

Medico-economic Evaluation of a Telehealth Platform for Elective Outpatient Surgeries: A Randomized Controlled Trial

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Abstract

Background: The increasing prevalence of ambulatory surgeries has highlighted the need for effective postoperative follow-up. While telemedicine represents a promising option for perioperative support and postoperative monitoring, evidence of its actual benefits remains limited.

Objective: To evaluate the medico-economic impact of a personalized telemedicine platform for postoperative follow-up in day-surgery patients in terms of cost-effectiveness and cost-utility.

Methods: Design and Setting: This single-blinded with two-group randomized controlled trial was conducted at the Centre hospitalier de l'Université de Montréal (CHUM) from August 2022 to September 2023.

Participants: Adults undergoing elective day surgery were randomized into two groups: the intervention group, which received postoperative follow-up via the LeoMed® telemedicine platform, and the control group, which received standard care. The study adhered to ethical standards and was registered with ClinicalTrials.gov (NCT04948632).

Intervention: The intervention group used a personalized telehealth platform offering preoperative education, psychological support, and postoperative monitoring through daily follow-up forms sent to patients' smartphones. Alerts generated by patient responses were reviewed by CHUM's telehealth support unit.

Main Outcomes and Measures: The primary outcome was unanticipated healthcare utilization, including emergency visits, readmissions, and medical consultations within 30 days post-procedure. Secondary outcomes included gained quality-adjusted life years (QALY), patient satisfaction, healthcare costs, and greenhouse gas emissions.

Results: Of 1,411 patients screened, 1,214 were randomized, with 436 in the intervention group and 445 in the control group analyzed. No significant differences in unanticipated healthcare utilization or costs were observed. The intervention group demonstrated a statistically significant QALY gain at postoperative day 14 (0.002, $p = 0.013$), but the difference was no longer significant at day 30 (0.001, $p = 0.143$). However, patient satisfaction was significantly higher in the intervention group at both days 14 ($p = 0.018$) and 30 ($p < 0.001$).

Conclusions: This trial demonstrates the potential of telemedicine platforms to enhance postoperative care in ambulatory surgery

settings. While no significant reductions in healthcare utilization were observed, the intervention improved QALYs and patient satisfaction, suggesting potential cost-utility benefits. Larger trials are needed to confirm these findings and explore the impact on long-term recovery and healthcare savings. Clinical Trial: ClinicalTrials.gov Identifier: NCT04948632

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Original Manuscript

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Keypoints

Question For patients undergoing outpatient surgery, can the implementation of a personalized telemedicine platform for postoperative follow-up be beneficial in terms of cost-effectiveness and cost-utility?

Findings In this randomized trial involving 1000 patients, no significant difference in cost-effectiveness was observed. However, a measurable improvement in quality of life was noted among patients using the platform.

Meaning Follow-up care delivered via a personalized telemedicine platform has the potential to improve patients' quality of life after day surgery.

Abstract

Importance The increasing prevalence of ambulatory surgeries has highlighted the need for effective postoperative follow-up. While telemedicine represents a promising option for perioperative support and postoperative monitoring, evidence of its actual benefits remains limited.

Objective To evaluate the medico-economic impact of a personalized telemedicine platform for postoperative follow-up in day-surgery patients in terms of cost-effectiveness and cost-utility.

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Main Outcomes and Measures The primary outcome was unanticipated healthcare utilization, including emergency visits, readmissions, and medical consultations within 30 days post-procedure. Secondary outcomes included gained quality-adjusted life years (QALY), patient satisfaction, healthcare costs, and greenhouse gas emissions.

Results Of 1,411 patients screened, 1,214 were randomized, with 436 in the intervention group and 445 in the control group analyzed. No significant differences in unanticipated healthcare utilization or costs were observed. The intervention group demonstrated a statistically significant QALY gain

at postoperative day 14 (0.002, $p = 0.013$), but the difference was no longer significant at day 30 (0.001, $p = 0.143$). However, patient satisfaction was significantly higher in the intervention group at both days 14 ($p = 0.018$) and 30 ($p < 0.001$).

