

Enhancing primary care for complex patients

Demonstration project using multidisciplinary teams

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ABSTRACT

PROBLEM BEING ADDRESSED Communication between community-based providers is often sporadic and problem-focused.

OBJECTIVE OF PROGRAM To implement collaborative community-based care among providers distant from one another and to improve or maintain the health of high-risk community-dwelling patients, with a focus on medication use.

PROGRAM DESCRIPTION Six primary health care teams were formed of a family physician, a pharmacist, and a home care case manager (nurse). Three of these teams also had a family physician's office nurse. Teams received training and decided on processes of care that included a home visit, medication history, and weekly 1.5-hour face-to-face team meetings. In 151 team conferences, 705 medication or health issues were identified for 182 patients over 6 months. Medication adherence was improved at 3 and 6 months. After 6 months, all providers had a greater understanding of the roles of the other providers.

CONCLUSION Primary health care teams developed in this study require few structural changes to existing health care systems, but will require more reimbursement options.

RÉSUMÉ

PROBLÈME À L'ÉTUDE La communication entre les intervenants du milieu est souvent sporadique et axée sur des problèmes spécifiques.

OBJECTIF DU PROGRAMME Faire en sorte que les intervenants du milieu collaborent entre eux pour la prestation communautaire de soins et améliorer ou préserver la santé des patients à risque élevé vivant en milieu naturel, notamment pour ce qui est de la médication.

DESCRIPTION DU PROGRAMME Six équipes de soins primaires étaient formées d'un médecin, d'un pharmacien et d'un responsable de soins à domicile (infirmière). Trois équipes comprenaient aussi l'infirmière d'un cabinet de médecine familiale. Après une formation, les équipes ont opté pour un plan de soin incluant une visite à domicile, une revue de la médication et des rencontres hebdomadaires d'une heure et demi des membres de l'équipe. Après 151 réunions, 705 problèmes de santé ou de médication ont été identifiés chez 182 patients sur une période de 6 mois. Une amélioration de l'observance médicamenteuse a été observée à 3 et à 6 mois. Après 6 mois, tous les intervenants comprenaient mieux le rôle des autres intervenants.

CONCLUSION Les équipes de soins primaires développées dans cette étude demandent peu de changements structurels par rapport aux systèmes de soins actuels, mais elles exigeront de nouvelles options de rémunération.

This article has been peer reviewed.

Cet article a fait l'objet d'une évaluation externe.

Can Fam Physician 2004;50:998-1003 .

Several major reports on the Canadian health system highlight the need for evidence on alternative approaches to primary health care: The Fyke Report,¹ the Mazankowski Report,² the Kirby Senate report,³ and the Romanow report.⁴ This paper provides preliminary evidence on primary health care teams (PHCTs).

Previous controlled studies⁵⁻¹² of multidisciplinary or interdisciplinary care teams in the community have been conducted. Only one was focused on primary health care,⁹ and the studies usually involved team members located at the same clinics.⁵⁻⁸ Evidence suggests that primary care delivered by other providers produces outcomes similar to those obtained by physicians.¹³⁻¹⁸

Several models suggest how community-based providers can work together. One model is health service organizations in Ontario, where physician groups are paid under a capitation or mixed model.¹⁹⁻²¹ In this model, group practices can

identify alternative health care providers, such as nurse practitioners or dietitians, to provide specific forms of care. Another model is the community health care centre.^{22,23} In this model, all providers work in one location, sharing patient records and often providing care for vulnerable populations. Funding in this situation is often for the centre itself. A final model is one where extended-role pharmacists act as consultants in family physicians' practices. This model is highly acceptable to physicians because pharmacists provide their consultations to physicians via letters or face-to-face meetings in physicians' offices.²⁴ This approach requires alternative funding mechanisms and does not include other health care providers.

Communication between community-based providers certainly does occur but is generally sporadic and problem-focused. It generally does not provide opportunities for real collaborative relationships among providers, where treatment goals, issues, and follow up can be clearly articulated, shared, and achieved or resolved.

This program aimed to implement collaborative, community-based care among providers not located in the same clinic. The aim was to improve or maintain the health status of high-risk community-dwelling patients, with a focus on improving medication use.

Program

Description. Six PHCTs were formed. Three teams consisted of a family physician, family physician's office nurse, pharmacist, and home care case manager (nurse). The three remaining teams did not have an office nurse. Providers on the teams were not located in the same building and did not have the same patient rosters. During the project, providers were paid on an hourly basis at market rates for the time required for collaboration, making the project cost-neutral to them.

