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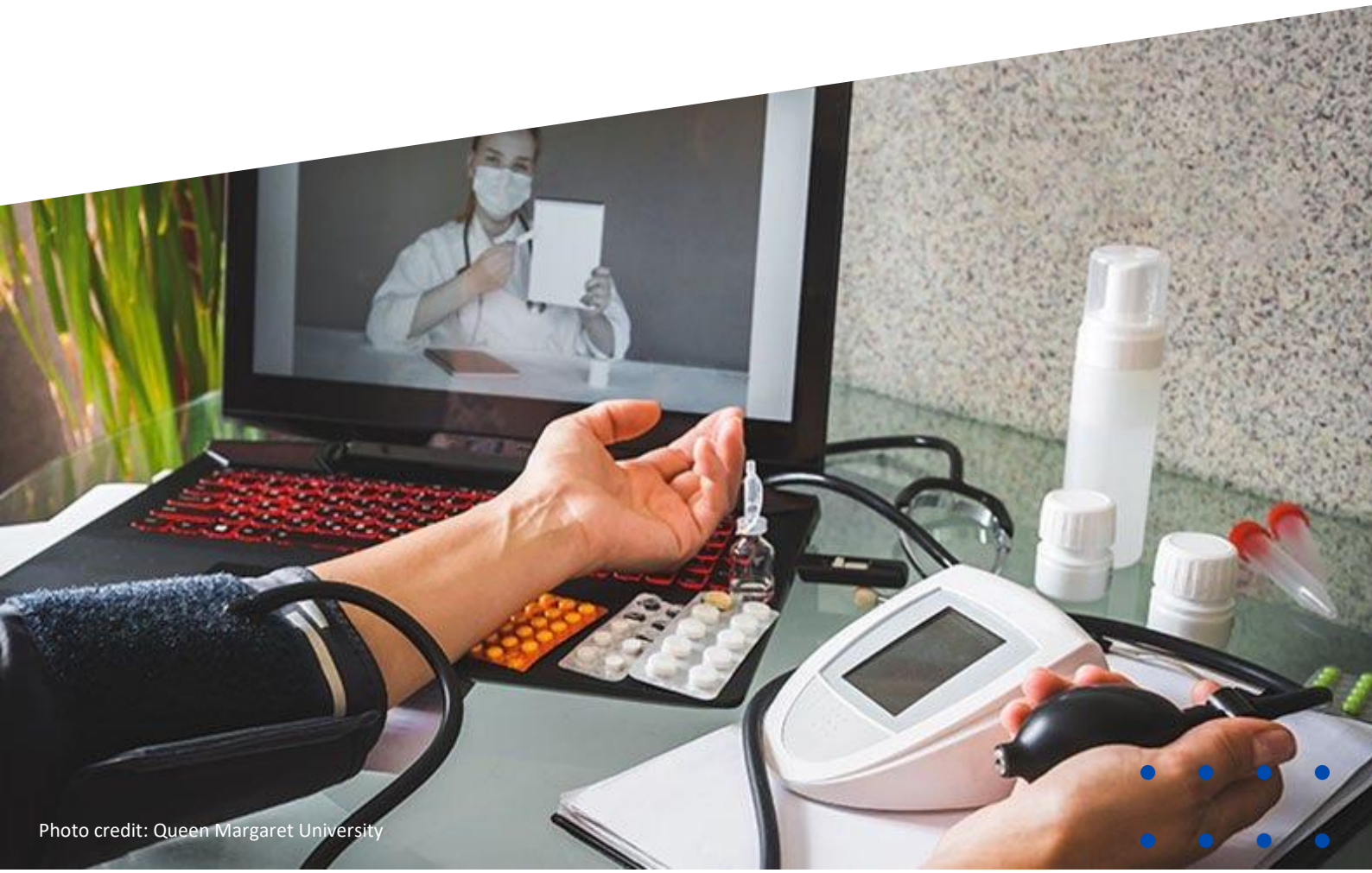
McGill University Health Centre

L'Unité d'évaluation des technologies et des modes d'intervention en santé (UETMIS) du Centre Universitaire de Santé McGill (CUSM)

Health Technology Assessment Unit (TAU) of the MUHC



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April 13, 2026

Remote Patient Monitoring for Patients with Chronic Diseases

Health Technology Assessment Report
Report no. 108

Report prepared for the Technology Assessment Unit (TAU) of the McGill University Health Centre (MUHC)

by

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Reviewed by the Policy Committee of the TAU on April 13, 2026

Mission Statement

The MUHC Health Technology Assessment Unit (TAU) advises hospital administrators and clinical teams in difficult resource allocation decisions. Using an approach based on independent, critical evaluations of the available scientific evidence and a transparent, fair decision-making process, novel and existing medical equipment, drugs and procedures used by healthcare professionals are prioritized on a continuous basis ensuring the best care for life with the best use of resources.

TAU Policy Committee

Declaration of Conflicts of Interest

Members of TAU's research staff and policy committee declare no conflicts of interest.

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- André Guigui, Deputy to the Director of Finance, MUHC

REPORT REQUESTOR

There is local interest at the McGill University Health Centre (MUHC) in assessing the clinical and cost benefits of using a remote patient monitoring (RPM) system to manage patients with chronic conditions. Samia Saouaf, Nursing Practice Consultant within the Nursing Directorate of the MUHC, requested that the Technology Assessment Unit (TAU) evaluate the clinical effectiveness and the cost or resource implications of adopting an RPM platform at the MUHC.

TYPES OF RECOMMENDATIONS ISSUED BY THE TAU COMMITTEE

Type of recommendation	Explanation
Approved	• Evidence for relevant decision criteria, including efficacy, safety, and cost, as well as context-specific factors such as feasibility, is sufficiently strong to justify a recommendation that the technology be accepted, used and funded through the institutional operating budget
Approved for evaluation	• There is a reasonable *probability* that relevant decision criteria, including efficacy, safety, and cost, as well as context-specific factors such as feasibility, are favourable but the evidence is not yet sufficiently strong to support a recommendation for permanent and routine approval. • The evidence is sufficiently strong to recommend a *temporary* approval in a restricted population for the purposes of evaluation, funded through the institutional operating budget.
Not approved	• There is insufficient evidence for the relevant decision criteria, including efficacy, safety, and cost; • The costs of any use of the technology (e.g. for research purposes) should not normally be covered by the institutional budget.

DISCLAIMER

The Technology Assessment Unit ("TAU") of the McGill University Health Centre ("MUHC") was created in order to prepare accurate and trustworthy evidence to inform decision-making and when necessary to make policy recommendations based on this evidence. The objective of the TAU is to advise the hospitals in difficult resource allocation decisions, using an approach based on sound, scientific technology assessments and a transparent, fair decision-making process. Consistent with its role within a university health centre, it publishes its research when appropriate, and contributes to the training of personnel in the field of health technology assessment.

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LIST OF ABBREVIATIONS

ACM	All-cause mortality
BMI	Body-mass index
CADTH	Canadian Agency of Drug and Technology in Health
CDA	Canadian Drug Agency
CHUM	Centre hospitalier de l'Université de Montréal
CI	Confidence interval
CIUSSS	Centre intégré universitaire de santé et de services sociaux
DST	Clinical decision support tools
DTx	Digital therapeutics
FBG	Fasting blood glucose
HbA1c	Hemoglobin A1c
HF	Heart failure
HFH	Heart-failure hospitalization
HR	Hazard ratio
INAHTA	International network of agencies for health technology assessment
LOS	Length of stay
MD	Mean difference
MID	Minimum important difference
MUHC	McGill University Health Center
OR	Odds ratio
PBG	2-hour postprandial blood glucose
QoL	Quality of life
RCT	Randomized clinical trial
RPM	Remote patient monitoring
RR	Risk ratio
SoC	Standard of care
TAU	MUHC Technology Assessment Unit
TM	Telemonitoring
UHN	University Health Network

PLAIN LANGUAGE SUMMARY

Can Remote Patient Monitoring Improve Care for Patients With Chronic Diseases at the McGill University Health Centre (MUHC)?

KEY MESSAGES

- Remote patient monitoring may offer some clinical benefits (e.g., improved blood sugar control and fewer heart failure hospitalizations), with no particular safety concerns such as increase in mortality.
- The certainty of evidence is low to moderate, and data on specific platforms are limited, meaning results remain uncertain and may change with further research.
- Implementation involves modest costs and may reduce hospitalization-related costs, but the economic impact is uncertain; a structured pilot could help clarify value in the local context.

What is remote patient monitoring (RPM)?

Remote patient monitoring or telemonitoring is a way for patients to track their health from home using digital tools, such as mobile apps or devices. Patients enter information like symptoms, weight, or blood sugar levels, and this data is shared with their healthcare team. This allows clinicians to monitor patients without needing frequent in-person visits.

What did we want to find out?

We wanted to know whether remote patient monitoring improves health outcomes for patients with chronic diseases (such as heart failure or diabetes), whether it is safe, and whether it would be worth the cost for the McGill University Health Centre (MUHC) to adopt this approach.

What did we do?

We reviewed many research studies comparing remote patient monitoring to usual care. We also examined the experience with a commercially available RPM program used at another hospital in Montreal. In addition, we estimated the potential costs of implementing such a program at the MUHC.

What did we find?

- **Clinical outcomes:** Remote patient monitoring may slightly improve blood sugar control in people with diabetes, but it does not seem to meaningfully improve other measures like weight or fasting blood sugar. For people with heart failure, it may help reduce the number of hospital visits.
- **Safety:** There is no clear evidence that remote monitoring improves survival, but it does not appear to cause harm.
- **Patient-reported outcomes:** Remote patient monitoring may have little or no effect on patients' quality of life or mental health outcomes, although this is uncertain**.**
- **Cost:** The estimated cost of implementing the RPM program at the MUHC is modest, with the potential for some savings, although this is uncertain.

How reliable is the evidence?

The evidence is rated as low to moderate certainty. This means we are not fully confident in the results, and future studies may change these findings.

Bottom line

Remote patient monitoring shows promise, especially for certain higher-risk patients, by helping detect problems earlier and improving patient engagement. However, evidence gaps remain for patient adoption and clinical workflow. A small pilot program at the MUHC is recommended to better understand how well it works in practice before making a larger investment.

EN BREF

La télésurveillance des patients peut-elle améliorer les soins prodigués aux patients atteints de maladies chroniques au Centre universitaire de santé McGill (CUSM) ?

MESSAGES CLÉS

- La télésurveillance peut offrir certains bénéfices cliniques (par exemple amélioration du contrôle glycémique et réduction des hospitalisations liées à l'insuffisance cardiaque), sans préoccupations particulières en matière de sécurité, comme une augmentation de la mortalité.
- Le niveau de certitude des données probantes est faible à modéré, et les données spécifiques aux plateformes sont limitées, ce qui signifie que les résultats demeurent incertains et pourraient évoluer avec de nouvelles recherches.
- La mise en œuvre implique des coûts modestes et pourrait réduire les coûts liés aux hospitalisations, mais l'impact économique demeure incertain; un projet pilote structuré pourrait aider à clarifier la valeur dans le contexte local.

Qu'est-ce que la télésurveillance des patients (TSP) ?

La télésurveillance est une approche permettant aux patients de suivre leur état de santé à domicile à l'aide d'outils numériques, comme des applications mobiles ou des dispositifs connectés. Les patients saisissent des informations telles que leurs symptômes, leur poids ou leur glycémie, qui sont ensuite transmises à leur équipe soignante. Cela permet aux cliniciens de suivre les patients sans nécessiter de visites fréquentes en personne.

Que voulions-nous découvrir ?

Nous voulions déterminer si l'utilisation de la télésurveillance permet d'améliorer les résultats de santé chez les patients atteints de maladies chroniques (par exemple l'insuffisance cardiaque ou le diabète), si elle est sécuritaire et si son adoption représenterait un bon rapport coût-efficacité pour le Centre universitaire de santé McGill (CUSM).

Qu'avons-nous fait ?

Nous avons analysé de nombreuses études comparant la télésurveillance des patients aux soins habituels. Nous avons également examiné l'expérience d'un logiciel de TSP commercial utilisé dans un autre hôpital de Montréal. De plus, nous avons estimé les coûts potentiels de la mise en œuvre d'un tel logiciel au sein du CUSM.

Qu'avons-nous trouvé ?

- **Résultats cliniques :** La télésurveillance peut légèrement améliorer le contrôle de la glycémie chez les personnes atteintes de diabète, mais elle ne semble pas améliorer de façon significative d'autres mesures comme le poids ou la glycémie à jeun. Chez les patients atteints d'insuffisance cardiaque, elle pourrait contribuer à réduire les hospitalisations.
- **Sécurité :** Il n'existe pas de données probantes claires indiquant que la télésurveillance améliore la survie, mais elle ne semble pas entraîner d'effets indésirables.
- **Résultats rapportés par les patients :** La télésurveillance pourrait avoir peu ou pas d'effet sur la qualité de vie ou la santé mentale des patients, bien que cela demeure incertain.
- **Coûts :** Le coût estimé de la mise en œuvre d'un programme de télésurveillance au CUSM est modeste, avec un potentiel d'économies, bien que cela reste incertain.

Quelle est la fiabilité des données probantes ?

Le niveau de certitude des données probantes est faible à modéré. Cela signifie que nous ne sommes pas pleinement confiants dans les résultats, et que de futures études pourraient modifier ces conclusions.

En résumé

La télésurveillance des patients est prometteuse, notamment pour les patients à risque élevé, car elle contribue à la détection précoce des problèmes et à l'amélioration de l'engagement des patients. Toutefois, des lacunes subsistent quant à l'adoption par les patients et à l'intégration dans les pratiques cliniques. Il est recommandé de mettre en place un petit programme pilote au CUSM afin de mieux comprendre son fonctionnement en pratique avant d'investir davantage.

