

Studies show the benefits of home health monitoring

HHM technology leads to improved outcomes for patients and reduced costs for hospitals.

BY MICHAEL GUERRIERE, MD

The Canadian Institute for Health Information (CIHI) recently estimated that roughly 8.5% of patients are readmitted to hospital within 30 days. Furthermore, an estimated 9% to 59% of those readmissions could be avoided by better identifying those most likely to return to hospital within short periods and improving the care they receive before and after discharge.

Home Health Monitoring (HHM) technology presents an important opportunity to reduce readmissions, particularly for patients with chronic conditions, such as Chronic Obstructive Pulmonary Disease (COPD), diabetes or congestive heart failure.

HHM empowers these patients, who are frequent users of the healthcare system, to monitor their own health from the comfort of their own homes, and to provide their healthcare teams with detailed information about their health in real-time. Healthcare providers can closely monitor patients and take action before situations become acute, averting the use of costly emergency visits or hospital readmissions.

The current research in HHM clearly demonstrates that HHM reduces readmissions to hospitals, decreases average length of stay and emergency room visits and, ultimately, results in fewer deaths. In addition, patients who use HHM services are consistent in reporting high satisfaction with the technology.

Key findings from published Home Health Monitoring studies: Several studies provide sound insights about the value and benefits of Home Health Monitoring (HHM) as a new model for patient care delivery. What follows is a synopsis of recent peer-reviewed and published studies that demonstrate the impacts telehealth and HHM can have for patients and the healthcare system.

Home Telemonitoring for Chronic Disease Management: An Economic Assessment. JR Health Centre, Montréal, 2012: The analysis assessed the economic impact of home telemonitoring on the consumption of health services at the JR Health Centre in Montréal. It followed 95 patients with chronic diseases over a 21-month period.

Patients were equipped with a touch-screen computer and integrated modem, which were pre-programmed to monitor various health parameters. Patients transmitted their clinical data using the internet, and completed a daily data entry table to report vital signs, symptoms and medication taken.

The device analyzed the data and generated an alert to a nurse if certain conditions were detected. (TELUS Health technology was involved in this study.)

The results showed:

- significant savings over traditional home care due to reduced hospitalizations, emergency room visits and shorter hospital stays (41% savings of \$1,557 per patient per year)
- 34% decrease in the number of patients visiting an emergency room
- 66% decrease in the number of hospital stays
- 75 fewer emergency room visits
- patient satisfaction was high, with 80% of respondents wishing to keep the telemonitoring system.

Economic Assessment of a Home Telemonitoring Program for COPD Patients – Maisonneuve Rosemont Hospital, Montréal, 2012: This assessment provides a detailed economic assessment of a home telemonitoring program aimed at treating people with severe COPD. Patients were recruited through the Service Régional de Soins à Domicile (SRSAD) at the Maisonneuve Rosemont Hospital. Data for the analysis was obtained from patient HHM devices, and then electronically transferred to the hospital where it was reviewed by nurses and respiratory therapists.

The study compared the effects and costs of care for a group of 60 patients under a telehomecare program, with a comparable group receiving tradi-

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tional home care. Summary findings showed there were significant economic savings even after considering the technology acquisition cost, as well as nursing and respiratory therapist time at monitoring centres. (TELUS Health technology was involved in this study.)

The analysis demonstrated:

- telehomecare saved 14% (\$1,613 per patient per year) over traditional care, by reducing hospitalizations by 45%, emergency department visits by 35% and achieving 50% shorter hospital stays
- faster recovery associated with early detection of COPD exacerbations followed by rapid and appropriate interventions
- telehomecare patients indicated a very high satisfaction rating with the device with 86% of patients willing to continue to use the system in their homes.

Effect of Telehealth on Use of Secondary Care and Mortality (BMJ), UK, 2012: This study assessed whether telehealth interventions to diagnose and manage patients could reduce both mortality and the number of patients admitted to hospital over a 12-month period. The study analyzed results from 3,230 people recruited from practices between May 2008 and November 2009 across the UK with diabetes, chronic obstructive pulmonary disease or heart failure.

The results of the study showed the telehealth group had:

- 20% fewer emergency admissions
- a 45% decrease in mortality rates
- shorter hospital stays

Because a relatively high number of low-risk participants were recruited for this study, cost savings per patient totalled only £188 (\$295 CDN). This cost savings is insignificant when compared to the up-front costs of the technology that was used. The authors point out that if services are targeted at patients with advanced stages of illness, the probability of cost savings and overall success of the program would increase.

