

## Enhancing Dementia Care: A Primary Care–Based Memory Clinic

Linda Lee, MD, MCISC,<sup>ab</sup> Loretta M. Hillier, MA,<sup>cd</sup> Paul Stolee, PhD,<sup>e</sup> George Heckman, MD, MSc,<sup>fg</sup> Micheline Gagnon, MD, MEd,<sup>b</sup> Carrie A. McAiney, PhD,<sup>ij</sup> and David Harvey, MA<sup>k</sup>

Memory clinics have been promoted as opportunities for improving dementia diagnosis and care. This article describes the implementation of an interdisciplinary memory clinic within primary care in Ontario, Canada, that aims to provide timely access to comprehensive assessment and care and to improve referring physicians' knowledge of the management of dementia through collaborative care and practice-based mentorship. Between July 2006 and September 2009, 246 initial and follow-up assessments were conducted with 151 patients, a high proportion of whom received a new diagnosis of mild cognitive impairment (44.4%) or dementia (19.2%). A trial of cholinesterase inhibitors was recommended for almost all patients newly diagnosed with dementia. Management interventions and recommendations included social worker outreach, long-term care planning, home safety or driving assessments, referral to community resources, and periodic follow-up and monitoring. A small proportion of patients (7.8%) were referred to a specialist. Surveyed patients and caregivers were very satisfied with their visit to the clinic. A chart audit conducted by two independent geriatricians indicated agreement with diagnosis and intervention, particularly related to use of specialists. The results indicate that memory clinics within primary care settings can support capacity building to ensure quality assessment and management of dementia at a primary care level. *J Am Geriatr Soc* 2010.

**Key words:** cognitive impairment; dementia; capacity building; primary care; memory clinics

From the <sup>a</sup>Centre for Family Medicine Family Health Team, Kitchener, Ontario, Canada; <sup>b</sup>Department of Family Medicine, Faculty of Health Sciences, <sup>c</sup>Division of Geriatric Medicine, <sup>d</sup>Department of Medicine, and <sup>e</sup>Department of Psychiatry and Behavioral Neurosciences, McMaster University, Hamilton, Ontario, Canada; <sup>f</sup>Specialized Geriatric Services, <sup>g</sup>Geriatric Psychiatry Service, St. Joseph's Health Care London, London, Ontario, Canada; <sup>h</sup>Aging, Rehabilitation, and Geriatric Care Research Centre, Lawson Health Research Institute, London, Ontario, Canada; <sup>i</sup>Health Studies and Gerontology and <sup>j</sup>Faculty of Applied Health Sciences, University of Waterloo, Waterloo, Ontario, Canada; and <sup>k</sup>Alzheimer Society of Ontario, Toronto, Ontario.

Address correspondence to Linda Lee, The Centre for Family Medicine, 10B Victoria Street South, Kitchener, ON, Canada N2G 1C5. E-mail: joelinda5@rogers.com

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Despite the profound effects associated with Alzheimer's disease and related dementia (ADRD), family physicians often do not recognize cognitive impairment.<sup>1</sup> It has been estimated that one-quarter to two-thirds of people with ADRD are not diagnosed and treated.<sup>2,3</sup> Unrecognized dementia increases the risk for delirium, motor vehicle accidents, medication errors, financial difficulties, caregiver burnout, early institutionalization, and high healthcare costs.<sup>4,5</sup>

Failure to recognize dementia has been attributed to lack of knowledge about dementia,<sup>6</sup> lack of familiarity with cognitive screening,<sup>2,7</sup> lack of symptom recognition,<sup>8</sup> and the challenging psychosocial and ethical aspects of care for patients with declining cognition.<sup>9</sup> A survey of 127 primary care physicians revealed that one-third were not confident about their ability to diagnosis dementia and two-thirds were not confident about their ability to manage dementia-related symptoms.<sup>10</sup> Dementia care has been described as more difficult to manage than other chronic disease conditions.<sup>11</sup>

Early detection of dementia is critical to ensuring that persons with dementia and their caregivers have access to treatment, education, counseling, and other services that can delay decline, prevent crises, ease caregiver burden, and delay institutionalization.<sup>12</sup> The development of specialized memory clinics has been promoted as an opportunity to improve the diagnosis and management of dementia<sup>13–16</sup> and support caregivers,<sup>17</sup> yet many such clinics are located in tertiary care settings, geriatric research centers, and specialized psychiatry services<sup>15,17</sup> at arm's length from primary care and with family physicians often ceding, rather than sharing in, important aspects of the care of their patients to these specialized services. In Canada, there is a shortage of specialists such as behavioral neurologists, geriatricians, and geriatric psychiatrists.<sup>18</sup> Time to access specialist care can be lengthy, and improving the efficiency of access to existing specialist resources is of paramount importance.

