



# Nurse–Physician Collaborative Partnership: a rural model for the chronically ill

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**Introduction:** Accessibility and quality of primary health care services in rural areas are challenging issues, particularly for the elderly and those with chronic or complex medical conditions. The objective of the Nurse–Physician Collaborative Partnership was to implement and evaluate a collaborative partnership between homecare nurses and family physicians in the rural Trochu–Delburne–Elnora area of Alberta.
**Methods:** Overall, 37 patients were enrolled in a shared care plan, which included comprehensive biopsychosocial assessment, early intervention, health education and self-management. Patient and provider outcomes were assessed using quantitative and qualitative data collected at baseline, 6 months and 12 months.
**Results:** Results showed that patients made improvements in activities of daily living and robust cognitive status. In interviews, patients reported improvements in psychological well-being, knowledge of disease processes and confidence to manage health issues. Patients' use of acute health care services decreased, showing a 51% reduction in the number of days in hospital, a 32% reduction in emergency department visits and a 25% reduction in hospital admissions. Total acute service costs, excluding program costs, decreased by 40% from an average of $15 485 to $9313 per person ($p \leq 0.05$).
**Conclusion:** Based on these results, policy initiatives that incorporate the shared care model developed in this project may be considered. To our knowledge, this type of evaluation has not previously been conducted in a rural Canadian setting.

**Introduction :** L'accessibilité et la qualité des services de soins primaires dans les régions rurales posent un défi, particulièrement dans le cas des personnes âgées et de celles qui sont atteintes de problèmes médicaux chroniques ou complexes. Le Nurse–Physician Collaborative Partnership avait pour objectif de mettre en œuvre et d'évaluer un partenariat de collaboration entre les infirmières en soins à domicile et les médecins de famille dans la région rurale de Trochu–Delburne–Elnora, en Alberta.
**Méthodes :** Au total, on a inscrit 37 patients à un régime de soins partagés qui comprenait une évaluation biopsychosociale détaillée, une intervention rapide, une formation en santé et l'autogestion. On a évalué les résultats pour les patients et les prestateurs à l'aide de données quantitatives et qualitatives recueillies au départ, puis 6 mois et 12 mois plus tard.
**Résultats :** Les résultats ont révélé chez les patients une amélioration des activités quotidiennes et un statut cognitif solide. Au cours d'entrevues, les patients ont signalé une amélioration de leur mieux-être psychologique, de leurs connaissances des processus morbides et de la confiance qu'ils avaient pour pouvoir gérer leurs problèmes de santé. L'utilisation par les patients des services de soins actifs a diminué : le nombre de jours d'hospitalisation a diminué de 51 %, le nombre de visites à l'urgence, de 32 %, et le nombre d'admissions à l'hôpital, de 25 %. Les coûts totaux des services de soins actifs, à l'exclusion des coûts de programme, ont diminué de 40 % pour passer en moyenne de 15 485 $ en moyenne à 9313 $ par personne ($p \leq 0,05$).
**Conclusion :** Compte tenu de ces résultats, on peut envisager des initiatives stratégiques incorporant le modèle de soins partagés mis au point dans le cadre de ce projet. Sauf erreur, on n'avait pas procédé auparavant à une telle évaluation en milieu rural au Canada.



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## Introduction

The challenge of maintaining both access to and quality of primary health care services in rural areas is well documented.[1] Rural residents face problems such as fewer health resources and distance or transportation issues.[2] In addition, rural residents are more likely to be elderly and in poorer health than urban dwellers.[3] Therefore, to be effective, primary health care services need to reflect the community in which they evolve[4] as well as be community based and community driven.[5]

Among the numerous issues facing rural residents, the need to coordinate the care of people with chronic illness is undisputed and gaining momentum. Recent studies show that chronic disease management accounts for a large proportion of health care funds.[6] Reid and colleagues[7] noted that "high users" bear an enormous burden of illness; they have multiple conditions — over 80% of "high users" have at least 6 different types of illness and 30% have 10 or more. Caregivers are often not well either. A recent study in the United Kingdom found that 40% of caregivers had illness or disability themselves and recommended that identifying and supporting caregivers is an essential part of primary care.[8,9] Successful interventions for people with chronic illness are complex and have many components. Although research is promising, demonstrating effectiveness in practice is limited.[10]

