

The Ontario Cardiac Rehabilitation Pilot Project: Recommendations for health planning and policy

Heather M Arthur RN PhD NFESC, Terri Swabey BSc MHSc MSc,
Neville Suskin MBChB Dip Sport Med MSc FRCPC FACC, Jillian Ross RN BScN MBA,
on behalf of the Cardiac Care Network of Ontario, Ontario Cardiac Rehabilitation Pilot Project Collaborative

HM Arthur, T Swabey, N Suskin, J Ross, on behalf of the Cardiac Care Network of Ontario, Ontario Cardiac Rehabilitation Pilot Project Collaborative. The Ontario Cardiac Rehabilitation Pilot Project: Recommendations for health planning and policy. *Can J Cardiol* 2004;20(12):1251-1255.

BACKGROUND: Expansion of cardiac rehabilitation (CR) could save both lives and costs by reducing illness and use of health care services. In February 2001, the Ontario Ministry of Health and Long-Term Care (the Ministry) announced a pilot project (the Pilot) to implement and evaluate a comprehensive, multifactorial model of CR service delivery at 17 centres across Ontario.

OBJECTIVES: To design, coordinate and evaluate a coordinated model of CR service delivery, and to collect and evaluate an extensive set of clinical and administrative data.

METHODS AND RESULTS: The Pilot was a large, province-wide observational investigation of a health service delivery model for CR and secondary prevention care. The present paper is the third in a three-part, policy-related series. In the present paper, the results of the evaluation of the service delivery model and the final health policy recommendations that were made to the Ministry in September 2002 are presented.

CONCLUSIONS: Within approximately one year, 4922 patients were enrolled in the Pilot at participating sites throughout Ontario; 88% of sites implemented all elements of the comprehensive services model, either on-site or through internal/external partnerships, and 94% of sites implemented the multidisciplinary Pilot staffing model. Based on this rapid and near-total implementation of the Pilot model, it was concluded that the Pilot model of care was generalizable. Furthermore, regional coordination was achieved through operationalization of the coordinating centres' roles in quality management, regional planning and program development, education and outreach.

Key Words: *Health care planning; Health policy; Prevention; Rehabilitation*

Despite the gradual decline in cardiac mortality rates in North America over the past half-century, heart diseases continue to be important causes of death and disability. Heart diseases are responsible for more hospital admissions than any other cause (with the exception of pregnancy and childbirth), accounting for 20% of male admissions and 11% of female admissions (1). The cost of heart disease in Canada was \$18 billion in 1994, including \$10.4 billion in direct costs and \$7.6 billion in indirect costs (2). The total cost in Ontario in 1996 was

Le projet pilote ontarien de réadaptation cardiaque : Des recommandations pour la planification et les politiques de la santé

HISTORIQUE : L'expansion de la réadaptation cardiaque (RC) pourrait à la fois sauver des vies et réduire les coûts en atténuant la maladie et le recours aux services de santé. En février 2001, le ministère de la Santé et des Soins de longue durée de l'Ontario (le ministère) a annoncé la tenue d'un projet pilote pour implanter et évaluer un modèle multifactoriel complet de prestation de services de RC dans 17 centres ontariens.

OBJECTIFS : Concevoir, coordonner et évaluer un modèle coordonné de prestation de services de RC et colliger et évaluer un ensemble fouillé de données cliniques et administratives.

MÉTHODOLOGIE ET RÉSULTATS : Le projet pilote était une vaste recherche d'observation provinciale d'un modèle de prestation des services de santé de RC et de soins de prévention secondaire. Le présent article est le troisième d'une série en trois parties sur les politiques. Les résultats de l'évaluation du modèle de prestation de services et les recommandations définitives en matière de politiques de santé présentées au ministère en septembre 2002 sont exposés.

