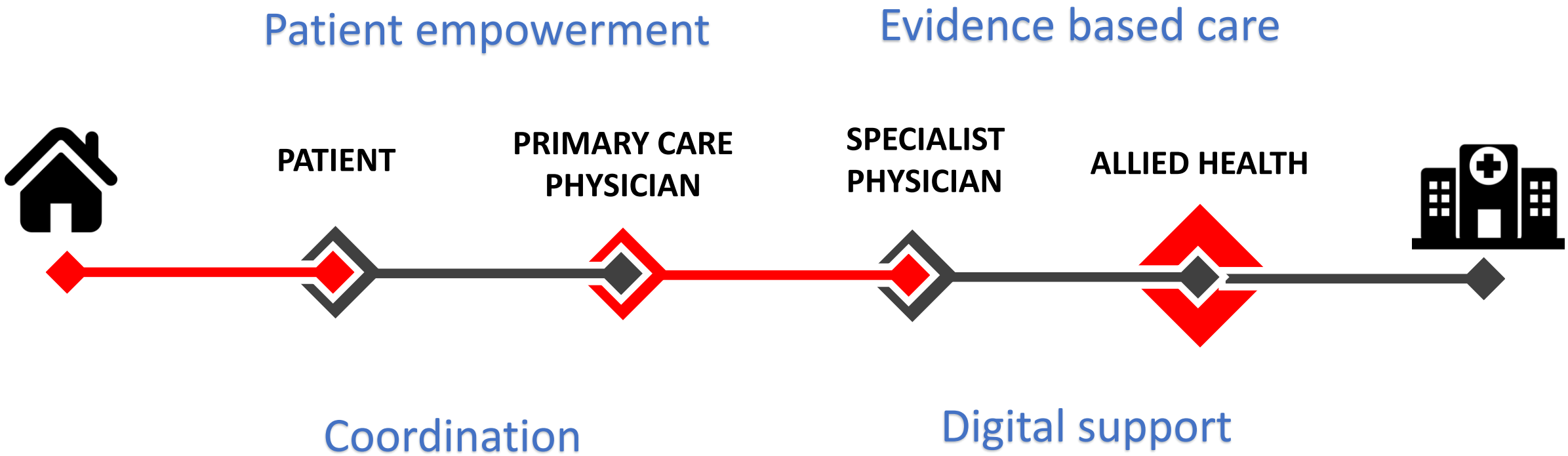
CEO at Health Circuit

isaac.cano@healthcircuit.es

HOSPITAL MANAGEMENT 2024

10.12.2024

Deploying the Chronic Care Model (early 2000s)



Satylganova, A. Integrated care models: an overview. Copenhagen: WHO Regional Office for Europe; 2016.

Epping-Jordan JE, et al. Improving the quality of health care for chronic conditions. Qual Saf Health Care. 2004 Aug;13(4):299-305.

Digital Health Transformation to support the Chronic Care Model

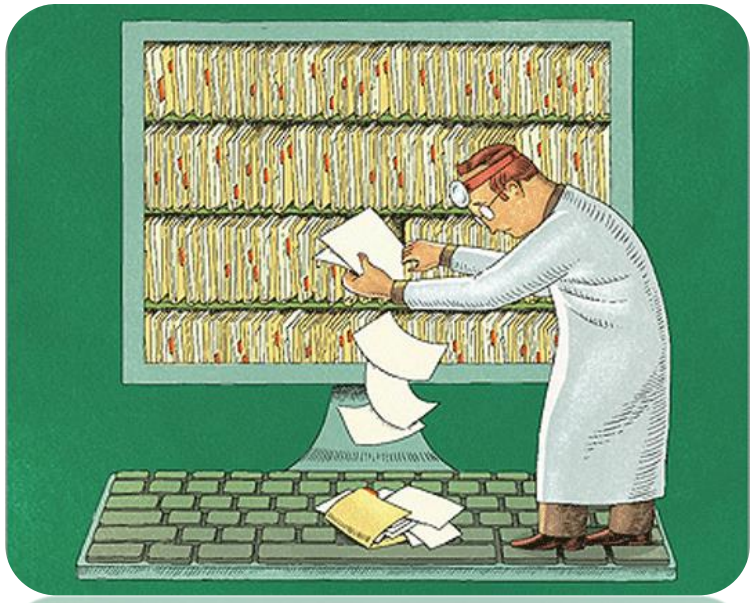
PHASES

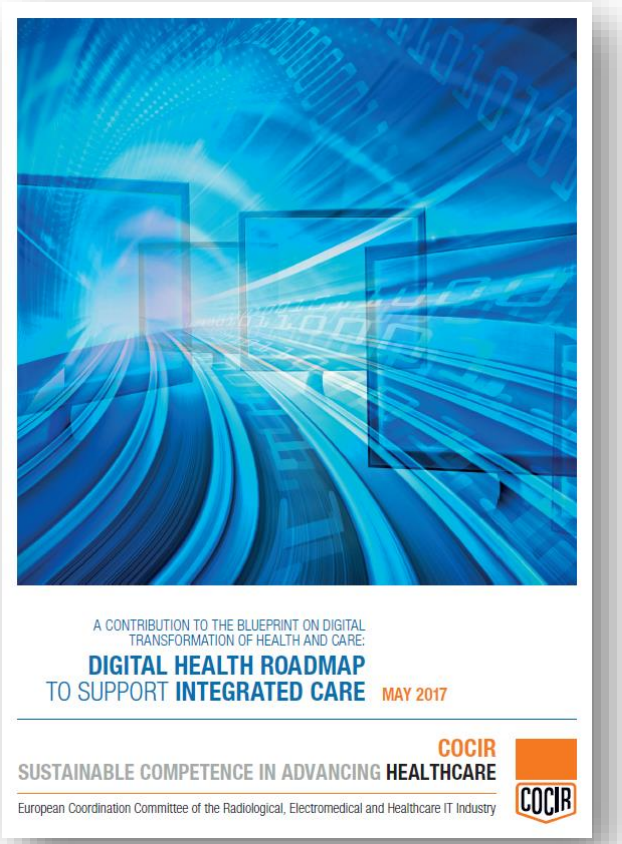
1

CAPTURE

FUNCTIONS

All stakeholders in the care continuum capture all necessary data





Digital Health Transformation to support the Chronic Care Model

PHASES

1

CAPTURE

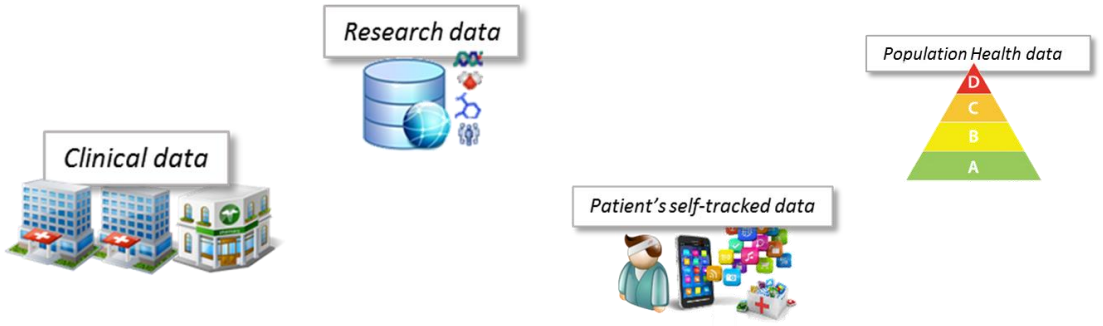
FUNCTIONS

All stakeholders in the care continuum capture all necessary data

NORMALISED PATIENT-CENTRIC DATA CAPTURE

Currently, a substantial proportion of resources are being spent on collecting health and care data.

However, **this (big) data is usually stored in different information silos** rather than generating a comprehensive knowledge base for the patient´s care.



