


Office of Health and the Information Highway



*Tele-homecare:
An Overview*
Background Paper for Discussion

Canada

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Background Paper for Discussion

Office of Health and the Information Highway
Policy and Consultation Branch
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INTRODUCTION

Homecare is a component of the Canadian continuing care-delivery system, which includes, but is not limited to, the following services:

“assessment and case management; meals on wheels; adult day-care; group homes; homemakers; home nursing care; community physiotherapy and occupational therapy; long-term care facilities; chronic care units; and assessment and treatment centres, and day hospitals. Other services such as respite care, adult foster care, assistive devices programs and quick response teams may also be included (2, 3)”.¹

Homecare programs are defined as programs specifically organized to co-ordinate and provide health care and supportive services to an individual in his or her place of residence (1) .

The continuum of care extends from clinical services to social support. The entire continuum of homecare can be structured along three distinct models: homecare as a substitute for acute care, homecare as a substitute for long-term care, and homecare as a preventive service (2). Home health care is comprised of medical, nursing and rehabilitation services. There is no universal national model of home health care delivery. Each province has different models for the provision of these services.

In the United States, home health care became a growth industry during the late 1980s and 1990s. Services are provided by nurses (about 60%); social workers; health care aides; physical, occupational and speech therapists; dietitians; and physicians. Services are provided mostly by for-profit and non-profit homecare agencies, although hospitals recently entered the home health care market as well (4).

Sweden has developed a remarkable system of home health care. It can be provided in a private home, a group home or service houses. Service houses are rather unique to Sweden. They are used to house both dependent people and the elderly who otherwise do not have suitable housing (4).

The apartments are equipped with special alarms, rails in bathrooms and other assistive devices needed to compensate for disabilities. Home health care is provided by the district primary health care clinics. District nurses and nursing assistants are responsible for the

¹ References are on pp. 12-13

delivery of this care. All other health care professionals are employed as supporting consultants (4). Nurses' aides are available on a 24-hour basis to visit homes, provide emergency services, administer medications, and provide general care services to home-based patients (4, 5).

HEMOCARE EXPENDITURES

Between 1987 and 1994, investment in homecare in the United States grew by \$22 billion, and it is expected to grow to \$70 billion by the year 2000. (Kinsella, 1997, cited from ¹⁰) In 1995, there were approximately 500,000,000 home health care visits in the United States at a cost of \$90 per visit (¹⁰). According to the Insight Research Corp. report, over 130,000,000 home visits, or 20 percent, could utilize telemedical applications by 2001 (¹⁰). In the *Balanced Budget Act* of 1997, the sum of \$30 million was allocated for a "demonstration and evaluation project of telehealth homecare services for the elderly (²⁸)."

Public homecare expenditures in Canada reached \$2.096 billion in 1997-98, and this represents an increase of \$1.1 billion, or 104 percent, from 1990-1991 (¹). The last five years were characterized by a decreasing length of stay in acute hospitals and an increasing percentage of out-patient treatment arrangements. The health care system is operating under fiscal constraints, which are stimulating a search for alternative models of health care delivery. Application of telemedicine to home health care may become one of the key alternatives, taking into account upcoming demographic changes in the next 20 to 30 years.

DEFINITION OF TELE-HOMECARE

There is no single universal term to identify an emerging application of telemedicine and telehealth to home health care. However, the idea of such an application is certainly not something new. By definition, telemedicine primarily deals with remote diagnostics and consultation. Therefore, the current development of "tele-homecare" is a reflection of the increasing level of technological expertise in telemedicine/telehealth industries, market trends, and an increasing social demand for economically viable professional services in a homecare setting. At present, different practitioners are using different terms, for example, "personal telemedicine(⁶)," "telehealth homecare (⁷)," "tele-homecare (⁸)" and "telecare (⁹)."
These terms are used interchangeably to identify *the use of electronic communication networks for two-way transfer of information and data required for medical diagnosis, treatment, consultation, and/or health maintenance between a patients' residence and a health care facility.*

THE ROLE OF TELE-HOMECARE

Tele-homecare systems have an enormous capacity to enhance the delivery of home health care and thereby to lessen the “economic burden of illness” in Canada. This can be accomplished by:

- ▶ reducing unnecessary visits to emergency rooms;
- ▶ reducing unscheduled visits to physicians’ offices;
- ▶ providing early intervention or prevention of repeat hospitalization;
- ▶ teaching the patient how to manage early symptoms, thus avoiding the development of an acute pathological condition ⁽¹¹⁾; and
- ▶ gathering information on vital signs’ data fluctuations within a 24-hour period, an important component of differential diagnosis and early prevention.

