Physicians' perceptions of capacity building for managing chronic disease in seniors using integrated interprofessional care models

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Abstract

Objective To explore the barriers to and facilitators of adapting and expanding a primary care memory clinic model to integrate care of additional complex chronic geriatric conditions (heart failure, falls, chronic obstructive pulmonary disease, and frailty) into care processes with the goal of improving outcomes for seniors.

Design Mixed-methods study using quantitative (questionnaires) and qualitative (interviews) methods.

Setting Ontario.

Participants Family physicians currently working in primary care memory clinic teams and supporting geriatric specialists.

Methods Family physicians currently working in memory clinic teams (n=29) and supporting geriatric specialists (n=9) were recruited as survey participants. Interviews were conducted with memory clinic lead physicians (n=16). Statistical analysis was done to assess differences between family physician ratings and geriatric specialist ratings related to the capacity for managing complex chronic geriatric conditions, the role of interprofessional collaboration within primary care, and funding and staffing to support geriatric care. Results from both study methods were compared to identify common findings.

Main findings Results indicate overall support for expanding the memory clinic model to integrate care for other complex conditions. However, the current primary care structure is challenged to support optimal management of patients with multiple comorbidities, particularly as related to limited funding and staffing resources. Structured training, interprofessional teams, and an active role of geriatric specialists within primary care were identified as important facilitators.

Conclusion The memory clinic model, as applied to other complex chronic geriatric conditions, has the potential to build capacity for high-quality primary care, improve health outcomes, promote efficient use of health care resources, and reduce health care costs.

EDITOR'S KEY POINTS

- There is an urgent need for system improvements within primary care to enable optimal care of seniors with multiple chronic conditions.
- Both family physicians and geriatric specialists believed that effective interprofessional collaboration and capacity building were required for optimal care of seniors with complex comorbidities.
- Funding and remuneration were identified as barriers to integrating care for seniors with multiple chronic conditions within an existing primary care model. Redesigning the existing primary care system to support structured training to form interprofessional primary care teams and increase access to integrated geriatric specialist support might improve the management of complex multiple comorbidities affecting the elderly and reduce health system costs.

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Opinion des médecins sur la possibilité d'utiliser des modèles de soins interprofessionnels intégrés pour mieux traiter les maladies chroniques des personnes âgées

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Résumé

Objectif Déterminer les facteurs favorables et ceux qui font obstacle à l'idée d'adapter et d'élargir le modèle existant des cliniques de la mémoire de première ligne pour y intégrer le traitement de problèmes gériatriques chroniques complexes (insuffisance cardiaque, chutes, maladie pulmonaire obstructive chronique et fragilité), et ce, dans le but d'améliorer les issues des personnes âgées.

Type d'étude Étude utilisant des méthodes mixtes, quantitatives (questionnaires) et qualitatives (entrevues).

Contexte L'Ontario.

Participants Des médecins de famille travaillant présentement en équipe dans des cliniques de la mémoire de première ligne, avec l'appui de spécialistes en gériatrie.

Méthodes Pour l'enquête, on a recruté 29 médecins de famille travaillant en équipe dans des cliniques de la mémoire de première ligne et 9 gériatres. Les entrevues ont été faites avec 16 médecins chefs de clinique de la mémoire. L'analyse statistique visait à évaluer la différence entre la cote attribuée par les médecins de famille et par les gériatres à la capacité de gérer des problèmes gériatriques complexes, au rôle de la collaboration interprofessionnelle en contexte de première ligne, et au financement et au personnel nécessaires pour optimiser les soins gériatriques. Les résultats de ces deux méthodes d'étude ont été comparés pour cerner les observations communes.

Principales observations Les résultats indiquent un appui global en faveur de l'idée d'élargir le modèle des cliniques de la mémoire pour y intégrer le traitement de problèmes de santé complexes additionnels. Toutefois, dans sa structure actuelle, la première ligne peut difficilement offrir des traitements optimaux aux patients souffrant de multiples conditions, notamment à cause d'un manque de financement et de personnel. Une formation bien structurée, des équipes interprofessionnelles et un bon soutien de la part des gériatres ont été identifiés comme des facteurs facilitateurs importants.

Conclusion En appliquant le modèle des cliniques de la mémoire à d'autres conditions gériatriques, on pourrait améliorer la capacité de fournir des soins primaires de haute qualité, améliorer les issues de santé, favoriser une utilisation efficace des ressources du système de santé et réduire les coûts pour le système.

POINTS DE REPÈRE DU RÉDACTEUR

- Il est urgent d'améliorer le système des soins primaires pour permettre un traitement optimal des aînés souffrant de multiples conditions chroniques.
- Selon les médecins de famille et les gériatres, une collaboration interprofessionnelle efficace et une amélioration des compétences sont nécessaires pour traiter de façon optimale les personnes âgées présentant plusieurs maladies chroniques.
- Le financement et la rémunération ont été identifiés comme des obstacles à l'intégration des soins des aînés souffrant de multiples conditions chroniques dans le contexte actuel des soins primaires. Si on réorganisait le système des soins primaires en encourageant la formation d'équipes interprofessionnelles et en augmentant la possibilité d'un soutien de la part des gériatres, on pourrait améliorer le traitement des personnes âgées souffrant de multiples conditions chroniques et ainsi réduire les coûts pour le système de santé.