EXECUTIVE SUMMARY

BACKGROUND

- Remote patient monitoring (RPM) or telemonitoring is a model of care that uses digital tools to collect and transmit patient health data remotely (e.g., heart rate, blood pressure, and weight for heart failure patients, and blood glucose for diabetic patients), enabling clinicians to monitor, interpret, and act on this information without in-person visits.
- RPM aims to improve timely monitoring, early detection of deterioration, and continuity of care while reducing the burden on healthcare systems.
- A systematic review of the evidence is needed to determine the clinical effectiveness, cost implications, and overall value of implementing RPM at the McGill University Health Centre (MUHC).
- The MUHC is particularly interested in a Quebec-developed RPM tool because it is available in French, meets provincial data security requirements, and has been implemented at other Quebec hospitals.

POLICY QUESTION

Should the MUHC adopt an RPM platform to monitor patients with high-burden chronic conditions (e.g., heart failure, diabetes, mental health disorders) at risk of acute care utilization?

EVALUATION QUESTIONS (Objectives of this report)

The objectives of this report were:

1. To evaluate the clinical effectiveness and safety of RPM systems on patient functional status, healthcare utilization, and patient-reported outcomes compared to standard care without RPM.
2. To specifically evaluate the clinical benefit of two commercial RPM systems.
3. To evaluate the cost and feasibility of adopting an RPM system at the MUHC.

METHODS

Systematic Review

We systematically searched major databases and grey literature to identify studies that met our predefined inclusion criteria below:

- **Population**: Adults with high-burden chronic conditions (e.g., heart failure, diabetes, mental health disorders) at risk of acute care utilization.
- **Intervention**: RPM using patient-owned devices with structured clinical monitoring, alerts, and response protocols.
- **Comparator**: Standard care without RPM, including periodic follow-up, medical therapy optimization, and self-management education.

- **Primary outcomes**:
  - Clinical benefit: Acute care utilization (e.g. emergency department [ED] visits, hospitalizations); disease-specific outcomes (e.g. cardiovascular events, HbA1c).
  - Safety: All-cause mortality
  - Patient-reported outcomes: Quality of life, adherence, engagement, and satisfaction
- **Secondary outcomes:**
  - Fidelity: Clinician workload, workflow integration, and satisfaction
  - Implementation: Feasibility and sustainability

Local Experience

We incorporated experiential data through interviews with a clinician at the Centre Hospitalier de l'Université de Montréal (CHUM) to inform implementation considerations.

Cost analysis

We estimated the implementation costs of an RPM pilot at the MUHC using platform-provided operating costs and nursing costs obtained from MUHC Finance.

RESULTS

Clinical benefit of RPM

Patients with type 2 diabetes

For monitoring patients with type 2 diabetes mellitus (T2DM), most RPM systems collect data on Hemoglobin A1c (HbA1c), blood glucose, and body mass index (BMI). One meta-analysis compared RPM with standard care in patients with type 2 diabetes mellitus (T2DM); the results are reported below.

HbA1c: The gold standard for long-term glucose control, reflecting average blood glucose over 2–3 months; measured in %, with a 1% change considered clinically meaningful.

- Pooled estimates from 26 RCTs (4,333 participants) showed a mean difference of -0.29% (95% CI -0.46 to -0.13) (low certainty evidence).
- This suggests that RPM may reduce HbA1c, although the effect is below the threshold for clinical importance.

Fasting blood glucose (FBG): Reflects baseline glucose metabolism; a reduction of ~1.6 mmol/L is considered clinically meaningful.

- Pooled estimates from 10 RCTs with 1,415 participants showed a mean difference of -0.62 mmol/L (95% CI -1.27 to 0.04) (low certainty evidence).
- This indicates that RPM may have little or no clinically meaningful effect.

Body mass index (BMI): Indicator of body fat and metabolic risk; a reduction of 1.5 kg/m² is considered clinically meaningful.

- Pooled estimates from 12 RCTs (1,525 participants) showed a mean difference of -0.28 kg/m2 (95% CI -0.55 to -0.003) (low certainty evidence).
- This suggests that RPM may reduce BMI, although the effect is below the threshold for clinical importance.

Heart Failure Patients

For monitoring patients with heart failure, most RPM systems collect data on blood pressure, heart rate, and weight. We identified a 2026 network meta-analysis with a moderate risk of bias that conducted direct comparisons between various telehealth modalities and standard care in patients with heart failure. We focused on evaluating telemonitoring as the principal modality that met our PICO definition.

All-cause mortality:

- Pooled estimates from 31 RCTs (1,316 events) reported a risk ratio (RR) of 0.91 (95% CI 0.80-1.03) (low certainty evidence; downgraded for imprecision: the confidence interval crosses the line of no effect).
- This suggests that telemonitoring may reduce all-cause mortality, but the effect is uncertain.

Total heart-failure hospitalization:

- Pooled estimates from 12 RCTs showed a 27% reduction in incidence of total heart failure hospitalization (incidence rate ratio [IRR] 0.73, 95% CI 0.59 to 0.89) (moderate certainty evidence).
- This indicates that telemonitoring probably reduces total HF hospitalization.

First heart failure hospitalization:

- Pooled estimates from 22 RCTs (2,015 events) showed a 13% reduction in first heart failure hospitalization (RR 0.87, 95% CI 0.78 to 0.97, moderate certainty evidence).
- This indicates that telemonitoring probably reduces first heart failure hospitalization.

Platform-specific benefit of RPM

- One RCT (n=49) evaluated **Medly** in patients with complex chronic conditions. Medly showed little to no impact on healthcare utilization vs. standard care (low certainty evidence): mean difference for hospital visits: 1.08 (95% CI -0.69 to 2.85); emergency

department visits: 0.28 (95% CI -0.28 to 0.84); clinic visits: 0.76 (95% CI -1.67 to 3.19); family doctor visits: -0.57 (95% CI -1.70 to 0.56); physical quality of life (QoL): 0.38 (95% CI -4.82 to 2.58), mental QoL: -4.54 (95% CI -11.1 to 2.02); anxiety: 1.36 (95% CI -1.80 to 4.51), and depression: -0.04 (95% CI -2.68 to 2.60).

- One RCT (n=106) evaluated **Greybox** in patients with heart failure at the CHUM, which reported an increased risk of all-cause hospitalization (hazard ratio [HR] 1.19, 95% CI 0.51 to 2.75) and of cardiac events (HR 2.23, 95% CI: 0.77- 6.41) (low certainty due to very small number of events; the wide confidence intervals indicate the evidence is highly uncertain).

Cost Analysis

Implementation costs at the MUHC

A proposed RPM initiative would begin with a 3-month, low-commitment pilot focused on patients with chronic diseases at high risk of acute healthcare use.

- Based on an estimated product cost of $30 per patient per month and 20 minutes of nursing time per patient per month (at $83.80/hour including salary and benefits), the total 3-month pilot costs are estimated at $13,191 CAD for 50 patients and $26,382 CAD for 100 patients**.**
- Any continuation beyond the pilot phase would be contingent on meeting predefined performance criteria, such as patient participation, data availability, and impact on clinical workflow efficiency

Experience at the CHUM

The CHUM experience suggests that implementation is feasible within existing workflows, though it requires clear protocols, such as patient selection criteria.

- Median patient compliance, defined as the proportion of follow-up days with any manual data entry in the app, was 76.9% (range 0–100%).
- At peak, ~125 patients were monitored, requiring 1–1.5 hours/day (~20 minutes per patient per month), which was absorbed into nursing workflows.
- Benefits appear greatest when targeting higher-risk patients with well-defined enrollment and monitoring criteria.

CONCLUSIONS

Clinical benefit:

- In patients with diabetes, low certainty evidence suggests that RPM may reduce HbA1c. In heart failure patients, low to moderate certainty evidence indicates RPM

reduces heart failure–related hospitalizations, with no difference in mortality versus standard care.

- Evidence specific to individual platforms is limited and does not demonstrate a clear clinical benefit compared to standard care.

Financial impact:

- A pilot of the RPM program at the MUHC could cost up to $26,382 CAD to treat 100 patients.

RECOMMENDATION: APPROVED FOR EVALUATION

- The TAU Policy Committee, comprising stakeholders from across the McGill University Health Centre, reviewed the evidence and issued the following recommendation for the adoption of RPM: Approved for Evaluation
- This recommendation is driven by the following:
    - Based on the best available evidence, there is a potential signal that RPM can provide clinical benefits in selected populations (e.g., reduced heart failure hospitalizations and improvements in glycemic control) without particular safety concerns;
    - Implementation costs for a limited pilot at the MUHC are modest.
    - A local evaluation is needed to assess feasibility, user acceptability, workflow integration (including clinician workload, care coordination, and alert management), and preliminary clinical and cost outcomes before any large-scale implementation.
        - The evaluation should be conducted using a structured pilot, in a population most likely to benefit from RPM, such as heart failure, with predefined indicators and clear governance to ensure objective assessment and support evidence-informed decision-making.

SOMMAIRE

CONTEXTE

- La surveillance à distance des patients (remote patient monitoring, RPM), ou télésurveillance, est un modèle de soins qui utilise des outils numériques pour recueillir et transmettre à distance des données de santé des patients, permettant aux cliniciens de surveiller, d'interpréter et d'intervenir sans nécessiter de visites en personne.
- Elle vise à combler certaines lacunes dans la prise en charge des maladies chroniques en améliorant le suivi en temps opportun, la détection précoce des détériorations et la continuité des soins, tout en réduisant la pression sur les systèmes de santé.
- Une revue systématique des données probantes est nécessaire afin de déterminer l'efficacité clinique, les implications économiques et la valeur globale de la mise en œuvre de la télésurveillance au Centre universitaire de santé McGill (CUSM).
- Le CUSM s'intéresse particulièrement à un outil de télésurveillance développé au Québec, puisqu'il est disponible en français, conforme aux exigences provinciales en matière de sécurité des données et déjà implanté dans d'autres hôpitaux québécois.

QUESTION DE POLITIQUE

Le CUSM devrait-il adopter une plateforme RPM pour surveiller les patients atteints de maladies chroniques à forte charge (par exemple, insuffisance cardiaque, diabète, troubles mentaux) à risque d'utilisation des soins aigus ?

QUESTIONS D'ÉVALUATION (Objectifs de ce rapport)

Les objectifs de ce rapport étaient :

1. Évaluer l'efficacité clinique et la sécurité des systèmes RPM sur l'état fonctionnel du patient, l'utilisation des soins de santé et les résultats rapportés par les patients par rapport aux soins standard sans RPM.
2. Évaluer spécifiquement les bénéfices cliniques de deux systèmes RPM disponibles sur le marché.
3. Évaluer le coût et la faisabilité de l'adoption d'un système RPM au sein du CUSM.

MÉTHODES

Revue systématique

Nous avons systématiquement recherché dans les principales bases de données et la littérature grise afin d'identifier les études répondant à nos critères d'inclusion prédéfinis ci-dessous :

- **Population** : Adultes atteints de maladies chroniques lourdes (par exemple, insuffisance cardiaque, diabète, troubles mentaux) à risque d'utilisation des soins aigus.

- **Intervention** : RPM utilisant des dispositifs appartenant au patient avec surveillance clinique structurée, alertes et protocoles de réponse.
- **Comparateur** : soins standards sans RPM, incluant un suivi périodique, optimisation de la thérapie médicale et éducation à l'autogestion.
- **Résultats principaux** :
  - Le bénéfice clinique : Utilisation des soins aigus (par exemple, visites aux urgences, hospitalisations) ; Résultats spécifiques à la maladie (par exemple, événements cardiovasculaires, HbA1c).
  - Sécurité : mortalité toutes causes confondues
  - Résultats rapportés par les patients : qualité de vie, adhésion, engagement et satisfaction
- **Résultats secondaires :**
  - Fidelity : charge de travail des cliniciens, intégration des flux de travail et satisfaction
  - Mise en œuvre : faisabilité et durabilité

Expérience locale

Nous avons intégré des données expérientielles recueillies lors d'entretiens avec des cliniciens de Centre Hospitalier de l'Université de Montréal (CHUM) afin d'éclairer les considérations de mise en œuvre.

Analyse des coûts

Nous avons estimé les coûts de mise en œuvre d'un projet pilote de télésurveillance au CUSM en utilisant les coûts d'exploitation fournis par le fabricant de la plateforme ainsi que les coûts infirmiers obtenus auprès des services financiers du CUSM.

RÉSULTATS

Objectif 1 : Bénéfice clinique de la RPM

Patients atteints de diabète de type 2

Pour le suivi des patients atteints de diabète de type 2 (DT2), la plupart des systèmes de télésurveillance recueillent des données sur l'HbA1c, la glycémie et l'indice de masse corporelle (IMC). Une méta-analyse présentant un risque élevé de biais comparait la RPM aux soins standards chez les patients atteints de diabète sucré de type 2 (DT2) ; les résultats sont rapportés ci-dessous.

HbA1c : La référence pour le contrôle du glucose à long terme, reflétant la glycémie moyenne sur 2 à 3 mois ; mesurée en pourcentage, avec une variation de 1 % considérée comme cliniquement significative.

- Des estimations combinées à partir de 26 ECR (4 333 participants) ont montré une différence moyenne de -0,29 % (IC 95 % -0,46 à -0,13) (preuves de faible certitude).
- Cela suggère que la RPM pourrait réduire l'HbA1c, bien que l'effet soit en dessous du seuil d'importance clinique.

Glycémie à jeun (FBG) : reflète le métabolisme de base du glucose ; une réduction de ~1,6 mmol/L est considérée comme cliniquement significative.

- Des estimations regroupées à partir de 10 ECR avec 1 415 participants ont montré une différence moyenne de -0,62 mmol/L (IC à 95 % -1,27 à 0,04) (preuve de faible certitude).
- Cela indique que le RPM peut avoir peu ou pas d'effet cliniquement significatif.

