The Effectiveness and Efficiency of Providing Homecare Visits in Nursing Clinics Versus the Traditional Home Setting

September 2004

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Key Implications for Decision Makers

This study investigated the effectiveness and efficiency of delivering homecare using nursing clinics instead of the traditional home visit. Three nursing clinics were built for the purpose of providing homecare to post-acute hospital clients who needed only short-term treatments, such as wound dressings and intravenous therapy. The clinic group and the home group were compared for effectiveness, satisfaction, and costs.

- Community care access centres recorded six million visits in 2002. Approximately 10 percent of these clients could be treated in nursing clinics, saving 146 full-time equivalent registered nurses and $10 million in lower-cost visits.
- The care provided in the clinics was as effective as that provided in the home.
- Both groups were satisfied with the care, but the home group was significantly more dissatisfied with the inconvenience of waiting for the nurse to come to the home.
- The time per visit in the clinic was significantly less than the home visits. Home visits take 32.2 percent longer for direct care and 46.4 percent longer when travel and documentation are included.
- Clients in the home group incurred slightly higher healthcare costs in the six weeks after they were discharged from homecare.

Nursing clinics could best operate in easily accessible places for clients, such as community health centres, and they could also serve clients who, for lack of alternative, go to emergency rooms or physicians’ offices for care.
Executive Summary

Purpose
This study investigated the effectiveness and efficiency of a new method of homecare delivery using nursing clinics instead of the traditional home visit. Three nursing clinics were built and equipped in geographically different areas of a large Canadian city for the purpose of providing homecare to post-acute hospital clients.

Objectives of the Study
• Develop and implement a new model of homecare delivery for homecare services that would better serve post-acute clients;
• Determine the effectiveness of the nursing clinic model of providing homecare;
• Determine if the model is a more efficient way to use nursing resources;
• Determine the satisfaction and acceptability of the clients and nursing staff with the new model; and
• Suggest how the model would complement and be assimilated into the acute and community healthcare sectors.

The Research Design
• The study was a randomized control trial with initial data collection immediately post-randomization and six weeks post-discharge from hospital.

The Sample Size
• The clinics served post-acute, ambulatory community care access centre clients requiring wound dressings, intravenous therapy, and other complex nursing care.
• Of 140 clients discharged from hospital or referred to homecare from their physicians, 99 (70.7 percent) were randomized to home or clinic treatments and retained for a six-week follow-up after discharge from homecare.
• The study participants were healthy, middle-aged adults, of whom 55.6 percent were female and 44.4 percent were male. Approximately 56.6 percent were working, with 36.3 percent retired, unemployed, or disabled. The most common diagnosis for the total group of clients was surgical wound/wound infection (29.3 percent), abscess/cellulites (33.5 percent), and others (10.6 percent).
percent), fistula/irrigations (12.2 percent), burns (7.1 percent), and leg ulcers (3.6 percent); the remaining 13.5 percent had medical diagnoses.

Methodology

Effectiveness:
The effectiveness variables included the Short Form – 36 Health Survey, which measured eight functional and physical health dimensions upon discharge from hospital and six weeks after discharge from homecare. The second effectiveness measure was the average number of visits required for treatment for the home and nursing clinic client.

Efficiency:
The efficiency variable was a comparison of time per visit for each group. In addition, the Health and Social Services Utilization Inventory Questionnaire compared the healthcare costs incurred by both groups during the six weeks after discharge from homecare. Satisfaction:
The satisfaction of the clients with the service they received was measured by a validated client satisfaction questionnaire, as well as questions measuring the convenience factor of both types of service. The satisfaction of providers was also measured using a new tool specific to nurses working in both the clinic and home setting.

Results:

- There were no statistically significant differences for the two groups in terms of effectiveness as measured by the Short Form – 36 Health Survey. This finding supports the hypothesis that the nursing clinics would be as effective as nursing treatment in the traditional home setting. In addition, the improvement in scores shown between the two groups was not clinically significant, except for a greater than 10 point improvement difference in social functioning for the clinic versus the home group.
- The Client Satisfaction Questionnaire, which compared the satisfaction of the clients with the service they received, found that the clients in the home were as satisfied as the clients in the clinic with their treatment. However, more positive responses were elicited for the clinic group compared to the home group for five out of the eight questions.
- The number of home clients who answered “yes” (27.3 percent) to the question “did your home/clinic visit interfere with your planned activities?” was statistically significant compared to the number that answered “yes” (2.3 percent) in the clinic group (p = .001). The comments made by the home clients about the inconvenience of “waiting at home for the nurse” indicates the importance to clients of being able to set their own appointments for treatment and plan their lives accordingly.
• The average treatment time for 632 visits of clients being seen in the clinic was 23.87 minutes, compared to the mean of 35.19 minutes for 650 visits for the home group (p < .001). When travel time and documentation were added to the visit time, the difference was 29.62 minutes for a clinic visit and 55.74 minutes for a home visit (p < .001). Travel time accounted for 12.79 minutes between home visits. The results support that the time per visit in a home setting is almost 32.2 percent longer for direct care and 46.4 percent longer when travel and documentation is included. This finding supports that it is more efficient to care for clients in a clinic setting than the home setting.