Cet article a fait l'objet d'une révision par des pairs.
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Population aging is leading to substantial increases in rates of chronic disease.[1] The most complex chronic conditions, such as cognitive impairment (CI), heart failure (HF), injurious falls, and chronic obstructive pulmonary disease (COPD), account for more than 30% of direct health care costs in Ontario[2] and affect health care resource use.[3-5] These conditions not only account for a disproportionate number of acute and alternate level of care hospitalization days, but also have the highest average costs per hospitalization, led by dementia and HF.[6] While substantial evidence (summarized in national clinical guidelines) exists that all of these conditions can be effectively managed in isolation,[7-10] their management is typically complicated by comorbidities, which have been shown to be important drivers in the use of health care services.[11] In particular, use of clinics led by non–family physician specialists might result in less appropriate care of comorbid conditions outside of the specialty focus, inadequate preventive care, and higher costs, suggesting a need for greater primary care involvement in the management of these conditions.[12]

There is much support for initiatives in chronic disease management (CDM) at a primary care level, with emphasis on the use of evidence-based guidelines; development of strategies and protocols for integrating the use of best-practice guidelines into clinical practice; coordination of services across providers using clinical case management approaches; incorporation of self-management strategies; and inclusion of routine follow-up with patients.[13-15] Various primary care CDM models exist. Patient-focused self-management programs that educate patients and provide them with self-help tools and resources to increase independence in managing and monitoring their own health have been shown to reduce use of health care services and improve quality of life and health outcomes.[16,17] Team approaches, in which patients have access to multidisciplinary services for specific conditions, have demonstrated improved health outcomes.[18-20] Similarly, nurse-led care models that incorporate patient education, as well as medication and symptom monitoring, have also been shown to improve health outcomes and reduce use of health services.[21,22]

To date, most CDM initiatives in primary care have focused on conditions such as asthma, diabetes mellitus, and depression.[23] Complex chronic illness is a challenge to manage in primary care, and primary care clinics for persons with complex chronic conditions have had only limited success in improving patient outcomes and reducing use of the health care system.[11,23] These results might reflect inappropriate targeting of high-intensity interventions to low- or moderate-risk patients,[24] inadequate interprofessional training in CDM,[12] poorly organized care processes, including limited access to allied health professionals (AHPs), and inadequate integration of other specialist input.[11,12] Primary care models in which care from other specialists is well integrated have the potential to improve health outcomes; however, these models require a more collaborative approach between primary and secondary care, as well as improved organizational structures such as shared information systems.[25] To successfully transform CDM in Canada, primary care capacity must be developed through a systematic reorganization of care processes, with an emphasis on training and effective interprofessional collaboration among family physicians, AHPs, and other specialists.[26]

Since 2006, the Centre for Family Medicine Family Health Team Memory Clinic in Kitchener, Ont, has been actively operating a primary care–based interprofessional memory clinic as described elsewhere.[27-30] An accredited interprofessional training program has been developed, which to date has established 40 primary care memory clinics across Ontario and supports 475 medical practices with a patient base of more than 700 000.[31,32] The collaborative interprofessional clinic teams typically consist of a family physician, 2 to 3 nurses, and a social worker, with receptionist support. Where available, some clinic teams also include a pharmacist, an occupational therapist, and representatives from local Alzheimer disease societies to facilitate access to information, education, and support for patients and caregivers.

Within this clinic, the roles of family physicians and AHPs are expanded to maximize the use of skills within their scopes of practice, with optimization of diagnostic and care processes for patients with cognitive disorders. Geriatric specialist physicians are linked with each clinic to facilitate access to consultation support. Based on the chronic care model,[33] the clinic conducts evidence-based assessments that are used to develop comprehensive treatment plans and provide support to primary care providers to manage primary memory disorders independently within their practices, thereby reducing unnecessary use of specialty care providers (eg, geriatricians) for management of cognitive disorders. Patients are followed intermittently through the course of their illness. Team members work collaboratively with the primary care physician to ensure that changes in patient and caregiver needs are identified and met (eg, increases or decreases in medications and coordinating community services, and managing specific issues such as fitness to drive and responsive behaviour).

Evaluation studies of the memory clinics have demonstrated high levels of patient, family member, and referring physician satisfaction; wait time reductions for referral from between 6 and 12 months, as is typical for geriatric specialists, to an average of 1.4 months; and increased access to community support services.[27,29,34] As a result, practices serviced by this model of care have been able to assume greater responsibility for the care

of patients with CI, with the need for referrals to geriatric specialists reduced from approximately 80% to less than 10%.[35] Chart audits by independent geriatricians have indicated the provision of high-quality care.[27,29]

Evidence to date would support that the primary care memory clinic model can transform the limited practice capacity of individual family practices into systematic and comprehensive interprofessional clinics for patients with CI. In this study, we explore the potential to adapt and extend the memory clinic model to integrate care for HF, COPD, falls, and frailty, assessing the extent to which chronic conditions in the elderly can be diagnosed and managed at a primary care level, and determining the required support for the expansion of the memory clinic model to address complex comorbidities. We focus on these conditions because, like CI, they are common chronic conditions in the elderly that have a profound effect on the use of health care resources.[3-5] These conditions are associated with substantial morbidity and mortality, as well as impaired quality of life.[36-39] Geriatric syndromes such as CI, functional decline, falls, and frailty often complicate the course of conditions such as HF and COPD, leading to worse outcomes.[40,41] Moreover, these conditions often occur concurrently, increasing the complexity of diagnosis and management, as symptoms are often subtle[42-44] and treatment of one condition might adversely affect other coexisting conditions.[45]

METHODS

Ethics approval for this study was obtained from the University of Waterloo Research Ethics Board.