Conclusions and Relevance This trial demonstrates the potential of telemedicine platforms to enhance postoperative care in ambulatory surgery settings. While no significant reductions in healthcare utilization were observed, the intervention improved QALYs and patient satisfaction, suggesting potential cost-utility benefits. Larger trials are needed to confirm these findings and explore the impact on long-term recovery and healthcare savings.

Trial Registration ClinicalTrials.gov Identifier: [NCT04948632](https://clinicaltrials.gov/ct2/show/study/NCT04948632)

Introduction

Perioperative care pathways have undergone profound changes over the past decade. The development of Enhanced Recovery After Surgery (ERAS) programs and minimally invasive surgical techniques has significantly reduced hospital stays and promoted ambulatory procedures for a broader range of surgeries¹. In Canada, more than 2.3 million ambulatory procedures are performed annually as of 2024². These procedures are no longer restricted to ASA 1-2 patients or low-risk, short-duration surgeries³. However, the rate of postoperative complications and the level of postoperative pain are not significantly lower in outpatient surgeries compared to inpatient procedures⁴.

A decade ago, patients benefited from daily morning check-ins by healthcare professionals to monitor vital signs, detect complications, and provide pain management support in the days following surgery. Today, patients are expected to take on much of their recovery independently. Consequently, many events may be underreported to healthcare professionals and, as a result, underestimated by healthcare institutions. For instance, postoperative opioid use remains a significant issue, with recent studies showing that nearly 10% of patients may still be using opioids three months after an outpatient procedure⁵. This highlights that the healthcare system has not adapted sufficiently to provide optimal perioperative support and postoperative follow-up.

Medical associations have advocated for establishing contact between the patient's discharge and the first few postoperative days. For example, the Haute Autorité de Santé (HAS) in France mandates that healthcare facilities contact patients within 1 to 3 days after surgery⁶. However, this timeframe is based on arbitrary decisions rather than robust scientific evidence, and not all patients necessarily require postoperative follow-up. Several authors, such as Dahlberg⁷, have proposed a patient-centered approach where patients determine if and when follow-up contact is needed.

New technologies offer significant potential to enhance remote follow-up methods. However, for these postoperative monitoring solutions to be widely adopted in routine practice, their clinical and economic benefits must first be demonstrated. To date, only a limited number of studies in the literature address this critical issue⁸.

In 2022, the Department of Anesthesiology at the Centre Hospitalier de l'Université de Montréal (CHUM) introduced an automated, personalized perioperative platform integrated with its telehealth service. This advanced digital health solution is smartphone-accessible, offering perioperative support and remote postoperative follow-up⁹.

We hypothesize that implementing this telehealth platform at CHUM will: (a) reduce the frequency of emergency department visits, unplanned medical consultations, unnecessary calls to Provincial Health Information Line, and unplanned hospital readmissions by offering more tailored health support, and (b) improve the quality of life 30 days after surgery through timely and effective recognition of postoperative complications.

The primary objective of this study is to evaluate the medico-economic impact of incorporating this patient-tailored telecare platform into perioperative pathways for day-surgery patients, through a cost-effectiveness and cost-utility analysis.

Methods

Trial design and ethics statements

This single-center, single-blind, two-group randomized controlled trial was conducted at CHUM between August 2022 and September 2023. Patients were divided into two groups: one group received perioperative support through a personalized telehealth platform (LeoMed®), while the other group received standard care. The study adhered to the principles of the Helsinki Declaration

and was approved by the institutional review board and research ethics committee at CHUM (21.110). The trial was registered with ClinicalTrials.gov (NCT04948632) and the study [protocol](#) was published in Avril 2023⁹.