While current methods of care incorporate chronic disease management,[11] more comprehensive models that address the complexity and required coordination of care are emerging, for example the Chronic Illness Care Model[12] and others.[13,14] In a review of best practices in coordinated care, Chen and colleagues[14] identified 2 main approaches: disease-based and case management. While the latter provides coordinated care to smaller groups of complex medically or socially vulnerable "high risk" individuals, the former provides disease management to larger populations of chronically ill people under a banner of a single primary disease, such as diabetes.

The aim of our project was to improve both access to and quality of primary health care services in rural Alberta through development, implementation and evaluation of a collaborative partnership between homecare nurses and a family physician practice within the context of a primary health care model. We also sought to identify levels of staff satisfaction with a change in service delivery model. This paper outlines key quantitative and qualitative findings related to patient, system and provider outcomes. Such information has not, to our knowledge, been previously reported in Canada.

## Study setting and history

The Trochu–Elnora–Delburne area is a large, rural geographic area in central Alberta that has limited primary health care services. Access to services and quality of services, in terms of choice of provider and scope of services, are lacking. This area has large numbers of patients who are elderly and who suffer chronic and complex medical conditions, or both. Like many other rural areas, there is an increasing demand for physician services with concurrent difficulties in the recruitment of physicians. This is intensified by the additional difficulties of recruiting and retaining nurse practitioners.

The history of our project dates back to 1995, when the Elnora Hospital was closed. In 1998, residents of the Elnora area became involved in the David Thompson Health Region's (DTHR) Healthy Communities Initiative. The DTHR received 2 years of health transition funding to develop a primary health care model consisting of a primary health care team that included a nurse practitioner as well as primary health care services and specific community action.[15] The project in turn led to further development of primary health care services, including increased collaboration and stronger primary care service links between the physician and the nurse practitioner. Funded by Alberta Health and Wellness health innovation funds, the physicians in Trochu then partnered with a nurse practitioner in an attempt to address the issue of accessibility to primary health care services. Following the resignation of the nurse practitioner and 9 months of intensive yet unsuccessful recruitment, a proposal was developed and accepted by Alberta Health and Wellness to continue the project described herein.

The purpose of the Nurse–Physician Collaborative Partnership was to focus on the development of a broader primary health care team to improve the access to and quality of primary health care services to high needs patients who are elderly and who have chronic or complex medical problems. The specific objectives of the project included establishing an appropriate and affordable nurse–physician partnership and implementing a primary health care model to meet the expressed needs of the local community.

## Methods

The project was implemented incrementally, building on identified learning from past local primary care projects and best practices in chronic illness care.[12] One physician and 2 community project nurses (and other allied health professionals on an "as required" basis) worked together to improve coordination of care for a select group of patients with chronic or complex medical problems. Between June and August 2002, 2 community nurses were recruited; additional computer hardware was purchased, programmed and tested; program admission criteria were developed; guidelines for nurses accessing patient records were developed; further development of "shared care guidelines" was initiated; and a privacy impact assessment by the primary physician and the DTHR was submitted.

The project became operational in September 2002, when the first patients were enrolled in shared care. During the start-up phase, the nurses completed initial computer training, enrolment criteria and a consent form, and a preliminary list of eligible patients was developed. A schedule was established to enroll patients in a graduated fashion, and procedures for long distance "dial up" were explored and implemented. In addition, existing guidelines for shared care were expanded to include:

1. defining the nurses' scope of practice;
2. clarifying roles and responsibilities;
3. clarifying accountability and liability issues;
4. developing guidelines; and
5. identifying and recommending policy changes.