POTENTIAL TELE-HOMECARE APPLICATIONS

According to the research conducted in the United States by the Capital Area Consortium on Aging and Disability, the bandwidth of 128 Kbs was sufficient for a wide range of applications ⁽¹²⁾. These include such potential medical/nursing applications as the following:

- ▶ patient interview, history, review of systems, activities of daily living;
- ▶ follow-up assessment for functional mental status;
- ▶ intervention not requiring physical presence;
- ▶ supervision of physician assistants and nurse practitioners;
- ▶ consultation with nursing colleagues and auxiliary services (physical therapy and occupational therapy);
- ▶ medical consultation;
- ▶ medication compliance;
- ▶ patient education;
- ▶ facilitation of case management;
- ▶ triage in lieu of transport to emergency room or office; and
- ▶ monitoring of vital signs, oximetry, electrocardiogram (ECG) ⁽¹²⁾.

CURRENT APPLICATIONS AND COSTS

At the present time, telehealth applications are utilized mostly by cardiac patients, or patients suffering from diabetes, hypertension, chronic obstructive pulmonary disease, septicaemia and adverse drug reactions (11). In this context, tele-homecare improves the quality of care by improving the access to care and by increasing the responsiveness of health care facilities to changes in vital signs of patients under their care (6). This increase in the quality of care can be achieved, as the costs of care are reduced. Tele-homecare can be delivered at approximately \$25 to \$35 per day (6).

ELIGIBILITY CONDITIONS AND CHALLENGES

Literature on telemedical applications for homecare acknowledges a need for a careful patient selection prior to commencing telecare. Patients should possess either sufficient cognitive ability, hearing and vision to use the system, or have an informal caregiver to provide assistance (11). Their disease processes should be stable. Patients should have an initial positive attitude toward technology, and they should be trained in terms of their ability to control the system's use and capacity (11).

Research shows that there are several issues representing challenges on the way to implementing tele-home care. Some of these issues are: reimbursement, liability, staff resistance, lack of standards, and client acceptance. Staff resistance was found to be one of the most significant barriers to using a home video system (26). The pilot tele-homecare project at Kaiser Permanente showed that staff regarded telemedical applications as a threat. Their major concern was that tele-homecare systems would replace nurses and result in job loss (26). Nurses also worried that the new system would unfavourably change their relationship with patients. However, an acceptance developed when staff observed how excited and interested patients were in the new method of delivering services. Nurses also found that the new technology allowed more flexibility in their daily schedule (26).

CANADIAN TELE-HOMECARE PROJECTS

Canadian tele-homecare is in its infancy. There are few programs in different parts of the country that are starting to use information and telecommunication technologies for home health care delivery. The fact that industry champions are emerging, despite the lack of specific funding, is encouraging. There may be a potential to develop knowledge centres, which could contribute greatly to the dissemination of tele-homecare in the near future.

With certainty, we can say that, to date, there are at least four organizations that are involved in tele-homecare projects. In addition, there are three projects that are either in the final stages of the planning process or have submitted proposals for financing. The small number of projects can be partially explained by the fact that the attention of some champions in the homecare health services is focussed on the utilization of information and telecommunication technologies for building an information infrastructure, and enabling the transmission of administrative and case-management information by qualified personnel from the point of care to central databases and to community health information networks. While these applications are, strictly speaking, not a part of the tele-homecare, they are a very important component of the emerging community health info-structure and should not be overlooked.

In a presentation at the Insight Press Conference held in January 1997, Ms. Anne E. Becker, Vice-President of Canadian Operations for Olsten Health Services (OHS), reported that OHS is using existing technology for telemedical management of high-risk pregnancies ⁽¹³⁾. The presentation identified three advances in homecare technologies, which are expected to transform patients' homes into effective and efficient primary health care sites:

- ▶ hand-held computers with case-management software for home health care nurses;
- ▶ remote-controlled drug-delivery devices and dialysis equipment; and
- ▶ point-of-care diagnostics (i.e., x-rays transmitted in real time over a cellular modem) ⁽¹³⁾.

Two hospitals located in Moncton, New Brunswick , participated as pilot sites for a emergency triage service to address a solution for the growing demand for their emergency room services ^(9, 29). Entitled Telecare Pilot Project, this project was staffed by emergency room nurses and it was receiving about 90 calls a day, after a year of operation in 1996.

After the pilot stage was completed, the province of New Brunswick decided to offer Telecare as a provincial 1-800 service through the private sector partner, Clinidata ⁽²⁹⁾.

A hospital telephone information line is not a new concept in Canada. However, the critical difference and the advantage of the New Brunswick program is its utilization of software, which provides diagnostic algorithms for more than 900 areas of patient complaints ⁽⁹⁾. This makes nursing triage so much more effective and practically delivers primary diagnostic procedures over the telephone line ⁽⁹⁾.

