

# Development of an interprofessional program for cardiovascular prevention in primary care: A participatory research approach

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## Abstract

**Background:** The chronic care model provides a framework for improving the management of chronic diseases. Participatory research could be useful in developing a chronic care model-based program of interventions, but no one has as yet offered a description of precisely how to apply the approach.

**Objectives:** An innovative, structured, multi-step participatory process was applied to select and develop (1) chronic care model-based interventions program to improve cardiovascular disease prevention that can be adapted to a particular regional context and (2) a set of indicators to monitor its implementation.

**Methods:** Primary care clinicians (n = 16), administrative staff (n = 2), patients and family members (n = 4), decision makers (n = 5), researchers, and a research coordinator (n = 7) took part in the process. Additional primary care actors (n = 26) validated the program.

**Results:** The program targets multimorbid patients at high or moderate risk of cardiovascular disease with uncontrolled hypertension, dyslipidemia or diabetes. It comprises interprofessional follow-up coordinated by case-management nurses, in which motivated patients are referred in a timely fashion to appropriate clinical and community resources. The program is supported by clinical tools and includes training in motivational interviewing. A set of 89 process and clinical indicators were defined.

**Conclusion:** Through a participatory process, a contextualized interventions program to optimize cardiovascular disease prevention and a set of quality indicators to monitor its implementation were developed. Similar approach might be used to develop other health programs in primary care if program developers are open to building on community strengths and priorities.

## Keywords

Participatory research, knowledge translation, health services, prevention, primary care, risk factors, cardiovascular diseases, intervention development

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## Introduction

Prevention of cardiovascular diseases (CVD) in primary care is less than optimal.<sup>1,2</sup> The chronic care model (CCM)<sup>3</sup> provides a general framework for improving follow-up for patients with chronic diseases<sup>4</sup> by targeting six domains for quality improvement: (1) self-management support, (2) delivery-system design, (3) decision support, (4) clinical-information systems, (5) community resources and policies, and (6) organization of health care.<sup>5</sup> Each domain may be translated into a variety of interventions and a range of possible modalities for delivery.<sup>3,6</sup> Interactive approaches have thus been used to engage clinicians in simultaneously developing and implementing CCM-based interventions (e.g. plan-do-study-act cycles, collaboratives, and breakthrough series).<sup>3,7,8</sup>

Although such initiatives have yielded evidence of practice transformation and positive patient outcomes, they have rarely been evaluated using solid methodological design such as randomized controlled trials.<sup>9–12</sup> In addition, it is not possible to differentiate the impact of an intervention from its implementation, since both occur simultaneously, and there is often scant description of the participatory processes.<sup>13</sup> Interventions may be developed intuitively, without explicit knowledge of factors that may hinder or facilitate implementation.<sup>13–15</sup> Quality-of-care indicators based on the structure, process, and outcomes of health care<sup>16</sup> are used to evaluate the implementation and impact of interventions, but they are often developed from scratch and without appropriate validation.<sup>17</sup>

To mitigate these limitations, preparatory phases separate from the implementation process and longitudinal collaboration among various primary care actors (clinicians, patients/family members, decision makers, and researchers) has been suggested.<sup>18</sup> To our knowledge, though, the preparatory or early phases of quality improvement trials have rarely been reported. In part as a response to this omission, the TRANSforming InTerprofessional clinical practices to improve CVD prevention in primary care (TRANSIT) research program was undertaken. The aims of the program are (1) to identify priorities for action to improve cardiovascular prevention in primary care (Phase I),<sup>19</sup> (2) to translate those priorities for action into an interventions program (Phase II), and (3) to evaluate the implementation of the interventions program (Phase III).

As part of Phase II of the TRANSIT research program, this article presents an innovative multi-step approach to select, develop, and validate a CCM-based interventions program and to develop quality indicators to monitor its implementation.

## Methods

### Context and study design

The TRANSIT research program was undertaken by the Research Team in Primary Care in collaboration with the

Laval Health and Social Services Agency (*Agence de la santé et des services sociaux de Laval*) and the Laval Health and Social Services Center (*Centre de santé et de services sociaux de Laval*). Members of the Chronic Disease Management Committee of Laval were involved in the development and conduct of Phases I and II.

A five-step process was designed (see Figure 1), incorporating a combination of approaches comprising both participatory and qualitative methods.<sup>20</sup> It included large-group and subgroup meetings, focus-group discussions and individual interviews, and appropriateness survey.

The study was approved by the local research ethics committee of the *Centre de santé et de services sociaux de Laval*. All participants gave their informed consent. Except for researchers and decision makers, all participants involved in Steps 1 to 4 received CAD\$100 compensation for each meeting attended. Participants involved in the validation process (Step 5) received a compensation of CAD\$50 for reviewing and commenting on the TRANSIT program.

### Recruitment of participants and sampling

In participatory research, different types of participants hold different views on preventive care and can make pertinent contributions to research.<sup>21,22</sup> In this research, primary care actors were purposively sampled from the primary care community of Laval (the third largest city in the province of Quebec, Canada) and included researchers, clinicians, administrative staff from medical clinics, patients/family members, decision makers, and representatives of the physicians', pharmacists', and nurses' professional corporations.