• The healthcare costs, as measured on Health and Social Services Survey Inventory, incurred by the clients six weeks after discharge were not significantly different, totalling $782 in the clinic group and $1,092 in the home group (p = 0.071). However, higher costs were incurred by the home group in the category of physician specialist (p = 0.061), social worker (p = 0.034), scans (p = 0.07), and other tests (p = 0.025).

**Implications**

The savings of using nursing clinics versus homecare translates into a potential $10 million savings and the release of 146 full-time equivalent registered nurse resources, based on six million homecare visits annually in Ontario (Doran, 2002). In addition, the satisfaction results reveal the home group was significantly less satisfied and inconvenienced waiting to be treated in the home. This study demonstrates that nursing clinics are an effective, acceptable, and more efficient alternative for home visits for certain groups of clients.
Context

Background

The 1999 Report on Home Care Programs defined homecare as “an arrangement of services enabling Canadians, incapacitated in whole or in part, to live at home, often with the effect of preventing, delaying, or substituting long-term care or acute care services.”

In reality, homecare is a combination of many different types of nursing, allied health, and support services that are loosely organized, provided by public and privately funded organizations in a largely unco-ordinated system. Co-ordination of homecare with the acute care sector is often disjointed and incomplete, an observation recognized by healthcare administrators, physicians, and policy makers advocating for improved continuity of care.

Although homecare represents a very essential component of the continuum of care, the sector represents only four to five percent of the 2002 total $112 billion cost of healthcare. However, it is one of the fastest-growing sectors, increasing from $205 million in 1980-81 to $2.5 billion in 2000-01. This rise in costs is expected to increase related to demographics, increased numbers of elderly, the decreased percentage of elderly living in nursing homes and long-term care facilities, and the continued decrease in length of hospital stays.

Homecare provides services to clients with chronic and acute conditions. The percentage of short-term post-acute clients ranges from 27 to 50 percent of total homecare nursing visits. Throughout Canada, homecare is delivered by providers who work directly for the government (public) or who are contracted by government to do the work (private). In Ontario, where this study took place, community care access centres (public) use a managed competition model to contract for-profit and not-for-profit agencies to provide the care (private).
Homecare, as well as acute care, is facing a nursing shortage, for reasons which have been studied both nationally and provincially.\textsuperscript{8,9,10,11,12,13} Contributing factors to the nursing shortage in both acute and homecare include:

(a) demographics: aging workforce (average age of 45 years old) and the projected loss to retirement of close to 30,000 registered nurses aged 50 or older by 2006, based on a total of 230,957 nurses in 2002;\textsuperscript{13}

(b) economic instability: the managed competition mechanism in Ontario for funding homecare results in requests for proposals every two to three years. Staff members lose their jobs when companies lose contracts, resulting in instability in the system as staff is buffeted between for-profit and not-for-profit companies that have different philosophies regarding professional nursing standards, education, opportunities, salary, and benefit structures; and\textsuperscript{14,15,16}

(c) worklife issues: studies have cited workplace safety, conflicts with professional colleagues, perceived lack of respect, and lack of involvement in decision-making as reasons for attrition from both the acute and homecare sectors.\textsuperscript{17,18} The need for increased education and training is cited as a major issue in nursing dissatisfaction in homecare.\textsuperscript{14} Homecare nurses visit eight to nine clients per day in homes that may be unsanitary, pest-infested, in remote areas, or in dangerous parts of a city, in all types of weather. The most frequent worker’s compensation requests are for animal bites, muscle strains related to assisting and mobilizing clients without proper equipment, and automobile accidents.\textsuperscript{19} Inadequate or incorrect supplies are a frequent problem encountered in the home environment.\textsuperscript{14}

In summary, the nursing shortages being experienced in homecare, as well as the need to investigate alternative ways to improve continuity between acute and homecare, are the compelling reasons to investigate an alternative homecare delivery system.
The purpose of this study is to determine, using a randomized control trial, the effectiveness and efficiency of a new method of providing homecare services. Nursing clinics offer an alternate form of homecare delivery for a population of clients normally cared for in the home. The underlying premise of this study is that certain groups of clients being discharged from acute care to home could be treated by nurses in a more efficient manner in an alternative setting, with the same or better effectiveness.