CONCLUSIONS : Dans un délai d'environ un an, 4 922 patients ont été inscrits dans le projet pilote des établissements participants en Ontario; 88 % des établissements ont adopté tous les éléments du modèle de services complet, sur place ou au moyen de partenariats internes ou externes, et 94 % ont adopté le modèle de dotation en personnel multidisciplinaire du projet pilote. D'après cette implantation rapide et presque totale du modèle de projet pilote, il a été conclu que le modèle de soins du projet pilote pouvait être généralisé. De plus, une coordination régionale a été obtenue grâce à une opérationnalisation des rôles des centres coordonnateurs en gestion de la qualité, en planification régionale et en développement des programmes, en éducation et en rayonnement.

estimated at \$5.5 billion (3). Research has identified risk factors for the development of coronary artery disease, including high blood pressure, lipid abnormalities, smoking, diabetes, obesity and a sedentary lifestyle. Furthermore, management of these risk factors can delay or prevent the onset of coronary artery disease. Primary prevention is the management of risk factors in patients who have not developed symptoms of heart disease. Secondary prevention, on the other hand, aims to prevent complications and death in those who have manifest heart disease.

Cardiac Care Network of Ontario Cardiac Rehabilitation Pilot Project Committees, Toronto, Ontario

This work was based on a report written by the Cardiac Care Network of Ontario Cardiac Rehabilitation Pilot Project Committees for the Ontario Ministry of Health and Long-Term Care, submitted in September 2002

Correspondence: Dr Heather M Arthur, Faculty of Health Sciences, McMaster University, 1200 Main Street West, HSC2J29, Hamilton, Ontario L8N 3Z5. Telephone 905-525-9140 ext 26140, fax 905-524-3277, e-mail arthurh@mcmaster.ca

Received for publication August 12, 2003. Accepted February 19, 2004

TABLE 1
Cardiac rehabilitation service requirements

Inpatient and outpatient referrals
Intake assessment
Risk stratification
Patient case management
Dietary counselling
Supervised exercise
Education/risk factor counselling
Smoking cessation
Psychosocial assessment/support
Stress management
Family/personal counselling
Vocational assessment/counselling
High-risk patient management*
Expert consultations
Progress evaluations
Exit assessment
Regional coordination*

*Regional coordination centres only

Historically, cardiac rehabilitation (CR) programs focused primarily on exercise, with the goal of restoring heart patients to full function and improving their prognosis after heart surgery or myocardial infarction. Gradually, other features were added, including psychological support, dietary advice, smoking cessation counselling and measures to modify risk factors such as hyperlipidemia, hypertension and diabetes. Today, CR programs are designed to improve patients' physical and emotional functioning, while improving their prognosis through secondary prevention measures. Unfortunately, studies of CR use show that a minority of eligible patients (less than 25%, on average) enroll in CR programs after a cardiac event (4). Although CR has been shown to be an effective secondary prevention intervention, significant problems remain with respect to access and standardization of program services and delivery.

In February 2001, the Ontario Ministry of Health and Long-Term Care (the Ministry) announced a \$9.6 million, 15-month pilot project (the Pilot) to implement and evaluate a comprehensive, multifactorial model of CR service delivery at 17 centres across Ontario. Among the 17 CR centres were nine previously existing and eight new CR sites. Five of the 17 centres were designated "regional coordinating centres"; they had additional responsibilities, including the establishment of "regional satellite sites". In total, seven satellite sites were established in small community hospitals and community centres. The Ministry extended funding for an additional six months midway through the Pilot. At the Pilot's conclusion, 4922 patients had been enrolled in the project at the participating sites throughout Ontario.

Detailed descriptions of the Pilot, and the foundational work that led to it, have been published previously (5,6). The present paper is the third and concluding one in a series related to the Pilot. Its focus is on the findings that resulted from the evaluation of the Pilot model of care and the policy recommendations made to the Ministry regarding implementation of CR within the continuum of cardiac care in Ontario. Detailed results from the Pilot in terms of patient outcomes will be published in separate papers.

DESCRIPTION OF MODEL

Based on the scientific literature and current national and international clinical guidelines (7-9), a high quality CR program is one that includes comprehensive service delivery via a skilled, multidisciplinary team. The Pilot service model was evidence-based and derived from recommended practice guidelines. The components of the model were described previously (6), and included defined staffing and service requirements. Project outcomes with respect to these aspects of the Pilot evaluation are described below.

OUTCOME OF MODEL EVALUATION

Services: Comprehensive service delivery

Compliance to the Pilot service model was defined as providing the required services on-site by dedicated staff, or through formal linkages with off-site or consultative services for which there was appropriate assessment and follow-up by Pilot staff (see Table 1 for a list of required services).

