Remote Patient Monitoring, barriers and enablers

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Definition

- Telemonitoring or '**remote patient monitoring**' (RPM) or 'remote care' or 'care at a distance': Measurements and queries are collected from the patient by means of **digital technologies** to monitor and capture medical and other **health data** from patients (at a distance) and electronically **transmit this information** to healthcare providers for assessment. It is a technology to enable monitoring of patients **outside of conventional clinical settings**, such as in the home or in a remote area.

(KCE report 354, 2022)

- Remote patient monitoring (RPM) can be defined as "a mode of healthcare delivery that gathers and integrates patient data outside of traditional healthcare settings, allowing providers to **track, assess, and engage patients regardless of location**." RPM can thus constitute an alternative (but also a complement) to conventional care, with potential **social and economic value** for both patients and providers.

(Miranda et al, 2023)

The (expected) intervention outcomes when telemonitoring is implemented

Patient care and health outcomes => positive effect on:

- Self-care or patient empowerment
- Quality of care
- Patient education
- Symptoms of disease
- Quality of life

Organisation and system outcomes :

- Treat more patients (and reduce admission and visits)
- Reduce workload
- Reduce costs
- Improve adherence to guidelines
- Contribute to continuity of care

(Gijsbers et al, 2022)

The (expected) intervention outcomes when telemonitoring is implemented

BUT WE FIND MIXED RESULTS IN LITERATURE!

- Methodological differences – Research

- Methodological differences – Implementation

    ➢ **Incomplete approach and lack of know how**

    ➢ **No alignment with existing care process**

(Christensen et al 2018, Dawes et al 2021, Taylor et al 2021, KCE report 354 a, Verma et al 2022, Ekstedt et al 2023)

Typical issues re-designing & implementing services

Task substitution, roles & responsibilities

- Lack of **clear definitions** or boundaries for roles & responsibilities

- Inadequate **training** or preparation for tasks

- Confusion about **accountability** and ownership of tasks

- **Concerns** quality of work

- **Communication** errors & inefficiencies

(Maier & Aiken, 2016)

Challenges specific for RPM projects?

- Data collection
- Reliability and validity
- Interoperability
- Authorization,
- Authentication
- Aggregation of data

- Effectiveness
- Stability
- Relevant dashboard
- Clinical algorithms
- Threshold values
- Timely responds

- Reimbursement
- Legislation, GDPR, MDR
- Profitability

- Acceptance
- Digital literacy
- Match with ecosystem

(Roderick et al 2016, Lakmini et al 2019, Thomas et al 2021, Gijsbers et al 2022, KCE report 354a 2022, De France et al 2023, Liljeroos et al 2023, Miranda et al 2023)

Solution?

Aspects of care

Succes factors in interventions

Organisational

- Have a central monitoring unit/dedicated professional monitoring RPM
- Integrate RPM into workflow with system to manage alerts
- Provide incentives to encourage uptake of RPM
- Enhance coordination between primary and secondary care

Interpersonal

- Encourage two-way interactive communication between patient and team
- Enhance pt self-management via support, education and feedback
- Use data from RPM to tailor and personalise care
- Ensure collaborative and multidisciplinary team involvement (including primary care to increase coordination and continuity)

(Thomas et al 2021)

Solution?

Aspects of care

Succes factors in interventions

Intrapersonal (patient or staff)

- Select patients at high risk of readmission (e.g. moderate-severe disease, high healthcare use, comorbidities)
- Motivate patients and staff to use RPM
- Increase adherence to RPM through routine data entry checks and frequent follow-ups

Intervention (RPM design)

- Co-design with target population
- Make it simple and easy to use
- Ensure accurate and sensitive measurements to enable early detection
- Patient-specific measurements need to be used
- Enhance self-management (e.g. monitor medication adherence)

(Thomas et al 2021)

Solution?

Towards A Framework for Implementing Remote Patient Monitoring From an Integrated Care Perspective: A Scoping Review

Rafael Miranda [1,2,*], Mónica Duarte Oliveira [1,3], Paulo Nicola [4], Filipa Matos Baptista [2], Isabel Albuquerque [5]

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A model for assessment of telemedicine applications: mast

Kristian Kidholm [1], Anne Granstrøm Ekeland, Lise Kvistgaard Jensen, Janne Rasmussen, Claus Duedal Pedersen, Alison Bowes, Signe Agnes Flottorp, Mickael Bech

Affiliations + expand

The Telemedicine Program Design Canvas: a visual tool for planning telemedicine interventions 🔓

Neha Verma ✉ , Izabella Samuel , Samuel Weinreb , Mackenzie Hall , Kai Zhang , Mariana Bendavit , Vibha Bhirud , Jordan Shuff , Youseph Yazdi , Soumyadipta Acharya

EHMA 2025

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Solution?