Knowledge and skill gaps were also identified for the project nurses and professional development followed. In addition, the electronic patient health record system was modified to enable nurses to access patients' records and communicate with the physician remotely from the point of care. This communication was through the Electronic Medical Record's (EMR) internal email system. The system had an urgent message feature that could interrupt the physician when he was working at his workstation; however, this was rarely used.

Program planning and development was firmly based on interdisciplinary collaboration and the shared care model evolved through experience and dialogue. Throughout, realistic expectations were maintained and consultation with partners was the standard model of service delivery. Services included referral and admission; comprehensive biopsychosocial assessment; shared care plan development and modification determined by patient condition; and active patient management through monitoring, standard and advanced nursing interventions, consultation with other health care providers and linkage to community supports.

### *Patient recruitment*

Patients were invited to participate based on the following criteria:

1. identification as eligible for shared care by either the physician or the nurse;
2. seeking health services at the medical clinic; and
3. provision of service based on assessed need, which could include 1 or more chronic disease states that are not controlled, 1 or more chronic disease states that are not currently being treated but could be, dosage regimen changing more than 4 times in the past 12 months, drug-related problem or potential for a drug-related problem, history of non-compliance and appointments with multiple health care providers, or a recent decline in health status.

Patients who agreed to participate were enrolled in the project after a discussion with the physician and signing an informed consent

About one-half of the patients was selected from the home care roster. The other half was patients from the physician's caseload who had chronic disease management issues but did not require home-care services. Once the patient was enrolled, the physician and nurse (and other allied health professionals, if indicated) developed, collaboratively, a shared care plan for each patient. The nurse put the plan into operation, which included comprehensive biopsychosoical assessment and monitoring, early intervention, health education and self-management to increase or maintain the patient's health status. Regular monthly meetings between the nurses and the physician were held to discuss and modify the care plans of those patients whose conditions were changing. The care plan was part of the EMR. The nurses and physicians entered their visit notes in the same part of the medical record. The discussion at the monthly care planning meeting with respect to each patient was entered as a progress note on that patient's electronic chart.

### *Evaluation*

#### Design and data collection

The evaluation was a prospective mixed methods design, using patients as their own controls (pre and

post). To strengthen the validity, comparisons were also made with relevant peer reviewed literature, and changes in service delivery and policy were monitored and documented over the course of the project. Data collection took place over the course of the 18 months that services were provided to patients.

### Quantitative methods

Patient data collection instruments were selected based on their use in similar studies, psychometric properties and relevance to the project. During a pilot phase, inadequacies were observed and the burden of response was noted with some instruments; thus, a decision was made to use the least burdensome instruments and triangulate with qualitative data from patients and caregivers as well as evaluator and provider observations. Data was entered into SPSS 10 (SPSS Inc., Chicago, Ill.), which was used to calculate descriptive statistics and to evaluate differences in mean values using 2 sample and paired *t* tests as appropriate.

Additionally, health system costs (i.e., direct payer) were examined for the 12 months pre- and post-enrolment. Comparisons were made between the standard service delivery model and the new service delivery model, which includes the nurse–physician partnership. This involved examining the incremental resource impact between the 2 models of service delivery, including the salaries of the nurses as well as differences in service use (physician visits, emergency department use, hospitalizations, referrals, and medications and equipment) due to changing practice patterns. A prospective service use form was developed and administered on patients to capture this information.

### Qualitative methods

We conducted semi-structured interviews with the project staff (nurses, family physician, project coordinator and project director), the family physician's office administrative staff, and with patients and primary caregivers at 6 months and 12 months to describe and understand structures, processes and impacts of the partnership. Additional interviews were also conducted with health care providers who worked closely with the project team, including the other 2 physicians in the family practice, the office manager, a pharmacist and a laboratory technician. Further, throughout the study period, minutes from project team meetings, local newspapers and newsletters, and progress reports were collected, reviewed and analyzed for both chronological events and themes. Finally, one author attended project meetings as required and documented processes, interactions and dynamics within and between groups. Data was coded by hand and content was analyzed for major themes and sub themes.