The researchers and the research coordinator designed the participatory process, coordinated the logistics of the study, and were much engaged in making the analyses and reporting the results. Patients and family members were referred to researchers by participating clinicians. Researchers were responsible for recruiting all participants. Participants to Steps 1 to 4, including patients and family members, contributed in a similar fashion to every step of the process.

To be eligible to Steps 1 to 4, participants had to commit to attending the first two large meetings while those invited to participate in Step 5 had to agree to review the interventions program and complete a telephone interview. Patients had high or moderate CVD risk, suffered from two chronic diseases other than CVD, and were perceived as somewhat capable of managing their health. Family members had to be closely related to multimorbid patients at high or moderate risk of CVD, but not necessarily to the patients taking part in the study. The participating clinicians were family physicians, nurses, community pharmacists, nutritionists, kinesiologists, psychologists, and tobacco-cessation experts concerned with cardiovascular prevention. A cardiologist was also involved. The decision makers were directors and

STEP	DESCRIPTION	OBJECTIVES	METHOD
1	<b>WORKING GROUP MEETING</b> May 5, 2010 (2 hours)	Make a list of interventions that could be included in the Program	Three parallel thematic focus-group discussions were conducted: <ul style="list-style-type: none"> <li>○ CLINICAL INFORMATION MANAGEMENT</li> <li>○ INTERPROFESSIONAL COLLABORATION</li> <li>○ SELF-MANAGEMENT SUPPORT</li> </ul>
	<b>ON-LINE APPROPRIATENESS SURVEY</b> (20 minutes)	Evaluate the appropriateness of including each intervention in the Program.	The appropriateness of each intervention was scored by each participant individually.
2	<b>WORKING GROUP MEETING</b> June 8, 2010 (3 hours)	Select the interventions to be included in the Program.	Interventions with “uncertain” appropriateness were discussed.
			Six working subgroups were constituted: <ul style="list-style-type: none"> <li>○ CLINICAL INFORMATION MANAGEMENT [Rejected] Electronic medical files</li> <li>○ INTERPROFESSIONAL COLLABORATION               <ol style="list-style-type: none"> <li>1. Protocol for interprofessional follow-up</li> <li>2. Enhanced access to other health professionals</li> <li>3. Collective prescriptions</li> </ol> </li> <li>○ SELF-MANAGEMENT SUPPORT               <ol style="list-style-type: none"> <li>4. Patient health booklet</li> <li>5. Motivational interviewing</li> <li>6. [Added] Directory of community and health resources</li> </ol> </li> </ul>
3	<b>WORKING SUBGROUPS</b> June 17, 2010 to February 16, 2011 (2 hours per meeting and 2-3 meetings per subgroup)	Develop the selected interventions.	Within each subgroup, participants meet as required to develop each intervention as well as the clinical tools to facilitate its implementation.
4	<b>WORKING GROUP MEETING</b> May 18, 2011 (4 hours)	Validate the Program with all participants. Confirm the relevance of process indicators developed to monitor the implementation of the Program.	Process indicators were presented and discussed. Then the appropriateness of each process indicator intervention was scored by each participant individually.
5	<b>VALIDATION</b> August – September 2011	Validate the Program with participants previously uninvolved in the project.	Participants reviewed the Program and completed a 20-minute telephone interview.

**Figure 1.** Summary of the five-step participatory process.

managers of regional departments of general medical services, pharmaceutical services, and public health. The researchers were professors in faculties of pharmacy ( $n = 1$ ), medicine ( $n = 2$ ), and nursing ( $n = 2$ ), and a school of management ( $n = 1$ ). The research coordinator has extensive training and experience in qualitative research.

A total of 34 participants were involved in Steps 1 to 4; 26 others were involved in Step 5 only (Table 1). Almost half (16/34) the participants in Steps 1 to 4 had previously participated in the Phase I of the TRANSIT research program. (Details of participant attendance are presented in Table S1 of supplemental material available at <http://www.recherchepl.ca>).<sup>23</sup>

### *Five-step participatory process*

*Step 1.* A first large-group meeting (20 min) was convened to present the priorities for action identified in Phase I. Those priorities were, in order of importance, (1) *improving management of clinical information* by providing tools for inter-professional and interinstitutional communication; (2) *improving interprofessional collaboration*, especially with nurses and pharmacists, by creating care teams that include a case manager and facilitating access to nutritionists; and (3) *improving self-management support* by giving patients access to health-care plans that include lifestyle recommendations and referrals to community and health resources.<sup>19</sup>

**Table 1.** Participants involved in the development (Steps 1 to 4) and validation (Step 5) participatory process.

	Number of participants	
	Development of interventions program and indicators (Steps 1 to 4)	Qualitative validation of relevance of the interventions program (Step 5)
Clinicians		
Cardiologist	1	0
Community pharmacists	3	3
Kinesiologists	1	2
Nurses	5	3
Nutritionists	2	2
Physicians	2	3
Psychologists	1	2
Tobacco-cessation experts	1	2
Administrative staff	2	2
Decision makers	5	0
Family members	2	2
Patients	2	2
Researchers	6	0
Research coordinator	1	–
Professional corporations	–	3
Total	34	26

Afterwards, three parallel 1-h focus groups were held. Each dealt with one of the three priorities. Participants were pre-assigned to a group by the researchers based on declared preference (participants stated their first and second choices) and type of expertise or experience. Each group was given the list of possible interventions for the assigned priority and a researcher asked participants to select or suggest two interventions and justify their choice. The two most frequently selected were discussed further until consensus was reached as to their relevance to the project. The two interventions chosen by each group were presented to a plenary meeting of participants (30 min), during which all of them could ask questions and make comments.