The study used a theoretical framework by Glouberman, which places homecare services in the context of the total healthcare system, which is fully explained in Appendix A. In addition, the study uses cost-effectiveness analysis as the basis for measuring the effectiveness and efficiency of the provision of services in the nursing clinic and home settings. Any mode of healthcare delivery in the present economic environment must be cost-effective to be adopted by provincial governments.

The background for the research question developed from observations and data, specifically:

- it was observed by the researcher and confirmed by homecare staff working in the field that a certain number of clients do not need to be seen in their homes and could be given treatment in an ambulatory care setting that provided nursing care;
- the most common documented reason that homecare clients cancelled their homecare treatment was because they had another appointment, usually with their physician, outside the home (Ottawa/Carleton VON Branch, 2000). It was assumed that if the clients were able to go to their physician’s office, they would be able to receive homecare treatment in a nursing clinic setting; and
- a pilot study carried out by the community care access centre’s director of patient services and the researcher confirmed that, conservatively, 10 percent of the clients referred from hospital to homecare could be seen in a nursing clinic/ambulatory care setting (Ottawa/Carleton CCAC, 2000).
**Previous Research**

An extensive review of the literature revealed some experience in the United States, England, and Canada with a “nursing clinic” concept, most often for health promotion and prevention activities. There were no randomized control trials found comparing the effectiveness of nursing clinics to traditional homecare visits, except for a trial done in England that compared the cost-effectiveness of nursing clinics versus traditional homecare visits to treat patients with leg ulcers.\(^{20}\)

The types of nurse-managed community health centres are best described as one of the following categories: \(^{21,22}\)

- community health or institutional outreach models, operated by an academic institution and used for educational purposes; \(^{23,24,25,26,27}\)
- community wellness and health promotion models, non-academic, and more commonly seen in rural or under serviced areas; and \(^{28,29,30}\)
- independent practice or nurse entrepreneurship models serving a group of clients with a particular health problem, \(^{31,32,33}\) such as homelessness, \(^{34,35,36}\) cardiovascular disease, \(^{37}\) or chronic illness.\(^ {38}\)

In England, a number of studies has suggested that the establishment of leg ulcer clinics increases healing rates through standardized treatments as well as transporting the clients to the clinics as part of a socialization process.\(^ {39,20,40,41}\) In Canada, a few nurse-managed clinics exist in rural and urban areas, providing multidisciplinary health prevention and promotion services.\(^ {42,43}\)

In summary, nurses, primarily nurse practitioners, are providing primary care, health promotion, and treatments in nurse-managed clinics located in urban and rural areas in the United States, England, and Canada. These clinics are under the jurisdiction of a university, provincial/municipal government(s), or a private group of nurses. However, none of the examples of nurse-managed clinics in the literature provided homecare services.
Implications of Research

Ministries of Health

This study provides the empirical evidence that nursing clinics are more efficient than home visits for eligible clients and can serve as a bridge between the acute care and community sectors. Post-acute hospital clients with certain diagnoses and treatments can be treated as effectively and more efficiently in a nursing clinic, rather than at home. Close to twice as many clients can be treated in a nursing clinic, compared to the average number of homecare clients treated by a registered nurse on a typical day. The satisfaction levels of clients treated in nursing clinics was higher than that of homecare clients, primarily for the convenience factor.

In addition to post-acute hospital clients, clients treated in expensive settings, such as emergency rooms or physicians’ offices, could be sent to a nursing clinic for wound dressings, intravenous therapies, and other treatments. Nursing clinics should be set up in the community, in existing buildings where healthcare is delivered, such as community health centres or shopping malls, which provide easy access for clients.

Community Care Access Centres

The costs per treatment at a nursing clinic are less than traditional homecare by 32 percent for direct care. The results of this study indicate that if 10 percent of the province’s six million annual homecare visits were completed in a nursing clinic setting, conservatively $10 million could be saved each year. In addition, approximately 146 full-time equivalent registered nurses in the Ontario homecare system could be freed up to do additional visits (see Appendix B).

Providers of Homecare (Agencies)

It is imperative that employers practice improved recruitment and retention strategies during this current nursing shortage. Nursing staff involved in this study stated their preference for working in both venues and that the clinics offered a fast-paced, clean environment, with adequate supplies and relief from driving. In addition, they stated the
nursing clinics offer an alternative venue for clients whose home surroundings are not appropriate for sterile dressing changes or for clients who live in a dangerous environment.

**Clients**

The client satisfaction survey and specific questions regarding the clinic/home convenience factors found the clinic service to be as acceptable as the home service. The home group, however, was significantly less satisfied and inconvenienced waiting to be treated at home.

**Approach**

**Study Design**

The study design was a randomized control trial comparing the effectiveness and efficiency of providing nursing care in a nursing clinic versus the traditional homecare setting.