Questionnaires

Two questionnaires were developed to identify physician perceptions of the management of comorbidities. One survey was distributed to family physician leads and co-leads (n = 60) of all primary care–based memory clinics in the province (n = 31) and one was distributed to geriatric specialists who provided consultation support to these clinics (n = 13). Family physicians were asked to rate their level of agreement, using a 9-point Likert scale (1 being the lowest level and 9 being the highest), with various statements related to their confidence in diagnosing and managing older patients with HF, high risk of falls, COPD, frailty, and multiple comorbidities. Using the same scale, geriatric specialists were asked to rate statements related to their confidence in the ability of family physicians to diagnose and manage similar patients. Both family physicians and geriatric specialists were also asked to rate their perceptions of the role of geriatric specialists in primary care clinics; existing funding and remuneration methods; potential effects of expanding the memory clinic model to address frailty and complex comorbidities on cost-effectiveness; wait time for assessment; and acute care use. Demographic and practice information was also collected. Invitations and reminders to complete these online surveys were distributed via e-mail. Statistical analysis was performed using SPSS, version 21.0. Analysis of variance (ANOVA) was used to determine differences in mean ratings between family physicians and geriatric specialists, testing significance ($P \leq .05$).

Interviews

Individual telephone interviews were conducted in February and March 2013 with a purposeful sample of memory clinic lead physicians selected to represent a diverse range of duration in their roles and in urban and rural locations. Structured interview questions asked about the current memory clinic model, practice challenges in caring for frail complex patients, and the anticipated required resources and supports for clinic model expansion, including funding and education or training. All interviews were audio-recorded and transcribed verbatim. Content analysis to identify common themes was done using NVivo software. Transcripts were open coded to identify categories and themes. Summarized results were e-mailed to interview participants for member-checking feedback.

RESULTS

Questionnaires were completed by 29 family physicians and 9 geriatric specialists (8 geriatricians and 1 geriatric psychiatrist). **Table 1** presents respondent characteristics. Interviews were completed with 16 memory clinic lead physicians; 8 were primary clinic leads and 8 were memory clinic co-lead physicians. The mean (SD) length of time in the memory clinic physician role was 2 (1.1) years and ranged from 5 months to 4.5 years.

A number of themes arose from the qualitative analysis of the interviews, which were supported by quantitative data collected from the questionnaires.

Themes

Willingness of existing memory clinics to expand to include other complex conditions. Interviewed physicians perceived the memory clinic model as an important opportunity to improve care for older patients with multiple complex conditions with the caveat that sufficient resources (training, funding, staffing) be in place to support and sustain this type of care model (**Table 2**). Physicians acknowledged that care planning within the memory clinic often required consideration of other existing chronic conditions, ensuring that multiple patient needs were targeted, not just dementia. Formalizing this care through an expanded care model was perceived as supporting better patient management. It was generally

Table 1. Characteristics of questionnaire respondents

CHARACTERISTICS	FAMILY PHYSICIANS (N = 29)	GERIATRIC SPECIALISTS (N = 9)
Mean (SD) age, y	51.1 (10.1)	50.0 (8.8)
Female sex, n (%)	14 (48.3)	5 (55.6)
Mean (SD) y working in the memory clinic	1.8 (1.0)	4.5 (3.5)
Residency training exposure, n (%)		
• CI	9 (31.0)	9 (100.0)
• HF	13 (44.8)	7 (77.8)
• COPD	11 (37.9)	6 (66.7)
• Falls	2 (6.9)	9 (100.0)
• Frailty or geriatrics	12 (41.4)	9 (100.0)
Continuing medical education exposure in past 5 y, n (%)		
• CI	28 (96.6)	9 (100.0)
• HF	19 (65.5)	4 (44.4)
• COPD	20 (69.0)	3 (33.3)
• Falls	11 (37.9)	9 (100.0)
• Frailty or geriatrics	17 (58.6)	9 (100.0)

CI—cognitive impairment, COPD—chronic obstructive pulmonary disease, HF—heart failure.

believed that family physicians, particularly with additional training and supports, were in a good position to provide more comprehensive CDM within primary care. Consistent with this, as measured in the questionnaires, family physicians were moderately confident in their ability to diagnose and manage multiple complex conditions (**Table 3**). Geriatric specialists' ratings were generally consistent with this; however, geriatric specialists had significantly lower, but still moderate, ratings of confidence in the ability of the family physicians to diagnose frailty ($P = .01$) and to manage 4 or more comorbidities ($P = .03$).