Study population

All patients over the age of 18 undergoing elective day surgery at CHUM were eligible. The inclusion criteria required patients to have internet access and be able to understand both written and spoken communication in either French or English. Patients were excluded at two stages: (a) Prior to randomization, if they did not meet the inclusion or chose not to participate, or if surgeries were postponed, and (b) After randomization, if patients withdrew their consent, met exclusion criteria not identified during the telephonic initial approach, were hospitalized on the day of surgery, or if surgeries were postponed at the last minute. Figure 1 illustrates the trial flowchart.

Randomization and blinding

Patients were initially approached by phone two days before their surgery, based on the operating schedule. To manage the resources available in the research unit, we limited the number of patients included each day to a maximum of five. During the assessment, a research assistant verified the inclusion criteria and provided verbal information about the study. If the patient agreed to participate, they could provide written consent either electronically via email or give verbal consent and sign in person on the morning of their surgery upon arrival at the day surgery unit. All enrolled patients were electronically randomized in a balanced 1:1 ratio into either the intervention group or the control group, using blocks of 2 to 4. The randomization list was created with the MedSharing Randomizer for Clinical Trials web application. Patients were not informed of their randomization group; however, due to the nature of the intervention, they were not blinded to their group allocation.

Intervention

The intervention consisted of perioperative support through a personalized telehealth platform (LeoMed Technologies Inc., Thetford Mines, Qc). Specifically, patients in the intervention group received a link the day before their surgery, prompting them to access the platform to prepare for their procedure. Preoperatively, the platform directed patients to CHUM's digital portal, which centralized health sheets outlining the perioperative process. Additionally, customized psychological support videos, developed in collaboration with CHUM's communications team, were made available to address patient concerns and provide comprehensive guidance. Postoperatively, the platform sent online follow-up forms to participants' phones daily during the first four days and again on the seventh day, prompting them to evaluate their health status. These forms included questions about potential surgical site infections and symptoms such as redness, pus, fever, and wound pain. Patient responses were analyzed automatically by an artificial intelligence algorithm, generating alerts visible to CHUM's telehealth service team. This service, staffed by approximately 50 specialized nurses trained in remote healthcare delivery, provides remote support and coordinates interventions with CHUM's medical and paramedical teams. As part of this project, nurses contacted patients within a maximum of eight hours following an alert to ensure appropriate care was delivered.

Participants assigned to the control group received the hospital's standard care, which included a preoperative phone call from a scheduling agent on the day before surgery. Postoperative follow-up for control group patients depended on the surgical specialty, with the timing of follow-up visits varying by surgeon and type of surgery, typically ranging from a few days to several weeks. However, like patients in the intervention group, control group patients were required to log in to the platform the day before surgery. At that time, they completed the preoperative quality of life assessment score (EQ-5D-5L VAS), as in the intervention group.

In both groups, the platform sent follow-up evaluation forms on postoperative days (POD) 14 and 30

to assess variables needed for the medico-economic analyses. These included the postoperative EQ-5D-5L VAS score, healthcare utilization, and patient satisfaction.

Compliance

To ensure compliance in the intervention group, we developed a Compliance Index to assess patient engagement with the telehealth platform during the immediate postoperative period, specifically the first four days. Compliance was measured by calculating the frequency of questionnaire responses, which served as a proxy for engagement. A participant who responded to all four questions received a compliance score of 1, while a participant who did not respond to any received a score of 0.

Data collection

Demographic data (age, gender, type of surgery and type of anesthesia) were extracted from CHUM's electronic medical record (EMR) system (Oacis; Telus Health, Montréal, Qc). Economic and health-related variables were collected from the telehealth platform via online questionnaires completed by patients preoperatively and on POD 14 and 30. To ensure the accuracy of the information provided, all patients who reported complications or events, such as any healthcare utilization, were systematically contacted by our research assistants via phone. Patients who did not complete the online questionnaires also received a reminder call. For each patient, the data were systematically recorded and securely stored on a local server, before being extracted into two Excel (Microsoft®, Redmond, WA, USA) databases. These data were cross-referenced with those extracted from the EMR.