Indice de masse corporelle (IMC) : Indicateur de la masse grasse et du risque métabolique ; une réduction de 1,5 kg/m² est considérée comme cliniquement significative.

- Des estimations regroupées à partir de 12 ECR (1 525 participants) ont montré une différence moyenne de -0,28 kg/m2 (IC à 95 % -0,55 à -0,003) (preuve de faible certitude).
- Cela suggère que le RPM peut réduire l'IMC, bien que l'effet soit en dessous du seuil d'importance clinique.

Patients atteints d'insuffisance cardiaque

Pour le suivi des patients atteints d'insuffisance cardiaque, la plupart des systèmes de télésurveillance recueillent des données sur la pression artérielle, la fréquence cardiaque et le poids. Nous avons identifié une méta-analyse de réseau de 2026 présentant un risque modéré de biais, qui a mené des comparaisons directes entre diverses modalités de télésanté et les soins standards chez les patients en insuffisance cardiaque. Nous nous concentrons sur l'évaluation de la télésurveillance comme modalité principale correspondant à notre définition PICO.

Mortalité toutes causes confondues :

- Des estimations combinées à partir de 31 ECR (1 316 événements) ont révélé un rapport de risque (RR) de 0,91 (IC 95 % 0,80-1,03) (preuve de faible certitude ; dégradée pour imprécision : l'intervalle de confiance franchit la ligne de l'absence d'effet).
- Cela suggère que la télésurveillance pourrait réduire la mortalité toutes causes confondues, mais l'effet reste incertain.

Hospitalisation totale pour insuffisance cardiaque :

- Des estimations combinées à partir de 12 ECR ont montré une réduction de 27 % de l'incidence totale des hospitalisations pour insuffisance cardiaque (taux d'incidence [IRR] 0,73, IC à 95 % 0,59 à 0,89) (preuve de certitude modérée).
- Cela indique que la télésurveillance réduit probablement le nombre total d'hospitalisations liées à l'IC.

Première hospitalisation en insuffisance cardiaque :

- Des estimations combinées à partir de 22 ECR (2 015 événements) ont montré une réduction de 13 % des hospitalisations pour première insuffisance cardiaque (RR 0,87, IC à 95 % 0,78 à 0,97, preuve de certitude modérée).
- Cela indique que la télésurveillance réduit probablement le risque de première hospitalisation pour insuffisance cardiaque.

Objectif 2 : Bénéfice spécifique à la plateforme du RPM

- Un ECR (n=49) a évalué **Medly** chez des patients atteints de maladies chroniques complexes. Medly a montré peu ou pas d'impact sur l'utilisation des soins de santé (la différence moyenne des visites à l'hôpital était de 1,08, IC à 95 % de -0,69 à 2,85 ; visites aux urgences de 0,28 (IC à 95 % de -0,28 à 0,84) ; visites en clinique 0,76, IC 95 % -1,67 à 3,19 ; visites chez le médecin de famille -0,57, IC 95 % -1,70 à 0,56) et les résultats rapportés par les patients, y compris la qualité de vie physique (différence moyenne 0,38, IC 95 % -4,82 à 2,58), la qualité de vie mentale (-4,54, IC 95 % -11,1 à 2,02), l'anxiété (1,36, IC 95 % -1,80 à 4,51) et la dépression (-0,04, IC 95 % -2,68 à 2,60), tous avec des preuves de faible certitude.
- Un ECR (n=106) a évalué Greybox chez des patients souffrant d'insuffisance cardiaque au CHUM, qui a rapporté un risque accru d'hospitalisation toutes causes confondues (rapport de risque [HR] 1,19, IC 95 % 0,51 à 2,75) et d'événements cardiaques (HR 2,23, IC 95 % : 0,77-6,41) (faible certitude due à un très faible nombre d'événements ; les larges intervalles de confiance indiquent que les preuves sont très incertaines).

Objectif 3 : Analyse de coûts

CUSM : Coûts de mise en œuvre

Une initiative proposée de RPM débuterait par un projet pilote de 3 mois, à faible engagement, axé sur les patients atteints de maladies chroniques à haut risque d'utilisation aiguë des soins de santé.

- Sur la base d'un coût estimé de 30 $ par patient par mois pour le produit et de 20 minutes de temps infirmier par patient par mois (à 83,80 $/heure, incluant le salaire et les avantages sociaux), les coûts totaux estimés pour un projet pilote de trois mois sont de 13 191 $ CA pour 50 patients et de 26 382 $ CA pour 100 patients.
- Toute poursuite au-delà de la phase pilote dépendrait du respect de critères de performance prédéfinis, tels que la participation des patients, la disponibilité des données et l'impact sur l'efficacité du flux de travail clinique

Expérience au CHUM

L'expérience du CHUM suggère que la mise en œuvre est réalisable dans les flux de travail existants, bien qu'elle nécessite des protocoles clairs, notamment des critères de sélection des patients.

- L'adhésion médiane des patients, définie comme la proportion de jours de suivi comportant au moins une saisie manuelle de données dans l'application, était de 76,9 % (intervalle : 0 à 100 %).
- Au pic d'activité, environ 125 patients étaient suivis, ce qui nécessitait 1 à 1,5 heures par jour (soit environ 20 minutes par patient par mois), intégrées aux activités infirmières.
- Les bénéfices semblent plus importants lorsqu'on cible des patients à plus haut risque, avec des critères d'inscription et de suivi bien définis.

CONCLUSIONS

Bénéfice clinique :

- Les preuves de faible certitude suggèrent que la MPR peut réduire l'HbA1c chez les patients diabétiques, et que la certitude faible à modérée réduit les hospitalisations liées à l'insuffisance cardiaque, sans différence de mortalité par rapport aux soins standard chez les patients atteints d'insuffisance cardiaque.
- Les preuves spécifiques à chaque plateforme sont limitées et ne démontrent pas de bénéfice clinique clair par rapport aux soins standard.

Impact financier :

- Un projet pilote de suivi à distance au CUSM pourrait représenter un coût modeste allant jusqu'à 26 382 $ CA pour traiter 100 patients, sans investissement initial.

RECOMMANDATION : APPROUVÉ POUR ÉVALUATION

- Le comité de la politique TAU, composé de parties prenantes du Centre universitaire de santé McGill, a examiné les données probantes et formulé la recommandation suivante concernant l'adoption de dispositifs d'insufflation permettant des réglages à basse et à pression standard/élevée : Approuvé pour évaluation.

- Cette recommandation est motivée par les éléments suivants :
    - Sur la base des meilleures preuves disponibles, il existe un signal potentiel que la RPM peut apporter des bénéfices cliniques dans certaines populations (par exemple, réduction des hospitalisations d'insuffisance cardiaque et amélioration du contrôle glycémique) sans préoccupations particulières de sécurité ;
    - Les coûts de mise en œuvre d'un projet pilote de portée limitée au CUSM demeurent modestes.
- Une évaluation locale est nécessaire pour évaluer la faisabilité, l'acceptabilité par les utilisateurs, l'intégration des flux de travail (y compris la charge de travail des cliniciens, la coordination des soins et la gestion des alertes), ainsi que les résultats cliniques et coûteux préliminaires avant toute mise en œuvre à grande échelle.
    - L'évaluation doit être menée à l'aide d'un projet pilote structuré avec des indicateurs prédéfinis et une gouvernance claire afin d'assurer une évaluation objective et de soutenir une prise de décision fondée sur des preuves.

Remote Patient Monitoring for Patients with Chronic Diseases

1. BACKGROUND

1.1 Remote Patient Monitoring (RPM)

- Telemedicine has historically been a broad term that includes what is now more specifically referred to as Remote Patient Monitoring (RPM). While early use dates back to the 1960s, adoption of RPM accelerated with the introduction of dedicated billing codes in 2019 and expanded further during the COVID-19 pandemic, which helped distinguish asynchronous data monitoring (RPM by collecting, tracking, and analyzing data from various sources at different times) from synchronous video-based telemedicine visits (real-time**,** immediate video communication, where everyone is present at the same time) (1).
- RPM uses digital tools (such as mobile apps, wearable devices, or connected home equipment) to collect and transmit patient health data remotely (e.g., heart rate, blood pressure, and weight for heart failure patients, and blood glucose for diabetic patients), enabling healthcare providers to monitor, interpret, and act on this information (2, 3). The recording and transmission of data may be automated or performed by the patient or by a health professional. RPM aims to address gaps in the management of chronic conditions by improving timely monitoring, early detection of deterioration, and continuity of care while reducing the burden on healthcare systems, such as hospitalizations (2, 3).
- A meta-analysis by the Cochrane group in 2013 on the benefit of telemedicine in a wide range of patients (e.g., cardiovascular, diabetes, respiratory and mental health conditions) showed that it improved some outcomes like blood sugar (diabetes), blood pressure, and quality of life in certain groups, but had little or no effect on survival, hospitalizations, or mental health outcomes compared to usual care (4).

1.2 Context of the current report

- There is local interest at the McGill University Health Centre (MUHC) in assessing the clinical and cost benefits of using the RPM platform to manage patients with chronic conditions. Samia Saouaf, Nursing Practice Consultant in the Division of Professional Practices, Education, Research and Work Organization, requested that the Technology Assessment Unit (TAU) evaluate the clinical effectiveness and the cost or resource implications for adopting an RPM platform.

- The MUHC is interested in two RPM systems that have been implemented in Quebec and at the University Health Network (UHN) in Toronto. The Quebec-developed RPM tool is available in French, meets provincial data security requirements, and has been implemented at the Mont Sinai Hospital of the Centre intégré universitaire de santé et de services sociaux (CIUSSS) West-Central Montreal for the pulmonary tele-rehabilitation program, at the Jewish General Hospital of Montreal in patients with chronic conditions, and at the Centre Hospitalier de l'Université de Montréal (CHUM) in heart failure patients.

2. POLICY AND EVALUATION QUESTIONS

2.1 Policy Question

Should the MUHC adopt an RPM system to help monitor patients with high-burden chronic conditions (e.g., heart failure, diabetes, mental health disorders) at risk of acute care utilization?

2.2 Evaluation Questions (Objectives of this report)

The objectives of this report were:

1. To evaluate the clinical effectiveness and safety of RPM systems on patient functional status, healthcare utilization, and patient-reported outcomes compared to standard care without RPM.
2. To specifically evaluate the clinical benefit of two commercial RPM systems.
3. To evaluate the cost and feasibility of adopting an RPM system at the MUHC.

3. METHODS

3.1 Systematic Review and Meta-analysis

The search strategies designed by Alessia Paparella, an MUHC librarian, used text words and relevant indexing to identify RPM for chronic conditions. The following databases were searched for relevant studies on February 4, 2026: The Cochrane CENTRAL Register of Controlled Trials & Cochrane Database of Systematic Reviews (via Wiley); Embase Classic +Embase (via Ovid 1947 to 2026 February 2); MEDLINE (via Ovid 1946 to February 3, 2026); and PubMed (from January 21, 2026 – current).

The MEDLINE strategy (Appendix A) was applied across all databases, with search terms modified as necessary. The search was limited from January 2023 to February 2026. No language limits were applied. In addition, Epistemonikos, Centre for Reviews and Dissemination (CRD), the Canadian Agency for Drugs and Technology in Health (CADTH, now the Canadian Drug Agency), Institut national d'excellence en santé et en services sociaux (INESSS), Library of the UETMISSS du Québec, and the international network of agencies for health technology assessment (INAHTA) database were searched. We manually searched relevant studies from the references. We limited the search to studies in humans and adults.

3.1.1 Inclusion Criteria

Table 1 shows our inclusion criteria for the population, intervention, control, and outcomes (PICO).

Table 1. Table Population, intervention, control and outcomes

	Inclusion Criteria
Population	Adults with selected high-burden chronic conditions (e.g., heart failure, diabetes, mental health disorders) at risk of acute care utilization.
Intervention	RPM using patient-owned devices with structured clinical monitoring, alerting, and response protocols.
Comparator	Standard care without RPM, including periodic follow-up, medical therapy optimization, and self-management education
Outcomes	
Primary	**Clinical effectiveness:** Acute care utilization (e.g. emergency department [ED] visits, hospitalizations); disease-specific outcomes (e.g. cardiovascular events, HbA1c).
	Safety: All-cause mortality
	Patient-reported outcomes: Quality of life, adherence, engagement, and satisfaction
Secondary	**Fidelity:** Clinician workload, workflow integration, and satisfaction **Implementation:** Feasibility and sustainability

3.1.2 Data extraction

Study selection was done by ES, while data extraction was done independently by ES and TO and any discrepancies were resolved by consensus.

For the systematic review and meta-analysis

We extracted:

- Study characteristics: first author, year of publication, country
- Chronic condition types (heart failure, diabetes mellitus, etc.)
- Description of the RPM
- For each outcome:
    - Number of the included studies
    - Total number of subjects of the included studies
    - Total number of events for dichotomous outcomes (i.e. proportions of hospitalizations, emergency department, clinic, or family doctor visits)
    - Mean and SD for continuous outcomes (i.e. number of hospitalizations, number of emergency department, clinic, or family doctor visits)
    - Effect estimates (the risk ratio for dichotomous outcomes and the mean difference for continuous outcomes) and their 95% confidence intervals.

For the randomized clinical trials (RCTs) on commercial RPMs

The following variables were collected:

- Study characteristics: first author, year of publication, country
- Description of the RPM
- Chronic condition types (heart failure, diabetes mellitus, etc.)
- Total number of patients per group
- Total number of events for dichotomous outcomes
- Mean and SD for continuous outcomes.

3.1.3 Assessment of Bias

Two reviewers independently assessed the risk of bias (RoB).