Digital Health Transformation to support the Chronic Care Model

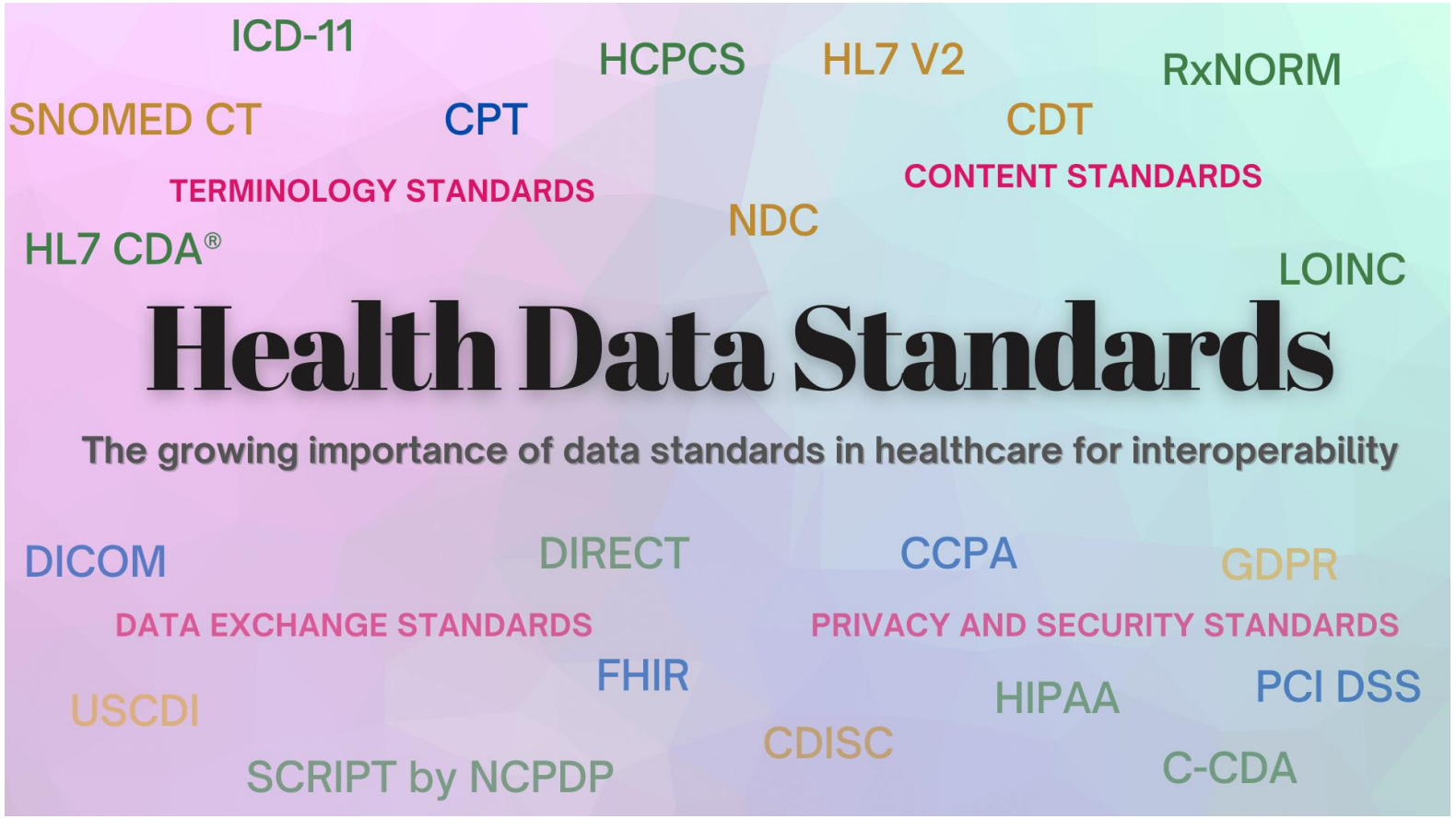
PHASES

1

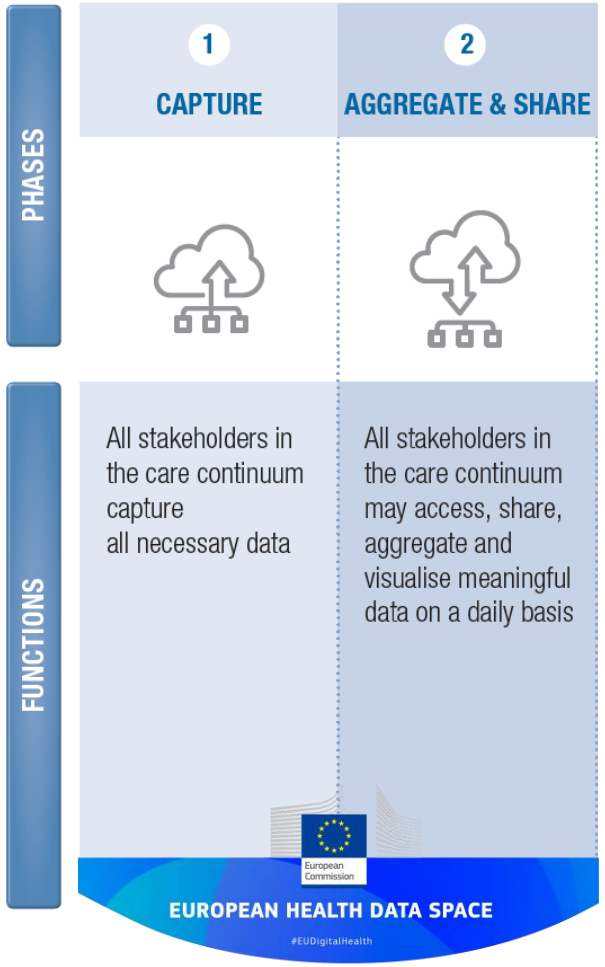
CAPTURE

FUNCTIONS

All stakeholders in the care continuum capture all necessary data



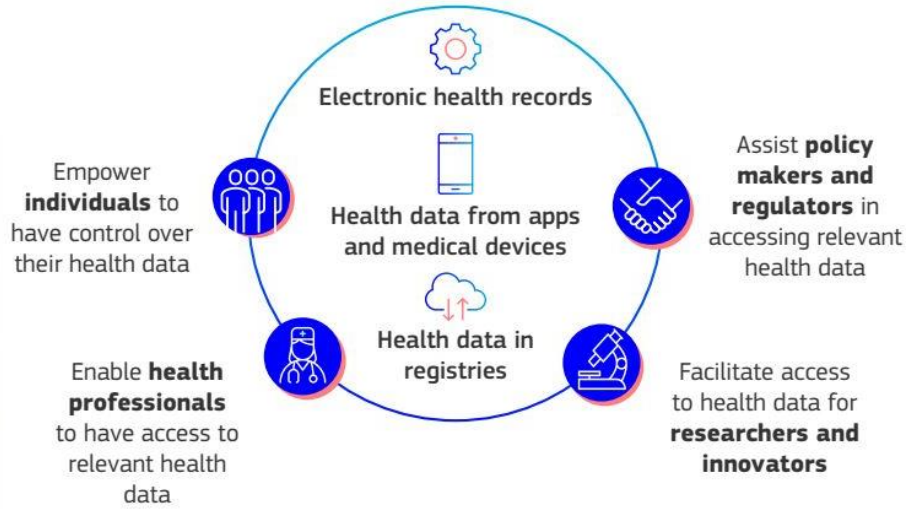
Digital Health Transformation to support the Chronic Care Model



AGGREGATING AND SHARING DATA IN A LONGITUDINAL PATIENT RECORD

There will need to be health data governance mechanisms in place to allow for data use and sharing.

These should **organise and provide access to health data while safeguarding patients' privacy and data protection rights.**



Digital Health Transformation to support the Chronic Care Model

PHASES	1 CAPTURE	2 AGGREGATE & SHARE
FUNCTIONS	All stakeholders in the care continuum capture all necessary data	All stakeholders in the care continuum may access, share, aggregate and visualise meaningful data on a daily basis

Published on 18.11.2024 in Vol 26 (2024)

Preprints (earlier versions) of this paper are available at https://preprints.jmir.org/preprint/58933, first published March 28, 2024.