Outcomes

Cost-Effectiveness

The cost-effectiveness analysis considered costs associated with unanticipated healthcare utilization,

defined as calls to the CHUM local health information line, calls to the Quebec health information line (811), emergency department visits, and unplanned readmissions or medical visits (to family doctors or outpatient clinics) related to the procedure within the first 30 days post-procedure. Table 1 presents the average unit costs of healthcare services and the sources used for estimating the categories of healthcare costs. We computed one different cost variables related to additional healthcare utilization. The variable 'Costs + Transportation' adds the roundtrip transportation costs from the patient's postal code to the respective service (nearest emergency department, specified clinic, or doctor). These transportation costs are based on our estimates of travel distance and time, as reported in the 'Other Outcomes' section.

Table 1. Categories of healthcare costs

Cost Categories	Mean Cost (CAD)	Sources
Family Doctor or Walk-in Clinic visit	\$54.0	Billing reference guide (2024). Santé Inc. Code 15823.
Emergency Room Visit (without additional tests)	\$1435.0	Tariffs for hospital visits to the CHUM, MSSS (2023)
Hospitalization (per day, all-inclusive)	\$8286.0	
Provincial 811 help line (per call)	\$46.0	Annual financial reports of institutions 2022-2023 - MSSS.
Health line (CHUM) (per call)	\$103.0	Internal data from CHUM 2023-2024 (AS-471 ca 6240)
Telehealth Platform (LeoMed) Access (per patient)	\$3.7	Internal CHUM estimates for telehealth platform usage (2023-2024) ^a

Abbreviations: CAD, Canadian Dollar; CHUM, Centre Hospitalier de l’Université de Montréal; MSSS, The Ministry of Health and Social Services; CISSS, Integrated Health and Social Services Centers.

^a Technology costs were calculated based on prevailing license prices during the study period and amortized on a straight-line basis over five years.

Cost-utility

The cost-utility analysis evaluates the gained quality-adjusted life years (QALYs). The EQ-5D-5L visual analog scale (VAS) was selected as the instrument for assessing quality of life and deriving utility values for health technology appraisals¹⁰. This choice was made based on the recommendations from the latest update to the economic evaluation guidelines published by the

^aAbbreviations: CAD, Canadian Dollar; CHUM, Centre Hospitalier de l’Université de Montréal; MSSS:The Ministry of Health and Social Services; CISSS: Integrated Health and Social Services Centers. Technology costs were calculated based on prevailing license prices during the study period and amortized on a straight-line basis over five years.

French National Authority for Health¹¹. The EQ-5D-5L comprises two components: an assessment of health status across five dimensions—mobility, self-care, usual activities, pain/discomfort, and anxiety/depression—and a visual analog scale (EQ VAS) that measures the patient's overall perception of health. This tool was used to evaluate health outcomes on POD 14 and 30, and the results were compared to preoperative baseline scores.

Other outcomes

Greenhouse gas (GHG) emission associated with the additional healthcare use was also evaluated. To calculate GHG emissions, we estimated the likely travel time from the patient's residence to the designated medical facility, assuming a typical weekday morning departure scenario (Wednesday, 15 May 2024, 8:00 AM, Montreal Time). The geographical coordinates of hospitals, emergency rooms, or other medical facilities visited by participants were determined using a comprehensive geocoding process implemented in the R programming environment (R Foundation for Statistical Computing, Vienna, Austria). This process employed the *googleway* package to perform geocoding and calculate distances and travel times in driving mode, based on explicit and implicit address data provided in the dataset. Finally, patient satisfaction with care services was assessed in both groups using Likert scales adapted from Sicotte et al.¹².