**Appropriateness survey.** The appropriateness of the selected interventions was evaluated in a Web survey adapted from the RAND/UCLA appropriateness method.<sup>24</sup> Participants rated each of the six interventions proposed in Step 1 on a scale of 1 to 9 (1 = totally inappropriate and 9 = totally appropriate). Appropriateness was assessed by Fitch's criteria.<sup>24</sup> If there was still uncertainty regarding an intervention, it was discussed again at the next meeting.

**Step 2.** A 2-h large-group meeting was held to finalize selection of the interventions. First, the survey results were presented and discussed, and the final selection was made by consensus. Then, in the second part of the meeting, participants were invited to join one of several subgroups set up to further work out each of the selected interventions.

**Step 3.** In the months following the second working-group meeting, each subgroup met two or three times to flesh out the selected interventions. Initially, each subgroup had four to nine self-designated members, including the research coordinator and a researcher. When specific expertise was needed, participants with the appropriate experience and knowledge were asked to attend. Some people thus contributed to more than one subgroup. External experts were also invited when necessary. Table S1 in the supplemental material shows the final composition of each subgroup.<sup>23</sup>

**Step 4.** In a 4-h, large-group meeting, the researchers began with a presentation of each of the interventions. Participants had the opportunity to make comments on the appropriateness and relevance of each of these interventions. In the second part of the meeting, the researchers presented a list of quality indicators they had developed on the basis of Canadian CVD-prevention guidelines along with selected indicators suggested by other investigators. (The list of bibliographic references used is provided in the supplemental material available at <http://www.recherchepl.ca>).<sup>23</sup> In an appropriateness survey conducted during the meeting, participants evaluated the indicators. They also had an opportunity to modify them and add new ones. A second Web-based appropriateness survey was conducted to confirm the pertinence of the new indicators. Adjustments were made to take into account constraints on data collection in the clinics. Additional indicators were developed to evaluate particular aspects of the TRANSIT program (e.g. the use of local health resources).

**Step 5.** To further validate the program, additional primary care actors were invited to review and comment on the final draft. Representatives of the physicians', pharmacists', and nurses' professional corporations also agreed to review and comment on the program from their perspective. All participants received a copy of the program by mail; thumbnail tabs identified sections requiring special attention depending on a participant's expertise and experience. A week later, the participants completed a 20-min telephone interview with a research assistant on the readability, relevance, and feasibility of the program.

## Analyses

**Appropriateness surveys.** The RAND/UCLA appropriateness method<sup>24</sup> (described in supplemental material available at <http://www.recherchepl.ca>)<sup>23</sup> was used to analyze the results.

**Participatory writing.** Audio recordings were made of all working-group and subgroup meetings, and summaries were written by the research coordinator. Miles and Huberman's<sup>25</sup> data-reduction procedure was used; the summaries followed a predetermined structure (list of participants attending, context of the meeting, predetermined thematic sections based on issues raised in previous meetings, and thematic sections based on issues emerging in the course of the current meeting). The summaries were validated by the researchers and key participants.<sup>26</sup> While the subgroups worked on developing the interventions, the research team decided on a writing plan for the interprofessional clinical protocol summarizing the interventions program. Participants contributed to writing and revising the drafts. The research coordinator liaised with participants to ensure consistency.

**Validation.** Audio recordings were made of the third working-group meeting and the interviews, and analytic summaries were written following the procedure set out by Miles and Huberman.<sup>25</sup> The analytic summary of each interview conducted as part of Step 5 documented all general comments and suggestions for changes. General comments on the overall program were categorized by theme. Suggestions for particular additions, corrections, and modifications were noted by protocol section. The relevance and appropriateness of suggestions to modify content were discussed with the researchers and other actors concerned before they could be incorporated into the final document. The interprofessional clinical protocol was then reviewed, and any necessary adjustments were made.

## Results

### *Selection of the interventions (Steps 1 and 2)*

The participants identified six interventions: (1) electronic medical records, (2) a protocol for interprofessional follow-up,

(3) enhanced access to other health professionals, (4) collective prescriptions, (5) a patient health booklet, and (6) motivational interviewing. In Quebec, collective prescriptions are clinical protocols written and approved by a group of clinicians, including physicians and health authorities. They allow nurses and/or pharmacists to perform clinical tasks that normally fall outside their scope of practice, for example, requesting laboratory tests, prescribing medication, and adjusting drug dosages.<sup>27</sup>

The appropriateness survey confirmed the pertinence of all six interventions. However, after presenting the survey results to the second large-group meeting, participants raised concerns about the feasibility, in terms of cost and complexity, of implementing the electronic-medical-records component. It was felt its inclusion would require an entire intervention program of its own, and so participants agreed to discard it. Instead, they decided by consensus to promote the Quebec Health Ministry's Internet-based directory of community and health resources to support self-management.