The study took place in a large urban/rural area in Ontario with a population base of more than one million. It was a collaborative project with the Community Care Access Centre of Ottawa-Carleton, two providers of homecare (one for-profit, the other not-for-profit), and the System Linked Research Unit of McMaster University. Over a period of 24 months, three nursing clinics were funded, built, equipped, and staffed through consultation between the researcher, the access centre, and a not-for-profit provider. Two clinics were established in large shopping malls, located in the east and central parts of the city. The third was established in the west, in a building housing a community day respite centre. Case management services consisting of eligibility assessments, treatment arrangements, and ongoing services were provided by the access centre for all subjects. The nurses from the provider agencies worked in both the clinics and home settings for the duration of the study.
**Study Population**

Subjects were referred to the access centre from two tertiary care hospitals, a community hospital, the provincial francophone hospital, and the community at large, including physicians’ offices and long-term care facilities. Clients who were eligible for the study included:

- clients who required intravenous therapy, wound dressing changes, medication administration by any route, wound irrigations, or teaching;
- clients who were ambulatory and able to travel to a clinic setting; and
- clients who could communicate in either English or French.

Clients were ineligible for the study if they were bedridden, too physically ill to leave their homes, or mentally incompetent. The presence of a caregiver was not required to participate in the study. Clients from hospital, emergency rooms, or physicians’ offices referred to the access centre for homecare were interviewed by the case manager for their willingness to participate in the study and randomized to the control or experimental group. The duration of treatment in the clinic or home was determined by the client’s treatment regime, disease process, and psychosocial needs.

**Study Procedures**

Prior to the start of the study, groundwork was done to establish the management structure, communication vehicles, and education components necessary to carry out the study. A steering committee was established with the researcher, the access centre’s program directors, and managers from the provider agency. Linkage with the McMaster University System Linked Research Unit for advice on methodology and analysis of the study was done through the researcher.

The purpose of the steering committee was to monitor the progress of the study, address problems regarding the research process, assist in planning staff education, and assist the case managers with the study protocols. Communication vehicles for the access centre’s case managers and provider agencies that were developed included a nursing clinic.
newsletter, which discussed the progress of the study, meetings with the case managers at each hospital site, and e-mail messaging. For external audiences, such as provider agencies, a nursing clinic primer was written, explaining the potential effectiveness and efficiencies of the nursing clinic concept and instructions on how to set up a clinic.

Over a period of six weeks, 150 case managers and staff from the access centre, including 20 hospital case managers who were directly involved in the study, and close to 100 nursing staff received education regarding the purpose and protocols of the study presented by the researcher and, at the access centre sessions, by the CEO of the centre.

**Outcome Measures**

The outcome measures were chosen to evaluate the effectiveness and efficiency of clinic versus home setting. A framework in Appendix C, developed by Birch, Gafni and associates, illustrates how to classify the possible outcomes, that is, effectiveness and efficiency of economic evaluations of healthcare programs.44

According to this classification framework, the effectiveness and expenditures of two alternatives in a randomized control trial can result in nine possible outcomes, as shown in Figure 1.44 Cell 1 indicates that increased benefits produced by a program are possible but at increased expenditures. This is in contrast to cells 4 and 7, which illustrate that programs which produce increased benefits may do so at the same or reduced expenditures. Cell 3 depicts a program which results in reduced benefits at increased costs, whereas in cell 9, the program has a reduced benefit but at reduced cost. Reduced expenditures may be preferred to release resources for other purposes. The framework has been used in 12 different community care studies to compare the effects and expense of alternative interventions for a single problem with the goal of maximizing improvements in health and well-being of groups of primarily community clients.45

The constructs being measured in the study included client characteristics, effectiveness, efficiency, and client and staff satisfaction. A summary of the constructs, measurement tools, and statistical analysis performed is in Appendix D. Client characteristics were
measured within 72 hours of randomization using a socio-demographic questionnaire, including such variables as age, gender, living arrangements, language, marital status, income range, and employment status.

**Effectiveness Measures:** the selection of the Short-form 36 Health Survey (Version 2) was based on the expectation that the subjects would be drawn from the general population base, with disparate but temporary conditions, relatively well, and not elderly (older than 75 years of age). The questionnaire was also chosen for ease of administration and short length of time to complete.

The survey is a multi-dimensional generic instrument, which can be used to compare the health status of clients with different conditions to those clients in the general population. It includes multi-item scales, which measure eight dimensions of health: physical functioning (10 items), role limitations related to physical health problems (four items), bodily pain (two items), social functioning (two items), general mental health, including psychological distress and well-being (five items), role limitations due to emotional problems (three items), vitality, energy, or fatigue (four items), and general health perceptions (five items). The eight dimensions are scored separately on a scale from 0 to 100; a higher score indicates better health. In addition to the eight dimensions of health, there are two summary component scores for physical and mental health.