An expanded clinic model could potentially result in improved health outcomes and health care cost savings. Generally, it was perceived that care improvements within an expanded clinic model had the potential to improve health outcomes and reduce medication errors, hospital admissions, and falls, resulting in cost savings for the health care system. Family physicians and geriatric specialists had moderate ratings regarding the degree of potential effects of an expanded memory clinic model on cost-effectiveness and reduced use of acute care services, with family physicians having substantially higher ratings ($P = .12$ and $P = .05$, respectively) of these effects than geriatric specialists did (**Table 4**).

Optimal care for elderly patients with multiple medically complex conditions is enabled by providing structured training, fostering interprofessional teams, and having access to geriatric specialist consultation. Comprehensive training provided to memory clinic team members involved didactic workshops, case-based learning, and mentorship opportunities. The training was viewed as critical to building capacity to manage complex geriatric issues, as well as fostering interprofessional collaboration, in that each member of the team was viewed as providing a unique and valuable contribution to the diagnostic and care planning process. Moreover, primary care physicians in memory clinics reported that access to geriatric specialists to discuss challenging cases increased their capacity to manage complex conditions, so that an expanded clinic model would be optimally effective with greater involvement of geriatric specialists. Questionnaire results consistently reflected that both family physicians and geriatric specialists perceived effective interprofessional collaboration and capacity building as requisites for optimal care of elderly patients with multiple medically complex conditions (**Table 5**).

The current structure of primary care does not allow for the optimal management of comorbidities. Physicians identified the amount of time it takes to assess and manage patients with comorbidities, particularly with adequate follow-up and monitoring, and the limited resources to do so as substantial challenges to the provision of CDM in primary care (**Table 2**).

Limited funding and staffing are barriers to an expanded clinic model. Many physicians expressed that it was difficult to remove themselves and other staff members from their regular practices to operate the memory clinic, noting that more time and staffing would be required for an expanded clinic, with substantial budget implications. Funding was broadly seen as a barrier to specialized clinics operating within primary care. Remuneration for clinic work was perceived as inadequate, as existing primary care fee-for-service funding models do not adequately account for the time needed to optimally manage HF, falls, and COPD. Although many of the physicians interviewed were willing to assume some financial loss in exchange for the high satisfaction of working within this expanded care model, they also noted that this loss would not be sustainable in the long term. Questionnaire data confirmed these funding concerns (**Table 4**).

DISCUSSION

The results of this study demonstrate an overall willingness of existing memory clinics to integrate care for other

Table 2. Interview participants' quotes related to themes

THEME	QUOTES
Willingness of existing memory clinics to expand to include other complex conditions	• "I think we can definitely develop a model, not only for COPD but [for] multiple chronic issues to be done in a similar fashion as we do memory" • "It has been an enlightening experience working with the memory clinic team and [it] provides an excellent basis to deal with other chronic issues. I will support any initiative based on the memory clinic model" • "Memory clinics and similar models apply well to care of frail, complex seniors because it places their care where it belongs—in primary care" • "If you have a cardiorespiratory-type clinic, that would be kind of ideal for a memory clinic setting because you can look at all the factors .... A lot of patients that we see have COPD, they have congestive heart failure, they have a bit of renal failure, maybe a little bit of coronary disease, and so creating a clinic to take all of that together is equally valuable"
An expanded clinic model could potentially result in improved health outcomes and health care cost savings	• "From the health point of view [the expanded clinic model] would reduce hospital admission [and] reduce ER visits. It would, I think, from the ledger sheet point of view, make sense" • "Well, it's really well known that if we can give better complex care to our seniors there [are] going to be fewer medication errors, there [are] going to be fewer times they enter the hospital setting, [and they will be] less likely to break their hips [and] less likely to be confused" • "Hopefully it will be better care for patients—that they were actually going to get more comprehensive care and better care, which then hopefully ... will translate into a better quality of life for the patient. Less [emergency department] trips, less hospitalizations, or shorter hospitalizations" • "I think that expanding the memory clinic model would reduce wait times, reduce acute care, and be cost effective if there was adequate remuneration for physicians and funding for appropriate training and staffing"
Optimal care for elderly patients with multiple medically complex conditions is enabled by providing structured training, fostering interprofessional teams, and having access to geriatric specialist consultation	• "I think we would need more training regarding issues of frailty ... how do we in the different domains pull that information together? [We need] a little bit more didactic information on that and how we approach it and manage it with more training" • "Working in a team makes a big difference ... such as access to an OT for patients with high risk of falls and a social worker for the family support complex vulnerable patients require" • "Working with the memory clinic and the training that we have had and the support from specialists has been exciting and rewarding in a way that is all too unusual in general practice. It is very much a 'win-win' model—patients and their families, allied health team members, physicians, and the health care system in general"
The current structure of primary care does not allow for the optimal management of comorbidities	• "The lack of time can be quite difficult if the patient comes in and they're frail, they're living maybe alone, they have a lack of support .... Multiple scenarios that come along in terms of COPD and CHF management ... polypharmacy becomes a big concern ... those are usually the sort of bigger concerns because they rarely do come in with just one simple concern, they come in with a few that [are] interrelated. So the time sometimes makes it difficult in a standard visit" • "Without the supports, even with a nice consult and package and things ... I could see that it would be a big challenge to keep that exceptional care of their comorbidities at a high level without the system [enhancements]" • "Family doctors are not equipped. They don't have the time [and] they don't have the resources at the facility. So if we have the team, if the resources are there, if we are trained to be able to do the assessment, then yes, definitely, there's a benefit to [the expanded model]"
Limited funding and staffing are barriers to an expanded clinic model	• "In the case of NPs and social workers ... they are attached to a specific site, so for the time that they are spending in the clinic ... the site is without an [NP] or social worker because they are in a clinic elsewhere. So maybe having to staff a clinic would be very helpful" • "Do I particularly think I was compensated based on how much involvement and how much we were doing? I'm not sure that the compensation was great" • "If we started doing lots more ... types of clinics then I would have to start to weigh the pros and cons of how much my satisfaction actually played into being able to tolerate [a] decreased salary" • "Family physicians have always looked after frail, complex seniors with multiple morbidities. Newer primary reform funding does reward health maintenance but does not reward looking after complex frail seniors"