A 25-Year Retrospective of Health IT Infrastructure Building: The Example of the Catalonia Region

Jordi Piera-Jiménez[1,2,3]; Gerard Carot-Sans[1,2]; Marina Ramiro-Pareta[2]; Maria Mercedes Nogueras[2,4]; Júlia Folguera-Profitós[1,2]; Pepi Ródenas[1]; Alba Jiménez-Rueda[2]; Thais de Pando Navarro[1,2]; Josep Antoni Mira Palacios[5]; Joan Carles Fajardo[6]; Joan Ustrell Campillo[5]; Emili Vela[1,2]; David Monterde[2,6]; Damià Valero-Bover[1,2]; Tara Bonet[1,2]; Guillermo Tarrasó-Urios[1,2]; Roser Cantenys-Sabà[1,2]; Pau Fabregat-Fabregat[1,2]; Beatriz Gómez Oliveros[2]; Jesús Berdún[7]; Xabier Michelena[2,8]; Isaac Cano[9,10,11]; Rubèn González-Colom[9,10]; Josep Roca[9,10,11]; Oscar Solans[6]; Caridad Pontes[2,7,12]; Pol Pérez-Sust[1,13]

Citation

Please cite as:

Piera-Jiménez J, Carot-Sans G, Ramiro-Pareta M, Nogueras MM, Folguera-Profitós J, Ródenas P, Jiménez-Rueda A, de Pando Navarro T, Mira Palacios JA, Fajardo JC, Ustrell Campillo J, Vela E, Monterde D, Valero-Bover D, Bonet T, Tarrasó-Urios G, Cantenys-Sabà R, Fabregat-Fabregat P, Gómez Oliveros B, Berdún J, Michelena X, Cano I, González-Colom R, Roca J, Solans O, Pontes C, Pérez-Sust P
A 25-Year Retrospective of Health IT Infrastructure Building: The Example of the Catalonia Region
J Med Internet Res 2024;26:e58933
doi: 10.2196/58933
PMID: 39556831

Digital Health Transformation to support the Chronic Care Model

PHASES	1 CAPTURE	2 AGGREGATE & SHARE	3 COLLABORATE
FUNCTIONS	All stakeholders in the care continuum capture all necessary data	All stakeholders in the care continuum may access, share, aggregate and visualise meaningful data on a daily basis	Multidisciplinary teams, including the patient, formal and informal caregivers and processes for collaboration are set-up

Digital support for the establishment of teams and **collaboration between team members**

e.g., Bi-directional instantaneous **communication** between team members

Digital Health Transformation to support the Chronic Care Model

	1	2	3	4
PHASES	CAPTURE	AGGREGATE & SHARE	COLLABORATE	COORDINATE
FUNCTIONS	All stakeholders in the care continuum capture all necessary data	All stakeholders in the care continuum may access, share, aggregate and visualise meaningful data on a daily basis	Multidisciplinary teams, including the patient, formal and informal caregivers and processes for collaboration are set-up	Delivery of integrated care may begin, based on agreed care pathways across health and care settings, covering first medical care but evolving to wellness and social care

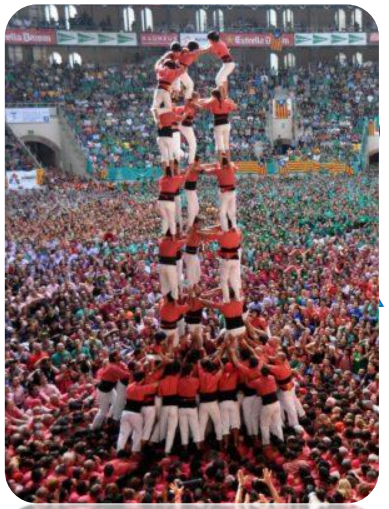
Collaboration

Working together

Towards our shared goal

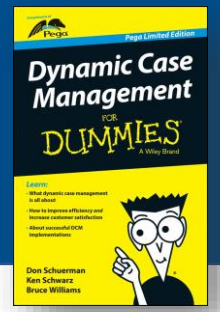
vs

Cooperation



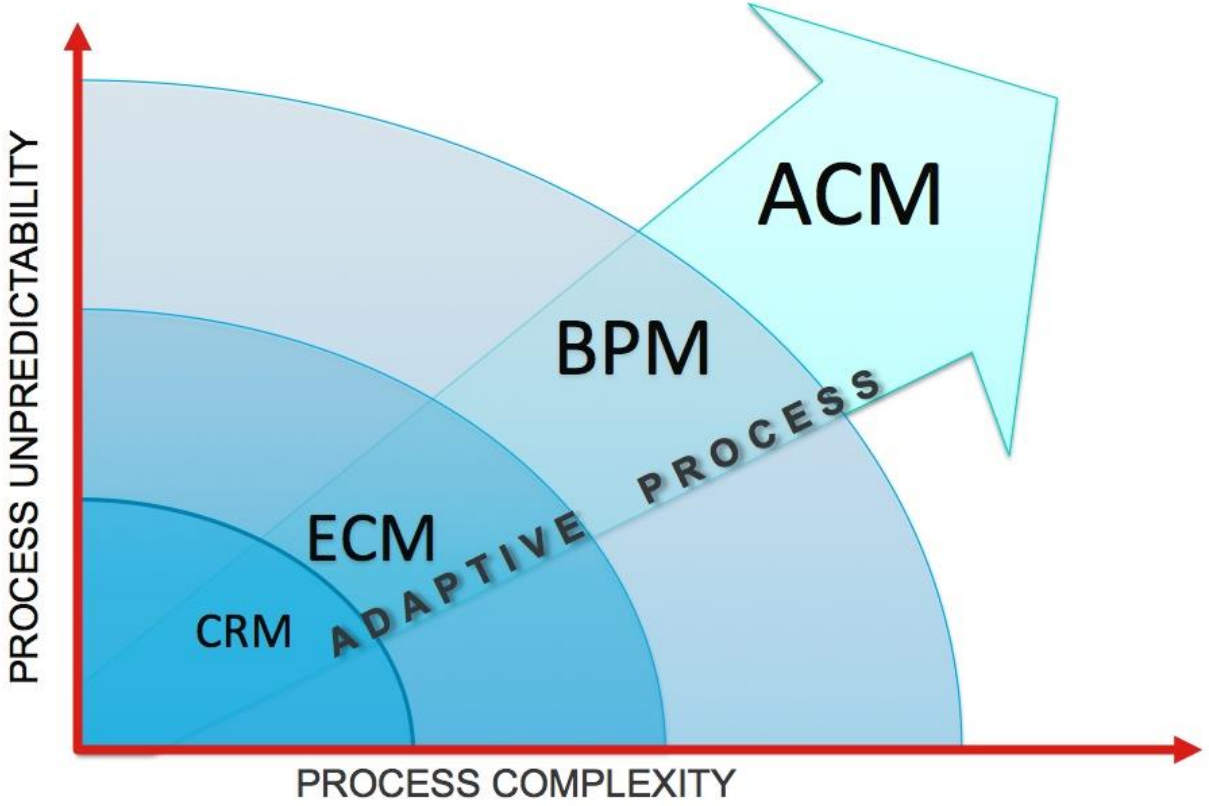
Towards an individuals goal

Knowledge Intensive Processes – Adaptive Case Management (ACM)



Routine work is automated

Hard, unpredictable Problems are left for ***Knowledge workers***



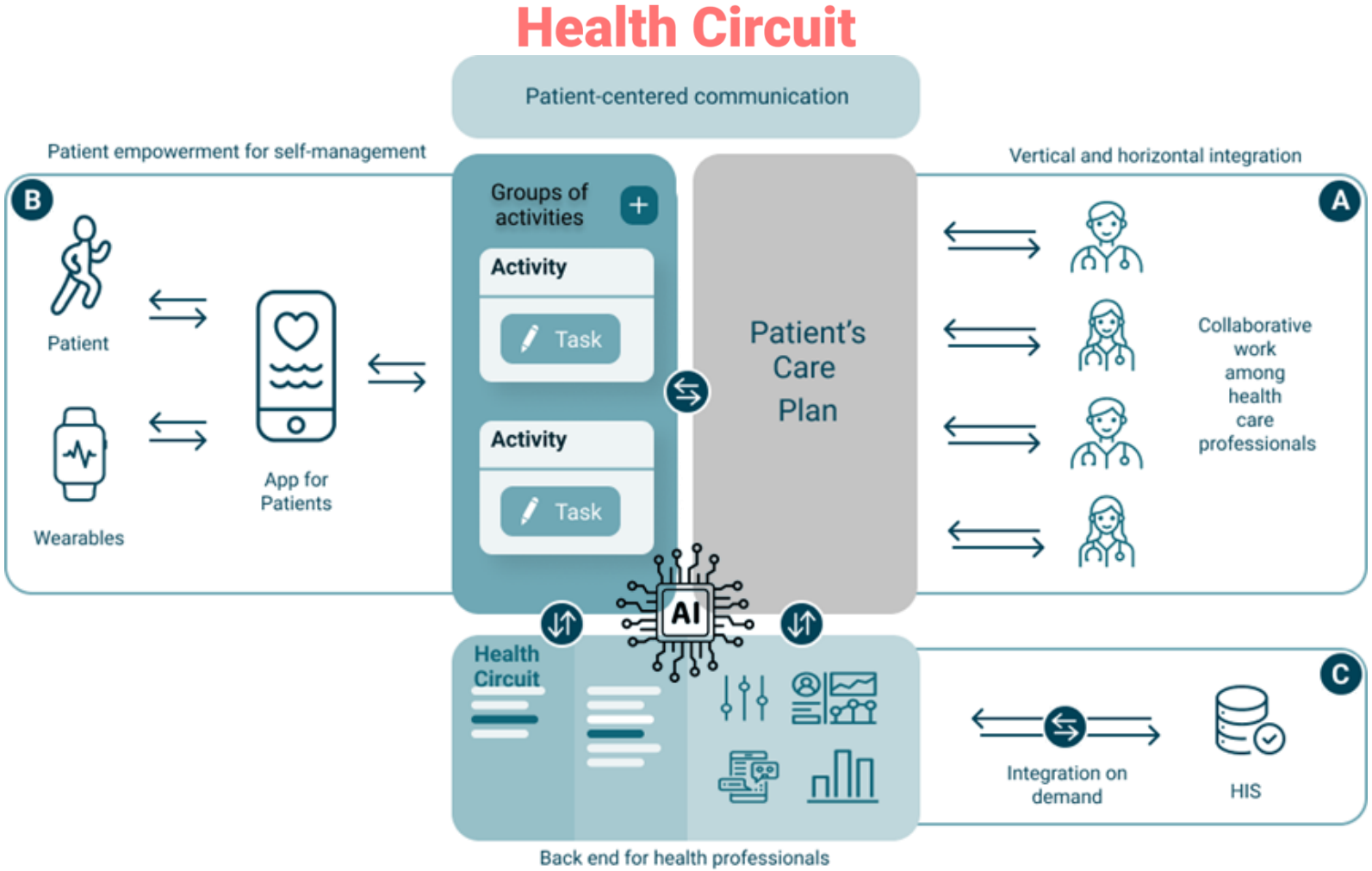
ACM supports very flexible and data-intensive processes that have complex human interactions and complex decision making