InfoSanté is a Quebec service operating out of the CLSCs (Centre local de services communautaires), which are equivalent to community health centres in Ontario. It is a primary care telephone information, and emergency diagnostics and triage service, similar to New Brunswick's Telecare project. It has implemented a 1-800 number and, with public health services decreasing, it receives an increasing number of calls⁽¹⁰⁾. In 1995, nurses answered 300,000 calls. By 1996, this number had reached 440,000⁽¹⁰⁾.

One of the most well-established and advanced tele-homecare programs is operated by TéléMedisys, a private sector Canadian company operating from Montreal, which is supported by Medisys Health Group, Imasco Corporation and Bell Canada. This company uses a proprietary portable (palm-size) ECG device. The device has a capacity to deliver a 12-lead ECG. When a cardiac patient feels discomfort, he or she can take his or her own ECG by attaching 12-leads to the chest area, calling the 1-800 number from anywhere in the country and "replaying the ECG over the phone to Emergency/CCU (Critical Care Unit) nurses⁽¹⁴⁾." In fact, the company went beyond tele-homecare into the realm of *mobile telehealth care*. This program operates outside the public health care system. The cost of this service for a patient is \$49.95 a month. According to the President of TéléMedisys, Mr. Stephen Maislin, this service helps to avoid 82 percent of the unnecessary (cardiac) visits to emergency rooms for the company's clients⁽¹⁴⁾. Another important benefit is the shortening of the medical response time. An average cardiac patient waits three and a half hours before an intervention⁽¹⁴⁾. The TeleMedisys service shortens this time to 20 minutes. If it is determined that the patient has a heart attack in progress, the call-centre nurse can arrange an ambulance and call the hospital. The patient's medical record and ECG can be transferred to the emergency room of the hospital, thereby eliminating a need for duplicate procedures⁽¹⁴⁾. The company is currently monitoring 600 patients in Ontario and Quebec⁽¹⁴⁾.

New Brunswick is starting a three-phase telecardiology project, which is a joint venture between NBTel Interactive and the Atlantic Health Sciences Corporation. The VITAL (Virtual Interactive Telehealth Assistance Link) project, led by a multi-disciplinary team of specialists from the New Brunswick Heart Center located in the Atlantic Health Sciences Corporation, will allow cardiologists, heart surgeons and cardiology nurses to monitor their patients' condition in the patients' homes during the six week post-operative period^(15, 29). As of November 1997, the project was scheduled to be fully operational in 18 months. Phase One will provide hospital-to-hospital triage throughout the province. In Phase Two, the tele-homecare will be initiated through the use of a device that "will look like a telephone with a small screen on it. . . .inside will be a processor of some kind, probably a mini-computer chip⁽¹⁵⁾." This device will allow the patient and physician to communicate interactively. The unit will also allow the physician to monitor the patients' vital signs. Phase-Three planning for the project has not yet been finalized.

In a recent submission to the Health Transition Fund (December 15, 1997), the Beauséjour Hospital Corporation and the Department of Health and Community Services of New Brunswick requested funding for a National Telehealth Community Care Pilot Project. An important component of this project is "communication at a distance with patients in their homes," and provision of "consultation following a visit to the hospital or as a replacement for a visit. . . . Data and video ports will be used to optimize consultations with a wide array of medical devices (27)." Preliminary discussions have been conducted with Health Canada to co-ordinate telehealth activities targeted to Aboriginal communities. The funding for this two-year project has been approved and announced.

Dr. William Hogg, Director of Faculty Development, and Dr. Jacques Lemelin, Associate Professor of the Department of Medicine, Faculty of Medicine, University of Ottawa, have proposed the creation of the Ottawa-Carleton Home Hospital (16, 17). The proposal describes the home hospital as an efficient alternative to acute care delivery. This project differs from the majority of tele-homecare projects by projecting high-level physician involvement in the delivery of home health services. The virtual hospital will include all diagnostic categories of disease with an average length of stay of 4 to 5 days of in-patient care (18). Patients in the comfort of their homes will receive daily visits from their physician, "complemented by a multidisciplinary team of caregivers (18)." The home hospital is expected to have a capacity of 387 "hospital beds." The estimated cost of the project is \$26 million (17). The project leaders anticipate savings of \$190 a day, "resulting from a reduction in staffing costs, laboratory tests, infrastructure and fixed expenses (18)." Therefore, when the hospital operates at full capacity, it will break even during the first year of operation, realizing over \$26 million in savings (\$190 x 387 patients x 365 days) starting from the second year of operation.