## Results

Overall, 37 patients were enrolled in the project, as shown in Figure 1. Table 1 shows the demographic profile of the patients. With attrition, a typical caseload was about 31 patients for 1 full-time equivalent; capacity was limited by geography, project and evaluation tasks, and by staff availability. The patient population was elderly and frail and their health was complicated by multiple problems and chronic illness. Many of the patients were living alone, some with very little support. A number of changes that affected participation in the project took place after enrolment, including 2 deaths, 4 patients' move to long-term care and one patient's move out of the area, which left 24 patients enrolled in the project after 12 months. Patient, caregiver and project staff data instruments are outlined in Table 2, as is the timeline of data collection for each instrument.

### *Patient and caregiver outcomes*

We assessed quantitative outcomes data for 24 patients. With respect to health-related quality of life, results from the SF-8 Health Survey indicated that patients were physically frail, with baseline scores below age-related norms, but that mentally they were quite robust, with scores equivalent to

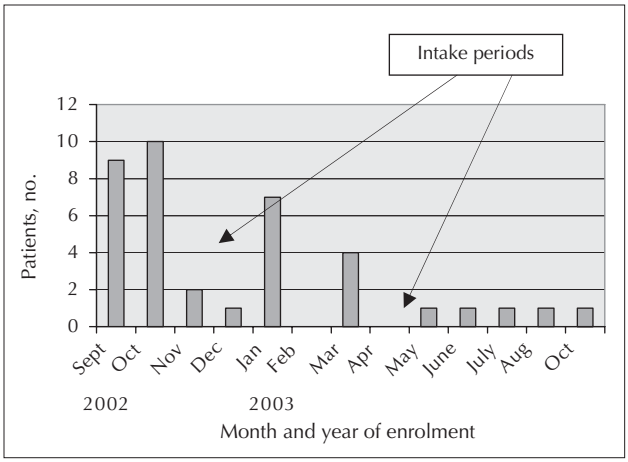



Fig. 1. Patient enrolment in the project between September 2002 and October 2003.

age-related norms (i.e., for patients aged 75 years and older, age-related norms are physical health scale = 45.46, mental health scale = 51.98). After 12 months of shared care, there was a slight decrease physically, but no change mentally. Differences in physical health and mental health were not significant ($p$ = 0.314 and $p$ = 0.968, respectively). When patients were asked to rate their health on the Euroquol (EQ5D) visual analogue scale, they indicated that they were "as good as they could be in the circumstances," with scores of 67% and 65% at baseline and 12 months, respectively. It appeared that patients rated their health more favourably than would have been expected, but this was often qualified with comments, such as "I'm good for my age" or "all things considered."

**Table 1. Patient ($n$ = 37) demographic profile at enrolment**

| Variable | No. (and %) of patients* |
|---|---|
| Sex | |
| Male | 11 (29.7) |
| Female | 26 (70.3) |
| Age, yr | |
| Mean (standard deviation) | 80.3 (7.8) |
| Median (range) | 82.5 (57–93) |
| Marital status | |
| Married | 21 (56.8) |
| Divorced | 2 (5.4) |
| Widowed | 11 (29.7) |
| Single | 3 (8.1) |
| Living arrangements | |
| Lives alone | 15 (40.5) |
| Lives with spouse only | 20 (54.1) |
| Lives with other family | 2 (5.4) |
| Type of residence | |
| House or apartment | 28 (75.7) |
| Housing with supports | 7 (18.9) |
| Assisted living | 2 (5.4) |
| Place of residence | |
| In town | 27 (73.0) |
| Rural area or farm | 10 (27.0) |

*Unless otherwise indicated.

In other words, their expectations of health were commensurate with their age and condition. With respect to cognitive status, most of the patients who participated showed normal age-related cognitive impairment (Mini Mental State Examination [MMSE] range 20–30). There was no significant difference in cognitive status between baseline and 12 months ($p$ = 0.32). Results on the Barthels Index indicated that although patients had some physical limitations, they were reasonably independent in their activities of daily living and improved slightly between enrolment and 12 months, particularly in terms of mobility.