Using this definition, only four of the nine existing sites had the full comprehensive model of care in operation before the Pilot began. At the conclusion of the Pilot, 15 of 17 sites had implemented all elements of the comprehensive services model, either on-site or through internal/external partnerships. Vocational assessment/counselling was the one service that two sites had difficulty implementing over the course of the Pilot. Overall, the implementation of the Pilot service model represents a significant improvement in the comprehensiveness and standardization of CR service delivery throughout the province.

There was consistently high satisfaction with the recommended service requirements by all clinical staff. The sites felt that all the Pilot services were essential to comprehensive CR care. However, there were differing opinions as to how these services could be delivered across regions (see 'Generalizability of the Model').

Staffing: Multidisciplinary service interventions

Compliance to the Pilot staffing model was defined as having hired, contracted or purchased services from the specified professional, or a previously approved alternative professional, to provide multidisciplinary Pilot services for the site, irrespective of the actual full-time equivalents (FTEs) allocated.

Using this definition, 16 of the 17 sites delivered the full Pilot staffing model. All sites put a multidisciplinary staffing model in place that was consistent with national and international guidelines; however, only one site had the exact staff mix and FTE allocation specified for the Pilot. Key barriers to implementing the prescribed model were lack of availability of certain health professionals within the region, time required to recruit qualified individuals, inadequate funding to support institutional or regional wage levels and unwillingness of potential employees to commit to a short-term contract. Where these barriers were irresolvable, certain modifications to the staffing model were permitted, as in the case of the nurse practitioner and psychologist roles.

Table 2 shows the average FTE per service provider type for Pilot sites compared with the project requirements. The allocation was based on a service level of 250 to 400 patients per site. The average FTEs employed at sites was very similar to the prescribed model; however, the range between sites was quite large. Although a nurse practitioner was a required element of the model, an accepted variation was a registered nurse (RN)

TABLE 2
Average full-time equivalents (FTEs) for service providers by type of site per 250 to 400 patients

Type of site	Sites (n)	Nursing			Psychosocial staff					Dietitian	Admin	RC	Manager	Pharm*	OT*	Other*
		RN-EC	RN	Total	Exercise	Psych	SW*	Total								
Required FTEs		1.0	N/A	1.0	3.0	0.5–1.0	N/A	0.5–1.0	0.5–1.0	1.0	0.5	0.5–1.0	N/A	N/A	N/A	
Existing site	9	0.2	1.1	1.3	2.7	0.3	0.3	0.6	0.7	1.0	0.6	0.7	0.0	0.1	0.4	
New site	8	0.0	1.2	1.2	2.5	0.3	0.1	0.4	0.7	1.2	0.7	0.8	0.2	0.0	0.1	
All sites: Average	17	0.1	1.2	1.3	2.6	0.3	0.2	0.5	0.7	1.1	0.6	0.7	0.1	0.1	0.2	
All sites: Range	17	0–1.0	0.1–2.0	0.1–2.5	0.8–4.2	0–1.0	0–0.9	0–1.4	0.2–1.5	0.4–2.1	0.2–1.0	0.2–1.8	0–1.0	0–0.5	0–1.5	
All sites: Median	17	0.0	1.3		2.1	0.2	0.1		0.6	1.0	0.7	0.9	0.0	0.0	0.0	

*Not specified by Pilot model. Data were obtained from Pilot site visit documentation, 2001. Admin Administration; EC Extended class; N/A Not available; OT Occupational therapist; Pharm Pharmacist; Psych Psychologist; RC Regional coordinator; RN Registered nurse; SW Social worker

accompanied by active physician involvement in the program. Using this definition, the total average RN complement for the Pilot was slightly in excess of the requirements (1.2 FTEs versus 1.0 FTE, respectively). Similarly, a social worker was an accepted modification to the requirement for a psychologist. When the FTEs for both the psychologist and the social worker were combined, the average FTEs for provision of psychosocial services fulfilled the project requirements. The average exercise staff FTE was slightly below requirements (2.6 versus 3.0), although the range was quite large (0.8 to 4.2). However, at many sites, the RN also played a role in the exercise program, and, therefore, the FTEs for the exercise staff may be under-reported and the FTEs for RNs over-reported as noted above.