The second effectiveness measure was a comparison of the average number of visits per client in both groups.

**Efficiency Measures:** the hypothesis of the study was that it would be more efficient to treat clients in a nursing clinic setting compared to the home environment. To test the hypothesis, direct and indirect costs of a clinic visit versus a home visit based on the number of minutes per visit were compared. Direct costs consisted of the average salary and statutory benefits. Indirect costs consisted of administrative and operating costs. The contract between the access centre and the provider (the Victorian Order of Nurses) is based on a cost per visit agreement, regardless of where the visit takes place. For this
study, the cost of visit in a clinic was the same as in the home. Therefore, if the time per
treatment in the clinics was less than in the home, a case could be made that the charge
per visit should be less in a clinic setting.

The second measure of efficiency was to compare the use and expenditures of acute
hospitalization, physician visits, and other health and community services for both groups
of clients six weeks after discharge from the access centre’s services. The decision to
measure healthcare expenditures after discharge from homecare was based on the notion
that if the treatment for both groups was equivalent, the residual health effects post-
discharge should not be significantly different, that is, one group should not require
additional healthcare expenditures more than the other group.

The Health and Social Service Utilization Inventory\textsuperscript{49} was used to measure the costs
expended over a six-week period. The questionnaire asks about the client’s use of
physicians (family or specialist), allied health personnel (such as physiotherapy,
occupational therapists, social workers, and others), nurses, community support such as
Meals on Wheels, homemakers, hospital episodes and lengths of stay, emergency room
visits, and laboratory and diagnostic services. Indirect costs and out of pocket expenses
for medications (type, dosage, and frequency), supplies, aids, and medical devices were
also recorded

**Satisfaction Measures:** Client: The Client Satisfaction Questionnaire was explicitly
developed and validated to evaluate a new or established service.\textsuperscript{50, 51} This questionnaire
was given to clients upon discharge from the clinics or home visits The questionnaire
consisted of eight questions on a four-point Likert scale, asking the clients to rate the
service, if it was effective in meeting their needs, was it what they wanted, if they would
recommend it, if and how satisfied they were with the amount of help they received, if
they could deal more effectively with their problems because of the service, and if they
would use the service again.

In addition to the Client Satisfaction Questionnaire, three questions were asked of clients:
Did you have any problems receiving home/clinic visits?
Did your home/clinic visit interfere with your planned activities?
Did you have to miss a scheduled home/clinic visit and why?

The reason for these last questions is related to the observation by the researcher that the most frequent complaints from clients is the uncertainty of waiting for the nurse to arrive to do their care and interfering with other activities. In addition, the most frequently cited reason for a client cancelling visits is to attend other appointments.

**Satisfaction Questionnaire:** Staff: There were no validated staff satisfaction questionnaires appropriate to compare staff’s opinion about working in the clinics versus the home. Therefore, a qualitative staff satisfaction interview/questionnaire was developed to measure and compare staff satisfaction with working in either venue of care delivery. One of the outcomes of this study was to demonstrate that a scarce human resource — nursing personnel — could be used in a more efficient manner. It was hypothesized that providing care in one place with proper supplies and equipment and without travel responsibilities would increase quality of worklife and potentially influence retention.

**Data Collection**

The data was collected at two points in time: time 1 within 72 hours of the first clinic or home treatment or referral from the community, and time 2 six weeks following discharge from homecare services. Both interviews were conducted in person or, if an in-home interview was not feasible, by telephone.

At time 1, demographic information was collected and the client filled out the Short-form 36 Health Survey. At time 2, clients completed the survey a second time, along with the Client Satisfaction Questionnaire, the additional satisfaction questions developed by the investigator, and the Browne Health and Social Services Expenditures Questionnaire. During the treatment phase, nursing staff documented the number of visits, type of treatments, method of transportation (clinic subjects), and number of kilometres of travel for the nurse (home subjects). In addition, the nurses documented the time per treatment.
Effectiveness and Efficiency Statistical Analysis

Effectiveness Data

A standard t-test statistic was used to compare the mean scores for eight dimensions of healthcare and the two summary component scores of physical and mental health from the Short-form 36 Health Survey of the two groups six weeks after discharge. The mean number of visits of both groups was also compared using t tests.

Efficiency Data

The mean times per visit of both groups, including documentation and travel time, were compared using t tests. The expenditures of the health and social services utilization data for each group at six weeks after discharge were compared using the non-parametric Mann-Whitney U test. This test was used because the data is typically skewed and variable.

Satisfaction Data

The percentage of clients satisfied was compared between groups at six weeks after discharge using chi-square analysis. Descriptive comments were categorized and summarized. The satisfaction data of the nursing staff, including average scores of the questions and descriptive comments, were presented, categorized, and summarized.