CHF—congestive heart failure, COPD—chronic obstructive pulmonary disease, ER—emergency room, NP—nurse practitioner, OT—occupational therapist.

Table 3. Family physicians' ratings of their confidence in their ability to diagnose and manage geriatric conditions and geriatric specialists' ratings of their confidence in family physicians' ability to diagnose and manage chronic conditions: *Level of agreement was measured on a 9-point Likert scale, on which 1 is the lowest level and 9 is the highest level.*

PERCEPTIONS OF CONFIDENCE	FAMILY PHYSICIANS (N = 29), MEAN (SD)	GERIATRIC SPECIALISTS (N = 9), MEAN (SD)	*P* VALUE FOR DIFFERENCE BETWEEN GROUPS
You are confident in your ability or family physicians' ability to diagnose older patients in primary care with the following:			
• HF	7.1 (1.4)	6.9 (1.4)	.64
• High risk of falls	6.6 (1.7)	5.8 (1.5)	.20
• COPD	7.2 (1.4)	6.8 (1.5)	.43
• Frailty	6.8 (1.7)	4.9 (2.0)	.01*
You are confident in your ability or family physicians' ability to manage older patients in primary care with the following:			
• HF	6.8 (1.7)	6.7 (1.0)	.74
• High risk of falls	6.0 (1.9)	5.3 (1.2)	.36
• COPD	7.0 (1.6)	6.7 (1.0)	.52
• Frailty	6.0 (1.9)	4.7 (1.5)	.06
You are confident in your ability or family physicians' ability to manage older patients with the following:			
• ≤3 chronic comorbidities	7.0 (1.4)	6.1 (1.5)	.10
• ≥4 comorbidities	6.7 (1.7)	5.2 (1.6)	.03*

COPD—chronic obstructive pulmonary disease, HF—heart failure.
*Significant at $P \leq .05$.

Table 4. Family physicians' and geriatric specialists' ratings of various aspects of funding and remuneration to expand the memory clinic model and potential effects: *Level of agreement was measured on a 9-point Likert scale, on which 1 is the lowest level and 9 is the highest level.*

PERCEPTIONS OF FUNDING AND REMUNERATION AND POTENTIAL EFFECTS	FAMILY PHYSICIANS (N = 29), MEAN (SD)	GERIATRIC SPECIALISTS (N = 9), MEAN (SD)	*P* VALUE FOR DIFFERENCE BETWEEN GROUPS
Current remuneration methods are adequate to support clinical services to care for patients with frailty and complex comorbidities	3.1 (1.8)	5.5 (2.4)	.005*
Current funding is sufficient for the education and training of staff to care for patients with frailty and complex comorbidities	3.1 (1.8)	5.3 (2.5)	.01*
Investing in the expansion of the memory clinic model to address frailty and complex comorbidities would be cost effective	6.9 (1.9)	5.6 (2.1)	.12
Investing in the expansion of the memory clinic model to address frailty and complex comorbidities would reduce patient wait times for assessment	6.9 (1.9)	6.3 (1.8)	.43
Investing in the expansion of the memory clinic model to address frailty and complex comorbidities would reduce acute care (hospital and emergency department) use	7.3 (1.4)	6.0 (1.9)	.05*

*Significant at $P \leq .05$.

chronic medical conditions. However, substantial barriers to expanding this care model were also identified.

Previous studies support approaches to managing complex conditions in primary care that are integrated, comprehensive, and sustained over time,[14,46-48] and that manage comorbidities rather than a single disease, with consultation support from non–family physician specialists.[49] Yet many Canadian seniors with chronic diseases receive suboptimal care.[2] In the face of the critical shortage of geriatric specialists in Canada and limited health care resources,[50,51] there is an urgent need for new care models to better manage seniors with multiple complex

Table 5. Family physicians' and geriatric specialists' ratings of the role of interprofessional collaboration within primary care to support geriatric care: *Level of agreement was measured on a 9-point Likert scale, on which 1 is the lowest level and 9 is the highest level.*