- For recent RCTs, we used the Cochrane Risk of Bias Tool for Randomized Trials (RoB 2.0) (5). RoB was done for each outcome result of each study. RoB 2.0 tool covers five domains: bias arising from the randomization process, bias due to deviations from intended interventions, bias due to missing outcome data, bias in the measurement of the outcome, and bias in the selection of the reported result. Each domain was graded as high, moderate (some concerns or unclear) or low risk of bias. A study is considered as having a low overall risk of bias when all domains have a low risk. We considered a high overall risk of bias when at least one domain had a high risk of bias for RCTs or a serious/critical risk of bias for observational studies. Other situations will be considered as moderate risk of bias.
- For the systematic review and meta-analyses, we used the ROBIS tool to assess risk of bias (6). ROBIS is completed in three phases: (1) assess relevance (optional), (2)

identify concerns with the review process and (3) judge risk of bias. Phase 2 covers four domains through which bias may be introduced into a systematic review: study eligibility criteria; identification and selection of studies; data collection and study appraisal; and synthesis and findings.

3.1.4 Certainty of the evidence

- We rated the overall certainty of evidence as high, moderate or low for each outcome using an in-house decision tree, which was based on Grading of Recommendations Assessment, Development and Evaluation (GRADE) quality assessment (7).
- Our tool has six domains (Appendix B) the first was the overall risk of bias of the RCT, systematic review and meta-analyses. Other domains include being an uncontrolled study; imprecision (e.g., wide confidence intervals, a low number of events [<300 for categorical outcomes], or small sample sizes for continuous outcomes); inconsistency (not applicable to individual RCTs); indirectness; and other considerations (e.g., not published in a peer-reviewed journal). For imprecision, we applied the null effect approach for outcomes reported as risk ratios, and the minimally important difference (MID) approach for outcomes reported as mean differences.
- Low-certainty evidence indicates that our confidence in the overall effect estimate is limited. A study with a high risk of bias by default has low-certainty evidence. A study with a low or moderate risk of bias could still be downgraded based on other domains. High-certainty evidence indicates we are very confident in the overall effect estimate, which results from studies with a low overall risk of bias and without downgrading from the above domains.

3.2 Experiential Data

We incorporated published evidence from an RCT conducted at the CHUM and experiential data gathered through interviews with their clinician to inform implementation considerations. We also searched for reports of RPM implementation elsewhere in Canada.

3.3 Cost Analysis

We estimated the implementation costs of an RPM pilot at the MUHC using operating costs provided by the platform manufacturer, and nursing costs provided by Marisa Picciano and André Guigui from MUHC Finance.

4. RESULTS

4.1. Systematic Review and Meta-analysis

Of 1,760 articles, 47 full-text systematic reviews and meta-analyses were reviewed. We identified multiple articles of RPM use for chronic obstructive pulmonary disease, chronic kidney disease, and mental health; however, the intervention did not meet the RPM criteria, or it was a mix of multiple modalities (Figure 1).

4.1.1 Clinical benefit of RPM

We identified two meta-analyses in type-2 diabetes mellitus (T2DM) patients and one network meta-analysis in heart failure that met our PICO.

4.1.1.1 Patients with type-2 diabetes

The meta-analyses by Cai et al. (2023)(8) and Xiao et al. (2025)(9) compared RPM versus standard care (Table 2). While both studies covered a similar search period, Cai included more studies and a diverse global population. Although both studies also showed an overall high risk of bias, Cai had a better quality with moderate concerns in data synthesis and appraisal, while Xiao had high concerns in this domain. Given their findings were largely consistent (Table 3), this report focuses on the results by Cai.

HbA1c: The gold standard for long-term glucose control, reflecting average blood glucose over 2–3 months; measured in %, with a 1% change considered clinically meaningful.

- Pooled estimates from 26 RCTs (4,333 participants) showed a mean difference of -0.29% (95% CI -0.46 to -0.13) (Table 3).
- The level of certainty was low because of the high risk of bias.
- Taken together, this indicates that RPM may reduce HbA1c, although the effect is below the threshold for clinical importance.

Fasting blood glucose (FBG): Reflects baseline glucose metabolism; a reduction of ~1.6 mmol/L is considered clinically meaningful.

- Pooled estimates from 10 RCTs with 1,415 participants showed a mean difference of -0.62 mmol/L (95% CI -1.27 to 0.04).
- The level of certainty was low because of the high risk of bias and was further downgraded for imprecision (i.e. the CI crosses the line of no effect).
- Taken together, this indicates that RPM may have little or no clinically meaningful effect.

Body mass index (BMI): Indicator of body fat and metabolic risk; a reduction of 1.5 kg/m² is considered clinically meaningful.

- Pooled estimates from 12 RCTs (1,525 participants) showed a mean difference of -0.28 kg/m2 (95% CI -0.55 to -0.003).
- The level of certainty was low because of the high risk of bias.
- Taken together, this indicates that RPM may reduce BMI, although the effect is below the threshold for clinical importance.

Favourable RPM characteristics: Cai et al. also did a subgroup analysis to identify favourable RPM characteristics. They report that greater HbA1c reductions were observed in patients <65 years and in interventions with more intensive monitoring, communication, and patient engagement features, although the effects remain below the threshold for clinical importance (Table 4).

4.1.1.2 Heart Failure Patients

We identified a recent meta-analysis by Scholte et al. (2026)(10) with a moderate risk of bias that conducted direct comparisons between various telehealth modalities versus standard care in heart failure patients (Table 2). We focus on the evaluation of telemonitoring as the principal modality that met our PICO definition (Table 5).

All-cause mortality:

- Pooled estimates from 31 RCTs (1,316 events) reported a risk ratio (RR) of 0.91 (95% CI 0.80-1.03).
- The level of certainty was low; the risk of bias was moderate and it was downgraded for imprecision (the confidence interval crosses the line of no effect).
- Taken together, this indicates that telemonitoring may reduce all-cause mortality, but the effect is uncertain.

Total heart-failure hospitalization:

- Pooled estimates from 12 RCTs showed a 27% reduction in incidence of total heart failure hospitalization (incidence rate ratio [IRR] 0.73, 95% CI 0.59 to 0.89).
- The level of certainty was moderate because of the moderate risk of bias without further downgrading.
- Taken together, this indicates that telemonitoring probably reduces total HF hospitalization.

First heart failure hospitalization:

- Pooled estimates from 22 RCTs (2,015 events) showed a 13% reduction in first heart failure hospitalization (RR 0.87, 95% CI 0.78 to 0.97).

- The level of certainty was moderate because of the moderate risk of bias without further downgrading.
- Taken together, this indicates that telemonitoring probably reduces first heart failure hospitalization.

4.1.2 Clinical benefit of platform-specific RPMs

We identified two RCTs evaluating the two commercial RPM platforms of interest, Medly and Greybox, respectively. In addition, we found one qualitative study examining both patient and physician perspectives on using Medly.

4.1.2.1 Medly

- One RCT(11) (n=49) evaluated Medly versus standard care in patients with complex chronic conditions with ≥1 diagnosis of heart failure, uncontrolled hypertension, and insulin-requiring diabetes mellitus from outpatient specialty settings (Table 6).
    - **Acute healthcare utilization:** the mean difference for hospital visits was 1.08 (95% CI -0.69 to 2.85); emergency department visits 0.28 (95% CI -0.28 to 0.84); clinic visits 0.76 (95% CI -1.67 to 3.19; family doctor visits -0.57 (95% CI -1.70 to 0.56) (Table 7).
    - **Patients' health-related QoL:** measured with the 36-Item Short Form Health Survey on a 0-100 scale from worst to best; a change of 15 points is considered clinically meaningful. The mean difference for the physical component was 0.38 (95% CI -4.82 to 2.58) and the mental component -4.54 (95% -11.1 to 2.02).
    - **Patient's mental health:** measured with the Hospital Anxiety and Depression Scale on a 0-21 range from best to worst; a change of ≥1.5 for anxiety and ≥0.5 for depression subscales is considered clinically meaningful. The mean difference of the anxiety scale was 1.36 (95% CI -1.80 to 4.51), and depression was -0.04 (95% CI -2.68 to 2.60).
    - All outcomes had low certainty of evidence due to a high risk of bias and imprecision (a small sample size and confidence intervals that crossed the null effect) (Table 7).
    - Taken together, this indicates that Medly had little to no impact on healthcare utilization, or patients' QoL and mental health.
- One qualitative study(12) was conducted to evaluate user perception of the Medly RPM system for remote titration intervention in patients with heart failure. Semi-structured interviews with clinicians (n=5) and patients (n=11) suggested:

- **Patients' perception:** Patients had an overall positive experience (fewer clinic visits, reduced travel/time costs, better daily monitoring), though some preferred in-person care or found ongoing monitoring burdensome.
- **Physicians' perception:** Physicians viewed it as efficient and effective. It enabled faster medication titration and better patient management, but concerns included increased workload (without nurse support) and lack of remuneration/resource.

4.1.2.2 Greybox

One RCT (n=106) evaluated Greybox (13) in patients at the CHUM with heart failure with New York Heart Association class ≥ 2, actively followed in a heart failure clinic (or equivalent) in Quebec (Table 6).

- **Acute healthcare utilization**
  - Events were defined as unplanned hospitalizations, emergency visits or deaths. The hazard ratio [HR] for all-cause hospitalizations was 1.19 (95% CI 0.51 to 2.75), and for cardiac events 2.23 (95% CI: 0.77 to 6.41) (Table 8).
  - The certainty level was low: the RCT itself had a low risk of bias, but it was downgraded by two levels because of a very small number of events and the wide confidence intervals that crossed the null effect.
  - Taken together, this indicates that Greybox had little to no impact on healthcare utilization.

4.2 Experiential Data

4.2.1 CHUM

We interviewed Emmanuel Marier-Tétrault, a nurse practitioner specializing in adult care, who has been involved in the implementation and evaluation of RPM in heart failure patients at the CHUM. Detailed interview points are presented in Appendix C.

Patient engagement and experience

- Patient engagement was a major strength; many patients became more consistent with self-monitoring and more aware of early warning signs by viewing their own data.
- Median patient compliance, defined as the proportion of follow-up days with any manual data entry in the app, was 76.9% (range 0–100%).
- For patients or caregivers who were less comfortable with technology, nurse follow-up calls ensured continued support and equitable care.

Impact on clinical workflow

- Nurses primarily used a web-based RPM dashboard showing trends, alerts, and adherence, with thresholds tailored to individual patients.
- At peak, approximately 125 patients were monitored concurrently, requiring 1–1.5 hours/day (~20 minutes per patient per month), absorbed into nursing workflows.

Costs

- Published cost estimates from the Continuum RPM program at CHUM indicate that program implementation costs were approximately $2 per patient per day, comprising $1 for the software license and $1 for nursing and clerical training and salaries. This corresponds to an estimated cost of $60 per patient per month, excluding costs associated with usual heart failure clinic care (13).

Key lessons learned

- Patient-facing features (data visibility, simple daily entry, clear communication) are critical for sustained engagement and impact.
- Successful RPM programs require targeted patient selection, clear clinical governance and expectations, and integration into existing nursing workflow.

4.2.2 Elsewhere in Canada

In 2021, CADTH published an environmental scan and a survey about RPM implementation in British Columbia, Ontario, Prince Edward Island, and Newfoundland and Labrador (3). Based on this survey, the CADTH Health Technology Expert Review Panel (HTERP) made recommendations for RPM implementation in Canada (Table 9) (14). Effective RPM programs should be patient-centred, integrated into standard care pathways, and supported by clear clinical and operational processes. They must prioritize data privacy and transparency, promote digital equity to avoid widening health disparities, and include ongoing evaluation to ensure intended outcomes are achieved.

4.3 Cost Analysis

4.3.1 MUHC: Implementation costs

A proposed RPM initiative would begin with a 3-month, low-commitment pilot focused on chronic disease patients at high risk of acute healthcare use.

- Based on an estimated product cost of $30 per patient per month and 20 minutes of nursing time per patient per month (at $83.80/hour including salary and benefits), total 3-month pilot costs are estimated at $13,191 CAD for 50 patients and $26,382 CAD for 100 patients (Table 10).

- Any continuation beyond the pilot phase would be contingent on meeting predefined performance criteria, such as patient participation, data availability, and impact on clinical workflow efficiency.

5. DISCUSSION

This HTA examined the clinical effectiveness, safety, patient-reported outcomes, and potential costs associated with the implementation of RPM. The assessment was informed by evidence from published RCTs and meta-analyses, supplemented by Canadian program experience and local contextual considerations.

5.1. RPM Evidence and Limitations

- More than a decade ago, the Cochrane Collaboration demonstrated RPM could improve glycemic control among patients with diabetes and improve blood pressure among patients with heart failure, but little or no effect on survival, hospitalizations, or mental health outcomes compared with usual care (4).
- Evidence from recent meta-analyses consistently suggests that RPM is generally safe and may provide clinical benefits compared with standard care, including small reductions in HbA1c among patients with type 2 diabetes and reductions in heart-failure–related hospitalizations. Despite the rapid development of RPM technology in recent years, the impact of RPM on other clinical outcomes remains uncertain.
- Scholte and colleagues (10) acknowledged the temporal changes in guideline-directed medical therapy and telemonitoring interventions over the 26-year study period (1999–2025) likely contributed to heterogeneity. The uptake of newer therapies varied over time and across regions, and telemonitoring evolved from simple telephone-based approaches to more advanced digital platforms. Although publication year was included in the analysis, unmeasured differences in background therapy and intervention evolution may have influenced the outcomes, even if the relative effects remain valid within individual trials.
- Moreover, reporting of telemonitoring interventions was inconsistent. Limited detail on platforms, alert mechanisms, and provider response processes constrained comparisons across studies (10). Key factors such as patient adherence, clinician responsiveness, care coordination, and health system context were often poorly described and could not be evaluated, despite their potential influence on real-world effectiveness.