CANADIAN HOME HEALTH INFO-STRUCTURE PROJECTS

In addition to tele-homecare, there are projects that are focussing on using information and telecommunication technologies for streamlining and enhancing administrative and case-management activities through the development of electronic networks. These projects are aimed at creating a *home health care info-structure*, which can be conceptualized as a subset of the Canadian Health Info-Structure (CHI), with the home health care as one of the primary areas of application.

One of the pioneers in the development of the home health care info-structure in Canada is the New Brunswick Extra-Mural Hospital (EMH). In 1993, the EMH piloted a clinical documentation/information system, PtCt (Patient Care Technologies) in one of its 16 service delivery units. The project was put on hold for a period of time when the management of the home care program was transferred to the Region Hospital

Corporations. At the present time, the PtCt project has been reactivated by the Province. The target date for the first Region Hospital Corporation to migrate to PtCt is March 1999. Once the system is in place it will provide a vehicle for the multidisciplinary home care team to assess and record patient information at point of care, as well as allow for integration of both home care and hospital patient information (29).

Another New Brunswick example illustrates advancements in developing comprehensive, multidisciplinary, integrated home care solutions. CSDS (Client Services Delivery System) is an administrative database and a case management tool that enables sharing of information and expertise across programs, divisions and partner organizations beginning with public health, mental health family and community services. CSDS replaces approximately six single purpose legacy systems. This multidisciplinary, multipurpose, comprehensive solution illustrates the Province's migration toward integrated solutions with the assistance of advanced technologies for accessing, sharing, analysing, storing and manipulating complex information derived from multiple sources and available for multiple purposes. The private sector partner that has developed CSDS is MCM Technology Inc., from New Brunswick(29).

In the last three years, homecare programs in several provinces started using SACPAT (Screening Assessment and Care Planning Automated Tool) software (21). This software was designed and implemented first in Manitoba, improved in Nova Scotia and is about to be implemented in Ontario by Community Care Access Centres (CCACs) (21). The pilot projects will be operating under the auspices of the Ontario Ministry of Health's Long-term Care Operations Support Branch (Director, Ms. Astrida Plorins). Home Care Nova Scotia has been piloting the software province-wide since the summer of 1997 (21). The nurses are equipped with Toshiba laptop computers with SACPAT/SACPAT II software. This software allows nurses to screen patients with regard to eligibility for care and then to manage that care (21). The SACPAT software "captures data whenever a co-ordinator creates a new record. At the end of the day, that record and the updated ones resulting from home visits are uploaded back to the main server" at the Nova Scotia Ministry of Health (21).

St. Elizabeth Health Care is a nursing and homecare agency that provides services in the Metro Toronto area, as well as in several locations of Eastern Ontario. This non-profit organization provides a full range of electronically supported services for its patients (21). Nurses visiting their patients can remotely access a medical records' database at St. Elizabeth Health Care headquarters in Toronto, and can record their assessment and intervention data in Clinical Pathway software used in their laptop computers (21). Like their counterparts in other provinces, they are also using PtCt (29) and can upload their updated records to the central database at the end of the day. According to Ms. Mary Lou

Ackerman (21, 22), Program Manager, advanced technologies have provided St. Elizabeth Health Care with significant benefits, namely:

- ▶ standardized clinical care;
- ▶ a database with readily available information, which allows better decision making; and
- ▶ a competitive advantage in being able to access necessary information at the point of care.

The development of information systems in St. Elizabeth Health Care is being credited to the vision of its CEO, Ms. Shirley Sharkey.

In April 1997, at the conference entitled “Telehealth in Canada: Clinical Networking, Eliminating Distances”, Mr. Christian Daigle, President of Artefact Informatique, presented a proprietary SISMAD system, which will assist in operational support for homecare in more than 160 sites in Quebec (23). The capabilities of the system appear to be quite similar to the SACPAT II software.

The Toronto HealthLink Clinical Data Network has been recently joined by the Home Care Program for Metro Toronto. HealthLink currently connects 7 hospitals and 39 homecare sites in Metro Toronto, allowing them to exchange vital signs’ data, patient records and diagnostic images (24). Operations of HealthLink are supervised by Mr. Matthew Anderson, Acting General Manager.

Kingston-Frontenac-Lennox CCAC is working with the Kingston General Hospital, the Hôtel Dieu Hospital, and the Providence Community Care Centre to create an integrated electronic network that would allow multidisciplinary teams to access the medical records of their patients (25). The project is utilizing UltiCare software, which is centred on the patient, rather than the department. The access by CCAC to the integrated medical records will decrease duplication in the system, and will improve community care and homecare.

SUGGESTED TELE-HOMECARE CONTACTS

The Canadian Home Care Association's Special Projects Manager, Ms. Pamela Martin, suggested the following list of contacts as likely knowledge experts on an operational level with regard to CHI/telemedical applications in home health care:

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