PERCEPTIONS OF THE ROLE OF INTERPROFESSIONAL TEAMS	FAMILY PHYSICIANS (N = 29), MEAN (SD)	GERIATRIC SPECIALISTS (N = 9), MEAN (SD)	*P* VALUE FOR DIFFERENCE BETWEEN GROUPS
Your current level of involvement in interprofessional collaboration can help optimize health outcomes for your patients with frailty and complex comorbidities	6.9 (1.6)	6.9 (1.6)	.95
In addition to direct clinical care, geriatric specialists should be available to provide continuing education to support the ability of primary care to manage patients with frailty and complex comorbidities	7.9 (1.0)	8.4 (1.7)	.24
Embedding geriatric specialists within the primary care structure would improve the care of patients with frailty and complex comorbidities	7.7 (1.3)	7.4 (1.9)	.70

chronic conditions. In this study, physicians believed that the memory clinic care model was likely applicable to managing HF, COPD, falls, and frailty. Of importance, physicians recognized the potential for improved health outcomes and health care cost savings. Like dementia, these particular chronic conditions account for the highest numbers of acute and alternate level of care hospitalization days in Canada.[3,5,6] The integration of these conditions into existing memory clinic care processes has the potential to expand capacity to better manage seniors with complex chronic conditions through more systematic, comprehensive, and effective collaborations among family physicians, AHPs, and geriatric specialists.

It has been suggested that, in ideal models of CDM, most patients with chronic disease can be adequately managed with low- to moderate-intensity interventions, with 5% to 10% requiring high-intensity interventions.[24] The memory clinic model exemplifies these principles by stratifying patients according to risk of poor outcomes and tailoring the intensity of management accordingly, with demonstrated referral rates of less than 10% to geriatric specialists and most care appropriately provided within primary care practice.[27,29] Within this care model, patients benefit from the varied expertise of those contributing to the care plan and the collaboration among care providers integrated within the primary care practice. Allied health professional assessments are conducted concurrently with those of physicians; and results and recommendations are shared among providers immediately and directly, as opposed to care models in which AHP and physician assessments are conducted at different times, which might limit and delay information sharing. Integration of AHPs and geriatric specialists into primary care enables "person-focused care" in which care is accessible, comprehensive, coordinated, and continuous.[52] A team-based case management approach allows these clinics to act as hubs in which patients are connected to a variety of health care providers and community services with concurrent assessment and information sharing. This not only more accurately identifies the medical and psychosocial needs of the patient-caregiver dyad, but also allows a much more coordinated and holistic care plan.

This study identified specific barriers to integrating care for other chronic conditions into the existing memory clinic model. In particular, funding to support the time and staff necessary to assess and manage multiple complex medical conditions remains a key challenge. With complex multiple comorbidities affecting aging Canadians being an important driver of health system costs, it is critical for provincial health care funding agencies to reinvest in a fundamental redesign of the structure of primary care, with appropriate remuneration and opportunities for capacity building.

In this study, family physicians had greater confidence in their ability to manage multiple complex comorbid conditions than geriatric specialists had in family physicians' ability to manage these conditions. The reasons for this discrepancy in perceptions is unclear. Less than half of the family physicians reported residency training exposure to CI, HF, COPD, fails, and frailty. Although more family physicians had exposure to these conditions in continuing medical education activities, there is likely room for greater capacity building. Similarly, geriatric specialists reported limited exposure to continuing medical education on HF and COPD. Embedding geriatric specialists in primary care settings to see patients alongside interdisciplinary team members, with opportunities to provide both "in the moment" and formal teaching, as well as mentorship and relationship building, has the potential to facilitate true collaboration and improve care.[53,54]

Limitations

The sample selected for this study might not be representative of all memory clinic members and geriatric specialists. Although the sample sizes are small, the sample is purposive in that it represents a diverse selection of participants.

Conclusion

This study demonstrated the potential for expansion of the memory clinic model to address HF, falls, COPD, and frailty. If the identified challenges can be addressed, the model has the potential to transform care processes, improve care for seniors with multiple chronic conditions, improve health outcomes, promote efficient use of health care resources, and reduce health care costs.

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Contributors

Drs Lee, **Heckman**, **McKelvie**, and **Jong** contributed to the study concept and design; data analysis, review, and interpretation; and final manuscript preparation and approval. **Ms D'Elia** contributed to the study concept and design; data collection, analysis, review, and interpretation; and final manuscript preparation and approval. **Ms Hillier** contributed to data analysis and interpretation, and final manuscript preparation and approval.