5.2. Importance of a Pilot Within a Living HTA Cycle

- Living health technology assessment is an evolving approach that supports ongoing reassessment of clinical benefits, costs, and operational impact as new evidence becomes available, including real-world data from pilot projects (15). This enables cautious, step-by-step adoption, reduces uncertainty before scale-up, and ensures that future HTA updates are informed by local implementation experience.
- For digital health interventions such as RPM, effectiveness is highly dependent on local context, workflows, user behaviour, and resource use. Unfortunately, these factors are often poorly captured in traditional research settings. A pilot is therefore essential to generate context-specific evidence on feasibility and implementation.
- An environmental scan and survey conducted by CADTH found that RPM for chronic cardiac conditions is widely used across Canada. While patient engagement and team-based care were identified as key facilitators, resourcing and funding were the main barriers to implementation, highlighting the importance of local evaluation before broader adoption (14).
- At the MUHC, the estimated cost of a 3-month RPM pilot is relatively modest, making it a feasible initial step. With a carefully selected patient population, predefined indicators and clear data governance, this pilot would support objective assessment and generate evidence on feasibility, acceptability, and implementation costs to inform potential scale-up.

6. CONCLUSIONS

- **Clinical benefit:**
  - In patients with diabetes, low certainty evidence suggests that RPM may reduce HbA1c. In heart failure patients, low to moderate certainty evidence indicates RPM reduces heart failure–related hospitalizations, with no difference in mortality versus standard care.
  - Evidence specific to individual platforms is limited and does not demonstrate a clear clinical benefit compared to standard care.
- **Financial impact:**
  - A pilot of the RPM program at the MUHC could cost up to $26,382 CAD to treat 100 patients without upfront investment.

7. RECOMMENDATIONS

- The TAU Policy Committee, comprising stakeholders from across the McGill University Health Centre, reviewed the evidence and issued the following recommendation for the adoption of RPM: Approved for Evaluation

- This recommendation is driven by the following:
    - Based on the best available evidence, there is a potential signal that RPM can provide clinical benefits in selected populations (e.g., reduced heart failure hospitalizations and improvements in glycemic control) without particular safety concerns;
    - Implementation costs for a limited pilot at the MUHC are modest.
    - A local evaluation is needed to assess feasibility, user acceptability, workflow integration (including clinician workload, care coordination, and alert management), and preliminary clinical and cost outcomes prior to any large-scale implementation.
        - The evaluation should be conducted using a structured pilot with predefined indicators and clear governance to ensure objective assessment and support evidence-informed decision-making.

FIGURES

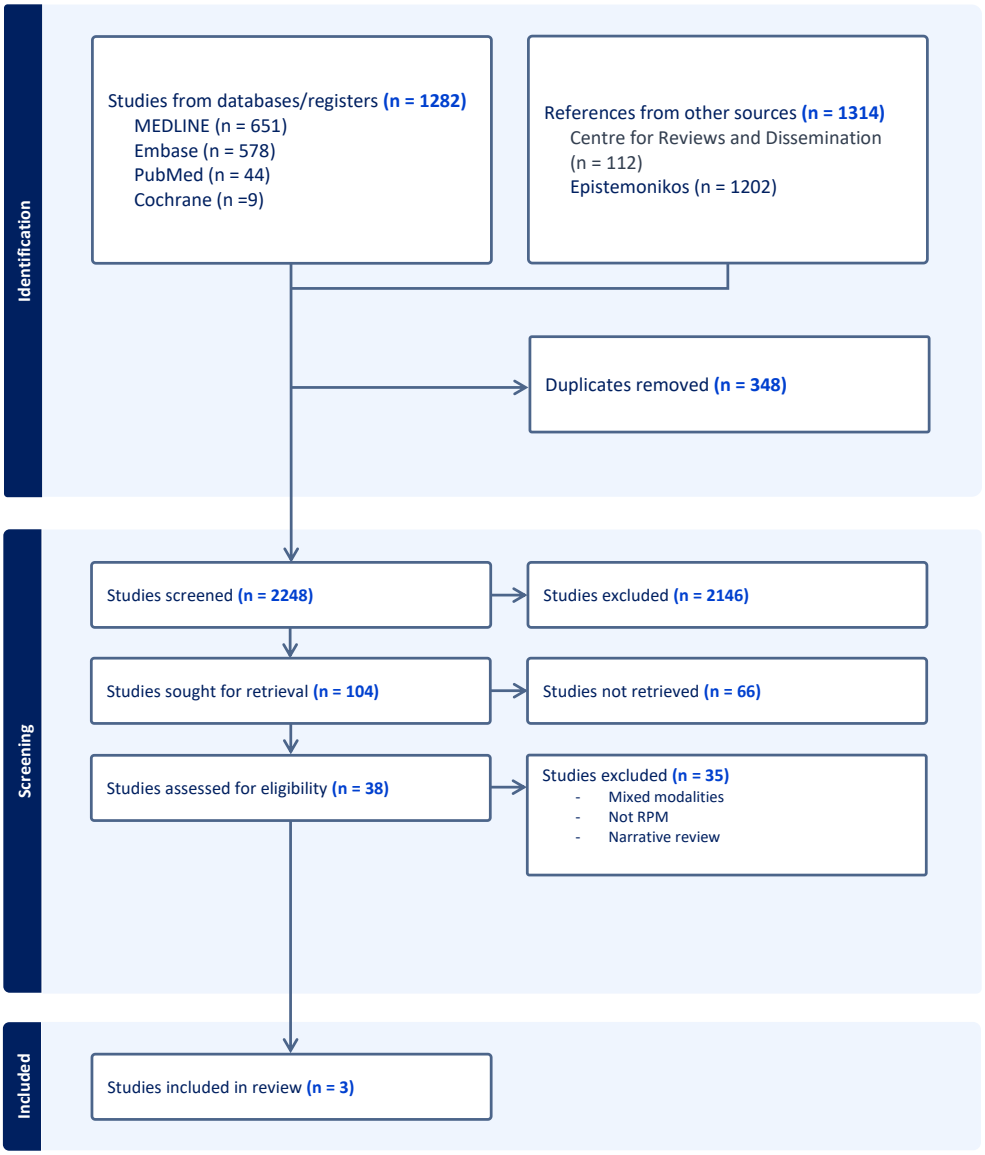


Figure 1. PRISMA Flowchart of the systematic reviews evaluating remote patient monitoring systems

TABLES

Table 2. Characteristics of the systematic review and meta-analysis of Remote Patient Monitoring systems

Reference	Population	Intervention	Control	Outcome
Scholte (2026)	Heart-failure patients	Telemonitoring: biometric data and/or health related questionnaires are collected and sent to an heart failure clinic.	The standard care	The primary outcomes were all-cause mortality, total and first heart-failure hospitalization.
Cai (2023)	Type-2 Diabetes Mellitus patients	The intervention group must be treated by a healthcare professional using the telemonitoring approach where physiological data of the patient are transmitted to the treating team on a regular basis using information technology.	Standard care with in-person consultations being the mainstay of care delivery.	Hemoglobin A1c (HbA1c), fasting blood glucose, and body mass index.
Xiao (2025)	Type-2 Diabetes Mellitus patients	Patients used a digital blood glucose management system that allowed for the automatic upload of self-measured blood glucose data from home to a secure platform via Bluetooth or other wireless technologies, and health-care personnel provided timely and responsive personalized guidance	Traditional home blood glucose monitoring methods (including routine outpatient follow-up, blood glucose monitoring logs, etc).	Hemoglobin A1c (HbA1c), fasting blood glucose, 2-hour postprandial blood glucose, and body mass index.

DST: clinical decision support tools, DTx: digital treatment, GDMT: guideline-directed medical therapy, RPM: remote patient monitoring.

Table 3. Certainty of Evidence Assessment for the Studies Evaluating Remote Patient Monitoring systems in Type-2 Diabetes Patients

Outcome	Certainty assessment						№ of studies	№ of subjects RPM	№ of subjects SOC	Pooled Mean Difference (95% CI)	Level of certainty
	Risk of bias (ROBIS)	Controlled study	Imprecision	Inconsistency	Indirectness	Others					
Xiao, 2025											
HbA1c	High	RCTs	No downgrading	No downgrading	No downgrading	No downgrading	12	860	809	−0.52% (−0.63 to −0.42)	Low
Fasting blood glucose	High	RCTs	No downgrading	No downgrading	No downgrading	No downgrading	7	450	389	−0.42 (−0.65 to −0.19) mmol/L	Low
Post-prandial blood glucose	High	RCTs	Small sample size	No downgrading	No downgrading	No downgrading	5	275	265	−0.64 (−0.97 to −0.32) mmol/L	Low
BMI	High	RCTs	Small sample size	No downgrading	No downgrading	No downgrading	6	390	330	−1.55 (−2.92 to −0.17) kg/m2	Low
Cai, 2023							№ of studies	№ of subjects		Pooled Mean Difference (95% CI)	Level of certainty
HbA1c	High	RCTs	No downgrading	No downgrading	No downgrading	No downgrading	26	4333		-0.29% (-0.46 to -0.13)	Low
Fasting blood glucose	High	RCTs	The CI showed both effects	No downgrading	No downgrading	No downgrading	10	1415		-0.62 mmol/L (-1.27 to -0.04)	Low
BMI	High	RCTs	No downgrading	No downgrading	No downgrading	No downgrading	12	1525		-0.21 (-0.42 to 0) kg/m2	Low

RPM: remote patient monitoring, SoC (Standard of care)

Table 4. Clinical Benefit by Remote Patient Monitoring Characteristics in Type-2 Diabetes Patients (Cai, et al. 2023)

Characteristics		№ of studies	№ of subjects	Effect Size for HbA1c Mean Difference (95% CI)
Number of the monitored parameters	>1 parameters	17	3056	-0.329 (-0.469 to -0.19)
	1 parameter	9	1159	-0.370 (-0.958 to 0.217)
Frequency of patient-physician communication	At least once weekly	16	2840	- 0.340 (-0.486 to -0.194)
	Less than once weekly	7	1031	-0.298 (-1.102 to 0.506)
Mode of input	Manual	14	2070	-0.444 (- 0.672 to - 0.216)
	Automatic	11	2210	-0.110 (-0.461 to 0.242)
Abnormality alert function	Present	13	1969	-0.363 (-0.533 to -0.193
	Absent	13	2364	-0.300 (-0.662 to 0.063)
Follow-up duration	6 months or more	16	2454	-0.361 (-0.544 to -0.178)
	<6 months	10	1708	-0.238 (-0.687 to 0.211)
Involvement of in person session	No	20	3412	-0.437 (-0.599 to -0.275
	Yes	6	921	0.096 (-0.545 to 0.737)
Disease education	Present	25	4304	-0.343 (-0.549 to -0.136)
	Absent	1	299	0.011 (-0.258 to 0.29)
Guidance on self- measure skills and techniques	Present	20	3348	-0.353 (-0.0.606 to -0.1)
	Absent	5	893	-0.253 (-0.511 to 0.004)
Age	<65 years	22	3518	-0.358 (-0.592 to -0.125)
	≥65 years	4	815	-0.144 (-0.305 to 0.017)

Subgroup analysis for baseline HbA1c >8%, baseline insulin requirement, mode of transmission Wi-Fi vs. Bluetooth vs. 4G/5G, frequency of self-assessment at least once daily vs. less, guidance on diet, guidance on exercise did not reveal significant between group difference.

Table 5. Certainty of Evidence Assessment for the Study Evaluating Remote Patient Monitoring systems in Heart Failure Patients (Scholte, et al. 2026)

Outcome	Certainty assessment							№ of studies	№ of events RPM/ Standard care	Pooled Effect Size (95% CI)	Level of certainty
	Risk of bias (ROBIS)	Risk of NMA	Controlled study	Imprecision	Inconsistency	Indirectness	Others				
Total HF hospitalization	Moderate	Moderate	RCTs	No downgrading	No downgrading	No downgrading	No downgrading	12		IRR: 0.73 (0.59-0.89)	Moderate
First HF hospitalization	Moderate	Moderate	RCTs	No downgrading	No downgrading	No downgrading	No downgrading	22	993/1066	RR: 0.87 (0.78-0.97)	Moderate
All cause mortality	Moderate	Moderate	RCTs	CI showed both effects	No downgrading	No downgrading	No downgrading	31	658/658	RR: 0.91 (0.80-1.03)	Low

RPM: remote patient monitoring, SoC: Standard of care.

Table 6. Characteristics of the RCTs Evaluating Commercial Remote Patient Monitoring systems

References	RPM	Population	Intervention	Control
Marier-Tetrault (2025)	Greybox	Patients with confirmed diagnosis of heart failure (HF), with New York Heart Association (NYHA) class ≥ 2, actively followed in a heart failure clinic (or equivalent) in Quebec, with no anticipated discharge within 3 months.	The Continuum program integrated 3 technologies: 1) an RPM system connecting patients' mobile app data to a secured web-based platform for healthcare professionals, 2) a DTx through the mobile app for smartphones or tablets, to encourage self-care management, and patients' education; and 3) a DST for GDMT optimization in the format of reports. For the RPM, a nurse reviewed patient data daily (Monday to Friday) using a secure web-based dashboard. Pre-programmed algorithms generated alerts based on patients' daily inputs and organized data into graphics. The nurse could contact patients, perform a comprehensive evaluation, and provide heart failure education sessions if needed. Additionally, the nurse could contact the patient's clinical team or refer the patient to the appropriate medical resource, such as the nearest emergency room, if necessary. Automated messages when nurses revised individual data, for example when automated alerts were checked, were sent to keep patients motivated.	The standard care included regular follow-ups at a heart failure clinic according to national guidelines. This clinical routine care remained unchanged for both groups. It also included a booklet with a reminder at the beginning of the study to record daily vital signs and heart failure symptoms, as recommended by the Quebec Heart Failure Society. This booklet also included reminders about acceptable weight fluctuations, liquid and sodium intake limits, and instructions on when to seek treatment.
Ware (2022)	Medly	Patients with ≥1 diagnosis of HF, uncontrolled hypertension (HT), and insulin-requiring diabetes mellitus (DM) from outpatient specialty settings	Patients with chronic conditions take relevant physiological measurements with wireless home medical devices and answer symptom questions using the Medly smartphone app. In response to these inputs, rule-based algorithms, which were iteratively developed and validated by HF, DM, and HT specialists and customized through target thresholds, displayed self-care instructions to patients (Figure 1) and sent alerts to the clinical team via email and a secure web portal where historical trends could also be viewed. As such, the system was designed to improve patient self-management and provide clinical decision support to health care professionals.	The standard care followed Canadian clinical care guidelines for HF, DM, and HT. In general, that included seeing the clinical team for scheduled follow-ups every 3 to 6 months, optimization of medical therapy, and self-management education.