The most common additions to the staffing model were a pharmacist, social worker and occupational therapist, none of which were included in the original prescribed model. Ten of 17 sites employed a social worker (average FTEs for these sites = 0.4), five employed pharmacists (average FTEs = 0.4) and two employed occupational therapists (average FTEs = 0.5) to support vocational services.

Analysis of data related to the staffing model indicated that, generally, the allocated FTEs per health professional were appropriate. For example, data showed that approximately 97% of patients were prescribed group exercise; of those, 94% attended the exercise sessions and the average number of sessions per patient was 30. In contrast, 52% of patients were prescribed individual dietary counselling and 46% attended an average of 2.2 sessions. Similarly, 53% of patients were prescribed either stress management or individual psychosocial counselling. Of those, 40% attended an average of 2.7 sessions. These numbers lend credence to the FTE allocations proposed in the staffing model for 250 to 400 patients. Clearly, not all patients require all services in comprehensive CR. There was unanimous agreement among participating sites that the staffing model should allow for flexibility, with the critical determinant being the skill set of the individual to provide the service. For instance, the same flexibility should exist for the provision of psychosocial services as existed in the required staffing model for exercise (ie, kinesiologist, physiotherapist, exercise physiologist, exercise therapist or nurse), and could include a combination of a psychologist, social worker, psychiatrist, occupational therapist or mental health nurse.

Role of the nurse practitioner

The role of the nurse practitioner (RN, extended class [RN-EC]) was explored in depth. Of the 17 Pilot sites and seven satellites, only three employed RN-ECs, two of whom were affiliated with

satellites and one with an acute care setting. Four Pilot sites employed other advanced practice nurses (Master's prepared). The RN-ECs based in hospital environments were either practicing under medical directives or not working to the full scope of practice as defined by the College of Nurses of Ontario. It was evident, both at mid-term and at the end of the Pilot, that there remained a considerable lack of understanding of the potential full scope of practice of the RN-EC by members of the CR teams. This lack of understanding made it difficult for them to assess the potential impact of integrating this role into their model of care.

The physician

Although not part of the Pilot funding model, the physician was recognized as an important member of the CR team. An exploratory look at the role of the physician was undertaken.

There was unanimous agreement from all sites that physician involvement in CR programs was essential, particularly to act as an advocate for the program, medical advisor and liaison with the larger medical community. Approximately 60% of sites (10 of 17) recommended that the physician role be consultative and advisory. Different recommendations were suggested for the physician role when comparing rural and urban settings. There was general agreement that where sites were community-based and/or in rural settings, the physician should be more actively involved.

REGIONAL COORDINATION MODEL

Coordinating sites required a longer start-up time than individual cardiac rehabilitation centres. This can be attributed to a number of factors, including the need to establish collaborative working relationships among several organizational units, and the development and launching of completely new satellite sites. Within the timelines of the Pilot evaluation, the coordinating sites ultimately had between six and nine months during which they were functioning as a network. In four of the five coordinating sites, CR service delivery was standardized between the coordinating centre and the satellites. By the conclusion of the Pilot, four of the five coordinating centres had established formal contractual relationships with their satellites and the fifth was moving to establish such arrangements.

The model outlined four areas of focus for regional coordination: quality management, planning and program development, research and education, and outreach activities. Improvements were made in the standardization of informational materials between most coordinating centres and their satellites. All coordinating sites implemented regional referral

processes, although the methodology varied among sites. Processes included the coordination and distribution of referrals through the coordinating centre, using standardized referral forms across sites, and developing regional CR program resource manuals for use on inpatient wards and physicians' offices. All sites were working toward common forms, policies, procedures and documentation.

Regional steering committees were implemented by four of the coordinating sites. These steering committees involved various CR stakeholders in the regions, and proved to be instrumental for planning and program development purposes. Coordinating sites exhibited leadership in education and staff development activities, and performed important work in outreach activities, such as meeting with district health councils; forming program advisory committees with representation from diverse interest groups; disseminating of information related to CR services to local media, physicians and health care providers; providing public education sessions; and developing resource guides and educational materials for the community.