Adaptive Case Management in Health

1. **Patient-Centric Approach:** The case encompasses all aspects of a patient's healthcare journey, including medical history, treatment plans, medications, appointments, and interactions with different healthcare providers.
2. **Flexibility and Adaptability:** Allows healthcare providers to adjust care plans dynamically based on the unexpected and evolving needs of the patient.
3. **Empowerment of Healthcare Professionals:** Empowers healthcare professionals to make informed decisions and take actions based on the real-time needs of the patient. This is especially important in integrated care, where collaborative decision-making is essential.
4. **Collaboration and Coordination:** Facilitates communication and cooperation among team members, ensuring that everyone involved in a patient's care is informed and aligned. This might include shared digital workspaces, task assignments, and secure messaging systems.
5. **Compliance and Auditability:** Ensures that all actions and decisions are documented, providing a clear audit trail and helping to meet regulatory standards.

The Health Circuit approach

Patients participate in effective health coaching and self-management strategies, on any device, for a goal-oriented and personalized health plan to manage both expected and unexpected events.



Health care professionals easily adapt and customize shared care plans over time, facilitating a connected experience for both the patient and the health care professional.

Without requiring tight system integration

Impact of Surgery

Surgical complications → Accounts for 30% of the global burden of disease

Projected losses of **$20.7 trillion** in 2030

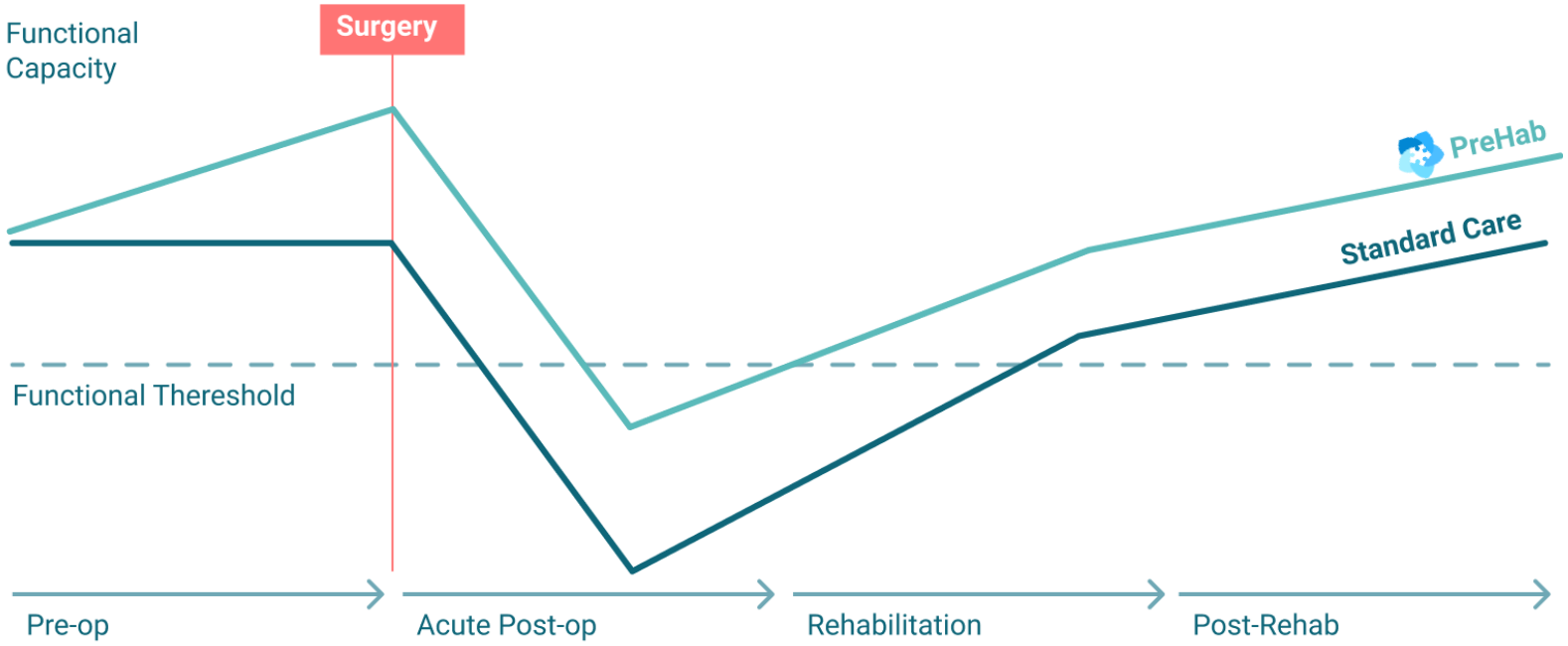
Postoperative deaths → 3rd Global cause of death

Each year die **4.2 million** people within 30 days of surgery

The Lancet – Global Health: Global Surgery. April 2015, vol 3;2:S1-S44
The Lancet Commission on Global Surgery. Vol 393 February 2, 2019

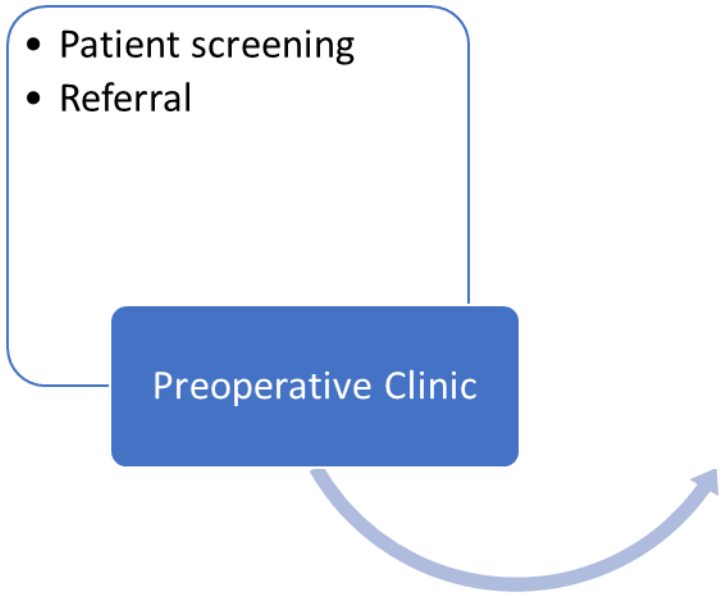
The case of Surgical Prehabilitation

Prehabilitation is the practice of enhancing a patient's functional capacity before surgery to improve postoperative outcomes



www.surgifit.es/en

The case of Surgical Prehabilitation



Patient screening

Major Surgeries (ERAS)

Digestive
Thoracic
Urologic
Cardiac
Gynaecologic

Patient Risk definition

Age > 70 and/or ASA 3-4

Or **unfit patients** undergoing highly aggressive surgeries
regardless of age or ASA class