Qualitative data showed that caregivers appreciated the improved access and quality of services afforded by the project. They reported decreased anxiety and improved ability to cope as a result of the support and availability of the team, the information and knowledge related to disease processes and use of the health system, and the 3 Rs — repeat, reinforce and reassure. Patients reported periods of improved health, which in the interim lifted their spirits and reduced their anxiety. They felt well cared for, which in turn appeared to free up some of their energy to manage their health and engage more fully in life. They were particularly impressed with the nurse–physician partnership, the holistic approach, the early intervention, the technological capabilities and the connections to other health care providers.

### *Provider outcomes*

The Collaborative Practice Scales measure collaboration based on the 2 general factors of assertiveness and cooperation. A high degree on each produces what the scale authors term a "synergistic interaction." One of the 2 nurses and the core team physician had high scores at the outset because they had a pre-existing working relationship; scores increased to some degree over time, suggesting that

**Table 2. Quantitative measures and timeline**

| Data instrument | Domain | Time of data collection | | |
|---|---|---|---|---|
| | | Baseline | 6 mo | 12 mo |
| SF-8 Health Survey[20] | Health-related quality of life | X | X | X |
| EQ5D[21] | Utilities; self-reported health | X | | X |
| MMSE[22] | Cognitive status | X | | X |
| Barthel Index[23] | Independent activities of daily living | X | | X |
| Collaborative Practice Scales[24] | Physician–nurse collaboration | X | X | X |
| Physician Work Life Survey[25] | Physician worklife satisfaction | X | X | X |
| Index of Work Satisfaction[26] | Nurse job satisfaction | X | X | X |

EQ5D = Euroquol visual analogue scale; MMSE = Mini Mental State Examination.

synergy was enhanced between them. The other nurse, however, began with lower scores, but as the relationship developed, she ended up with very similar scores, compared with the first nurse, at 12 months. The nurses' and physicians' scores were well above norms when the project started and improvements over time were noted in several areas.

According to the Index of Work Satisfaction, nurse job satisfaction appeared to decrease very slightly between baseline and 12 months, but the difference is unremarkable. In addition, the nurses' scores at all times considerably exceeded norms. Closer inspection reveals that, across time, weighted scores increased for task requirements and professional status; decreased for interaction, organizational policies, and autonomy; and stayed about the same for pay. The Physician Work Life Survey reported little change in overall job satisfaction between baseline and 12 months. However, there was a slight improvement in the total career satisfaction in the same timeframe as a result of improved satisfaction with career specialty.

Interviews with other health care providers who worked closely with the core team indicated that the partnership improved accessibility and availability, provided continuity of care through consistent providers working closely together and provided effective case management through an identified health provider being "in charge" of a patient's health. As a result, patients' and caregivers' anxiety about their health decreased and a reduction in unnecessary emergency room and physician visits as well as a reduction in hospital admissions was noted.

Pharmaceutical knowledge and interpretation of laboratory tests were the 2 major areas of additional learning for the nurses. The pharmacist reported that she frequently interacted with the nurses on the phone to answer questions, problem solve and provide information about medications. While other health care providers recognized the benefits of the project to patients, they also acknowledged the logistical and personnel challenges that such a change would involve. However, the value of distinct components of the project, such as collaboration and communication, were acknowledged. Finally, access to the EMR system from patients' homes used dial-up internet connections. As high speed connections become more available, this method of communication should become easier and more efficient.