GENERALIZABILITY OF THE MODEL

Transference or generalizability is defined as the ease and success with which a model can be implemented and operationalized across settings.

As mentioned previously, 15 of 17 Pilot sites successfully implemented all aspects of the Pilot model of care, which supports the generalizability of the comprehensive service model across all regions of the province. However, there was consensus that the following three issues require additional discussion and deliberation by experts in the CR community before final recommendations can be made:

1. On-site versus off-site service delivery. The perceived advantages of all CR services being offered on-site were identified as improved access to care, cost-effectiveness and a holistic approach to secondary prevention. On the other hand, it was suggested that some services, particularly smoking cessation, vocational assessment/retraining and psychological counselling might be best delivered off-site by established community-based programs.
2. Implementation of case management was inconsistent among Pilot sites. Case management was defined and structured in different ways, was provided by different health professionals across sites, and was sometimes applied only to certain subsets of patients. Although case management was perceived by all sites to be integral to effective care delivery, it was a new process for many centres and clear guidelines were not available. These findings, together with direct recommendations from Pilot sites, suggest that clear definitions and criteria need to be established before case management becomes standardized in CR.
3. Sites made recommendations to enhance the staffing model. The most common recommendation was to add a social worker, followed closely by recommendations to add an occupational therapist and a pharmacist. Also consistent throughout the Pilot evaluation was the belief that a

physician should be associated with the CR program. There was unanimous agreement that the staffing model should allow for some flexibility, with the critical determinant being the skill set required to provide the service.

Regional coordination model

The Pilot regional coordination sites were all acute care hospitals. The regional coordination model was implemented at all five of these coordination sites. All sites employed a regional coordinator (RC), implemented one or two satellite programs within their regions, and accomplished objectives within their four regional coordination functions (described previously). The most frequently reported successes of working within a regional coordination model were development of regional referral processes; standardized care delivery and processes; networking and communication links between programs and service providers; the development of common tools and forms, including patient education material; and regional training and continuing education opportunities.

Despite these successes, a number of issues were identified as requiring clarification before a regional coordination model could be more widely adopted. These included a clear definition of what constitutes a region, an explicit role description for the RC, guidelines for a contractual relationship between coordinating centres and satellites, exploration of whether the RC should be employed by a specific site and guidelines for siting regional coordination centres.

Costs

Case costs, exclusive of overhead, were calculated using the total number of patient intakes during the Pilot with consideration of both cost per intake and total operating costs. All patient cases were weighted equally. It is recognized that there may be some variation in resource intensity, particularly with respect to the number and types of visits prescribed to each patient. However, the standardized nature of the CR program that was implemented resulted in minimal variation in these variables. The average cost per case in the Pilot was approximately \$1,500 (program duration of six months). There is limited information in the literature regarding case costs for CR. Perkins (10) reported a cost per case as US\$1,485 in 1999. However, program comparability in terms of length and service comprehensiveness prevents meaningful comparisons.

SUMMARY

The primary goal of the Pilot was to examine the feasibility of implementing a standardized model of care across a wide range of delivery settings. Therefore, success was defined by the degree to which complete implementation occurred. The Pilot was evaluated as being successfully implemented on the basis of two primary achievements: 17 sites across the province of Ontario implemented the same model of care, and widespread implementation was achieved within 10 months of project start-up. In this short period of time, 88% of sites implemented all elements of the comprehensive services model, either on-site or through internal/external partnerships. Similarly, 94% of sites implemented the multidisciplinary Pilot staffing model. Both the services and staffing models, as developed by the Ministry for this project, were endorsed by the personnel at all Pilot sites and supported for future use.

All five of the coordinating centres established one or more satellites. In the majority of situations (80%), care was standardized between the coordinating centre and the satellites. Coordinating centres met their mandate of being responsible for quality management, regional planning, and program development, education and outreach.

Generalizability of the model was achieved as demonstrated by successful implementation of the model of care in different regions, different practice settings, and in centres with and without prior experience in providing CR services; the planning, implementation and operationalization of seven satellite CR centres by the regional coordinating centres; the acceptance by and support of all Pilot physicians, staff and administrators of the Pilot model; the development of regional referral processes; and the regional standardization of service delivery.