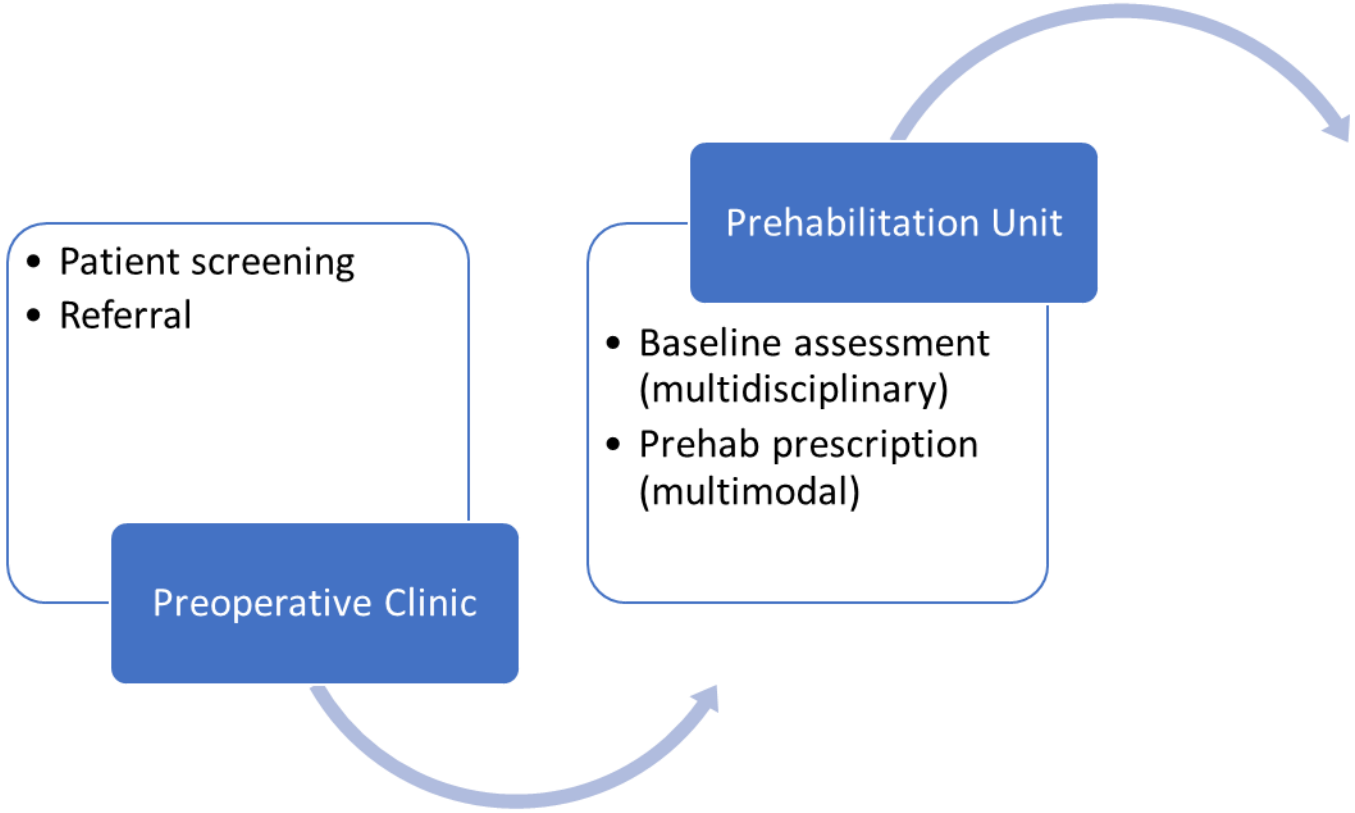
Minimal program duration expected

3-4 weeks

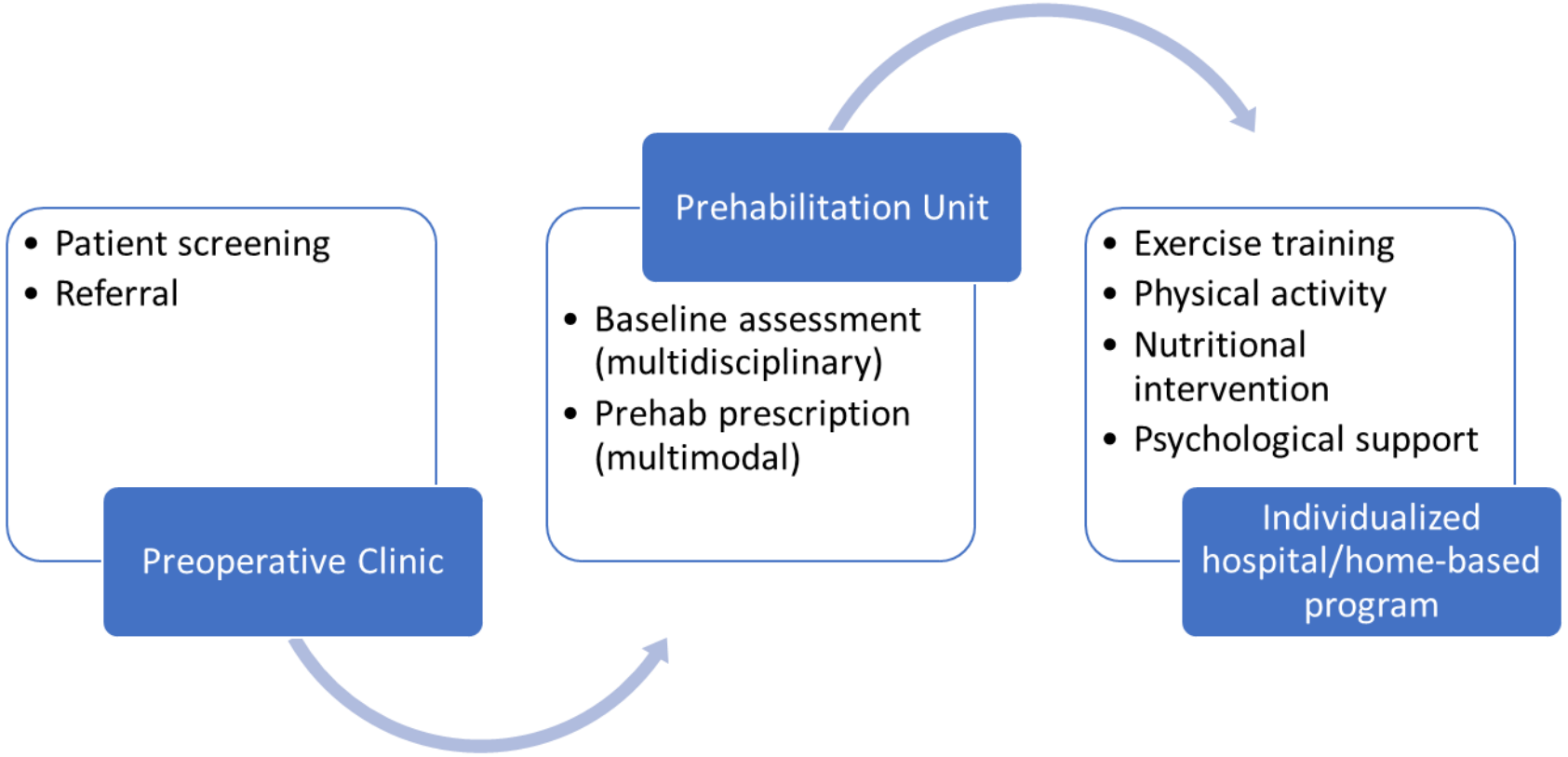
Total≈ 250 – 350/year

www.surgifit.es/en

The case of Surgical Prehabilitation