Statistical analysis

Data analysis was conducted using R. Demographic data were summarized using descriptive statistics. Categorical data were presented as frequencies and percentages, while continuous variables were reported as means with standard deviations. Healthcare service utilization was analyzed alongside associated costs and carbon dioxide (CO₂) emissions. All financial calculations were expressed in Canadian dollars (CAD). QALYs were calculated using EQ-5D-5L scores converted into utility values based on the Canadian Time Trade-off Value Set¹⁰. Utility scores were derived

using a predefined function and adjusted for the number of days since surgery (14 or 30 days) divided by 365. This method accounts for differences across all EQ-5D-5L dimensions. Our analysis primarily followed the intention-to-treat (ITT) principle, comparing the LeoMed group to the control group across various dependent variables. To detect differences between the two groups, as well as gender differences, we used the Chi-square test (χ^2), Mann-Whitney U-test, or independent Student's t-test, as appropriate. This study adhered to the SPIRIT (Standard Protocol Items: Recommendations for Interventional Trials) 2013 Statement¹³ and the CHEERS (Consolidated Health Economic Evaluation Reporting Standards) guidelines¹⁴.

Sample size

Our sample size calculations were based on the study of Jaensson et al., who suggested that better postoperative recovery—indicated by a reduction in symptoms and complications—would likely result in fewer postoperative calls to health information lines, visits to the emergency department, unplanned readmissions, and associated medical visits, thus lowering overall costs¹⁵. In their study, they found that patients in the intervention group, who utilized a recovery assessment mobile app, exhibited better recovery outcomes (as measured by the global Swedish Web Version of the Quality of Recovery [SwQoR] score) compared to those receiving standard care on POD seven (effect size 0.21; $p < .001$).

Using a significance level of .05 and a statistical power of .90, the necessary group size was calculated by G*Power (Heinrich Heine University) to be 357. To accommodate a 20% loss to follow-up and potential protocol deviations, we planned to recruit 500 patients for each arm of the study, for a total of 1,000 patients.

Results

Between August 2022 and September 2023, 1,411 patients were assessed for eligibility. After excluding 197 patients, 1,214 participants were randomized into two groups: 608 in the control group and 606 in the intervention group (Figure 1). After randomization, 108 participants from the control group and 106 from the intervention group were excluded, primarily due to following reasons: withdrawal of consent (n=34), surgery cancellations or postponements (n=68), technical problems (n=46), conversion to inpatient hospitalization (n=40) or other reasons (n=26). 55 patients in the control group and 64 in the intervention group did not return follow-up questionnaires or respond to telephonic contacts, resulting in a loss to follow-up. Baseline characteristics are described in Table 2. Compliance was estimated at 0.89 in the intervention group.

Table 2. Patients baseline characteristics

Characteristic	No. (%)		P value
	Control (n=500)	Intervention Group (n=500)	
Age, mean (SD)	47.4 (13.1)	46.6 (12.9)	.29
Gender (Female)	327 (65)	342 (68)	.31
Type of Anesthesia ^b			
General Anesthesia (GA)	342 (70)	355 (72)	.39
Spinal Anesthesia	40 (8)	39 (8)	.90
Peripheral Nerve Block	113 (24)	101 (21)	.25
Sedation	5 (1)	5 (1)	.90
Type of Surgery			
Orthopedics	111 (22)	96 (19)	.24
Plastic	100 (20)	106 (21)	.65
Gynecology	78 (16)	79 (16)	.94
ENT	60 (12)	63 (13)	.78
Oncology	61 (12)	60 (12)	.91
Hepatobiliary	14 (3)	16 (3)	.72
Thoracic	14 (3)	8 (2)	.20
Urology	11 (2)	15 (3)	.43
Others ^c	49 (<10)	56 (11)	N/A
Distance and Travel Time, mean (SD)			
Distance from Home to CHUM (km)	52.3 (14.2)	41.9 (11.1)	.06
Distance from Home to Closest ER (km)	12.8 (3.3)	13.0 (3.4)	.79
Travel time from Home to CHUM (min)	47.8 (13.3)	39.1(10.6)	.03
Travel time from Home to Closest ER (min)	18.3 (4.95)	18.9 (5.04)	.40

Abbreviations: CHUM, Centre Hospitalier de l'Université de Montréal; GA, general anesthesia.