Each team received 4.5 hours of team development training, and a professional facilitator met with each team every 6 to 8 weeks to discuss issues. The roles of providers and processes of team care were established by the teams themselves during the team development. The processes of care included, at

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and Ms Dieleman was a Research Assistant, in the Faculty of Pharmacy and Pharmaceutical Sciences at the University of Alberta. Dr Farris was an Associate Professor at the University of Alberta, and Dr Côté was a post-doctoral fellow completing the final project analysis for her tenure at the Institute of Health Economics when this project was conducted.

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minimum, home visits by pharmacists for medication reviews. The teams met weekly for 1.5 hours to discuss patient care and medication-related issues from September 1999 to April 2000. During team meetings, patients' medication histories were presented by the pharmacists. Medication or health issues were identified by the team. The teams then chose actions to resolve or issues to monitor. Follow up was completed as necessary via telephone or in person by the appropriate provider.

Team pharmacists were generally not patients' dispensing community pharmacists, so they contacted those pharmacists as necessary. Home care nurses on the teams either contacted patients' home care case managers or directly assumed responsibility for patients. Patients not receiving home care at the outset of the project had a home care assessment if the team noted decreases in function, impaired health, or that additional monitoring would be beneficial. Information from follow-up assessments was shared during the next team meeting. Pharmacists documented any health issues identified and actions taken by the teams.

Patient inclusion criteria included having:

- three or more routine medications daily,
- at least one poorly controlled chronic disease,
- at least one untreated chronic disease,
- dosage regimen changes more than four times in the previous year,
- medications with narrow therapeutic indices,
- an identified drug-related problem or the potential for one,
- a history of noncompliance, or
- a recent decline in health status.

The teams recruited 199 patients from study physicians' rosters over 4 months. Office nurses were especially helpful in identifying patients for the study and contacting them about their interest in this project. Patients' medication adherence, health status, and health care system use were collected using a structured mailed questionnaire at baseline, 3 months, and 6 months.²⁵⁻²⁷

Evaluation. A single group pre-post design was used. The evaluation focused upon the combined effect of care from the PHCT, not upon care

provided by individual members. Ethical review was obtained from the University of Alberta.

Adherence to medication regimens was evaluated. The internal consistency of the adherence measure has been reported to be 0.61, and the sensitivity and the specificity are 0.81 and 0.44, respectively.²⁵ The RAND-12 Health Status Inventory (RAND-12) was used to assess health status. Physical and mental component summaries are T scores, which are norm-based scores for the general US population. In the RAND-36 guidelines, a longer version of the RAND-12, a physical health component summary score lower than 43 suggests that patients' perceived physical health problems are impeding life functioning. Mental health component summary scores lower than 39 mean that individuals have psychological symptoms that impede life functioning.^{26,27} Questions on health care use were taken from the National Population Health Survey.

Patient participants in the study were an average of 66 (\pm 17) years old. Average number of regularly scheduled medications reported to pharmacists was 8.4 (\pm 4.1). Compliance was good at baseline but could be improved. Visits to physicians were high for the 6-month period before the study, with 8% to 9% of study participants seeing physicians each of two, three, or four times and 50% seeing physicians six times or more. One quarter of patients had at least one emergency department visit, and 30% had at least one hospital admission in the 6 months before the study.

During the 6 months of follow up, pharmacists completed 182 medication histories, and 151 team conferences were held (**Table 1**). Teams identified an average of 3.9 issues per participant. Decline in health status was the most common care issue identified; need for a medication, a nondrug issue, and noncompliance were other common issues. Fifty-nine percent of issues were resolved, controlled, improved, or partially improved. Compliance, lack of treatment, and adverse drug reactions (potential or actual) were the most common issues resolved. Self-reported compliance improved at 3 months ($P < .001$), and this improvement was maintained at 6 months ($P = .02$) (**Table 2**).

Overall, the health status of study participants was poor and below the Canadian average. During