### *Development of the program (Step 3)*

Six working subgroups developed the TRANSIT program. It is summarized in a protocol for interprofessional follow-up supported by specific clinical tools, including collective prescriptions, listings of available resources, and a health booklet for patients (in French only, available at <http://www.recherchepl.ca>, under *Autres publications scientifiques*). The objectives of the program are to improve CVD prevention through enhanced interprofessional follow-up and optimal use of available health and community resources.

In the TRANSIT program, medical-clinic nurses trained in motivational interviewing will be responsible for case management. They will evaluate cardiovascular health and use the patient health booklet to support patients in setting a treatment plan. They will refer patients to the most appropriate community and health resources, employing the electronic directory to provide patients and family members with accurate and pertinent information. Low-income patients may be referred to a specially designed program to enhance access to nutritionists, kinesiologists, and psychologists, as appropriate. Community pharmacists will monitor medication adherence, safety, and efficacy. Using collective prescriptions, pharmacists may adjust drug dosages, and medical-clinic nurses may monitor the attainment of clinical targets.

**Interprofessional clinical protocol.** The subgroup working on the protocol for interprofessional follow-up was tasked with integrating and defining the roles of all primary care clinicians in a coherent program. The nurse, acting as case manager, will coordinate the follow-up. A budget had been set aside to recruit two case-management nurses for the upcoming 2-year implementation trial (Phase III). However, to ensure the sustainability of the interventions, subgroup participants proposed training the nurses already employed in

medical clinics; the budgeted funds were thus freed for other purposes.

**Enhanced access to other health professionals.** Subgroup participants identified free regional educational programs for patients, mostly in the form of group classes on diabetes, hypertension, cholesterol, healthy weight management, and tobacco cessation. These resources are currently underexploited, presumably because they are not widely known or involve travel and so are not readily accessible to patients. A program for enhanced access to nutritionists, kinesiologists, and psychologists was developed to be supported financially with the funds that had been freed in accordance with participant recommendations. The case-management nurse will assess the appropriateness of referring a patient to a group or an individual education program and refer patients to clinicians in the private sector when these programs do not meet their needs. Each clinic will be responsible for managing its own enhanced-access budget.

**Collective prescriptions.** Collective prescriptions were deemed necessary to support advanced nursing and pharmaceutical care in the context of interprofessional follow-up. The subgroup on this intervention worked in collaboration with the regional Committee on the Harmonization of Nursing Practices in Primary Care, which decided to give priority to developing collective prescriptions for cardiovascular prevention that could be applied by nurses as well as pharmacists.

**Patient health booklet.** Participants developed and put together a patient health booklet to share information between patients and clinicians and to support motivational interviewing and self-management. The booklet contains separate sections on cardiovascular health evaluation, definition of an action plan, follow-up monitoring, including information on clinical targets, recommended community and health resources, health professionals currently following the patient, and blood-pressure and glucose journals.

**Motivational interviewing.** The subgroup looked for training programs available in French in the region around Laval and selected PsyMontréal (in Montreal, QC, Canada), a private firm staffed by members of the Motivational Interviewing Network of Trainers. Training in motivational interviewing will be offered to all primary care clinicians involved in implementing the TRANSIT program. Targeted advertising will promote the training to the nurses, all of whom should take it, and to the physicians, who should encourage the nurse in their clinic to take it.

**Directory of community and health resources.** Participants in the subgroup recommended using the Quebec Health Ministry's Internet-based directory of provincial health resources, which can be accessed free of charge. Because very

few primary care clinicians are aware of the directory's existence, the subgroup decided to promote it by updating the information on regional resources and providing training on how to consult it. The administrative support staff or the case-management nurse should use the directory to make the appropriate patient referrals.

### *Validation (Steps 4 and 5)*

We collected the participants' comments on the program overview (presented by the researchers at the third meeting of the working group). The participants' comments and questions helped the research team make the interprofessional-follow-up protocol clearer. The revised document was sent to primary care actors who had not been involved in developing the TRANSIT program, and their comments were collected in brief telephone interviews. The interviewees found the protocol easy to read, use, and understand. They considered the descriptions of the role and interventions of health professionals, administrative support staff and patients clear, complete, and appropriate to CVD prevention.

Specific comments on the interventions are reported in Table 2. The role of the case-management nurse in TRANSIT program was deemed consistent with the role of the nurse in a primary care medical clinic. The role of the community pharmacists was judged to be adequate. Participants suggested including a role description for an in-house pharmacist based in the clinic, who would liaise with external community pharmacists and other clinicians and give consultations to physicians (see Figure 2); this position is currently being instituted in Laval. Collective prescriptions applied by nurses and pharmacists were deemed pertinent and necessary, but training should be provided.