^a Percentage do not add up to 100% for the type of anesthesia because of either the combination of peripheral nerve block and general anesthesia or conversion into general anesthesia.

^b Neurosurgery, maxillofacial surgery, ophthalmology, vascular surgery, cardiac procedures, and radiology procedures, each comprising fewer than 10 patients.

^bAbbreviations: CHUM, Centre Hospitalier de l'Université de Montréal; GA, general anesthesia.

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^c Neurosurgery, maxillofacial surgery, ophthalmology, vascular surgery, cardiac procedures, and radiology procedures, each comprising fewer than 10 patients.

Primary outcome

No significant differences were observed in unanticipated postoperative healthcare utilization between the groups (Table 3). The mean cost of healthcare utilization was \$370 in the control group compared to \$323 in the LeoMed group ($p = 0.595$). No significant difference was observed for the 'Costs + Transportation' variable (\$374 vs \$323; $p = 0.326$).

Table 3. Healthcare utilization

Outcome	No. (%)		P value
	Control (n=445)	Intervention Group (n=436)	
Unplanned healthcare contacts			
Family doctor or walk-in clinic visits	40 (8.9)	36 (8.4)	.54
Emergency room visit	37 (8.3)	30 (6.8)	.31
Hospitalization	10 (2.2)	7 (1.6)	.43
Provincial 811 help line	23 (5.1)	13 (2.9)	.18
Health line (CHUM)	26 (5.8)	33 (7.6)	.06

Abbreviations: CHUM, Centre Hospitalier de l'Université de Montréal.

Secondary outcome

At POD 14, the intervention group demonstrated a statistically significant QALY gain of 0.002 compared to the control group ($p = 0.013$). Among the five dimensions of the EQ-5D-5L, autonomy, daily activities, and pain showed significant improvements in the intervention group at POD 14 (Table 4). At POD 30, the difference was no longer statistically significant (QALY gain = 0.001; $p = 0.143$). No significant differences were observed between the groups for the EQ-5D-5L VAS scores at POD 14 and 30 (Table 4).

Health variables	Mean		P value
	Control (n=445)	Intervention Group (n=436)	
Perceived Quality of Life (POD 14)			
EQ-5D-5L Global Score (VAS)	7.4	7.7	.10
EQ-5D-5L dimensions			
Mobility	1.6	1.4	.11

*Abbreviations: CHUM, Centre Hospitalier de l'Université de Montréal.

Autonomy	1.6	1.4	<.001
Daily activities	2.1	1.8	<.001
Pain	2.3	2.0	<.001
Anxiety and depression	1.5	1.4	.08
Perceived Quality of Life (POD 30)			
EQ-5D-5L Global Score (VAS)	8.0	7.8	.10
EQ-5D-5L dimensions			
Mobility	1.4	1.3	.09
Autonomy	1.3	1.2	.09
Daily activities	1.7	1.5	.02
Pain	1.9	1.8	.02
Anxiety and depression	1.5	1.4	.12
Gained QALY			
POD 14	0.000	0.002	.01
POD 30	0.000	0.001	.14

Table 4. Comparison of postoperative health scores

Abbreviations: VAS, visual analog scale; POD, postoperative day; QALY, quality-adjusted life years.

There were also no significant differences in GHG emissions between the groups, with the intervention group emitting an average of 0.870 kg CO₂ equivalent compared to 1.055 kg CO₂ equivalent in the control group ($p = 0.520$). However, patient satisfaction was significantly higher in the intervention group at both POD 14 and POD 30, with mean scores of 8.9 versus 8.4 ($p = 0.018$) and 8.8 versus 8.1 ($p < 0.001$), respectively.