Limitations

The limitations of the study were related to the challenges of health services research in a changing political environment. These limitations were:

- the total number of eligible clients was not known, only estimated using 10 percent of the total client population;
- the access centre’s budget constraints in 2001-02 restricted recruitment into the study for one year; the case managers and nursing staff required retraining after the one-year period. The explanations about the study and the case managers’ perceptions about the study may have altered;
- a number of hospital case managers were not active participants in the study, thereby missing potential subjects. The actual number of clients missed could not
be measured without a daily audit of the access centre, for which the resources were not available; and

- the project investigator was not blinded to the clients at time 2 because the questions were specific to where the client had treatment.

Results

Response Rate

Intake of subjects into the study began March 2001 and continued until August 2003, with completion by December 2003. Originally, intake was planned for one year; however, in the early fall of 2001, the Ontario Ministry of Health informed the access centres that budget increases would not be possible and instructed them to balance their budgets. The Ottawa-Carleton centre informed the case managers that clients ready for hospital discharge and assumed to need a certain level of care (for example, intravenous therapy for a short duration) were to be sent to their personal physician’s office or emergency room. Unfortunately, the clients in this category, including those clients in need of wound dressings, were those most likely to be eligible for the nursing clinic study. As a result of the budget constraints, recruitment into the study nearly ceased from November 2001 to August 2002. During this period of time, numerous meetings took place with the investigator and the centre’s management to find alternatives to re-establish recruitment, including engaging another access centre (Sudbury) that also employed a very active nursing clinic. However, none of the alternatives was successful. In September 2002, the access centre lifted the restrictions, recruitment resumed, and case managers and staff were reoriented to the study. Therefore, due to the centre’s change in policy, the number of clients who would have been eligible for the study is not known. The total number of clients in 2001 was 21,581 and in 2002 was 19,870 (O/C CCAC, personal communication). The initial pilot testing of eligible clients for the clinics estimated that there would be approximately 10 percent, or 2,158 (2001) and 1,987 (2002), clients eligible, far fewer than those actually recruited into the study.

Two additional disruptive factors affected recruitment into the study:
a) total turnover of the access centre’s management staff, including the resignation of the CEO, who was co-investigator in the study; and
b) non-participation by a number of hospital case managers in the study, who expressed the opinion that, due to the nursing shortage and inability by the nursing providers at times to provide home visits, any client who could be seen in the clinic should go to the clinic and not be randomized, thereby allowing more available home visits. In addition, some of the case managers did not want to spend time explaining the study and asking for participation. Fortunately, a number of case managers at each hospital supported the purpose of the nursing clinic study and participated in the recruitment process.

**Study Participants**

Individuals 18 and older who were eligible for the study were screened from four hospital settings. Between March 2001 and August 2003, 140 individuals eligible for community care access services and fitting the eligibility criteria for the study were screened and asked to participate in the study. Of the 140 clients eligible for services and the clinic study, 18 refused participation (12.9 percent refusal rate). Of the 122 consenting clients, three subsequently refused to fill out the Short-form 36 Health Survey after being contacted by the research nurse, for a total of 119 consenting, eligible clients. The study flow diagram is illustrated in Appendix E.

Of the 119 clients eligible and consenting to be randomized to the clinic or home setting, 99 (83.2 percent) were retained for time 1 and time 2, that is, during the delivery of services and for six weeks after discharge. If services were still being delivered three months after time 1, the client was considered stable and chronic and was asked to fill out time 2 data. There were no significant differences in the demographics, social characteristics, and Short-form 36 Health Survey scores in the clients lost to follow-up and the study completers.

Ninety-nine people completed both phases of the study. They were a fairly healthy, working adult population with an average age of 52.8 years. Most (90.8 percent) lived
with a spouse, family member, partner, or roommate, 56.6 percent worked full or part time, and 36.3 percent were retired, unemployed, or disabled. There was no statistically significant difference in the baseline characteristics between the experimental (clinic) and control (home) groups.

**Primary research question #1: Is a nursing clinic an equally effective way, as measured by the differences in improvement in the Short-form 36 Health Survey scores, to provide homecare as compared to the traditional home visit for patients with targeted conditions?**

The mean scores and standard deviation for the two summary component scales and each of the eight dimensions on the Short-form 36 Health Survey at baseline and six weeks after discharge was not statistically significant for any of the scales, which supports the hypothesis that patients attending the nursing clinics would be equivalent to the traditional home setting in their survey scores. The point improvements in the mean scores of both groups between times 1 and 2 were compared in Appendix F.

Although the mean scores were equivalent between treatment groups, the point improvement differences in the clinic group in the pain, role physical, vitality, and social functioning dimensions may indicate that the client enters recovery stage more quickly after receiving treatment in the clinic setting. The home group showed a greater than 10 percent improvement difference between the two times compared to the clinic group in physical functioning only. The average number of visits per client was 14.4 for the clinic clients and 11.8 for the home clients, the difference of which was not statistically significant.

