University of Ottawa Heart Institute: Telehome Monitoring Technology - Regional Home Monitoring Program for Cardiac Patients

This is a regional program designed to:

- assist acute cardiac patients in the transition home
- reduce readmissions
- improve compliance with best practice guidelines
- improve self-care among patients and families.

The University of Ottawa Heart Institute (UOHI) provides an acute home monitoring program for cardiac patients in the Champlain LHIN. Patients who meet preset criteria (complex heart failure; acute arrhythmia; complex cardiac surgery etc) are provided with home monitors that transmit pulse, ECG, weight, B/P, INR and blood sugar over a regular phone line to a central station located at the UOHI. The use of phone lines is an important element of this program as it allows reach into rural communities, ease of use by elderly patients and is cost effective.

Each patient has an individualized plan in terms of vital signs transmitted, the frequency of transmission and alarm parameters for each of the vital signs. Advanced practice registered nurses (RN) use medical directives to titrate medications such as diuretics and arrange for blood work according to best practice guidelines. In addition, the monitoring system, which ‘speaks’ to the patient, has a series of preset symptom questions to which the patient responds. When a patient’s vital sign transmission or response to a question is outside alarm parameters, a call-back is triggered and a RN contacts the patient for further assessment or changes to the regimen.

Health status and progress is communicated to the primary care physician, specialists and all health care providers involved in the patient’s care. Regular reports of vital sign trends and adjustments to medications are provided through the system’s electronic health record.

We use a hub and spoke model in which monitors are allocated in local and rural communities. Community physicians determine which patients require the service based on criteria. They provide the monitor and the patient is managed by the Cardiac Telehealth staff at the UOHI. Community hospitals and 2 community health care centers have received 3-8 monitors depending on their patient needs (currently the program has 160 monitors). Patients are followed daily for 3-4 months by Telehome Monitoring and then are transitioned to an automated call follow-up system or interactive voice response technology that calls patients every 2 weeks for an additional 3 months to provide information relevant to self-care and offer opportunities to continued intervention based on their condition. The program manages > 300 patients/year. To date 1500 patients have been followed since 2005.

A 2002 randomized control trial showed statistically significant differences in readmission rates and patient satisfaction for those patients receiving home monitoring. This finding led to the program being permanent. Outcomes related to timely interventions have proven to be positive to date. A cohort of 121 heart failure patients studied in 2008 showed that 69.4% of patients had 1-2 admissions for heart failure
in the previous 6 months prior to Telehome Monitoring follow-up compared to 14.8% in the 6 months post Telehome Monitoring.

In 2009 a case-matched cohort study showed a significant difference in the 6 month readmission rate (P<0.001) pre & post Telehome Monitoring follow-up of 91 heart failure patients matched by age, gender and ejection fraction (% used to quantify heart function).

In 2010, 594 heart failure patients followed by Telehome Monitoring were divided into 2 cohorts <75 (n=350) & >75(n=244) to assess whether age produced any differences in care or outcomes. There was no difference in the number of medication adjustments, number of calls, monitoring duration, or outcomes (ER visits, admission, death) between the 2 groups.