Competing interests

None declared

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References

1. Strong K, Mathers C, Leeder S, Beaglehole R. Preventing chronic diseases: how many lives can we save? *Lancet* 2005;366(9496):1578-82.
2. Ministry of Health and Long-Term Care. *Preventing and managing chronic disease: Ontario's framework*. Ottawa, ON: Ministry of Health and Long-Term Care; 2007. Available from: **www.health.gov.on.ca/en/pro/programs/cdpm/pdf/framework_full.pdf**. Accessed 2013 Dec 16.
3. Sanchez M, Vellanky S, Herring J, Liang J, Jia H. Variations in Canadian rates of hospitalization for ambulatory care sensitive conditions. *Healthc Q* 2008;11(4):20-2.
4. Canadian Institute for Health Information. *Highlights of 2008-2009 inpatient hospitalizations and emergency department visits*. Ottawa, ON: Canadian Institute for Health Information; 2010. Available from: **https://secure.cihi.ca/free_products/dad_nacrs_highlights_2010_05_18_e.pdf**. Accessed 2015 Feb 4.
5. Canadian Institute for Health Information. *Alternative level of care in Canada*. Ottawa, ON: Canadian Institute for Health Information; 2009. Available from: **https://secure.cihi.ca/free_products/ALC_AIB_FINAL.pdf**. Accessed 2013 Dec 16.
6. Canadian Institute for Health Information. *Patient cost estimator*. Ottawa, ON: Canadian Institute for Health Information; 2009. Available from: **www.cihi.ca/cihi-ext-portal/internet/en/documentfull/spending+and+health+workforce/spending/pce_application**. Accessed 2013 Dec 16.
7. Arnold JM, Liu P, Demers C, Dorian P, Giannetti N, Haddad H, et al. Canadian Cardiovascular Society consensus conference recommendations on heart failure 2006: diagnosis and management. *Can J Cardiol* 2006;22(1):23-45. Erratum in: *Can J Cardiol* 2006;22(3):271.
8. Hogan DB, Bailey P, Carswell A, Clarke B, Cohen C, Forbes D, et al. Management of mild to moderate Alzheimer's disease and dementia. *Alzheimers Dement* 2009;3(4):355-84. Epub 2007 Sep 17.
9. Michael YL, Whitlock EP, Lin JS, Fu R, O'Connor EA, Gold R, et al. Primary care–relevant interventions to prevent falling in older adults: a systematic evidence review for the U.S. Preventive Services Task Force. *Ann Intern Med* 2010;153(12):815-25.
10. O'Donnell DE, Hernandez P, Kaplan A, Aaron S, Bourbeau J, Marciniuk D, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease—2008 update—highlights for primary care. *Can Respir J* 2008;15(Suppl A):1A-8A.
11. Boult C, Reider L, Leff B, Frick KD, Boyd CM, Wolff JL, et al. The effect of guided care teams on the use of health services: results from a cluster-randomized controlled trial. *Arch Intern Med* 2011;171(5):460-6.
12. Yach D, Hawkes C, Gould CL, Hofman KJ. The global burden of chronic diseases: overcoming impediments to prevention and control. *JAMA* 2004;291(21):2616-22.
13. Ministry of Health and Long-Term Care. *Guide to chronic disease management and prevention*. Toronto, ON: Ministry of Health and Long-Term Care; 2005. Available from: **www.health.gov.on.ca/en/pro/programs/fht/docs/fht_chronic_disease.pdf**. Accessed 2014 Aug 28.
14. Rothman AA, Wagner EH. Chronic illness management: what is the role of primary care? *Ann Intern Med* 2003;138(3):256-61.
15. Wagner EH. The role of patient care teams in chronic disease management. *BMJ* 2000;320(7234):569-72.
16. Chodosh J, Morton SC, Mojica W, Maglione M, Suttorp MJ, Hilton L, et al. Meta-analysis: chronic disease self-management programs for older adults. *Ann Intern Med* 2005;143(6):427-38.
17. Warsi A, Wang PS, LaValley MP, Avorn J, Solomon DH. Self-management education programs in chronic disease: a systematic review and methodological critique of the literature. *Arch Intern Med* 2004;164(15):1641-9.
18. Renders CM, Valk GD, Griffin S, Wagner EH, Eijk JT, Assendelft WJ. Interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings. *Cochrane Database Syst Rev* 2001;(1):CD001481.
19. Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness. The chronic care model, part 2. *JAMA* 2014;288(15):1909-14.
20. McAlister FA, Lawson FME, Teo KK, Armstrong PW. A systematic review of randomized trials of disease management programs in heart failure. *Am J Med* 2000;110(5):378-84.
21. Strömberg A, Mårtensson J, Fridlund B, Levin LA, Karlsson JE, Dahlström U. Nurse-led heart failure clinics improve survival and self-care behaviour in patients with heart failure: results from a prospective, randomised trial. *Eur Heart J* 2003;24(11):1014-23.
22. Österlund Efraimsson E, Hillervik C, Ehrenberg A. Effects of COPD self-care management education at a nurse-led primary health care clinic. *Scand J Caring Sci* 2008;22(2):178-85.
23. Coleman EA, Grothaus LC, Sandhu N, Wagner EH. Chronic care clinics: a randomized controlled trial of a new model of primary care for frail older adults. *J Am Geriatr Soc* 1999;47(7):775-83.
24. Scott IA. Chronic disease management: a primer for physicians. *Intern Med J* 2008;38(6):427-37. Epub 2008 Feb 20.
25. Vedel I, Monette M, Beland F, Monette J, Bergman H. Ten years of integrated care: backwards and forwards. The case of the province of Québec, Canada. *Int J Integr Care* 2011;11(Spec Ed):e004. Epub 2011 Mar 7.
26. Manca DP, Breault L, Wishart P. A tale of two cultures. Specialists and generalists sharing the load. *Can Fam Physician* 2011;57:576-84.
27. Lee L, Hillier LM, Stolee P, Heckman G, Gagnon M, McAiney C, et al. Enhancing dementia care: a primary care-based memory clinic. *J Am Geriatr Soc* 2010;58(11):2197-204. Epub 2010 Oct 26.
28. Lee L, Weston WW, Heckman G, Gagnon M, Lee FJ, Sloka S. Structured approach to patients with memory difficulties in family practice. *Can Fam Physician* 2013;59:249-54 (Eng), e129-34 (Fr).
29. Lee L, Hillier LM, Heckman G, Gagnon M, Borrie MJ, Stolee P, et al. Primary care–based memory clinics: expanding capacity for dementia care. *Can J Aging* 2014;33(3):307-19. Epub 2014 Aug 11.
30. Lee L, Hillier LM, Harvey D. Integrating community services into primary care: improving the quality of dementia care. *Neurodegener Dis Manag* 2014;4(1):11-21.
31. Lee L, Kasperski MJ, Weston WW. Building capacity for dementia care. Training program to develop primary care memory clinics. *Can Fam Physician* 2011;57:e249-52.
32. Lee L, Weston WW, Hillier LM. Developing memory clinics in primary care: an evidence-based interprofessional program of continuing professional development. *J Contin Educ Health Prof* 2013;33(1):24-32.
33. Wagner EH, Austin BT, Von Korff M. Organizing care for patients with chronic illness. *Milbank Q* 1996;74(4):511-44.
34. Massoud F, Lysy P, Bergman H. Care of dementia in Canada: a collaborative care approach with a central role for the primary care physician. *J Nutr Health Aging* 2010;14(2):105-6.