**Secondary research question #1: Are the nursing clinics, compared to home visits, a more efficient way to deliver community care?**

The difference in the average direct treatment time for those clients being seen in clinic compared to the home was statistically significant (p < .001). The clinic clients experienced 632 visits with a mean of 23.87 minutes per visit, compared to 35.19 minutes
per visit and 650 visits in the home group (Appendix G). This finding supports the assumption that the same treatment could be offered at a nursing clinic setting in a far reduced period of time. Adding documentation time for the clinic group resulted in an average total time per visit of 29.62 minutes, while adding documentation and travel time for the home group resulted in 55.74 minutes per visit. The average travel time for each nurse between home visits was 12.79 minutes. This travel time is consistent with the Victorian Order of Nurses’ average travel time between home visits (B. Cernuik, ED VON Ottawa Carleton, 2003). If the travel time were removed from the average total home visit time, the average total time for direct treatment and documentation would be 42.95 minutes versus the direct treatment and documentation of 29.62 minutes in the clinic. The difference between the home and the clinic is the time required for the nurse to get accustomed to each home setting, arrange dressings and supplies, and set up a safe place to do the care. In a clinic setting, the supplies and equipment are readily available, the nurse is accustomed to the setting, and a sterile field is easily set up.

Secondary research question #2: Are the healthcare costs incurred by the client six weeks after discharge different in the clinic versus the home group?

Clients were asked to complete the Health and Social Services Utilization Inventory to capture the amount of services required by the two groups during the six weeks after their discharge from homecare. The inventory of unit charges or costs for each service was based on averages for Ontario, Canada as reported by Browne et al,49 as well as the current Ottawa-Carleton access centre nursing rate contract charges.

The mean cost of each item on the Health and Social Services Utilization Inventory was compared between the clinic and home groups (see Appendix H). The costs were not annualized, as the need for health and social services was thought to be associated and limited to the recent episode of illness. The total costs for each group for the 33 services averaged $954, with the clinic group costing the system less ($782.19) than the homecare group ($1092.58) (p = .071). The main cost difference between the two groups was for the inventory items: physician specialist, social worker, laboratory test, other tests,
medications, and visiting nursing services. The largest difference, however, was the visiting nursing cost, which was more costly for the home group ($108.52) than the clinic group ($12.92) (p = .009). The reason for the nursing visits, either in the home or clinic, post-discharge is two-fold:

a) four clients in the home group and three clients in the clinic group continued their visits from time 1 onward for three months. At the end of three months, they were considered to be at time 2 and interviewed, even though they were not formally discharged. For the six weeks prior to the end of time 2, the number of clinic or home visits that occurred were counted in the Browne survey; and

b) there were five clients that returned for services after their discharge and within six weeks of time 2, and the cost of their visits, whether home or clinic, are captured.

The home group used more family physician, walk-in clinic, and physician specialist services than the clinic group ($92.99 clinic versus $129.51 home) as well as social worker services ($0 clinic versus $108.72 home). Increased physician services resulted in increased laboratory test costs for the home group ($45.27 clinic versus $110.63 home). Of note is that the medication costs of the clinic group were higher than the home group ($123.87 clinic versus $73.32 home). Hospital costs were equal and low in both groups, indicating that most clients did not require further hospital care six weeks after discharge. The reason why the clinic group sought out less physician assistance than the home group is not evident. However, the clinic venue could assure clients that their needs are being addressed in a professional, ambulatory, medical-like atmosphere, and as a result the clients may seek out less physician assistance post-discharge.

Secondary research question #3: Are the clients more satisfied by the treatment received in the nursing clinics or that received in the home?

The Client Service Evaluation questionnaire consisted of eight questions inquiring about the client satisfaction with the services they received in either setting (Appendix I). The difference in the responses of the home or clinic clients to all eight questions was not
statistically significant, indicating that the clients were generally satisfied with the care in either setting. However, there were some differences in the gradations of the responses on each of the Likert scales.

*Secondary research question #4: What are the advantages and disadvantages of the clinic versus home setting from the opinion of the providers?*

During the data collection, 15 nursing staff were involved in providing care in both the clinics and home setting. Twelve of the 15 responded to a staff satisfaction questionnaire. A summary of the advantages and disadvantages of clinic versus home as perceived by the nurses is available in Appendix J. The nurses perceived the advantage of the clinic environment to be a safer, cleaner, and better-equipped place to treat clients. The disadvantages of the clinic are that it is faster-paced with little down time, and it is more task-oriented, resulting in less social time spent with the clients.