With established and ongoing relationships with patients, family physicians are in an ideal position to assess and manage dementia, including ensuring that patients and caregivers are linked to the appropriate community and

psychosocial supports. Emerging evidence on the potential effect of primary care memory clinics is positive.<sup>19</sup> The potential exists for these clinics to diagnose dementia earlier, accurately implement comprehensive evidence-based care, and use specialists more efficiently, reducing wait times for specialist care.

This article describes the implementation of a memory clinic operated within a primary care setting and provides some preliminary evidence of its effect on patients and caregivers, referring health professionals, and use of specialist services.

## PROGRAM DESCRIPTION

To address the challenges of caring for patients with cognitive difficulties, the Centre for Family Medicine (CFFM) Family Health Team (FHT), in Kitchener, Ontario, established a memory clinic in 2006. In Ontario, Canada, FHTs consist of groups of health professionals (physicians, nurses, social workers, pharmacists, and other interdisciplinary healthcare providers) working together to provide primary care to patients as a patient-centered approach to care that is garnering increasing attention.<sup>20</sup> The CFFM is a well-established FHT that includes 11 full-time family physicians caring for a patient base of approximately 20,000 patients in an urban setting with a population of 302,143.<sup>21</sup> The memory clinic represents an innovative, interdisciplinary approach to the management of dementia that aims to provide timely access to comprehensive assessment and to improve family physicians' knowledge of cognitive impairment and their confidence and comfort with managing cognitive impairment through collaborative care and practice-based education and mentorship.

Figure 1 is a diagram illustrating patient flow through the clinic. The clinic currently consists of one family physician lead, two registered nurses, one social worker, one pharmacist, and one receptionist (but may function adequately with a minimum of one physician and two nurses). Before the assessment date, the social worker and pharmacist review each patient chart to determine whether their assessments are needed (if there is any suggestion of potential depression or mood changes, safety concerns, caregiver stress or need for community supports, or concerns about medication adverse effects or adherence); the team nurse and physician may request their services if it becomes evident that they are needed. The pharmacist and social worker are involved in approximately 50% of assessments. A designated geriatrician is available for consultation over the telephone or e-mail support to the lead physician and to directly assess more-complex patients. Collaborative working relationships between physicians in which the specialist is aware of and trusts the expertise and skills of the lead family physician are necessary. This type of consultation requires sufficient information for reasonable decision-making, good documentation, and explicit identification of the responsibility of the lead physician.

The clinic operates 1 to 2 days per month, with four new assessments and two follow-up appointments scheduled each clinic day. Urgent referrals are seen within 1 month of referral (sooner if the referring physician specifically requests). Nonurgent referrals are seen within at most 2 to 3 months from referral. This represents a significant

decrease in the length of time it takes to schedule an assessment with geriatricians in the region. The typical wait times to see a geriatrician in the region for a nonurgent consultation are approximately 4 to 6 months. The time commitment for new assessments ranges from 1.3 to 3.0 hours (average 2 hours), of which direct physician time is approximately 0.6 hours. Follow-up appointments typically range in length from 0.8 to 2.3 hours (average 1.4 hours), of which direct physician time is approximately 0.7 hours.

The memory clinic's approach to care is characterized as collaborative, capacity building, and evidence based.