The patient health booklet was deemed supportive of communication with patients and health professionals on important aspects of the follow-up, including motivational intervention. Patients and family members considered that they need help to complete the booklet. They thought the booklet and the follow-up protocol realistically reflected their role in treatment. Participants were unaware that an Internet-based directory of resources could be accessed from the clinic, but they recognized it would be useful to the case-management nurse in supporting self-management. Other comments concerned the role of the case-management nurse in interprofessional follow-up; her clinical judgment was said to be essential to it and to enhancing access to other health professionals. Training for nurses in motivational interviewing and their use of the directory of community and health resources were both considered appropriate.

### *Quality indicators (Step 4)*

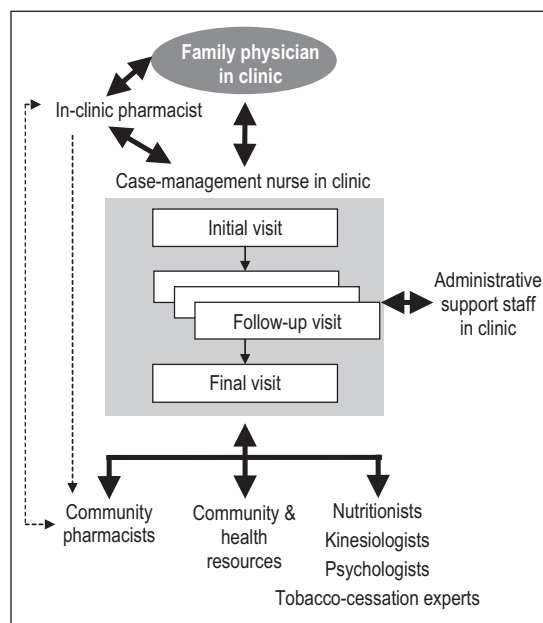
As summarized in Supplemental Table S2 (available at <http://www.recherchepl.ca>),<sup>23</sup> in round 1 of the RAND/UCLA appropriateness surveys, 33 of the 42 submitted indicators

**Table 2.** Results of the qualitative validation of the relevance of the interventions program (Step 5).

Theme	Comments
1. Interprofessional clinical protocol	
Case-management nurse	All primary care nurses should do cardiovascular disease case management Motivational interviewing is relevant to nurse-led cardiovascular disease case management Evaluation of the family support is relevant to cardiovascular disease case management
Pharmacist	The in-clinic pharmacist should be included in the program
2. Enhanced access to other health professionals	
Clinical judgment	The clinical judgment of the case-management nurse plays an important role in orienting patient towards relevant and useful resources
Lists of health resources	Lists of public and private resources could be used to better coordinate the existing resources in the region
3. Collective prescriptions	
Feasibility	Training may be needed to apply collective prescriptions
4. Patient health booklet	
Communication	The health booklet facilitates communicating with the patient and between clinicians
Patient and family needs	Patients and family need the nurse's help to fill it in
5. Motivational interviewing	
Motivational section in the health booklet	The health booklet may facilitate changing attitudes and creating awareness regarding the adoption of healthy lifestyle The health booklet enables priority setting in collaboration with patient respecting his or her objectives
Role of the patient	Patient engagement in treatment as described in the program is realist, as far as patient limits and priorities are taken in consideration, including patient's motivation
6. Directory of community and health resources	
Awareness	The respondent was unaware of the existing computerized directory of resources
Relevance	The computerized directory of resources could be useful to the case-management nurse
Role of the administrative support staff	The clinic staff may provide information on health resources and the patient should take the responsibility to schedule appointment

were judged appropriate by participants and 3 were judged inappropriate. In addition, six indicators were reframed and eight indicators were added as suggested by participants. In round 2, 8 of the 15 submitted indicators were judged appropriate and 7 were considered inappropriate. After the second round, researchers added 48 indicators to take into account every aspect of the interventions protocol (e.g. interprofessional follow-up), and to systematically apply each type of indicators to the management of dyslipidemia, diabetes, and hypertension when appropriate. In addition, some double-barreled indicators had to be split into multiple indicators (e.g. the indicator "Height and weight noted in the medical file" was split into two indicators, one for height and one for weight). The clinical indicators are set out in Supplemental Table S3 available at <http://www.recherchepl.ca>.<sup>23</sup>

Table 3 sets out the number and types of quality indicators ultimately selected. In all, 89 clinical and process indicators were chosen and classified under eight categories: (1) anthropometric measurements (n = 8); (2) evaluation of general and cardiovascular health (n = 2); follow-up and treatment of (3) hypertension (n = 12), (4) dyslipidemia (n = 8) and (5) diabetes (n = 18); (6) lifestyle habits (n = 15); (7) interprofessional follow-up (n = 15); and (8) motivational interviewing and use of patient health booklet (n = 11). Indicators need to



**Figure 2.** Schematic representation of the interprofessional follow-up in the TRANSIT program. TRANSIT: TRANSforming InTerprofessional clinical practices to improve cardiovascular diseases prevention in primary care.

**Table 3.** Description of indicators to monitor the implementation of the interventions program.

Categories of indicators	Number of indicators documented through	
	Medical chart	Patient's interview
1. Anthropometric measurements	8	0
2. Evaluation of general and cardiovascular health	2	0
3. Follow-up and treatment of hypertension	10	2
4. Follow-up and treatment of dyslipidemia	8	0
5. Follow-up and treatment of diabetes	13	5
6. Follow-up of and counseling on lifestyle habits	15	0
7. Interprofessional follow-up	8	7
8. Motivational interviewing and use of patient health booklet	7	4
Total number of indicators	71	18

be documented on the basis of medical records (80%) and patient questionnaires (20%).