Table 1. Primary health care teams' activities

ACTIVITIES AND CHARACTERISTICS	PHCT 1: PHYSICIAN, PHARMACIST, HOME CARE NURSE	PHCT 2: PHYSICIAN, PHARMACIST, HOME CARE NURSE	PHCT 3: PHYSICIAN, OFFICE NURSE, PHARMACIST, HOME CARE NURSE	PHCT 4: PHYSICIAN, PHARMACIST, HOME CARE NURSE	PHCT 5: PHYSICIAN, OFFICE NURSE, PHARMACIST, HOME CARE NURSE	PHCT 6: PHYSICIAN, OFFICE NURSE, PHARMACIST, HOME CARE NURSE	ALL PHCTS: 6 PHYSICIANS, 3 OFFICE NURSES, 6 PHARMACISTS, 6 HOME CARE NURSES
Mission statement summary*	Learning	Process	Visionary	Unclear	Boundary controversy	Enhance	
Patients (baseline)	44	29	30	17	32	47	199
Medication histories completed†	37 (84%)	29 (100%)	29 (97%)	12 (71%)	32 (100%)	43 (91%)	182 (91%)
Number of team conferences	28	24	23	23	28	25	151
Medication or other care issues identified‡	214	83	125	11	165	106	704
Issues/patient	7.1	2.9	4.5	1.6	5.2	2.7	3.9
Actions§	411	97	189	17	230	141	1085
Actions/patient	13.7	3.3	6.8	2.4	7.2	3.6	6
Actions/issue	1.9	1.2	1.5	1.1	1.4	1.3	1.5
Issues resolved	11%	27%	10%	6%	36%	60%	49%

*Each team provided a mission statement that was coded and labeled via qualitative analysis.

†Patients for whom medication history was completed.

‡Issues included decline in health status, adverse drug reaction, not receiving medication, requires a medication, too low dose, too high dose, drug interaction, wrong medication, unnecessary medication, and other.

§Actions included improve compliance, request consultation, administer laboratory test, discontinue medication, change dose or interval, initiate new drug, monitor clinical parameters, provide counseling, offer doctor visit, perform home care assessment, refer patient to another professional, and other.

Table 2. Mean scores for compliance and for the physical and mental health component of the RAND-12 Health Status Inventory at baseline, 3 months, and 6 months according to the primary health care teams (PHCTs)

TESTS PERFORMED BY PHCT	FOR ALL PARTICIPANTS (N=199)			FOR PARTICIPANTS WITH 6 MONTHS' FOLLOW UP (N=108)				
	SCORE AT BASELINE (T1)	SCORE AT 3 MONTHS (T2)	T2 VS T1 P VALUE* (N)	SCORE AT BASELINE (T1)	SCORE AT 3 MONTHS (T2)	SCORE AT 6 MONTHS (T3)	T3 VS T2 P VALUE* (N)	T3 VS T1 P VALUE* (N)
Compliance†	2.91 ± 1.03	3.16 ± 0.95	P < .001 (n=159)	2.85 ± 1.01	3.24 ± 0.85	3.13 ± 0.90	.24 (n=102)	.02 (n=103)
PHC-12‡	36.99 ± 10.25	38.44 ± 11.39	.01 (n=169)	35.64 ± 10.38	37.98 ± 11.20	36.96 ± 10.94	.14 (n=103)	.29 (n=104)
MHC-12§	40.71 ± 10.84	41.46 ± 10.10	.25 (n=169)	40.34 ± 11.00	41.14 ± 11.20	40.65 ± 11.03	.50 (n=103)	.85 (n=104)

*Paired t test.

†0-4 scale, where 4 indicates best compliance. The scale was reverse coded so that higher numbers mean higher compliance.

‡PHC—physical health component score.

§MHC—mental health component score.

the study period, patients' health status was maintained at baseline levels. The mean physical health component score was improved at 3 months (Table 2). The mean mental health component score at 3 and 6 months remained unchanged. There was a trend toward fewer visits to physicians, hospital admissions, and emergency department visits. In the 6 months before the study, 50% of participants visited physicians six or more times compared with

37% in the 6 months during the study. The number of patients with no emergency department visits increased from 64.9% to 70.6%, and the number of patients with no hospital admissions increased from 74.6% before the study to 79.4% 6 months later. There were, however, no statistically significant differences in these distributions.

Most providers (86%) found the team meetings useful and strongly agreed that working with other health

professionals was helpful. Providers reported that the program helped clarify providers' respective roles in the health care system. As well, providers indicated they had more information to make decisions. A more detailed evaluation can be found in Côté et al.²⁸

Discussion

The PHCTs generated numerous patient care activities that resulted in resolution of more than half the medication or other care issues identified within a relatively short time. In general, the health of these high-risk patients with poor health living in the community was maintained. Medication adherence was improved at 3 months, and this improvement was maintained at 6 months. Crude guidelines for interpreting change scores (5% or more change in scale = 0.20; small effect size of 0.18) indicate that the change observed was small but meaningful. Physical health was improved at 3 months, and mental health remained stable over the study. Health care use remained statistically unchanged, although follow-up visits occurred during winter when increases in use would have been expected.