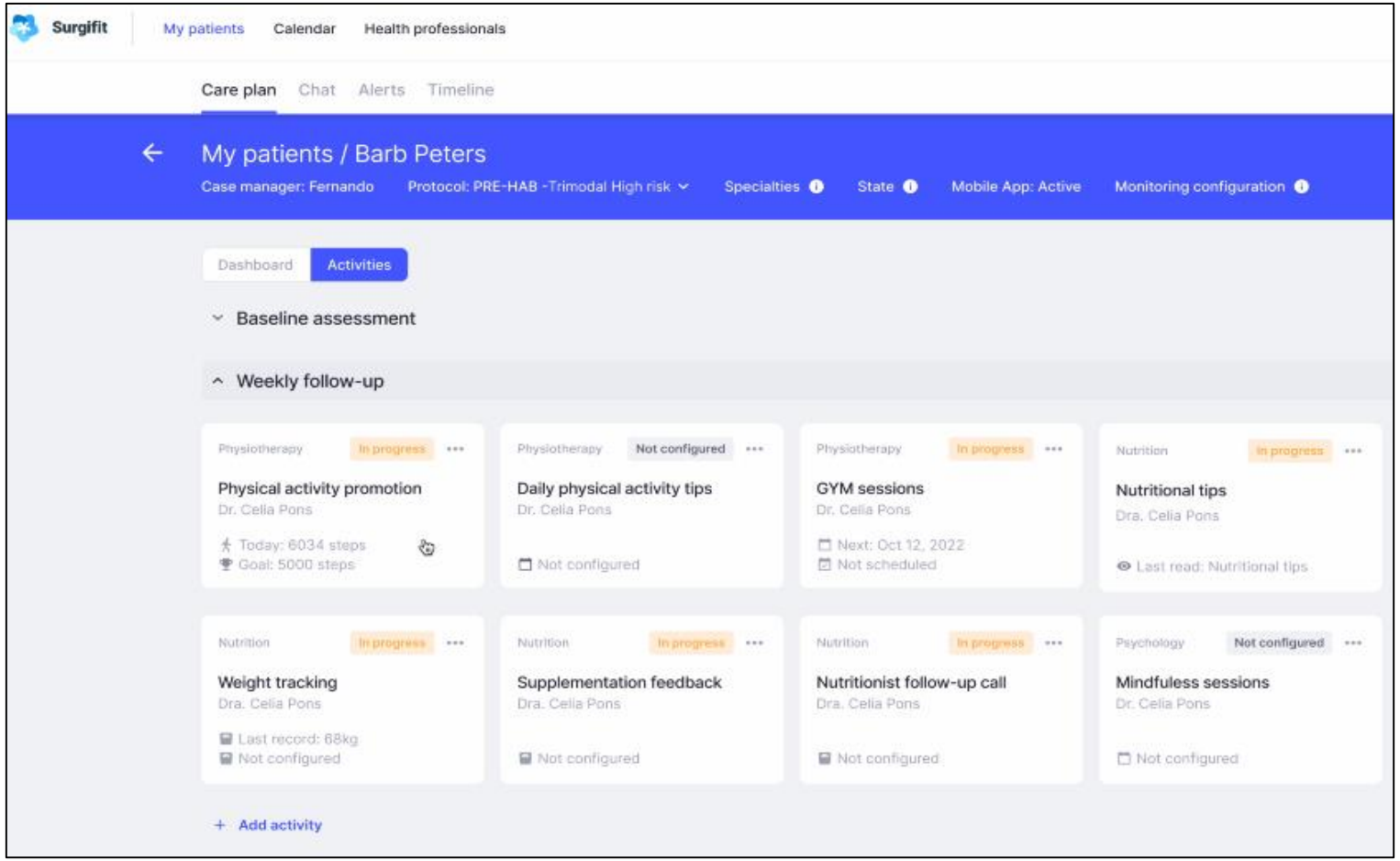


The case of Surgical Prehabilitation



The case of Surgical Prehabilitation

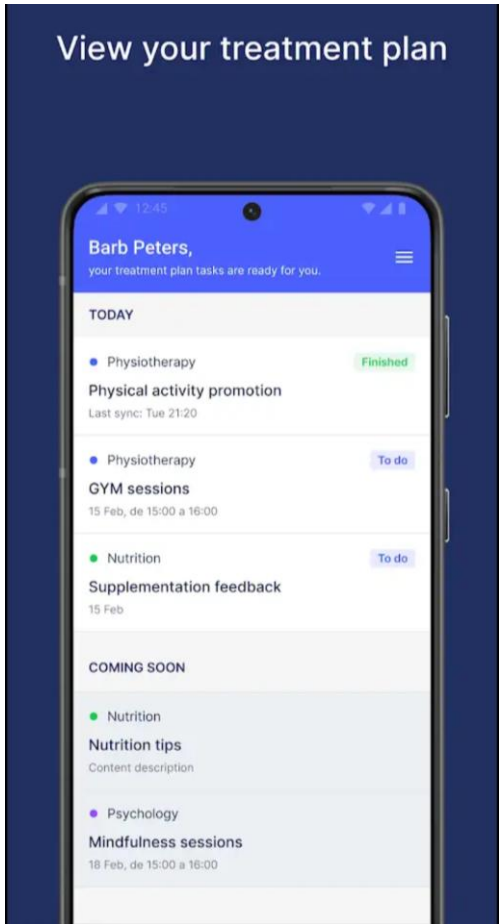
ACM approach to personalized care plans based on evidence-based treatments