35. Pimlott NJG, Siegel K, Persaud M, Slaughter S, Cohen C, Hollingworth G, et al. Management of dementia by family physicians in academic settings. *Can Fam Physician* 2006;52:1108-9. Available from: **www.cfp.ca/content/52/9/1108.long**. Accessed 2015 Feb 4.
36. Mitchell SL, Teno JM, Kiely DK, Shaffer ML, Jones RN, Prigerson HG, et al. The clinical course of advanced dementia. *N Eng J Med* 2009;361(16):1529-38.
37. Haleem S, Lutchman L, Mayahi R, Grice JE, Parker MJ. Mortality following hip fracture: trends and geographical variations over the last 40 years. *Injury* 2008;39(10):1157-63. Epub 2008 Jul 24.
38. Rodríguez-Rodríguez P, Jiménez-García R, Hernández-Barrera V, Carrasco-Garrido P, Puente-Maestu L, de Miguel-Díez J. Prevalence of physical disability in patients with chronic obstructive pulmonary disease and associated risk factors. *COPD* 2013;10(5):611-7. Epub 2013 Jul 11.
39. Hobbs FD, Kenkre JE, Roalfe AK, Davis RC, Hare R, Davies MK. Impact of heart failure and left ventricular systolic dysfunction on quality of life: a cross-sectional study comparing common chronic cardiac and medical disorders and a representative adult population. *Eur Heart J* 2002;23(23):1867-76.
40. Heckman GA, Demers C, McKelvie RS, Hogan DB. Heart failure in older adults. *Can J Gen Intern Med* 2007;2(4):24-6.
41. Corsonello A, Antonelli Incalzi R, Pistelli R, Pedone C, Bustacchini S, Lattanzio F. Comorbidities of chronic obstructive pulmonary disease. *Curr Opin Pulm Med* 2011;17(Suppl 1):S21-8.
42. Bradford A, Kunik ME, Schulz P, Williams SP, Singh H. Missed and delayed diagnosis of dementia in primary care: prevalence and contributing factors. *Alzheimer Dis Assoc Disord* 2009;23(4):306-14.
43. Bednarek M, Maciejewski J, Wozniak M, Kuca P, Zielinski J. Prevalence, severity, and underdiagnosis of COPD in the primary care setting. *Thorax* 2008;63(5):402-7. Epub 2008 Jan 30.
44. Fonseca C, Morais H, Mota T, Matias F, Costa C, Gouveia-Oliveira A, et al. The diagnosis of heart failure in primary care: value of symptoms and signs. *Eur J Heart Fail* 2004;6(6):795-800, 821-2.
45. Boyd CM, Darer J, Boult C, Fried LP, Boult L, Wu AW. Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance. *JAMA* 2005;294(6):716-24.
46. Grumbach K, Bodenheimer T. A primary care home for Americans: putting the house in order. *JAMA* 2002;288(7):889-93.
47. Starfield B. Challenges to primary care from co- and multi-morbidity. *Prim Health Care Res Dev* 2011;12(1):1-2.
48. Braman SS, Lee DW. Primary care management of chronic obstructive pulmonary disease: an integrated goal-directed approach. *Curr Opin Pulm Med* 2010;16(2):83-8.
49. Starfield B, Lemke KW, Bernhardt T, Foldes SS, Forrest CB, Weiner JP. Comorbidity: implications for the importance of primary care in 'case' management. *Ann Fam Med* 2003;1(1):8-14.
50. Heckman GA, Molnar FJ, Lee L. Geriatric medicine leadership of health care transformation: to be or not to be? *Can Geriatr J* 2013;16(4):192-5.
51. Hogan B. Human resources training and geriatrics. *Geriatrics Today* 2001;4:7-10.
52. Starfield B. Is patient-centered care the same as person-focused care? *Perm J* 2011;15(2):63-9.
53. Parboosingh IJ, Reed VA, Caldwell Palmer J, Bernstein HH. Enhancing practice improvement by facilitating practitioner interactivity: new roles for providers of continuing medical education. *J Contin Educ Health Prof* 2011;31(2):122-7.
54. Hutchison B, Levesque JF, Strumpf E, Coyle N. Primary health care in Canada: systems in motion. *Milbank Q* 2011;89(2):256-88.