This "dispersed" community-based team model has promise: physicians, pharmacists, and home care case managers met in a convenient location and were paid for their travel and their time to collaborate. Providers were able to meet weekly for 1.0 to 1.5 hours. Some teams were able to provide more services than others, however, as providers had to learn to work with each other. Main reasons for variance were lack of focused team processes, low motivation, and frustration with continually enrolling new patients.

This project implemented and evaluated teams that were different from those previously reported. The advantages of this approach over other community-based teams were:

- providers did not have to change work sites to engage in team care;
- centralized information systems were unnecessary;
- the current fee-for-service system can easily accommodate such arrangements, provided that collaboration and consultation with nonphysician providers is billable; and
- this model combined services from private and public sectors.

Community pharmacists are not covered under the Canada Health Act; physicians are typically paid fee-for-service and work independently; and home care case managers are part of the regional health authority. The disadvantages of this approach over other models of team care were, in reality, the opposite of the advantages.

Without important changes in methods of compensation, it is unlikely that providers working in the community would have the financial resources to work as teams. In our teams, hourly wages were used to reimburse providers, and this model could easily be adopted by provincial payers, limiting the program to professionals trained to work in teams. Providers could limit team services to high users of the health care system or people meeting certain "high-risk" criteria.

While PHCTs and the outcomes used in this study have some positive associations, the project has limitations. The demonstration project did not have a control group. The follow-up period of 6 months was short; a longer period might be required to observe other changes. Data were collected using self-reported mail surveys. Recall bias could be an issue, particularly recall of health care system use. Social desirability bias could also occur. As well, some patients were lost to follow up, and the sample size was small. The latter affects the extent to which findings are statistically significant.

Conclusion

Community-based teams consisting of providers who were not based or employed at the same location are unique. Six PHCTs cared for 182 patients over 3 to 6 months. Given that these patients were quite ill at baseline, maintaining their health was a positive outcome. Self-reported medication adherence improved. Health care use showed decreasing trends in visits to physicians and emergency departments, and hospital admissions. At the end of the study, all providers had a greater understanding of the roles of the other providers.

Policy initiatives that should be considered include the development of a larger, randomized controlled study to compare patients in several communities who have access to community-based team care with patients who do not. At minimum,

cost-neutral incentives should be implemented for family physicians and pharmacists who want to practise in this manner. Enhanced funding for home care to support “early intervention” nurses should also be considered because most of the patients in the study did not meet the criteria for admission to home care. ❁

Acknowledgment

We thank all providers and patients who participated in this project. Steering Committee members were especially helpful in increasing the relevance of our ideas to practice, and they were key to our dissemination efforts. We acknowledge constructive comments provided by the Associate Scientific Editor and three reviewers. Financial support for this project was obtained from the Health Transition Fund, Health Canada, and Alberta Health and Wellness.

The views expressed herein do not necessarily represent the official policy of Health Canada or Alberta Health.

Competing interests

None declared

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EDITOR'S KEY POINTS

- The lack of communication and collaboration between health care workers leads to less than optimal care for patients at risk who live in the community.
- A multidisciplinary intervention program was implemented in Alberta consisting of six primary health care teams made up of family physicians, pharmacists, nurses, and home care case managers.
- These professionals, who worked in different locations, participated in weekly meetings to discuss 199 patients at risk. They discussed health problems and medications and planned interventions involving various caregivers.
- Preliminary evaluation indicated that compliance with treatment improved after 3 and 6 months and that patients had fewer visits to doctors' offices and emergency departments and fewer hospital admissions. Team members developed greater understanding of one another's roles and appreciated team support for complex cases.

POINTS DE REPÈRE DU RÉDACTEUR

- Le manque de communication et de collaboration entre les dispensateurs de soins est un problème qui entraîne un manque d'efficacité dans les interventions auprès des patients à risque vivant dans la communauté.
- Un programme d'intervention multidisciplinaire a été implanté en Alberta, constitué de six équipes de soins primaires incluant des médecins de famille, des infirmières, des pharmaciens et un courtier en soins à domicile.
- Ces professionnels, qui ne travaillent pas dans les mêmes établissements, ont participé à des discussions hebdomadaires concernant 199 patients à risque. Lors des discussions multidisciplinaires, les problèmes de santé et de médicaments ont été identifiés avec un plan d'intervention impliquant les divers prestataires de soins.
- L'évaluation préliminaire a montré une amélioration de l'observance au traitement après 3 et 6 mois. Une tendance à la diminution a été observée dans le nombre de visites médicales, de consultations à l'urgence, et d'hospitalisations. Les dispensateurs de soins ont acquis une meilleure compréhension du rôle des autres intervenants et ont apprécié le soutien de l'équipe pour les cas complexes.

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