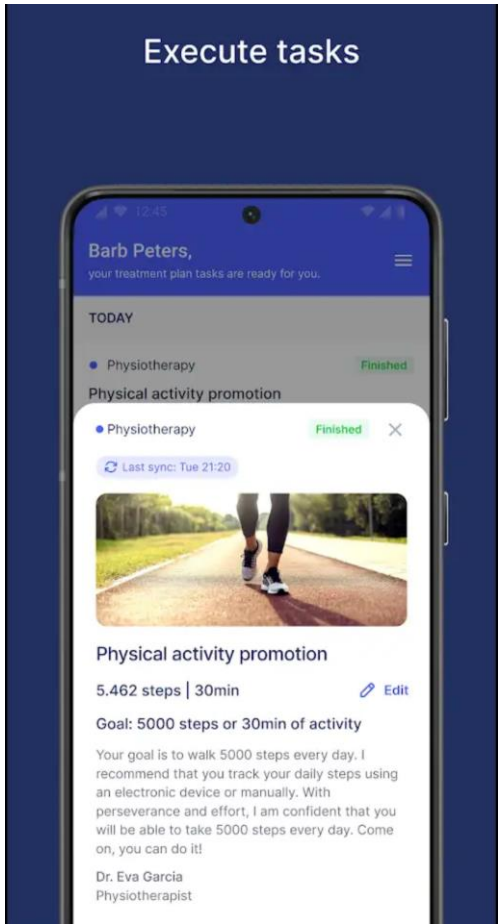


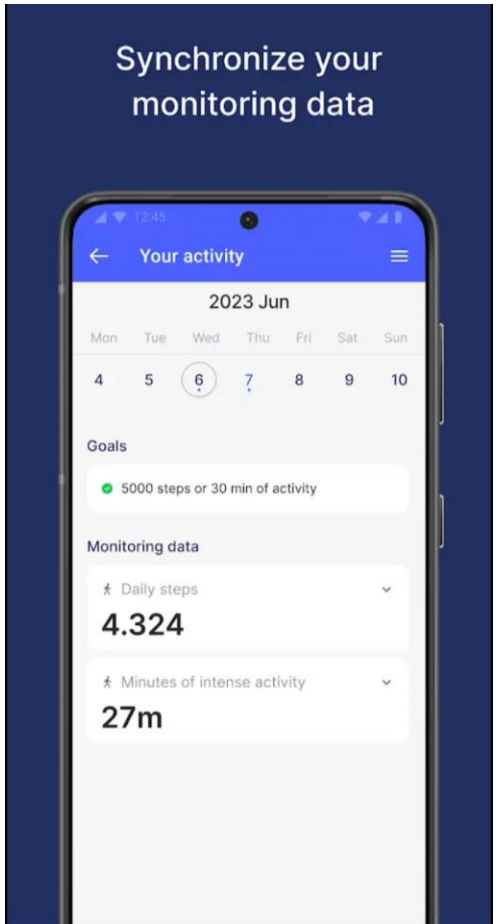
www.surgifit.es/en

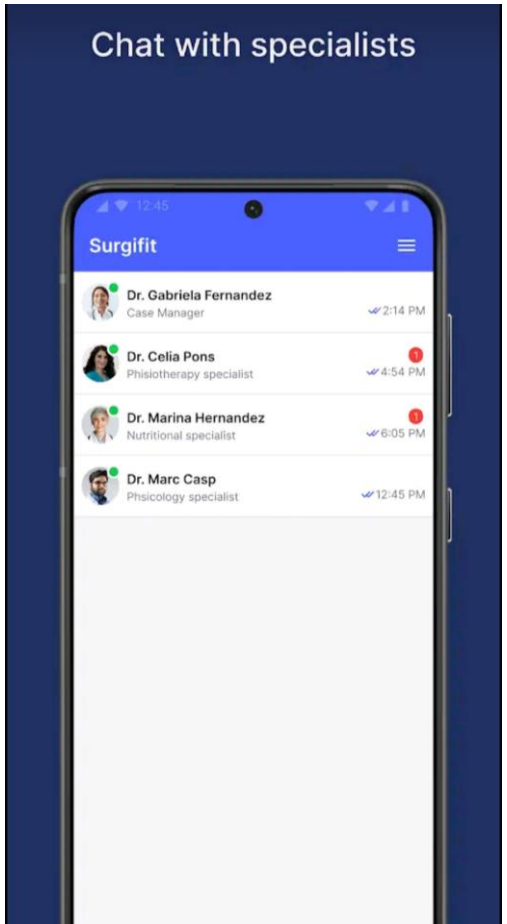
The case of Surgical Prehabilitation

Towards patient's empowerment for self-management



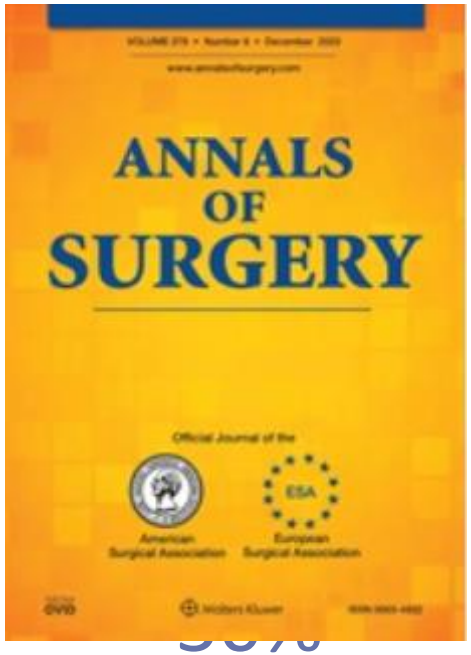


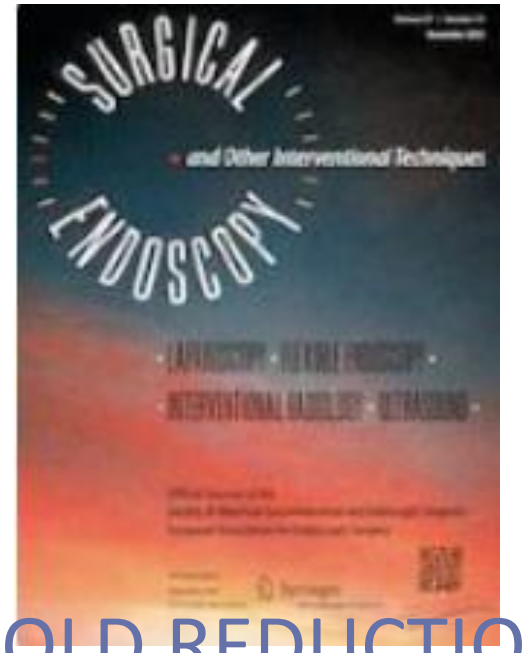




The case of Surgical Prehabilitation

www.surgifit.es/en/evidence





36%
COMPLICATIONS

2x TIMES FASTER RECOVERY

6x FOLD REDUCTION 30-DAY READMISSION

Future perspective

nature medicine

Review article

https://doi.org/10.1038/s41591-024-02970-3

Artificial intelligence in surgery

Received: 24 January 2024

Accepted: 3 April 2024

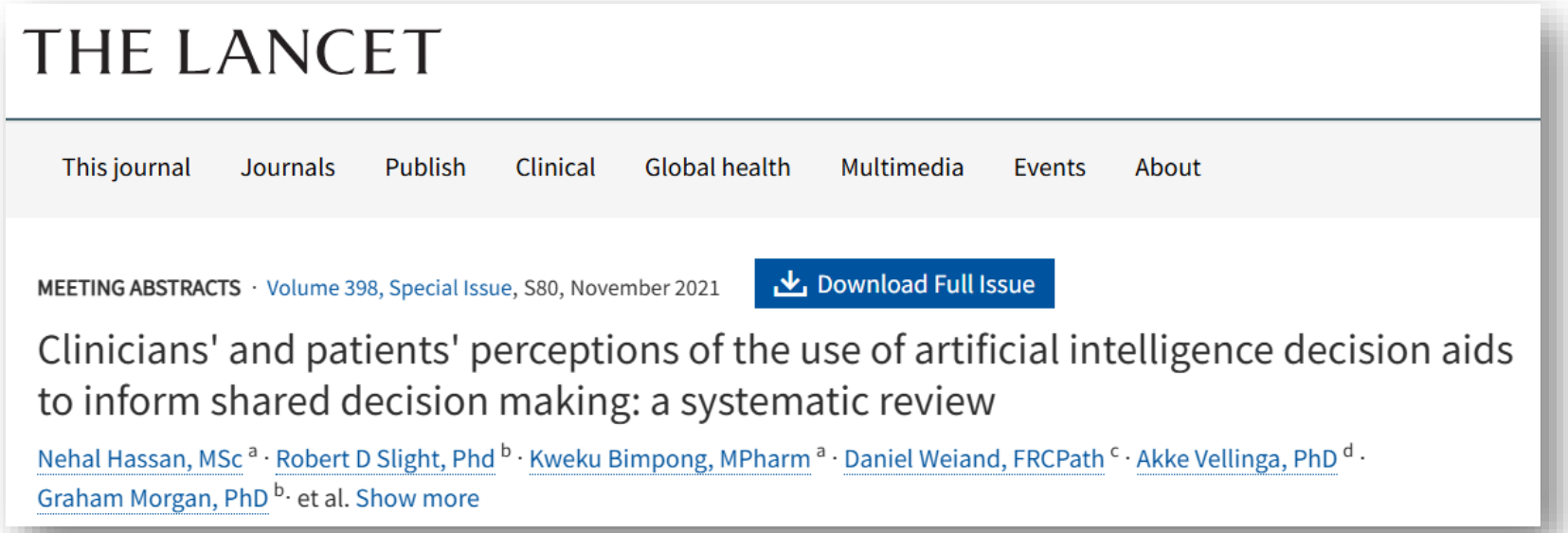
Published online: 13 May 2024

Check for updates

Chris Varghese[1], Ewen M. Harrison[2], Greg O'Grady[1,3] & Eric J. Topol[4]

Artificial intelligence (AI) is rapidly emerging in healthcare, yet applications in surgery remain relatively nascent. Here we review the integration of AI in the field of surgery, centering our discussion on multifaceted improvements in surgical care in the preoperative, intraoperative and postoperative space. The emergence of foundation model architectures, wearable technologies and improving surgical data infrastructures is enabling rapid advances in AI interventions and utility. We discuss how maturing AI methods hold the potential to improve patient outcomes, facilitate surgical education and optimize surgical care. We review the current applications of deep learning approaches and outline a vision for future advances through multimodal foundation models.

Future perspective



THE LANCET

This journal Journals Publish Clinical Global health Multimedia Events About

MEETING ABSTRACTS · Volume 398, Special Issue, S80, November 2021 Download Full Issue

Clinicians' and patients' perceptions of the use of artificial intelligence decision aids to inform shared decision making: a systematic review

Nehal Hassan, MSc [a] · Robert D Slight, Phd [b] · Kweku Bimpong, MPharm [a] · Daniel Weiand, FRCPath [c] · Akke Vellinga, PhD [d] · Graham Morgan, PhD [b] · et al. Show more

Findings

509 articles were identified, with 17 articles eligible for inclusion. All included studies received a score of 7 or higher on the CASP checklist. AI decision aids were used to support SDM at various stages of the patient journey, including prevention, screening, prognosis, diagnosis, and treatment. It was perceived by patients and clinicians that these decision aids helped to promote patient engagement and communication with their clinicians, increase patient confidence and compliance, inform the consenting process, present risk estimates in an interactive and individualised manner, and improve patient satisfaction around their overall clinical care. The main barriers to using such aids were around patients' variability in technology literacy, and incomplete or missing information that could potentially affect the findings.