Discussion

This single-center, two-group randomized controlled trial highlights the potential utility of telemedicine platforms in enhancing postoperative follow-up for ambulatory surgeries. While we observed no statistically significant reduction in unplanned healthcare utilization, our study demonstrated a gain in QALYs at POD 14 in the intervention group. With willingness-to-pay thresholds for QALYs ranging from CA\$47,048.84 to CA\$73,936.87, the estimated economic benefits range from CA\$94 to CA\$148 per patient¹⁶.

Several factors may explain these findings. Although the study did not demonstrate a significant difference in cost-effectiveness, we observed a trend toward reduced healthcare visits in the intervention group, similar to results reported by Temple-Oberle et al., who found no significant

*Abbreviations: VAS, visual analog scale; POD, postoperative day; QALY, quality-adjusted life years.

differences in unplanned healthcare contacts in a randomized trial evaluating a smartphone app for postoperative monitoring¹⁷. This lack of significant results may reflect limited statistical power due to the sample size. However, the observed QALY improvement at day 14 suggests that patients in the Intervention group recovered more rapidly during the initial postoperative period compared to the control group. At day 30, recovery levels were similar between groups. These results are particularly relevant in the context of the growing volume of ambulatory surgeries worldwide. With an incremental QALY gain of 0.002, applied to the approximately 2.3 million ambulatory surgeries performed annually in Canada, potential cost savings could range between CA\$216 million and CA\$340 million².

Despite the promise of telemedicine in postoperative care, few studies have demonstrated clear benefits of digital health solutions^{18, 19}. This is partly due to the heterogeneity of available platforms and the challenges of conducting large-scale multicenter trials with standardized solutions. Our study also showed higher patient satisfaction in the intervention group, corroborating existing literature suggesting that digital follow-up addresses a critical gap in postoperative care²⁰. For instance, Day et al. demonstrated that automated messaging during the perioperative period enhanced satisfaction, improved health literacy, and fostered collaborative decision-making between patients and care teams²¹. Additionally, a meta-analysis of telemedicine interventions found that over 80% of patients receiving remote follow-up reported high satisfaction levels²².

Study Limitations

The single-center design of this trial limits the generalizability of findings to other settings, particularly those involving minor surgical procedures. However, this limitation underscores the broader challenges of implementing standardized telehealth platforms across multiple institutions. The observed trend toward reduced unplanned healthcare contacts and costs might have reached statistical significance with a larger sample size.

Additionally, healthcare costs may have been underestimated. For instance, hospitalization costs were calculated based on single-night stays and excluded extended emergency department visits that were not classified as formal admissions. Diagnostic testing costs associated with emergency visits were also not included.

Finally, we were unable to identify subgroups that might benefit more from the platform due to heterogeneity across age groups and surgical specialties. Future research should focus on identifying high-risk populations that might derive the greatest benefit from telemedicine interventions.

5. Conclusions

In conclusion, with the expansion of ambulatory surgery and the inclusion of more comorbid patients and increasingly complex procedures, ensuring effective follow-up care is becoming increasingly important. Our study demonstrated promising results regarding the cost-utility benefit of telemedicine platforms for perioperative monitoring. However, further large-scale, multicenter studies are needed to better determine the exact medico-economic impact and the clinical benefits for the broader patient population.

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Author Contributions: Dr Robin had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Castonguay, Kuftedjian, Paré, Robin, Roy

Acquisition, analysis or interpretation of data: Benatia, Kuftedjian, Paré, Robin, Roy

Drafting of the manuscript: Kuftedjian, Robin

Critical review of the manuscript for important intellectual content: Benatia, Castonguay, Desrosiers,

Kuftedjian, Lavoie, Paré, Pomey, Robin, Roy

Statistical analysis: Benatia, Castonguay, Paré
Obtained funding: Robin
Administrative, technical, or material support: Desrosiers, Pomey
Supervision: Robin, Roy