### *System outcomes*

System data were available for 24 patients who received a full 12 months of shared care between September 2002 and February 2004. Comparing data for 12 months pre-enrolment to data for 12 months post enrolment revealed a 25% reduction in hospital admissions, a 50% reduction in days spent in the hospital, a 32% reduction in emergency room visits, a 28% reduction in visits for diagnostic tests and a 15% reduction in ambulatory care visits. Service use in the community was not captured (and is

**Table 3. Health service use and cost for 12 months pre- and post-enrolment ($n$ = 24)**

| | Pre-enrolment | | Post-enrolment | | |
|---|---|---|---|---|---|
| Variable | No. of services or total cost | Mean (and SD) | No. of services or total cost | Mean (and SD) | $p$ value |
| Service | | | | | |
| Inpatient admission | 47 | 1.95 (1.90) | 35 | 1.45 (2.02) | 0.31* |
| Days in the hospital | 517 | 21.54 (28.95) | 252 | 10.50 (14.61) | 0.067* |
| ER visits | 50 | 2.08 (3.30) | 34 | 1.42 (1.84) | 0.295* |
| Diagnostics | 25 | 1.04 (0.95) | 18 | 0.75 (1.11) | 0.245* |
| Ambulatory care | 19 | 0.79 (1.44) | 16 | 0.67 (1.24) | 0.740* |
| Cost | | | | | |
| Inpatient cost | $379 770 | $15 824 | $180 824 | $7537 | ≤ 0.047 |
| ER cost | $10 926 | $455 | $8754 | $365 | 0.478* |
| Diagnostics cost | $3814 | $159 | $6319 | $263 | 0.222* |
| Ambulatory cost | $2319 | $97 | $2260 | $94 | 0.969* |
| Physician cost | $27 108 | $1130 | $25 797 | $1075 | 0.692* |
| Total costs | $423 936 | $17 664 | $223 633 | $9318 | ≤ 0.05 |
| Program costs | NA | NA | $136 307 | $5679 | NA |
| Total costs plus program costs | $423 936 | $17 664 | $359 929 | $14 997 | 0.509* |

SD = standard deviation; ER = emergency room; NA = not applicable.
*Values not statistically significant.

discussed below). There was a statistically significant reduction in total costs when 12 month pre- and post-enrolment periods for system variables, including physician billing, were compared (Table 3). Although the difference between pre- and post-enrolment total costs, including the program costs, was not statistically significant, there was a mean cost decrease for this sample (pre to post) of $2667 per patient.

## Discussion

In a recent policy synthesis, LaMarche and colleagues[16] explored ways to restructure primary health care in Canada. They reported that 2 models are superior: the professional coordination model, which is based on a physician–nurse team and premised on case management and continuous, coordinated care; and the integrated community model, which is based on an interprofessional team and cooperation and interaction with the community. Alone, neither model meets all of the anticipated effects of primary health care (effectiveness, quality, access, continuity, productivity and responsiveness), but it may be possibile to attain more of these effects using some combination of the 2 models. However, significant organizational change, particularly in the way funds are currently allocated, would be required.

The Nurse–Physician Collaborative Partnership developed a broader primary health care team to improve access to and quality of primary health care services for patients who were elderly and who had chronic or complex medical problems. As an innovative solution, the services had 2 key elements: a graduated, interprofessional approach to a primary health care team in which the core team was kept to a minimum of 1 family physician and 2 part-time (1 full-time equivalent) project (community) nurses, and a broader network of providers (a pharmacist and community care professionals) who were consulted as needed; and shared care, which capitalized on the expertise of both medical and nursing staff, and reflected best practices in coordinated care (thorough assessment, monitoring and early intervention). The primary intent of services was to have measurable impact on the health and health-related quality of life of patients and their caregivers.

Boult and colleagues[13] reported that interdisciplinary homecare was one of a few interventions that improves outcomes and reduces cost, a model supported by Hollander Analytical Services[17] in a recent policy paper on chronic home care services. In the United States, the Evercare program provides a coordinated approach to care of elderly patients in nursing homes.[18] The model includes a team approach and a nurse practitioner that monitors patients, provides early intervention and intensive management, and liaises with family and the primary physician; physicians are paid to spend more time with families and attend case conferences. The program, which demonstrated a 50% reduction in hospital admissions and emergency room visits as well as a cost savings of US$90 000 for each nurse practitioner employed, is now being tested in selected communities in the United Kingdom. Although patients' satisfaction did not change appreciably, families' satisfaction improved considerably.