Veteran Health Administration, US, 2008: In 2003, the Veterans Health Administration (VHA) introduced the national Care Coordination/Home Telehealth (CCHT) program to coordinate the care of patients with chronic conditions and avoid unnecessary admission to long-term care.

Between 2003 and 2007, the number of patients involved in the program grew from 2,000 to 31,570. CCHT is now a routine program provided by VHA to support veterans with chronic conditions as they age, improving both quality of life and reducing overall healthcare costs.

Analysis of 17,025 patients demonstrated:

- substantially lower cost over other programs and home care (\$1,600 per patient annually)
- 25% reduction in number of bed care days
- 19% reduction in number of hospital admissions

PEER-REVIEWED STUDY HIGHLIGHTS

Categories	SRSAD-Maisonneuve Rosemont Hospital Canada 2012	JR Health Centre Canada 2012	A.Steventon England (BMJ) 2012	Veteran Health Admin (VHA) USA 2008
STUDY CONTEXT				
Patient types	COPD	COPD, CHF, Diabetes and HT	COPD, Heart Failure, Diabetes	Veterans with chronic conditions
Number of patients	120	95	3,230	17,025
Period of service delivery (months)	21.5	21	12	53
KEY OUTCOMES				
% Reduction of ER visits	36%	34%	20.60%	N/A
Reduction of hospitalizations	45%	66%	10.80%	19%
Number of home visits	Increased overall, but reduced during the intervention (per) phase	Volume increased but shorter stays	N/A	N/A
Annual cost savings (%) per patient over usual care	\$1613 (14%)	\$1557 (41%)	£188	Substantial savings
Other outcomes	50% reduced hospitalization days	Reduced LOS	45% reduced mortality	25% reduced bed days
Satisfaction level	Very high	Very high	N/A	86%

Critical Success Factors: As the studies reviewed in this paper highlight, HHM programs have significant impact on patient outcomes and on more efficient provision of healthcare. Achieving important results relies on several critical success factors:

- user-friendly technology
- well-trained and supported staff
- patient engagement and education to help them understand their care plan and how to use the technology
- well-designed clinical workflow and delivery of services from the start.

The use of best practices and implementation standards is equally critical. Core Standards for Telemedicine Operations, developed by the American Telemedicine Association in 2007, is a recommended resource for healthcare leaders who are planning to implement electronic communications with patients.

Patient selection is a critical part of any successful HHM program. Select a group of patients who are too ill, then the number who fail to use the technology successfully will be prohibitively high. Cast the net too broadly, and the costs of the monitoring program will outweigh the value of the acute care encounters that are avoided.

Patient cohorts that are likely to require acute care services more frequently would justify a higher cost,

HHM facilitates better patient engagement, improved experiences, and better health.

high intensity monitoring service, as those costs would be more than offset by avoided acute care costs. Larger cohorts of people dealing with less complex conditions would have to be managed with lower cost monitoring solutions.

Strategies to reduce cost might include self-managed protocols that require minimal oversight from a clinician, use of the patient's smart phone device rather than a device provided by the health service, and alert measures that involve members of the patient's family.

Identification of appropriate patients for monitoring and their enrolment into an HHM program are significant challenges which require planning and appropriate resources. Family physicians, emergency departments, home care agencies and selected specialist practices all have something to contribute to finding candidates for a HHM program. Making these busy care providers aware of the HHM services that exist and the criteria for enrolment is not a trivial task.

Based on the research and analysis presented in this paper, there is a strong business case to be made for home health monitoring care – particularly for sub-acute patient populations at risk of exacerbating their condition and being readmitted to

hospital or having to visit an emergency department. The benefits gained by reducing the use of acute care services alone provide a compelling argument for investing in technologies that support home health monitoring.

What is perhaps even more compelling is the potential to improve the quality of life

for individuals suffering from COPD, CHF or diabetes. HHM facilitates better patient engagement, improved patient experiences and better health. The high level of patient satisfaction with HHM services – 80% or higher, depending on the study – also gives healthcare organizations the opportunity to improve their relationship with patients

and families. HHM services empower patients to manage their own health and also provide the security of additional oversight and biometric monitoring when they are at their most vulnerable.

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