The advantages of the home environment are that the pace is more relaxed and the nurse can spend more time with the client to do an in-depth assessment. The disadvantages stated that the conditions in the home are not always conducive to procedures (lack of cleanliness) and there is an increased risk to nurses for back injuries, exposure to pets, and smoking. Supplies are frequently not delivered to the home in time for treatment. In addition, the nurses mentioned traveling in all sorts of weather as a disadvantage, along with the clients’ expectations of set times for visits, which cannot be guaranteed.
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List of Appendices

Appendix A       Conceptual Framework
Appendix A

Conceptual Framework

Home care is part of the larger health care system, which is made up of the acute care, long term care and community care sectors, loosely associated through disjointed linkages. Could a new venue for delivering health care, specifically nursing clinics, fit into the health care system and into which sector, the acute or community care?

A theoretical framework has been proposed to explain the activities, organization and unreconciled mindsets of the healthcare world known as the acute, home care, long term sectors. The purpose of introducing this model is to use it as a framework to explain how a new way to deliver health care services, through a nursing clinic, could be introduced into the system. The model divides health care into a “four sectors” model of care, cure, community, and control. In the bottom left of Figure 1 is “cure” representing acute care provided by physicians primarily in hospitals, highly specialized to focus on the acutely ill, or disease “cure.” In the lower right is “care” representing hospitals, long term care, home care, and primary care provided by general practitioners, nurses, other professionals, as well as “alternative” health services. In the upper right, “control” at the societal level, is represented by authorities such as hospital managers, public health authorities, regulatory agencies, charged with controlling the overall system. At the societal level, upper left, “community” is represented by elected officials, advisory groups, hospital trustees who seek to exercise influence but not provide direct delivery of service.

The four sectors of health care are divided by horizontal and vertical boundaries or cleavages. Both the care and cure sectors are separated horizontally by a “clinical divide” from the control (government, regulatory agencies) and community (politicians, Board of Directors, advocacy groups), those sectors that are not directly involved in clinical work. The vertical cleavage separates those who are employees in the system and those who are not. The staff who work in the care quadrant (hospitals, long term care, community support) and control quadrant (government, regulatory agencies/managers) are employed by the system, whereas people working in the community (politicians, Boards of
Directors, advocacy groups) and cure (physicians) quadrants are not employed by the system.

The model defines the boundaries between the quadrants and helps explain the difficulties in integrating and coordinating the delivery of health care services. The authors conclude that efforts to smooth boundaries between the system elements have either been unsuccessful or have concentrated on integrating one of the four sectors, i.e. merging hospitals, and not on the system as a whole.54

The “four sectors” model represents a system that is highly differentiated and one that requires integration in order to work properly. For the most part, acute care hospitals dominate a highly specialized part of the system, the “cure” quadrant, and primary community and home care services dominate the “care” quadrant.

A nursing clinic could serve as an alternative to home care and a bridge between the acute hospital and community, by offering post acute services, similar to those discussed in the Kirby and Romanow Reports.55,56

Four mechanisms, adopted from Glouberman for improved coordination and integration, are used to explain how a nursing clinic could bridge between the acute and home care sectors.

1. Coordination of the Acute “Care” Clinical Operations:

In order for a nursing clinic service to be accepted by physicians, nurses and health care administrators, the “cure” and “control” group of the system, the service would need to be as, or more, clinically effective as the present home care delivery system. If the effectiveness can be supported, the new service must then be incorporated into care plans and “best practice” for clients who could benefit from nursing clinics.
2. Coordination from Acute to Community Care

Effective discharge planning would be essential to incorporating nursing clinics as an alternative home care service. Nursing staff, social workers, physicians, and CCAC case managers would require education about the appropriate use of the nursing clinics and develop mechanisms to refer the clients to the clinics. The CCAC case managers are key to developing the referral mechanisms, treatment care plans and the travel arrangements for the clients. The CCAC administration would require agreements with provider agencies to set up and run nursing clinics.

3. Collaborative Management over Departmental Walls

Managers between the acute care and community sectors are key to facilitating the link between the two sectors through (a) the development of best practice care plans that link the provision of treatments from out of acute into the community; (b) provision of common technology and equipment, such as IV pumps, which would be used by both sectors to complement the care from acute to community; (c) education of the acute care and community staff about the purpose of the clinics, the eligibility criteria and types of clients who would most benefit from the treatment.

4. Collaborative Management of the Entire System

The “control” (ministries of health, hospital administration) and “community” (boards of directors) quadrants of the model would not accept nursing clinics as an alternate model of health care delivery unless it could be demonstrated to be as, or more, cost efficient as the present home care services. In addition, it would be important to consider the capital costs involved to implement the new service. If the service could be provided in available facilities, without new capital investment, and with decreased operating costs, the argument to include nursing clinics in the present home care delivery system is compelling.