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List of Figures

Figure 1. Flow Chart



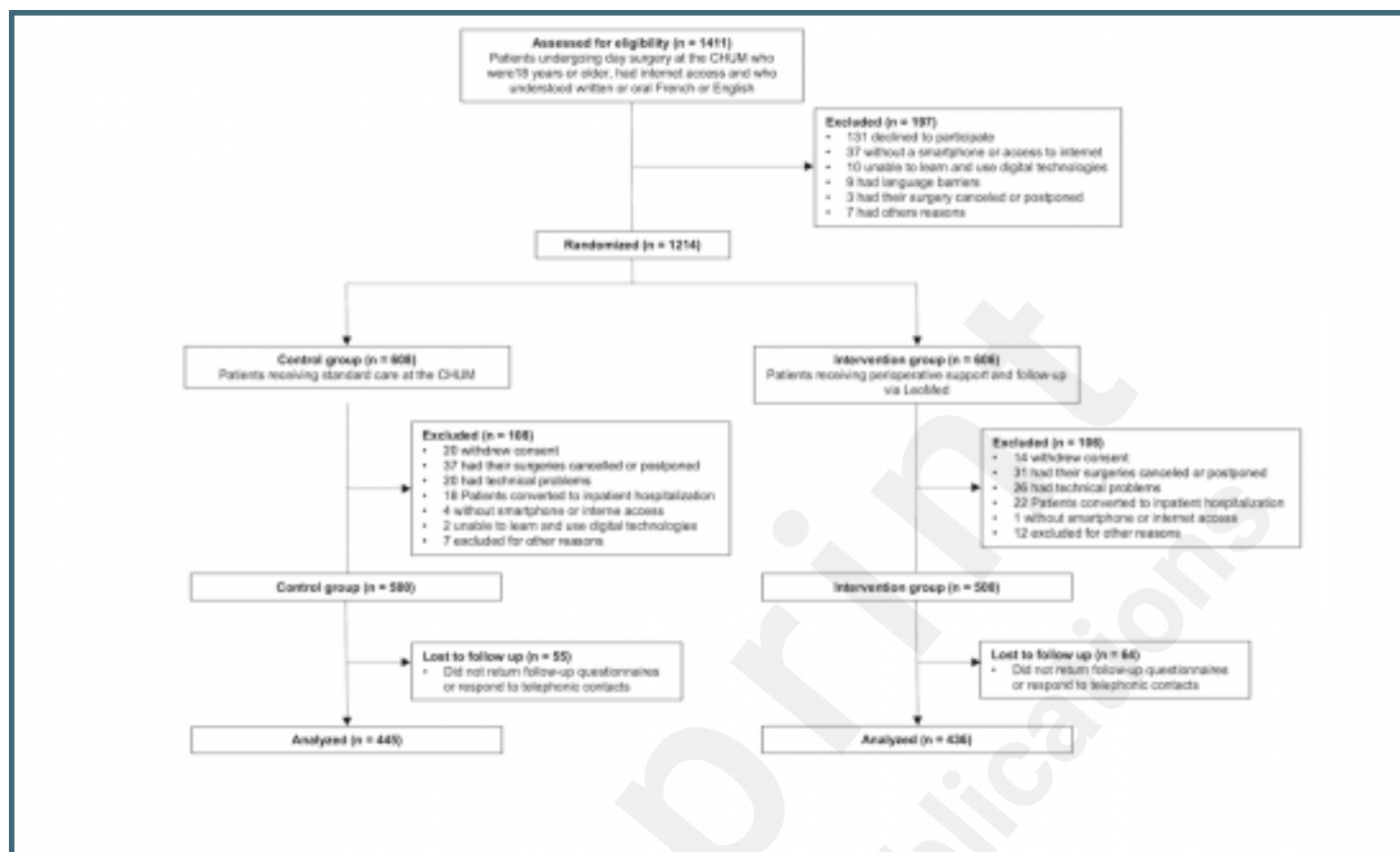
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Supplementary Files

Figures

Study flowchart.



CONSORT (or other) checklists

Consort Checklist.

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