Surgical risk prediction for shared decision making

CHEST Critical Care
Volume 1, Issue 3, December 2023, 100024

Sepsis and Infections: Original Research

The Association Between Days Alive and Out of Hospital and Health-Related Quality of Life in Patients With Sepsis

Anthony Delaney PhD [a b c h], David H. Tian PhD [a d], Alisa Higgins PhD [a h], Jeffrey Presneill PhD [h i j], Sandra Peake PhD [h], Balasubramanian Venkatesh MD [a], John Myburgh PhD [a f g], Simon Finfer DrMed [a], Kelly Thompson PhD [a e], Colman Taylor PhD [a], Lachlan Donaldson MD [a b], Joseph A. Santos PhD [a], Naomi Hammond PhD [a b]

ANZ Journal of Surgery
Royal Australasian College of Surgeons

SURGICAL AUDIT AND OUTCOMES | Open Access

Days alive and out of hospital after laparoscopic cholecystectomy

Harry Alexander MBChB, BMSc (Hons), Matthew Moore BE, PhD, Jacqueline Hannam BSc, (Hons) PhD, Garth Poole MBChB, FRACS, Adam Bartlett FRACS, PhD, Alan Merry FANZCA, FFPMANZCA

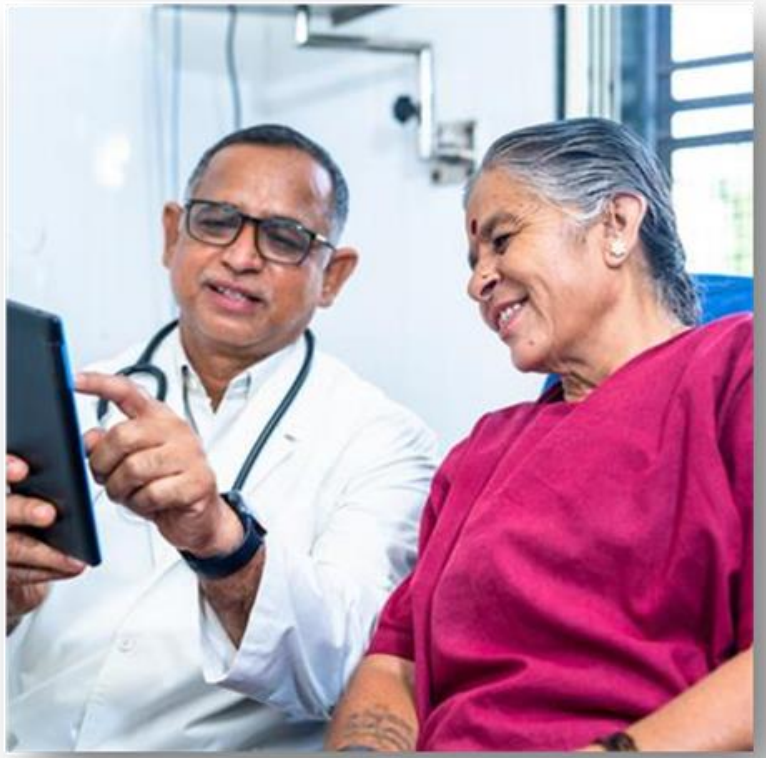
First published: 17 October 2022 | https://doi.org/10.1111/ans.18099 | Citations: 1

H. Alexander MBChB, BMSc (Hons); **M. Moore** BE, PhD; **J. Hannam** BSc, (Hons) PhD; **G. Poole** MBChB, FRACS; **A. Bartlett** FRACS, PhD; **A. Merry** FANZCA, FFPMANZCA.

Open access Original research
BMJ Open

Using days alive and out of hospital to measure surgical outcomes in New Zealand: a cross-sectional study

Luke Boyle [1], Thomas Lumley,[1] David Cumin,[2] Doug Campbell,[3] Alan Forbes Merry [2,3]



RISK

Patient Education:
Understanding Surgical Risk

Empowering Patients for Informed Decision Making

MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

Instituto de Salud Carlos III

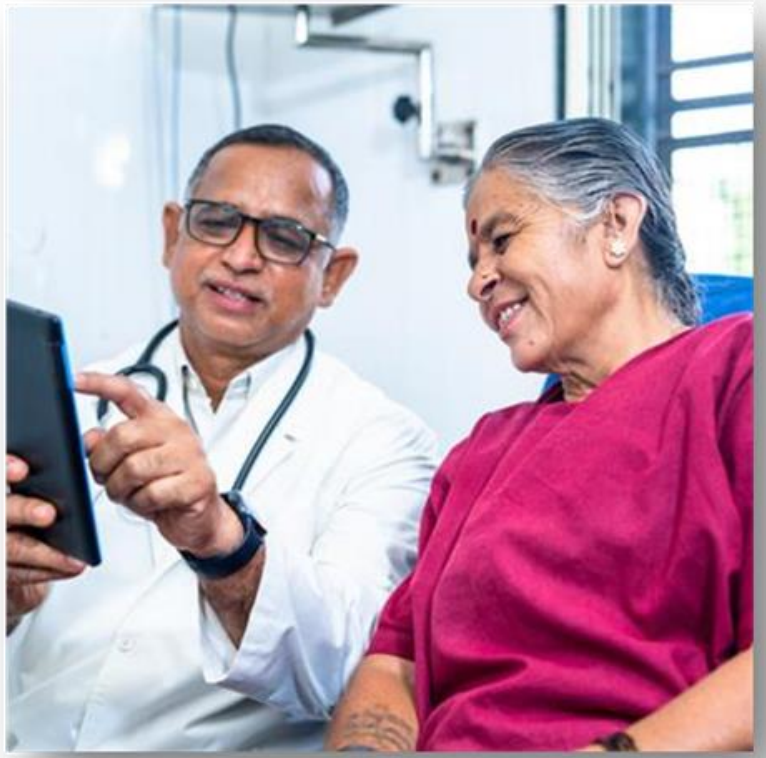
Surgical risk prediction for shared decision making

JAMA Network | Open

Original Investigation | Health Informatics

APPRAISE-AI Tool for Quantitative Evaluation of AI Studies for Clinical Decision Support

Jethro C. C. Kwong, MD; Adree Khondker, MD; Katherine Lajkosz, MSc; Matthew B. A. McDermott, PhD; Xavier Borrat Frigola, MD; Melissa D. McCradden, PhD; Muhammad Mamdani, PharmD; Girish S. Kulkarni, MD; Alistair E. W. Johnson, DPhil



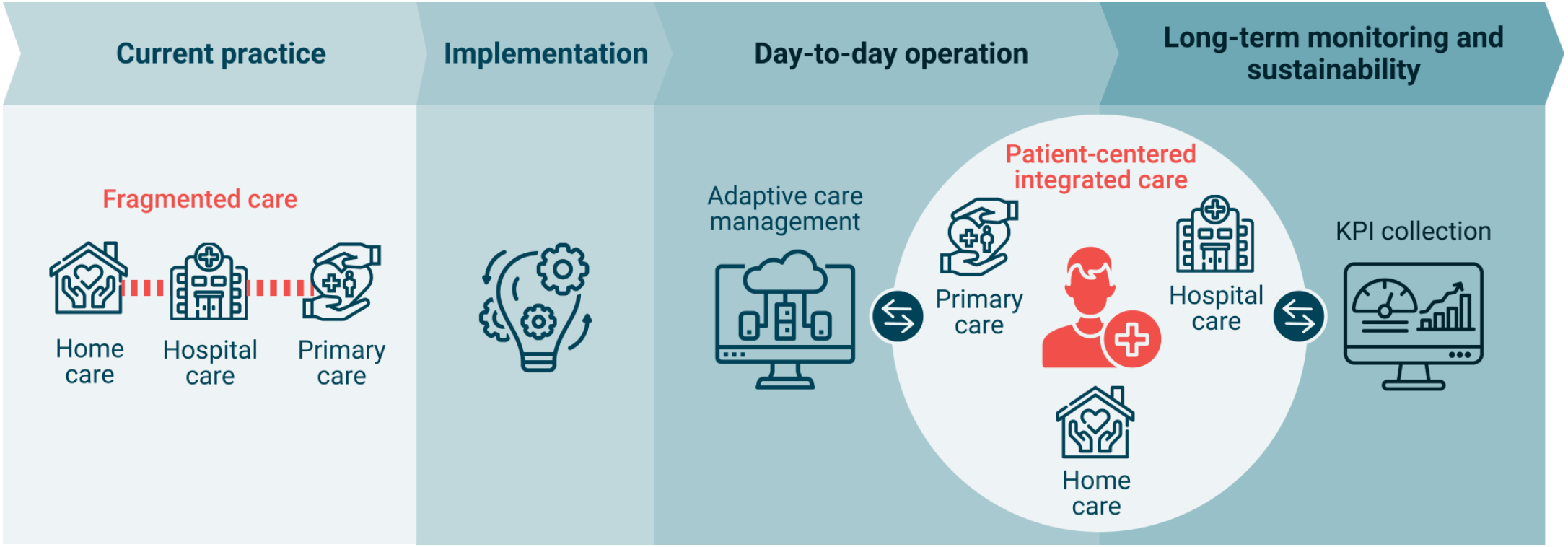
Patient Education:
Understanding Surgical Risk

Empowering Patients for Informed Decision Making

MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

Instituto de Salud Carlos III

Future vision



A comprehensive framework for implementing and sustaining digitally-enabled integrated care

Health Circuit

Adaptive Case Management for Digital Scaling of Surgical Prehabilitation

Isaac Cano

Researcher at IDIBAPS

iscano@clinic.cat

CEO at Health Circuit

isaac.cano@healthcircuit.es

HOSPITAL MANAGEMENT 2024

10.12.2024