DESIGN AND ALIGN:

1. DEFINE THE CONCEPT
2. INITIATE THE PROJECT
3. DEVELOP THE CARE PATH
4. TEST AND IMPLEMENT

Verma et al. The Telemedicine Program Design Canvas: a visual tool for planning telemedicine interventions, *Oxford Open Digital Health*, Volume 1, 2023, oqac002, https://doi.org/10.1093/oodh/oqac002

TELEMEDICINE PROGRAM DESIGN CANVAS

Designed by: Date: Version:

Problems
What problem am I solving for patients?
What problem am I solving for the health system?
What are the costs/consequences of not solving this problem?

Ecosystem
Where will this project be implemented? (eg: rural villages, conflict zones, urban areas)
Describe the current health system - how do patients currently access care for this issue?
What is the availability of internet & mobile connectivity?
What regulation exists?
Are there any telemedicine laws and guidelines I have to comply with?

Patients
Who are my patients?
What is my target population - Rural patients, Urban patients, Children, women, elderly?
Describe the persona of your target patients groups
What kind of access do they have to the internet, mobile devices, power?
What is their level of technical literacy?
Do they trust/accept telemedicine?

Patient workflow
What will the teleconsultation workflow be?
How will I manage patient consent?
What is the patient journey?
What will be the indications for referral, i.e. what cases will not be managed over telemedicine?
Where will they be referred to?

Patient engagement & trust
How will patients find out about the telemedicine project?
How will I generate trust and acceptability so that they will use the service?
How do I keep them coming back?

Providers
Who are my providers?
What are the types of providers I will need to recruit? (eg: nurses, midwives, community health workers, general physicians, specialists, counsellors)
Where would they be based?
Ideal characteristics (eg: speak the same language, retired doctors, international specialists)?

Provider training
What training will they need?
What is their current level of training and education?
What skills do they need - clinical skills, technology skills?
What refresher/continuous training will they need?

Provider engagement
How will I keep a ready pool of health providers?
How will I recruit them?
How will I retain them?

Channels
How might I reach patients?
Directly (D2P) - IVR, Call center, mobile app, website, chat (Whatsapp / Facebook)?
Via an intermediary (HW2D) - health worker assisted telemedicine
Indirectly (P2P) - doctor consulting with specialist

Technology
What technology will I use?
What key features do I need in my software?
What point of care diagnostics will I need?
What clinical protocols will be needed?
Who will maintain the technology?
What safeguards do I need to maintain data privacy & security?

Medicines & Diagnostics
How will patients get medicines after the teleconsultation?
Where will they be able to access diagnostic tests?
Will the project require any point of care diagnostic devices? (eg: providing patients with a blood pressure monitor at home, providing a local health worker with a point of care diagnostic kit)

Costs
What are the various cost components of the project?

Revenue
Who pays?
Patient / Insurance / Government / Donor?

Desired outcomes
What will success look like?
How will I monitor that the project is meeting its goals?
How will I monitor and maintain clinical quality?
eg: Reduction of time, distance, money to access healthcare
Improvement in hypertension status of patients
Increase in number of children receiving treatment for illness
Number of patient visits
Profit per teleconsultation
Population covered

Use cases

Large bowel surgery – From start to implementation:

- 1st time: 9 months; Now: 6 months
- 3 months is achievable through a structured approach

Outcome large bowel surgery

- 75 patients included.
- Length of stay: Median from 6 to 2 days, Average from 9 to 3 days.
- Safety: No false positives or negatives
- Patient satisfaction: +90% overall patient satisfaction.

Other use cases (FOD innovation project)

- Bariatric surgery / Kidney surgery / Bladder surgery / Pancreatic surgery / Anti reflux surgery

Implementing RPM

Take away messages

- Use a conceptual framework (TPDC is useful at organizational level)
- Be aware of barriers and enablers
- Align with existing care pathways
- Use an implementation strategy (projectmanagement)
- Pay attention to Change management (process redesign)
- Contract with partners and stakeholders
- Use a conceptual framework (TPDC is useful at organizational level)
- Cave health equity

THANK YOU

TOTeM

Integrating technology
in healthcare

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