## Discussion

Clinicians, managers, administrative staff, patients, family members, and researchers followed an innovative, multi-step, participatory approach to translate the priorities for action previously identified by the primary care community in Laval into a validated program of specific interventions, the TRANSIT program. The program comprises interprofessional follow-up coordinated by case-management nurses and includes timely referrals for motivated patients to appropriate clinical and community resources as well as enhanced access to nutritionists, kinesiologists, and psychologists, when needed. Nursing and pharmaceutical care are supported with clinical tools. Clinician training in motivational interviewing is provided. Furthermore, a set of 89 process and clinical indicators grouped into eight categories was drawn up to evaluate the implementation of the program.

### *A comprehensive, contextualized intervention program*

By the end of this participatory process, the primary care community had designed an evidence-based program inspired by the CCM. Its main components have already been shown to be efficacious. Team-based care involving nurses and pharmacists is one of the most effective interventions available for improving hypertension, diabetes, and dyslipidemia treatment.<sup>28–32</sup> In Quebec, interprofessional teams can currently use clinical protocols called “collective prescriptions” to extend and support nursing and pharmaceutical care. Based on practice guidelines and written for specific professionals performing specific acts, collective prescriptions are thus appropriate to supporting team-based care. Studies on multifaceted interventions including lifestyle interventions in primary care have had promising

results,<sup>33,34</sup> although more research is needed to assess cost-effectiveness.<sup>35</sup> Psychologist intervention may also be appropriate in CVD prevention.<sup>36</sup> As part of a comprehensive approach, educational programs for individuals and groups could improve patient knowledge, awareness, and self-management.<sup>37–39</sup> Motivational interviewing is appropriate to support patient self-management and has been shown to be more efficacious than conventional counseling in improving patient outcomes.<sup>40,41</sup>

Given current primary care practices in Quebec, the TRANSIT program is very ambitious, and much time and effort will probably be required to ensure full implementation. In the past decade, nurses have gradually been integrated into primary care clinics. However, collaborative practices are not widely applied. In Laval, few nurses and almost no pharmacists prescribe medication, adjust drug dosage, or request laboratory tests under a collective prescription. Medical clinics rarely include other primary care clinicians, such as nutritionists, psychologists, and kinesiologists, who are usually consulted in the private sector. The program may therefore be seen as an ideal model of primary care practice.

### *A structured participatory process for developing contextualized interventions*

Participatory research has not often been used for selecting and developing interventions.<sup>42</sup> In our view, though, it has many advantages over traditional program development insofar as it involves a wide range of participants—patients, family members, clinicians, and decision makers—in every step. It enhances community input, provides contextual information on barriers and facilitating elements, fosters trusting relationships, facilitates participant buy-in to further studies, and enhances the translation of research findings into appropriate interventions.<sup>26</sup> Participatory research also facilitates social interaction and builds on the tacit knowledge of participants and the resources of their organizations.<sup>43</sup> The innovative aspect of the TRANSIT program thus



lies not in its specific component interventions but in their contextualization by primary care actors.

In the case of the TRANSIT research program, the five-step participatory process helped focus research on primary care priorities with respect to CVD prevention. The program-development process was initiated on the basis of priorities and challenges previously identified by the primary care community.<sup>19</sup> Participants could provide feedback on the pertinence and feasibility of the interventions throughout the process. When it was completed, other participants, who had not been involved in developing the program, played a role in providing qualitative validation. Participatory research created a communication space that made it possible to partner with the regional Committee on the Harmonization of Nursing Practices in Primary Care. It also made it possible to share contextual information on existing local and regional resources and programs, which would not have been addressed in conventional research. Finally, the qualitative validation of the program provided researchers with invaluable information on the impending introduction of in-house pharmacists in clinics and the computerized directory of health resources. The TRANSIT program thus reflects the priorities of primary care, optimally uses existing resources and appeals to health professionals.

### *Lessons learned and limitations*

Participatory research is most potent when it involves the full range of possible participants.<sup>18</sup> Decision makers contributed by sharing their extensive knowledge of existing health care and community resources and providing logistic and financial support. Patients and family members contributed to the development of a patient-centered intervention program based on truly interprofessional collaboration. The process may have been intimidating for them, though. We therefore suggest future studies include activities aimed specifically at maximizing their input. Researchers played a pivotal role in the conception and conduct of this multi-step process, and a full-time dedicated coordinator with expertise in qualitative research was essential.

A large number of quality indicators were deemed appropriate to monitor implementation of the program. The RAND appropriateness surveys were not very effective in determining which indicators were most relevant and which could be discarded, perhaps because only a limited amount of time was allocated to the discussion of each one of them. In an implementation study, documenting each of the indicators would be extremely time-consuming. Future studies should, perhaps, include an additional step to allow participants to explicitly decide which indicators best suit their purposes. Additionally, the feasibility of documenting these indicators will have to be tested, and their reliability, validity, and responsiveness assessed.<sup>44</sup>

Overall, the process was lengthy (lasting from May 2010 to September 2011) and relatively expensive. Patients, family

members, and primary care clinicians receive no salary for performing research activities. The offer of monetary compensation explains, at least in part, the high participation rate in each step of the process. Participatory writing and qualitative validation furthermore require a dedicated research task force; although time-consuming (taking 16 months), these procedures further helped make the program more relevant.