In the Nurse–Physician Collaborative Partnership in Alberta, similar results were demonstrated. With respect to system outcomes, total acute service costs excluding program costs decreased by 40% and physician costs decreased from an average of $1130 to $1075. Inpatient costs showed the most significant decrease. A 40% increase in outpatient diagnostic tests was observed owing to use of more expensive, comprehensive type tests such as CT scans (mean increase from $159 to $263). There was a decrease of $2667 in cost post enrolment compared with pre enrolment, even when the program cost ($136 307) itself was factored in (mean $17 664 for the 12 months preceding enrolment, compared with $14 997 for the 12 months following enrolment).

In addition to our primary findings on patient and caregiver outcomes, we also found that patients and caregivers reported a high level of satisfaction. Overall, shared care appeared to improve quality of care due to increased scope of services, improved coordination or continuity of care and early intervention, and improved access due to reduced transportation concerns, regular visits and alternative arrangements for obtaining prescriptions and laboratory tests. Standardized test results showed that patients made slight improvements in activities of daily living, most notably in mobility, and that patients' mental health remained stable in the face of declining physical health. In interviews, patients and caregivers specifically reported improvements in psychological well-being due to decreased anxiety and worry about their own or their family member's health, knowledge of disease processes and confidence to manage health issues. Further research with an expanded sample is required to determine whether the trends in our small sample

would hold and enable the identification of statistically significant differences.

As we see stable outcomes (on several provider and patient dimensions) alongside decreased costs, the implication is that, all other things being equal, the shared care program appears to be the favourable option, compared with not having this program available. What this analysis does not tell us is whether the shared care program should be funded, as this requires comparison of this program on the basis of costs and benefits with other alternative uses of these resources.[19]

The Nurse–Physician Collaborative Partnership project provides a model for the integration of homecare and family practice to provide chronic illness care in rural areas. A successful partnership was facilitated by the professionals' willingness to participate, their predisposition to collaboration and regular face-to-face communication. In addition, a small core team facilitated relationship building and knowledge transfer and streamlined communication as well as case management efficiency. A working relationship based on a collaborative partnership that maximized both medical and nursing scopes of practice was satisfying to the physician, the nurses and the patients. A mutually developed shared care model provided the definition and parameters of the working relationship between the physician, nurses and the other health care providers as well as the delivery of care to patients.

Several caveats must be noted. First, the sample numbers are small and thus interpretation must be made with caution. However, the results from patient data are strengthened by system data, by triangulation, by age-related norms where available and by results from other studies in the literature. Second, the population as a whole is in declining health and therefore health-related improvements were not necessarily expected. Third, as with any pre–post design, our study is subject to potential biases due to confounding variables exerting influence during the study period. Fourth, although community use was not captured, costs would be expected to be higher before enrolment, compared with after enrolment, since one-half of the patients were receiving home care services. The physician also continued to maintain pre-enrolment level contact with patients who were seen on a regular basis at home because of the time limited nature of the program. However, this would be expected to decrease over time. Finally, the program coordinator cost is an economy of scale in as much as 5 times the number of nurses could be supervised for the same cost.

## Conclusion

A small primary health care team — 1 physician and 2 nurses — demonstrated an efficient and coordinated approach to caring for patients with chronic or complex medical illness in rural Alberta. A mutually developed shared care model provided the definition and parameters of the working relationship between the physician, the nurses and the other health care providers. This working relationship was based on a collaborative partnership that maximized both medical and nursing scopes of practice and was satisfying to the physician, the nurses and the patients.

Interventions to patients and caregivers in their homes followed evidenced-based practices, reduced patient and caregiver anxiety related to health concerns and increased their confidence to manage health issues overall. The program resulted in a reduction in the number of hospital admissions and days spent in hospital, the number of emergency room and ambulatory care visits, and the number of diagnostic tests. Based on these initial results, policy initiatives, which incorporate the shared care model developed in the Nurse–Physician Collaborative Partnership, may be considered. Further research is required to test these findings with larger sample sizes and experimental study designs.

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