DM: Diabetes mellitus, DST: clinical decision support tools, DTx: digital treatment, GDMT: guideline-directed medical therapy, HF: heart failure, HT: hypertension, RPM: remote patient monitoring.

Table 7. Certainty of Evidence Assessment for the Study Evaluating Medly (Ware, et al. 2023)

Outcomes	Certainty assessment									Mean Difference (95% CI)**	Level of certainty
	Risk of bias (RoB)	Controlled study	Imprecision	Inconsistency	Indirectness	Others	№ of individuals RPM/SOC	Mean (SD) RPM	Mean (SD) in SOC		
QoL SF-36											
Physical component	High	RCT	Downgraded*	NA	No downgrading	No downgrading	24/25	42.77 (8.58)	42.39 (9.47)	0.38 (-4.82 to 2.58)	Low
Mental component	High	RCT	Downgraded*	NA	No downgrading	No downgrading	24/25	43.77 (12.28)	48.31 (10.51)	-4.54 (-11.1 to 2.02)	Low
Mental health											
Anxiety	High	RCT	Downgraded*	NA	No downgrading	No downgrading	24/22	7.33 (5.07)	5.97 (3.5)	1.36 (-1.80 to 4.51)	Low
Depression	High	RCT	Downgraded*	NA	No downgrading	No downgrading	23/23	5.51 (4.67)	5.55 (4.2)	-0.04 (-2.68 to 2.60)	Low
SCHFI questionnaires	High	RCT	Downgraded*	NA	No downgrading	No downgrading					Low
Maintenance							24/17	79.83 (15.81)	76.18 (17.48)	3.65 (-6.94 to 14.23)	
Management							24/17	75.42 (19.83)	69.53 (26.53)	5.89 (-8.74 to 20.52)	
Confidence							24/16	71.83 (19.74)	76.38 (19.86)	-4.55 (-17.57 to 8.47)	
MLHFQ questionnaires	High	RCT	Downgraded*	NA	No downgrading	No downgrading					Low
Total							23/17	35.88 (23.65)	31.55 (29.45)	4.33 (-12.67 to 21.34)	
Physical							23/17	14.58 (10.9)	19.05 (12.4)	-4.47 (-11.95 to 3.01)	
Emotional							22/15	9 (7.45)	9.33 (7.1)	-0.33 (-5.30 to 4.64)	

Outcomes	Certainty assessment						№ of individuals RPM/SOC	Mean (SD) RPM	Mean (SD) in SOC	Mean Difference (95% CI)**	Level of certainty
	Risk of bias	Controlled study	Imprecision	Inconsistency	Indirectness	Others					
Healthcare use *(self-report)*											
Number of hospital visits	High	RCT	Downgraded*	NA	No downgrading	No downgrading	28/23	1.43 (4.11)	0.35 (1.11)	1.08 (-0.69 to 2.85)	Low
Number ED visits	High	RCT	Downgraded*	NA	No downgrading	No downgrading	28/23	0.5 (1.33)	0.22 (0.57)	0.28 (-0.28 to 0.84)	Low
Number Clinic visits	High	RCT	Downgraded*	NA	No downgrading	No downgrading	20/21	3.71 (2.85)	2.95 (4.61)	0.76 (-1.67 to 3.19)	Low
Number Family physician visit	High	RCT	Downgraded*	NA	No downgrading	No downgrading	25/23	1.28 (1.62)	1.85 (2.23)	-0.57 (-1.70 to 0.56)	Low

CI: confidence interval, NA: not applicable, RCT: randomized clinical trial, RPM: remote patient monitoring, SoC: Standard of care

***** Imprecision because of small sample size and the confidence interval crosses the null effect

** Mean differences were calculated using OpenEpi

Table 8. Certainty of Evidence Assessment for the Study Evaluating Greybox (Marier-Tétrault, et al. 2025)

Outcomes	Certainty assessment						Outcome distributions			Level of certainty
	Risk of bias	Controlled study	Imprecision	Inconsistency	Indirectness	Others	№ of individuals RPM/SOC	№ of events RPM/SOC	HR (95% CI)	
All-cause events	Low	RCT	Downgraded*	NA	No downgrading	Article is under peer review	52/54	10/12	*HR=1.19 (0.51-2.75)*	Low
All-cause readmissions	Low	RCT	Downgraded*	NA	No downgrading	Article is under peer review	52/54	3/10	*NR*	Low
Cardiac events	Low	RCT	Downgraded*	NA	No downgrading	Article is under peer review	52/54	5/11	*HR=2.23 (0.77-6.41)*	Low
Major cardiovascular events (MACE)	Low	RCT	Downgraded*	NA	No downgrading	Article is under peer review	52/54	5/8	NR	Low
Unplanned cardiac consultations/visits	Low	RCT	Downgraded*	NA	No downgrading	Article is under peer review	52/54	18/21	NR	Low

CI: confidence interval, HR: hazard ratio, NA: Not applicable, NR: not reported, RPM: remote patient monitoring, SD: Standard deviation, SoC: Standard of care

* Imprecision because of small sample size and the confidence interval showed both effects

Table 9. CADTH Recommendations for the Implementation of Remote Monitoring in Canada

Key Domains	Considerations
Patient and Caregiver Considerations RPM should be flexible and adaptable to patient circumstances.	• The need for functional and easy-to-use technologies that fit within patients' life styles (considerations may include battery life, reliable connectivity, equipment size, cost, ease of use, adaptability for travel, etc.) • The availability of technical support • The ability to address the needs of caregivers (caregivers may be a facilitator to the uptake and success of RM programs; however, the potential burden on caregivers could be a barrier) • The views of key stakeholder groups regarding their preferences in the potential adoption of RM programs
Provider Considerations RM programs should be an integral part of the care pathway for chronic cardiac conditions, with processes and policies to support it.	• Integration of RM technologies into health care processes (including aligning them with clinical practice guidelines) • Integration of RM technologies into electronic medical records (to minimize duplicate data entry, reduce errors, and ensure smooth transitions between care providers) • A potential increase in workload for cardiologists, primary care providers, and nurses associated with RM programs (e.g., from activities such as increased administrative tasks, increased number of patient contacts, and the need for rapid decision-making and responding to alerts, all of which can interrupt workflow) • Appropriate remuneration • Policies for patients accessing specialist cardiac care outside their jurisdictions of residence
Data and Privacy There should be transparency about information flow and patient data use and privacy should be at the forefront of service contract negotiations.	• Protecting consumers from third-party use of data (e.g., through the negotiation of service contracts between jurisdictions and technology providers) • Consideration of how data is transmitted and stored, and associated privacy and security (particularly extra-jurisdictional data storage, with consideration for who has data sovereignty)
Digital Equity RM programs should avoid creating or exacerbating inequalities in health care.	• Access to reliable internet connection and sufficient technology (note potential inequalities with bring-your-own-device models) • Consideration of the potential for RM programs to exacerbate disparities in care because of other underlying social determinants of health (e.g., it is important not to neglect in-person options for high-needs populations)
Evaluation RM programs should include an evaluation component to ensure program aims are met.	• Appropriate metrics (e.g., morbidity and mortality, patient quality of life, access to care for those for whom in-person care is more challenging to access, burdens and costs associated with RM programs, etc.) • Clinical practice guidelines quality indicators could be used to benchmark care and could be part of what is collected in the evaluation • Evaluation may also aid in determining costs in general, as well as cost-effectiveness moving forward

Table 10. Costs estimation for the RPM pilot at the MUHC

Number of patients	Product cost		Nursing cost			Monthly pilot costs	3-month pilot costs
	Unit cost ($)	Total	Monthly labour hours (20 minutes per patient)	Unit cost/hour ($)	Total		
50	30	$1,500	17	83.8	$1,397	$2,897	$13,191
100	30	$3,000	33	83.8	$2,794	$5,794	$26,382

APPENDICES

APPENDIX A: SYSTEMATIC SEARCH STRATEGY

Databases Searched

Cochrane CENTRAL Register of Controlled Trials [Wiley] (February 4, 2026)

ID	Search	Hits
#1	[mh ^"Remote Patient Monitoring"]	8
#2	([mh "Monitoring, Physiologic"/is,mt] OR [mh "Remote Consultation"]) AND ([mh ^"Mobile Applications"] OR [mh ^Telemedicine] OR [mh "Cell Phone"])	505
#3	((remote* NEAR/3 patient* NEAR/3 monitor*)):ti,ab,kw	483
#4	(((telemonitor* OR ("online" NEXT track*) OR ("digital" NEXT medicine*) OR ("online" NEXT monitor*) OR ("remote" NEXT track*) OR self-track* OR real-time OR transmi*) AND (("mobile" NEXT application*) OR ("mobile" NEXT phone*) OR cell-phone* OR cellphone OR smartphone* OR smart-phone* OR ("smart" NEXT watch*) OR iphone* OR i-phone* OR ipad* OR i-pad* OR ("smart" NEXT device*) OR ("wearable" NEXT device*) OR ("body" NEXT sensor*) OR ((text OR phone*) NEAR/3 messag*) OR ((mobile OR smartphone* OR tablet*) NEAR/3 (app OR apps OR application*))))):ti,ab,kw	2468
#5	((greybox* OR graybox* OR takecare OR Medly*)):ti,ab,kw	25
#6	((continuum NEAR/3 (platform OR program OR software))):ti,ab,kw	19
#7	#1 OR #2 OR #3 OR #4 OR #5 OR #6	3349
#8	[mh "Heart Failure"] OR [mh "Cardiovascular Diseases"]	161204
#9	(((heart* OR cardiac* OR congestiveheart* OR myocardi*) NEAR/3 (fail* OR decompensat*))):ti,ab,kw	42848
#10	((cardio* OR cardia* OR heart* OR coronary* OR angina* OR ventric* OR (myocard* NEXT orpericard*) OR isch?m* OR emboli* OR arrhythmi* OR thrombo* OR ("atrial" NEXT fibrillat* NEXT ortachycardi*) OR endocardi* OR "sick sinus" OR hypertension* OR stroke OR ((vascular OR cerebrovascular OR arterial) NEAR/3 (disease* OR disorder*)) OR ventricular)):ti,ab,kw	481522
#11	(((non-communicable OR non-infectious OR noncommunicable OR noninfectious OR chronic) NEAR/3 disease*)):ti,ab,kw	73950
#12	((pacemaker* OR (cardiac NEAR/2 pacing))):ti,ab,kw	4673
#13	[mh "Lung Diseases"]	66728
#14	(((lung* OR pulmonary) NEAR/3 disease*) OR "cystic fibrosis" OR asthma* OR sarcoidos*):ti,ab,kw	75637
#15	[mh Neoplasms]	131553
#16	((cancer* OR neo?plasm*)):ti,ab,kw	258628
#17	[mh "Diabetes Mellitus"]	48118
#18	(((mental OR mood* OR personalit* OR eating* OR affective* OR adjustment* OR obsess* OR compulsi* OR panic OR phobi* OR post-trauma* OR posttrauma*) NEAR/3 (illness* OR disorder* OR health))):ti,ab,kw	81878
#19	((anxiet* OR anxious* OR depress* OR anorex* OR bulimi* OR (self NEAR/3 (harm* OR injur* OR mutilat*)) OR suicid* OR parasuicid* OR bipolar* OR dysthymi* OR neurotic OR neurosis OR PTSD OR (chronic NEAR/3 fatigue) OR schizo*)):ti,ab,kw	214285

#20	((chronic* NEAR/3 (condition* OR illness* OR disorder* OR disease*))):ti,ab,kw	91570
#21	#8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20	1065628
#22	#7 AND #21	2030
	Reviews	**9**
	Trials	2021

Embase [Ovid] (February 4, 2026)

Database(s): **Embase Classic+Embase** 1947 to 2026 February 02
Search Strategy:

#	Searches	Results
1	telemonitoring/	8636
2	(exp physiologic monitoring/ or exp teleconsultation/) and (exp mobile application/ or exp telemedicine/ or exp mobile phone/)	20398
3	(remote* adj3 patient* adj3 monitor*).tw,kf.	3961
4	((telemonitor* or online track* or digital medicine* or online monitor* or remote track* or self-track* or real-time* or transmi*) and (mobile application* or mobile phone* or cell-phone* or cellphone or smartphone* or smart-phone* or smart watch* or iphone* or i-phone* or ipad* or i-pad* or smart device* or wearable device* or body sensor* or ((text or phone*) adj3 messag*) or ((mobile or smartphone* or tablet*) adj3 (app or apps or application*)))).tw,kf.	15591
5	(greybox* or graybox* or "takecare" or Medly*).tw,kf.	92
6	(continuum adj3 (platform or program or software)).tw,kf.	146
7	1 or 2 or 3 or 4 or 5 or 6	45136
8	exp heart failure/ or exp cardiovascular disease/	6576818
9	(cardio* or cardia* or heart* or coronary* or angina* or ventric* or myocard* orpericard* or isch?m* or emboli* or arrhythmi* or thrombo* or atrial fibrillat* ortachycardi* or endocardi* or sick sinus or hypertension* or stroke or ((vascular or cerebrovascular or arterial) adj3 (disease* or disorder*)) or ventricular).tw,kf.	5881191
10	((non-communicable or non-infectious or noncommunicable or noninfectious or chronic) adj3 disease*).tw,kf.	704850
11	(pacemaker* or (cardiac adj2 pacing)).tw,kf.	83900
12	exp lung disease/	2562692
13	(((lung* or pulmonary) adj3 disease*) or cystic fibrosis or asthma* or sarcoidos*).tw,kf.	735996
14	exp *neoplasm/	5453628
15	(cancer* or neo?plasm*).tw,kf.	4271274
16	exp diabetes mellitus/	1578470
17	(diabetes or diabetic or hyperglycemia* or glucose intoleran*).tw,kf.	1502638
18	exp mental disease/	3495095
19	((mental or mood* or personalit* or eating* or affective* or adjustment* or obsess* or compulsi* or panic or phobi* or post-trauma* or posttrauma*) adj3 (illness* or disorder* or health)).tw,kf.	713132
20	(anxiet* or anxious* or depress* or anorex* or bulimi* or (self adj3 (harm* or injur* or mutilat*)) or suicid* or parasuicid* or bipolar* or dysthymi* or neurotic or neurosis or "PTSD" or (chronic adj3 fatigue) or schizo*).tw,kf.	1717300
21	(chronic* adj3 (condition* or illness* or disorder* or disease*)).tw,kf.	848540
22	8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21	19864326
23	7 and 22	23376

24	(((systematic or state-of-the-art or scoping or literature or umbrella) adj (review* or overview* or assessment*)) or "review* of reviews" or meta-analy* or metaanaly* or ((systematic or evidence) adj1 assess*) or "research evidence" or metasynthe* or meta-synthe*).tw. or systematic review/ or "systematic review (topic)"/ or meta analysis/ or "meta analysis (topic)"/	1166654
25	23 and 24	1732
26	limit 25 to yr="2023-current"	651

Medline [Ovid] (February 4, 2026)

Database(s): **Ovid MEDLINE(R) and Epub Ahead of Print and In-Process, In-Data-Review & Other Non-Indexed Citations and Daily** 1946 to February 03, 2026
Search Strategy:

#	Searches	Results
1	Remote Patient Monitoring/	82
2	(exp Monitoring, Physiologic/is, mt or exp Remote Consultation/) and (Mobile Applications/ or Telemedicine/ or exp Cell Phone/)	5055
3	(remote* adj3 patient* adj3 monitor*).tw,kf.	2346
4	((telemonitor* or online track* or digital medicine* or online monitor* or remote track* or self-track* or real-time or transmi*) and (mobile application* or mobile phone* or cell-phone* or cellphone or smartphone* or smart-phone* or smart watch* or iphone* or i-phone* or ipad* or i-pad* or smart device* or wearable device* or body sensor* or ((text or phone*) adj3 messag*) or ((mobile or smartphone* or tablet*) adj3 (app or apps or application*)))).tw,kf.	11029
5	(greybox* or graybox* or "takecare" or Medly*).tw,kf.	49
6	(continuum adj3 (platform or program or software)).tw,kf.	108
7	1 or 2 or 3 or 4 or 5 or 6	17765
8	exp Heart Failure/ or exp Cardiovascular Diseases/	2921456
9	((heart* or cardiac* or congestiveheart* or myocardi*) adj3 (fail* or decompensat*)).tw,kf.	283026
10	(cardio* or cardia* or heart* or coronary* or angina* or ventric* or myocard* orpericard* or isch?m* or emboli* or arrhythmi* or thrombo* or atrial fibrillat* ortachycardi* or endocardi* or sick sinus or hypertension* or stroke or ((vascular or cerebrovascular or arterial) adj3 (disease* or disorder*)) or ventricular).tw,kf.	3844779
11	((non-communicable or non-infectious or noncommunicable or noninfectious or chronic) adj3 disease*).tw,kf.	450836
12	(pacemaker* or (cardiac adj2 pacing)).tw,kf.	50964
13	exp Lung Diseases/	1374026
14	(((lung* or pulmonary) adj3 disease*) or cystic fibrosis or asthma* or sarcoidos*).tw,kf.	457582
15	exp *Neoplasms/	3750537
16	(cancer* or neo?plasm*).tw,kf.	2915352
17	exp Diabetes Mellitus/	563344
18	(diabetes or diabetic or hyperglycemia* or glucose intoleran*).tw,kf.	928637
19	exp Mental Disorders/	1587996
20	((mental or mood* or personalit* or eating* or affective* or adjustment* or obsess* or compulsi* or panic or phobi* or post-trauma* or posttrauma*) adj3 (illness* or disorder* or health)).tw,kf.	545961
21	(anxiet* or anxious* or depress* or anorex* or bulimi* or (self adj3 (harm* or injur* or mutilat*)) or suicid* or parasuicid* or bipolar* or dysthymi* or neurotic or neurosis or "PTSD" or (chronic adj3 fatigue) or schizo*).tw,kf.	1197285

22	(chronic* adj3 (condition* or illness* or disorder* or disease*)).tw,kf.	543617
23	8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22	13012832
24	7 and 23	7706
25	(((systematic or state-of-the-art or scoping or literature or umbrella) adj (review* or overview* or assessment*)) or "review* of reviews" or meta-analy* or metaanaly* or ((systematic or evidence) adj1 assess*) or "research evidence" or metasynthe* or meta-synthe*).tw. or exp Review Literature as Topic/ or exp Review/ or Meta-Analysis as Topic/ or Meta-Analysis/ or "systematic review"/	4085000
26	24 and 25	1388
27	limit 26 to yr="2023-current"	578

PubMed (February 4, 2026)

Search number	Query	Filters	Results
1	"Remote Patient Monitoring"[Mesh]		82
2	("Monitoring, Physiologic/instrumentation"[Mesh] OR "Monitoring, Physiologic/methods"[Mesh] OR "Remote Consultation"[Mesh]) AND ("Mobile Applications"[Mesh]) OR "Telemedicine"[Majr] OR "Cell Phone"[Mesh])		71,164
3	(remote*[tiab] AND patient*[tiab] AND monitor*[tiab])		10,529
4	((telemonitor*[tiab] OR "online track*"[tiab] OR "digital medicine*"[tiab] OR "online monitor*"[tiab] OR "remote track*"[tiab] OR self-track*[tiab] OR real-time[tiab] OR transmi*[tiab]) AND ("mobile application*"[tiab] OR "mobile phone*"[tiab] OR cell-phone*[tiab] OR cellphone[tiab] OR smartphone*[tiab] OR smart-phone*[tiab] OR "smart watch*"[tiab] OR iphone*[tiab] OR i-phone*[tiab] OR ipad*[tiab] OR i-pad*[tiab] OR "smart device*"[tiab] OR "wearable device*"[tiab] OR "body sensor*"[tiab] OR ((text[tiab] OR phone*[tiab]) AND messag*[tiab]) OR ((mobile[tiab] OR smartphone*[tiab] OR tablet*[tiab]) AND (app[tiab] OR apps[tiab] OR application*[tiab]))))		12,930
5	(greybox*[tiab] OR graybox*[tiab] OR takecare[tiab] OR Medly*[tiab])		164
6	(continuum[tiab] AND (platform[tiab] OR program[tiab] OR software[tiab]))		3,687
7	#1 OR #2 OR #3 OR #4 OR #5 OR #6		92,298
8	"Heart Failure"[Mesh] OR "Cardiovascular Diseases"[Mesh]		2,920,681
9	((heart*[tiab] OR cardiac*[tiab] OR congestiveheart*[tiab] OR myocardi*[tiab]) AND (fail*[tiab] OR decompensat*[tiab]))		352,548
10	(cardio*[tiab] OR cardia*[tiab] OR heart*[tiab] OR coronary*[tiab] OR angina*[tiab] OR ventric*[tiab] OR "myocard* orpericard*"[tiab] OR ischem*[tiab] OR ischaem*[tiab] OR emboli*[tiab] OR arrhythmi*[tiab] OR thrombo*[tiab] OR "atrial fibrillat* ortachycardi*"[tiab] OR endocardi*[tiab] OR "sick sinus"[tiab] OR hypertension*[tiab] OR stroke[tiab] OR ((vascular[tiab] OR cerebrovascular[tiab] OR arterial[tiab]) AND (disease*[tiab] OR disorder*[tiab])) OR ventricular[tiab])		3,970,500

11	((non-communicable[tiab] OR non-infectious[tiab] OR noncommunicable[tiab] OR noninfectious[tiab] OR chronic[tiab]) AND disease*[tiab])		778,029
12	(pacemaker*[tiab] OR (cardiac[tiab] AND pacing[tiab]))		60,445
13	"Lung Diseases"[Mesh]		1,373,537
14	(((lung*[tiab] OR pulmonary[tiab]) AND disease*[tiab]) OR "cystic fibrosis"[tiab] OR asthma*[tiab] OR sarcoidos*[tiab])		691,253
15	Neoplasms[Mesh]		4,205,390
16	(cancer*[tiab] OR neoplasm*[tiab] OR neolplasm*[tiab])		2,916,013
17	"Diabetes Mellitus"[Mesh]		563,122
18	(diabetes[tiab] OR diabetic[tiab] OR hyperglycemia*[tiab] OR "glucose intoleran*"[tiab])		928,997
19	"Mental Disorders"[Mesh]		1,587,435
20	((mental[tiab] OR mood*[tiab] OR personalit*[tiab] OR eating*[tiab] OR affective*[tiab] OR adjustment*[tiab] OR obsess*[tiab] OR compulsi*[tiab] OR panic[tiab] OR phobi*[tiab] OR post-trauma*[tiab] OR posttrauma*[tiab]) AND (illness*[tiab] OR disorder*[tiab] OR health[tiab]))		751,647
21	(anxiet*[tiab] OR anxious*[tiab] OR depress*[tiab] OR anorex*[tiab] OR bulimi*[tiab] OR (self[tiab] AND (harm*[tiab] OR injur*[tiab] OR mutilat*[tiab])) OR suicid*[tiab] OR parasuicid*[tiab] OR bipolar*[tiab] OR dysthymi*[tiab] OR neurotic[tiab] OR neurosis[tiab] OR PTSD[tiab] OR (chronic[tiab] AND fatigue[tiab]) OR schizo*[tiab])		1,249,190
22	(chronic*[tiab] AND (condition*[tiab] OR illness*[tiab] OR disorder*[tiab] OR disease*[tiab]))		978,962
23	#8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22		13,657,754
24	#7 AND #23		42,539
25	(((systematic[tiab] OR state-of-the-art[tiab] OR scoping[tiab] OR literature[tiab] OR umbrella[tiab]) AND (review*[tiab] OR overview*[tiab] OR assessment*[tiab])) OR "review* of reviews"[tiab] OR meta-analy*[tiab] OR metaanaly*[tiab] OR ((systematic[tiab] OR evidence[tiab]) AND assess*[tiab]) OR "research evidence"[tiab] OR metasynthe*[tiab] OR meta-synthe*[tiab]) OR "Review Literature as Topic"[Mesh] OR Review[Mesh] OR "Meta-Analysis as Topic"[Majr] OR Meta-Analysis[Majr] OR "systematic review"[Majr]		1,760,064
26	#24 AND #25		6,340
27	#24 AND #25	from 2026/1/21 - 3000/1/1	44

Centre for Reviews and Dissemination [CRD] (February 6, 2026)

2023 publications: https://www.york.ac.uk/crd/knowledge-centre/publications/journal-articles/2023/

2024 publications: https://www.york.ac.uk/crd/publications/journal-articles/2024/
2025 publications: https://www.york.ac.uk/crd/publications/journal-articles/2025/
2026 publications: https://www.york.ac.uk/crd/publications/journal-articles/2026/

Epistemonikos (February 6, 2026)

Link to retrieve search

(title:((title:(remote AND patient AND monitor*) OR abstract:(remote AND patient AND monitor*)) OR (title:(((telemonitor* OR online track* OR digital medicine* OR online monitor* OR remote track* OR self-track* OR real-time OR transmi*) AND (mobile application* OR mobile phone* OR cell-phone* OR cellphone OR smartphone* OR smart-phone* OR smart watch* OR iphone* OR i-phone* OR ipad* OR i-pad* OR smart device* OR wearable device* OR body sensor* OR ((text OR phone*) AND messag*) OR ((mobile OR smartphone* OR tablet*) AND (app OR apps OR application*))))) OR abstract:(((telemonitor* OR online track* OR digital medicine* OR online monitor* OR remote track* OR self-track* OR real-time OR transmi*) AND (mobile application* OR mobile phone* OR cell-phone* OR cellphone OR smartphone* OR smart-phone* OR smart watch* OR iphone* OR i-phone* OR ipad* OR i-pad* OR smart device* OR wearable device* OR body sensor* OR ((text OR phone*) AND messag*) OR ((mobile OR smartphone* OR tablet*) AND (app OR apps OR application*)))))) OR (title:(greybox* OR graybox* OR "takecare" OR Medly*) OR abstract:(greybox* OR graybox* OR "takecare" OR Medly*)) OR (title:(continuum AND (platform OR program OR software)) OR abstract:(continuum AND (platform OR program OR software)))) OR abstract:((title:(remote AND patient AND monitor*) OR abstract:(remote AND patient AND monitor*)) OR (title:(((telemonitor* OR online track* OR digital medicine* OR online monitor* OR remote track* OR self-track* OR real-time OR transmi*) AND (mobile application* OR mobile phone* OR cell-phone* OR cellphone OR smartphone* OR smart-phone* OR smart watch* OR iphone* OR i-phone* OR ipad* OR i-pad* OR smart device* OR wearable device* OR body sensor* OR ((text OR phone*) AND messag*) OR ((mobile OR smartphone* OR tablet*) AND (app OR apps OR application*))))) OR abstract:(((telemonitor* OR online track* OR digital medicine* OR online monitor* OR remote track* OR self-track* OR real-time OR transmi*) AND (mobile application* OR mobile phone* OR cell-phone* OR cellphone OR smartphone* OR smart-phone* OR smart watch* OR iphone* OR i-phone* OR ipad* OR i-pad* OR smart device* OR wearable device* OR body sensor* OR ((text OR phone*) AND messag*) OR ((mobile OR smartphone* OR tablet*) AND (app OR apps OR application*)))))) OR (title:(greybox* OR graybox* OR "takecare" OR Medly*) OR abstract:(greybox* OR graybox* OR "takecare" OR Medly*)) OR (title:(continuum AND (platform OR program OR software)) OR abstract:(continuum AND (platform OR program OR software)))))
Publication Type: Systematic Reviews
Publication year : 2023
Results: 275

HTA Databases (February 4, 2026)

Link to open results

Remote monitoring for long-term physical health conditions: an evidence and gap map. de Bell S, Zhelev Z, Shaw N, Bethel A, Anderson R, Thompson Coon J

CADTH (March 27, 2026)

- Remote Diagnostics, Remote Monitoring, and Remote Care Management
- Remote Monitoring Programs for Cardiac Conditions
- Considerations for the Implementation of Remote Monitoring Programs in Canada
- In- Brief Remote Monitoring for Cardiac Conditions: A Review

2. Vital Signs Monitoring Sticker

Institut national d'excellence en santé et en services sociaux [INESSS] (February 2026)

Nothing since 2024.