Although the TRANSIT program is consistent with the findings of other studies on primary care,<sup>45,46</sup> its application to different settings would require some adaptation to take into account their specific contextual features.

### **Conclusion**

Following an innovative, multi-step, regional participatory research approach, primary care actors developed the TRANSIT program, a contextualized intervention program to optimize CVD prevention, and a set of quality indicators to monitor its implementation. In Phase III of the TRANSIT research program, a controlled cluster randomized trial will be conducted to assess the effectiveness of a facilitation process, compared to a passive diffusion approach, to implement the interventions program at a regional level. Change in process and clinical indicators after 1 year will be the primary outcome. If TRANSIT program found to be effective, this participatory process might be used to develop other health programs in primary care if program developers are open to building on community strengths and priorities.

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### Declaration of conflicting interests

The following authors report conflicts of interest: Lyne Lalonde is currently conducting a research sponsored by Pfizer Canada Inc. Marie-Thérèse Lussier has recently completed a study sponsored by AstraZeneca Canada Inc. Since 2011, Eveline Hudon has been leading a workshop sponsored by AstraZeneca Canada Inc. on interprofessional collaboration. The other authors report no conflicts.

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### References

- Hackam DG, Leiter LA, Yan AT, et al. Missed opportunities for the secondary prevention of cardiovascular disease in Canada. *Can J Cardiol* 2007; 23(14): 1124–1130.
- Kones R. Is prevention a fantasy, or the future of medicine? A panoramic view of recent data, status, and direction in cardiovascular prevention. *Ther Adv Cardiovasc Dis* 2011; 5(1): 61–81.
- Wagner EH, Austin BT, Davis C, et al. Improving chronic illness care: translating evidence into action. *Health Aff (Millwood)* 2001; 20(6): 64–78.
- Hung DY, Rundall TG, Tallia AF, et al. Rethinking prevention in primary care: applying the chronic care model to address health risk behaviors. *Milbank Q* 2007; 85(1): 69–91.
- Bodenheimer T, Wagner EH and Grumbach K. Improving primary care for patients with chronic illness. *JAMA* 2002; 288(14): 1775–1779.
- Hroschikowski MC, Solberg LI, Sperl-Hillen JM, et al. Challenges of change: a qualitative study of chronic care model implementation. *Ann Fam Med* 2006; 4(4): 317–326.
- Wagner EH, Glasgow RE, Davis C, et al. Quality improvement in chronic illness care: a collaborative approach. *Jt Comm J Qual Improv* 2001; 27(2): 63–80.
- Barcelo A, Cafiero E, de Boer M, et al. Using collaborative learning to improve diabetes care and outcomes: the VIDA project. *Prim Care Diabetes* 2010; 4(3): 145–153.
- Schouten LM, Hulscher ME, van Everdingen JJ, et al. Evidence for the impact of quality improvement collaboratives: systematic review. *BMJ* 2008; 336(7659): 1491–1494.
- Gugiu PC, Westine CD, Coryn CL, et al. An application of a new evidence grading system to research on the chronic care model. *Eval Health Prof* 2013; 36(1): 3–43.
- Schonlau M, Mangione-Smith R, Chan KS, et al. Evaluation of a quality improvement collaborative in asthma care: does it improve processes and outcomes of care? *Ann Fam Med* 2005; 3(3): 200–208.
- Grimshaw J, McAuley LM, Bero LA, et al. Systematic reviews of the effectiveness of quality improvement strategies and programmes. *Qual Saf Health Care* 2003; 12(4): 298–303.
- Newton PJ, Halcomb EJ, Davidson PM, et al. Barriers and facilitators to the implementation of the collaborative method: reflections from a single site. *Qual Saf Health Care* 2007; 16(6): 409–414.
- Van Bokhoven MA, Kok G and van der Weijden T. Designing a quality improvement intervention: a systematic approach. *Qual Saf Health Care* 2003; 12(3): 215–220.
- Shojania KG and Grimshaw JM. Evidence-based quality improvement: the state of the science. *Health Aff (Millwood)* 2005; 24(1): 138–150.
- Mainz J. Defining and classifying clinical indicators for quality improvement. *Int J Qual Health Care* 2003; 15(6): 523–530.
- Donabedian A. Evaluating the quality of medical care. *Milbank Q* 2005; 83(4): 691–729.
- Hoffman A, Montgomery R, Aubry W, et al. How best to engage patients, doctors, and other stakeholders in designing comparative effectiveness studies. *Health Aff (Millwood)* 2010; 29(10): 1834–1841.
- Lalonde L, Goudreau J, Hudon E, et al. Priorities for action to improve cardiovascular preventive care of patients with multimorbid conditions in primary care—a participatory action research project. *Fam Pract* 2012; 29(6): 733–741.
- Meyer J. Qualitative research in health care. Using qualitative methods in health related action research. *Br Med J* 2000; 320(7228): 178–181.
- Calderon C, Balague L, Cortada J, et al. Health promotion in primary care: how should we intervene? A qualitative study involving both physicians and patients. *BMC Health Serv Res* 2011; 11(1): 62.
- Schmittiel JA, Grumbach K and Selby JV. System-based participatory research in health care: an approach for sustainable translational research and quality improvement. *Ann Fam Med* 2010; 8(3): 256–259.
- Lalonde L, Goudreau J, Hudon E, et al. Development of an interprofessional program for cardiovascular prevention in primary care: a participatory research approach—supplemental material, <http://www.recherchepl.ca/autres-productions-scientifiques.php> (2013, accessed 15 August 2013).
- Fitch K, Bernstein SJ, Aguilar MS, et al. *The RAND/UCLA appropriateness method user's manual*. Santa Monica, CA: RAND Corporation, 2001.
- Miles MB and Huberman AM. *Qualitative data analysis: an expanded sourcebook*. Thousand Oaks, CA: SAGE, 1994, 338 p.
- Horowitz CR, Robinson M and Seifer S. Community-based participatory research from the margin to the mainstream. *Circulation* 2009; 119(19): 2633–2642.
- Desrosiers G. Bill 90: repercussions for all nurses. *Perspect Infirm* 2007; 4(3): 8–10.