A complete list of the final Pilot recommendations can be found in the Ontario Cardiac Rehabilitation Pilot Project – Report and Recommendations (11). The following recommendations, made to the Ministry, pertain specifically to health policy decision making.

1. The planning and delivery of CR services should be integrated with the planning and delivery of overall cardiac care services.
2. The Ministry should implement a CR system in Ontario based on the comprehensive Pilot services model, which is consistent with national and international CR guidelines.
3. The Ministry should adopt a regional coordination model of CR services as a network of regional services across the province that would support regional referral processes, communication and sharing of regional resources, and integration and standardization of patient care.
4. The Ministry should incorporate flexibility into the multidisciplinary staffing model to ensure that the appropriately trained health professionals are employed to provide the requisite services.
5. The Ministry should support a system for provincial coordination of CR services.
6. A centralized, comprehensive patient data registry should be developed, using the Pilot database as a template, and implemented at all CR programs across the province to promote ongoing data collection on patient outcomes and resource use, and to monitor patient access to the system.
7. The Ministry should support the collection and monitoring of standardized central data on CR services and patients, including referral patterns, wait lists, wait times and events on wait lists, to ensure equitable access, monitor availability versus need, determine optimal wait time for CR services, and provide ongoing information on outcomes, effectiveness and resource use.
8. The Ministry should support research of CR services to assess the most cost-effective way of delivering services to the target population.
9. An accreditation process for CR services should be developed.

ACKNOWLEDGEMENTS: Dr Suskin holds a Career Scientist Award from the Ontario Ministry of Health and Long-Term Care. Dr Arthur holds the Heart and Stroke Foundation of Ontario Chair in Cardiovascular Nursing Research.

REFERENCES

1. Canadian Institute for Health Information and Statistics Canada. Health Care in Canada, 2002. <<http://www.cihi.ca>> (Version current at July 28, 2004).
2. Chan B, Coyte P, Heick C. Economic impact of cardiovascular disease in Canada. *Can J Cardiol* 1996;12:1000-6.
3. Chan B, Young W. Burden of cardiac disease. In: Naylor CD, Slaughter PM, eds. *Cardiovascular Health and Services in Ontario: An ICES Atlas*, 1st edn. Toronto: Institute for Clinical Evaluative Sciences, 1999:1-14.
4. Barlow K. Physician relations programs can increase referrals. *Healthc Financ Manage* 2000;54:35-9.
5. Suskin N, MacDonald S, Swabey T, Arthur H, Vimr MA, Tihaliani R. Cardiac rehabilitation and secondary prevention services in Ontario: Recommendations from a consensus panel. *Can J Cardiol* 2003;19:833-8.
6. Swabey T, Suskin N, Arthur HM, Ross J. The Ontario Cardiac Rehabilitation Pilot Project. *Can J Cardiol* 2004;20:957-61.
7. Stone JA, Cyr C, Friesen M, Kennedy-Symonds H, Stene R, Smilovitch M; Canadian Association of Cardiac Rehabilitation. Canadian guidelines for cardiac rehabilitation and atherosclerotic heart disease prevention: A summary. *Can J Cardiol* 2001;17(Suppl B):3B-30B.
8. The American Association of Cardiovascular and Pulmonary Rehabilitation. *Guidelines for Cardiac Rehabilitation and Secondary Prevention Programs*. 3rd edn. Windsor: Human Kinetics Press, 1999.
9. Oldridge NB, Guyatt GH, Fischer ME, Rimm AA. Cardiac rehabilitation after myocardial infarction. Combined experience of randomized clinical trials. *JAMA* 1988;260:945-50.
10. Perkins BB. Re-forming medical delivery systems: Economic organization and dynamics of regional planning and managed competition. *Soc Sci Med* 1999;48:241-51.
11. Cardiac Care Network of Ontario. The Ontario Cardiac Rehabilitation Pilot Project – Report and Recommendations, September 2002. <http://www.ccn.on.ca/rehabpublic/FinalReport_PDF_Sep30_02_FINALpassword.pdf> (Version current at July 28, 2004).