Library of the UETMISSS du Québec

Webpages for publications under construction.
Link to Zotero library with their reports:
https://etmiquebec.wordpress.com/publications/rapports-detmi-publies/

Limits

Last 3 years (2023-current)

Legend for Databases

Legends for Medline (Ovid), Embase (Ovid) & CINAHL are available on our website:
http://www.muhclibraries.ca/Documents/Database_Legends.pdf

Duplication & Removal of Records

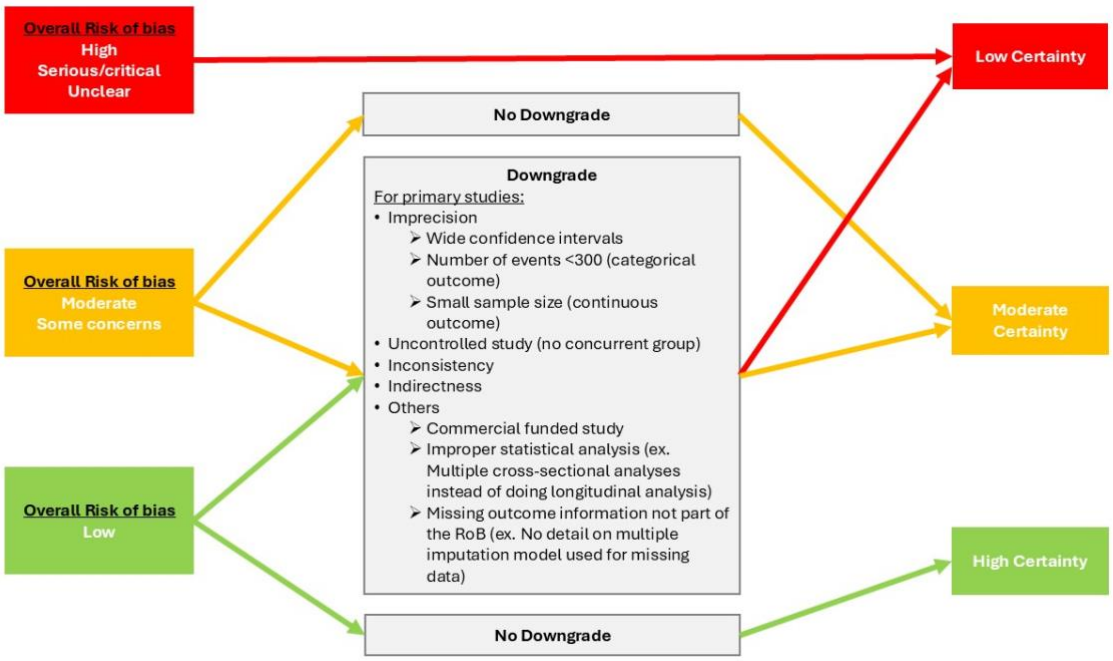
Duplicates were removed by using EndNote's and Covidence's Author/Title/Year duplicate checker, followed by a manual verification of duplicates.

Database	Before duplicate removal	After duplicate removal
Cochrane	9	1
Embase	651	471
Medline	578	576
PubMed	44	35
Epistemonikos	1202	1055
CRD	112	110

APPENDIX B: QUALITY ASSESSMENT ALGORITHM

Our in-house tool incorporated the following dimensions to evaluate the evidence quality:

i. Overall risk of bias of the included studies (based on controlling bias due to confounding, selection, misclassification, reporting and analytic concerns)
ii. Uncontrolled study (no comparator group)
iii. Imprecision (bias arising from small sample size)
   - Wide confidence intervals
   - Low number of events (<300 for categorical outcomes)
   - Small sample size (for continuous outcomes)
iv. Inconsistency (results vary widely between studies)
v. Indirectness (extrapolating results from indirect comparisons)
vi. Others
   - commercially funded study
   - improper statistical analytical tests (e.g., multiple cross-sectional analyses for a longitudinal data)
   - missing outcome information that is not part of RoB (e.g. no details on multiple imputation models used for missing data)



Low certainty evidence:

- This indicates that our confidence in the overall effect estimate is limited.
- Studies with a high overall risk of bias were, by default, considered low certainty evidence.

Moderate certainty evidence:

- Moderate certainty evidence suggests that we are moderately confident in the effect estimate; the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
- Included studies with a low or moderate overall risk of bias could be downgraded and considered a lower certainty of evidence if one of these domains were met
    - Imprecision (i.e. confidence intervals, low number of events (<300 for categorical outcomes), or small sample size (for continuous outcomes))
    - Uncontrolled study (no comparator group)
    - Inconsistency (i.e. studies have inconsistent effects, or are too heterogenous to compare)
    - Indirectness (i.e. studies reporting outcomes that indirectly answer our research question)
    - Others
        - commercially funded study
        - improper statistical analytical tests (e.g., multiple cross-sectional analyses for a longitudinal data)
        - missing outcome information that is not part of RoB (e.g. no details on multiple imputation models used for missing data)

High certainty evidence:

- High certainty evidence indicates that we are very confident that the true effect lies close to that of the estimate of the effect.
- When studies are not downgraded for any of the elements considered above and overall risk of bias is low, this would indicate an overall high certainty evidence.

APPENDIX C: THE CONTINUUM PROGRAM AT CHUM

1. Program Overview

- Continuum is a clinician-led RPM initiative developed with Greybox to support outpatient heart failure (HF) patients.
- Originated as a research project (2019) and transitioned into real-world clinical use during COVID-19, when remote care became essential.
- At peak, approximately 125 patients were monitored concurrently in a clinical (non-research) setting.

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2. Greybox Platform – Strategic Capabilities

Greybox was described as a three-layer platform, offering capabilities beyond basic monitoring:

1. Patient-facing App
    - Patients or caregivers manually enter vital signs, weight, and symptoms
    - Enable to communicate with clinicians
    - Enables self-care and education
    - Enable access to personal health data and share them with their family doctors
    - Supports patient engagement and transparency
2. Clinician RPM Dashboard
    - Web-based interface used primarily by nurses
    - Displays trends, alerts, and patient compliance
    - Alerts and thresholds can be individualized per patient
3. Clinical Decision Support (Advanced)
    - Designed to assist with medication optimization
    - Developed and validated in research settings
    - Not yet integrated with EMRs, limiting current clinical deployment

Key differentiator noted: Greybox includes a patient-facing mobile app, which some competing platforms lack, limiting patient engagement and self-management.

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3. Clinical and Operational Impact

- **Clinical value:**
    - Earlier detection of patient deterioration (e.g., weight gain)
    - Enable patients self-initiating contact when they are worried
    - Improved clinician confidence and reassurance through continuous data access
- **Nursing workflow:**
    - Monitoring requires approximately **1–1.5 hours covering 125 patients per day**, or 20 minutes per month per patient including follow-up calls

- RPM tasks were absorbed into **existing HF clinic workflows**
- Nurses could prioritize higher-risk patients

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4. Patient Engagement and Equity

- Patient compliance varied but was **not strongly age-dependent**; some elderly patients were highly engaged.
- **Daily data entry** was associated with better outcomes than sporadic use.
- Importantly, RPM does **not exclude less digitally literate patients or caregiver**:
  - Patients unable or unwilling to use apps can still benefit through structured phone follow-ups
  - RPM should complement, not replace, traditional care pathways

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5. Patient Selection and Monitoring Model

- RPM is most effective when focused on **higher-risk HF patients**, such as those with recent hospitalizations.
- Proposed clinical model:
  - **3-6 month monitoring periods**, renewable based on clinician's assessment
  - Clear patient agreements and disengagement criteria
  - RPM explicitly positioned as a **support tool**, not an emergency system

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6. Key Takeaways for Leadership

- RPM can improve early intervention, patient engagement, and clinician efficiency when thoughtfully implemented.
- Patient-facing functionality (mobile apps, data access, secure messaging) is a critical success factor.
- Successful RPM programs require:
  - Targeted patient selection
  - Clear clinical governance and expectations
  - Integration into existing nursing workflows
- Cost should be weighed against capability, maturity, and long-term value, not price alone.

REFERENCES

1. Bajowala SS, Milosch J, Bansal C. Telemedicine Pays: Billing and Coding Update. Curr Allergy Asthma Rep. 2020;20(10):60.
2. HAUTÉ AUTHORITE SANTÉ. Télésurveillance médicale du patient insuffisant cardiaque chronique. 2023. [Available from: https://www.has-sante.fr/upload/docs/application/pdf/2023-03/tls_lg_insuffisance_cardiaque_chronique_dm_eval-320_avis_du_21_03_2023.pdf]
3. Hill S, Li K, McDougall D. Remote Monitoring Programs for Cardiac Conditions in Canada: An Environmental Scan. Can J Health Technol. 2021;1(3):1-40.
4. Flodgren G, Rachas A, Farmer AJ, Inzitari M, Shepperd S. Interactive telemedicine: effects on professional practice and health care outcomes. Cochrane Database Syst Rev. 2015;2015(9):CD002098.
5. Sterne JAC, Savovic J, Page MJ, Elbers RG, Blencowe NS, Boutron I, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. BMJ. 2019;366:l4898.
6. Whiting P, Savovic J, Higgins JP, Caldwell DM, Reeves BC, Shea B, et al. ROBIS: A new tool to assess risk of bias in systematic reviews was developed. J Clin Epidemiol. 2016;69:225-34.
7. Guyatt G, Oxman AD, Akl EA, Kunz R, Vist G, Brozek J, et al. GRADE guidelines: 1. Introduction-GRADE evidence profiles and summary of findings tables. J Clin Epidemiol. 2011;64(4):383-94.
8. Cai J, Xu H, Jiang S, Sung J, Sawhney R, Broadley S, et al. Effectiveness of telemonitoring intervention on glycaemic control in patients with type 2 diabetes mellitus: A systematic review and meta-analysis. Diabetes Res Clin Pract. 2023;201:110727.
9. Xiao Y, Wang Z, Zhang L, Xie N, Chen F, Song Z, et al. Effectiveness of Digital Diabetes Management Technology on Blood Glucose in Patients With Type 2 Diabetes at Home: Systematic Review and Meta-Analysis. J Med Internet Res. 2025;27:e66441.
10. Scholte NTB, Clephas PRD, Boersma E, Gürgöze MT, Ronner E, Feyz L, et al. Telemonitoring modalities in heart failure: comparative effectiveness across the heart failure population-a meta-analysis. NPJ digital medicine. 2026.
11. Ware P, Shah A, Ross HJ, Logan AG, Segal P, Cafazzo JA, et al. Challenges of Telemonitoring Programs for Complex Chronic Conditions: Randomized Controlled Trial With an Embedded Qualitative Study. J Med Internet Res. 2022;24(1):e31754.
12. Artanian V, Ware P, Rac VE, Ross HJ, Seto E. Experiences and Perceptions of Patients and Providers Participating in Remote Titration of Heart Failure Medication Facilitated by Telemonitoring: Qualitative Study. JMIR Cardio. 2021;5(2):e28259.

13. Marier-Tétrault E, Ribeiro P, Béchard S, Bebawi E, Brouillard P, Yuan S, et al. Combined Digital Interventions for Enhancing Heart FailureContinuum Care and Their Impact on Care Consumption: A Randomized Controlled Trial. Preprint on Research Square. 2025. [Available from: https://assets-eu.researchsquare.com/files/rs-6629871/v1/646eacfd-3f85-4d86-a1f7-144963618b17.pdf?c=1747133453]
14. HTERP C. Considerations for the Implementation of Remote Monitoring Programs in Canada. CADTH; 2021. [Available from: https://www.cda-amc.ca/sites/default/files/attachments/2022-01/OP0549_SummaryTool_considerations_for_the_implementation_of_remote_monitoring_programs_in_canada.pdf]
15. Sarri G, Forsythe A, Elvidge J, Dawoud D. Living health technology assessments: how close to living reality? BMJ Evid Based Med. 2023;28(6):369-71.