28. Berra K. Does nurse case management improve implementation of guidelines for cardiovascular disease risk reduction? *J Cardiovasc Nurs* 2011; 26(2): 145–167.
29. Carter BL, Rogers M, Daly J, et al. The potency of team-based care interventions for hypertension: a meta-analysis. *Arch Intern Med* 2009; 169(19): 1748–1755.
30. Shojanian KG, Ranji SR, McDonald KM, et al. Effects of quality improvement strategies for type 2 diabetes on glycemic control: a meta-regression analysis. *JAMA* 2006; 296(4): 427–440.
31. Santschi V, Chiolero A, Burnand B, et al. Impact of pharmacist care in the management of cardiovascular disease risk factors: a systematic review and meta-analysis of randomized trials. *Arch Intern Med* 2011; 171(16): 1441–1453.
32. Chisholm-Burns MA, Kim Lee J, Spivey CA, et al. US pharmacists' effect as team members on patient care: systematic review and meta-analyses. *Med Care* 2010; 48(10): 923–933.
33. Haskell WL, Berra K, Arias E, et al. Multifactor cardiovascular disease risk reduction in medically underserved, high-risk patients. *Am J Cardiol* 2006; 98(11): 1472–1479.
34. Plotnikoff RC, Pickering MA, Glenn N, et al. The effects of a supplemental, theory-based physical activity counseling intervention for adults with type 2 diabetes. *J Phys Act Health* 2011; 8(7): 944–954.
35. Lauritzen T, Borch-Johnsen K and Sandbaek A. Is prevention of Type-2 diabetes feasible and efficient in primary care? A systematic PubMed review. *Prim Care Diabetes* 2007; 1(1): 5–11.
36. Hamer M, Stamatakis E, Kivimaki M, et al. Psychological distress, glycosylated hemoglobin, and mortality in adults with and without diabetes. *Psychosom Med* 2010; 72(9): 882–886.
37. Cochran J and Conn VS. Meta-analysis of quality of life outcomes following diabetes self-management training. *Diabetes Educ* 2008; 34(5): 815–823.
38. Deakin T, McShane CE, Cade JE, et al. Group based training for self-management strategies in people with type 2 diabetes mellitus. *Cochrane Database Syst Rev* 2005; 2: CD003417.
39. Diedrich A, Munroe DJ and Romano M. Promoting physical activity for persons with diabetes. *Diabetes Educ* 2010; 36(1): 132–140.
40. Rubak S, Sandbaek A, Lauritzen T, et al. Motivational interviewing: a systematic review and meta-analysis. *Br J Gen Pract* 2005; 55(513): 305–312.
41. Thompson DR, Chair SY, Chan SW, et al. Motivational interviewing: a useful approach to improving cardiovascular health? *J Clin Nurs* 2011; 20(9–10): 1236–1244.
42. Jansen YJ, Foets MM and de Bont AA. The contribution of qualitative research to the development of tailor-made community-based interventions in primary care: a review. *Eur J Public Health* 2010; 20(2): 220–226.
43. Kothari AR, Bickford JJ, Edwards N, et al. Uncovering tacit knowledge: a pilot study to broaden the concept of knowledge in knowledge translation. *BMC Health Serv Res* 2011; 11: 198.
44. Mainz J. Developing evidence-based clinical indicators: a state of the art methods primer. *Int J Qual Health Care* 2003; 15(Suppl. 1): i5–i11.
45. Block RC and Pearson TA. Organizing services for cardiovascular prevention. *Curr Treat Options Cardiovasc Med* 2007; 9(4): 278–286.
46. Nemis-White J, Mackillop J, Bennett M, et al. Addressing primary care needs: a participatory approach to collaborative policy development. *Healthc Pap* 2011; 11(2): 69–78.