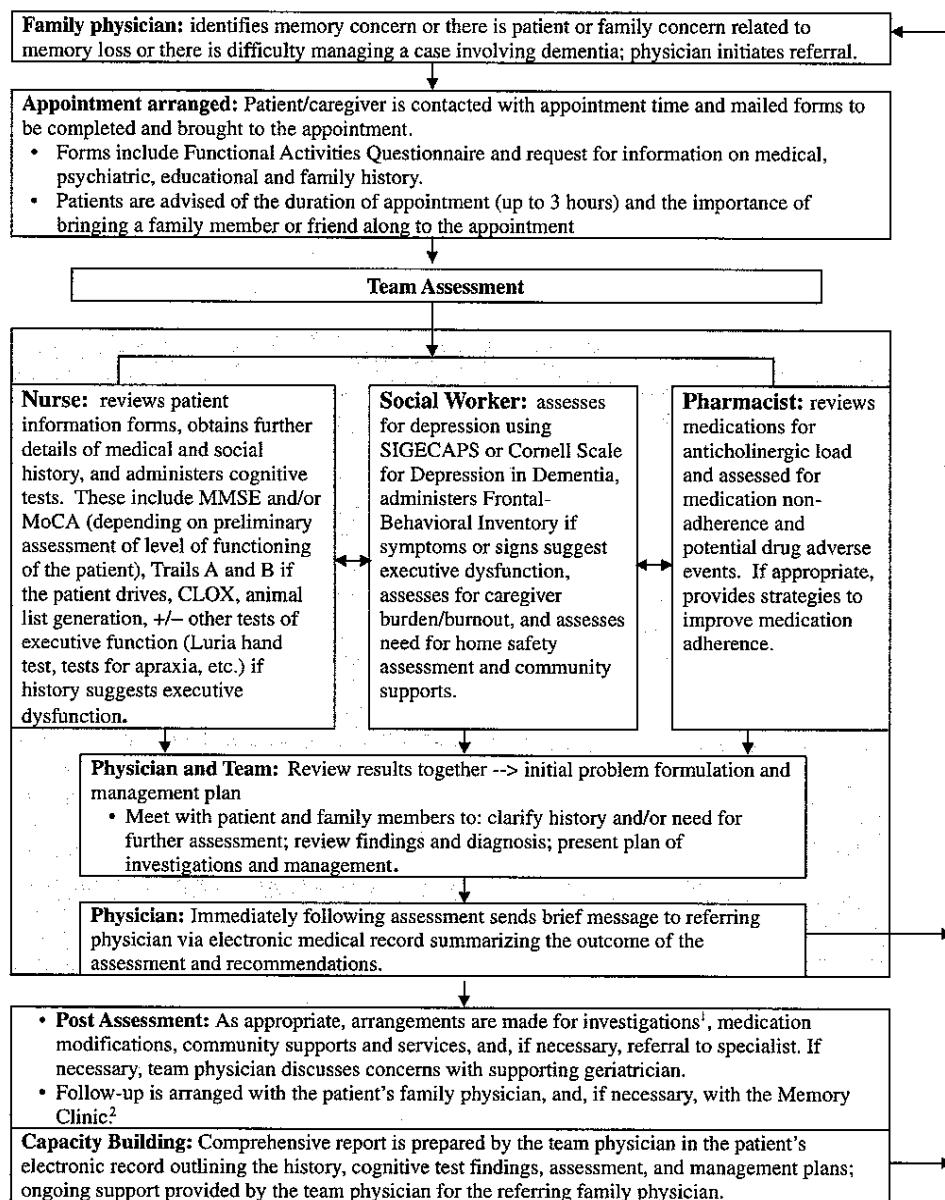
## COLLABORATIVE CARE

Collaborative care approaches, involving care provided by an interdisciplinary team, have been recommended as an effective strategy to address the challenges of providing dementia care in primary care settings.<sup>23-26</sup> The CFFM Memory Clinic distinguishes itself from other specialty clinics in that it functions to enhance the care that family physicians can provide at a primary care level. The aim is not to replace the role of the patient's own family physician or the role of the consultant, who remains an invaluable resource for more challenging patient concerns. The patient's own family physician maintains a critical role in the management of their patient in having established a trusting relationship over time and a broader understanding of the patient and his or her illness in the context of family and culture. Referring physicians are encouraged to share in the responsibility of informing patients about the Memory Clinic assessment. Physicians are provided with tear-away pads outlining information to patients about what to expect during their Memory Clinic visit (duration, the need to bring a family member or friend with them, assessment of driving safety). Patients are given this sheet at the time that their family physician suggests a referral to the Memory Clinic. Referring physicians are informed when patients decline to schedule an assessment; clinic staff are available to assist the physician with strategies to increase likelihood of acceptance of the referral.

A geriatrician supporting the Memory Clinic is available to discuss challenging questions or concerns that may arise with the family physician lead. If it is felt that a referral to a specialist is required, a formal consultation request is arranged. In Ontario, the Ministry of Health and Long Term Care provides alternate funding solutions to allow geriatricians to earn payments that are not directly dependent on the numbers of patients seen.

## Evidence-Based Care

The clinic uses evidence-based assessment tools (Figure 1) to balance diagnostic accuracy with efficient, sustainable use of resources within an FHT model of care. Assessments are patient centered, and the use of specific assessment tools individualized to the needs of the patient. There is no accepted, agreed-upon, or recommended way to diagnose or screen for mild cognitive impairment (MCI),<sup>27</sup> but in the clinic, the diagnosis of MCI is based on a structured clinical process consisting of standardized multidomain cognitive tests and assessment of functional ability, which are complemented with a thorough history from the patient and caregiver. As in many areas in medicine, the process of diagnosing MCI is based on



**Figure 1.** Flow diagram of Family Health Team Memory Clinic Model of Care.

<sup>1</sup>Laboratory investigations and imaging are ordered as appropriate and consistent with Canadian Consensus Guidelines: Patterson, C.J.S., et al., The recognition, assessment and management of dementing disorders: conclusions from the Canadian Consensus Conference on Dementia. *CMAJ*. 1999;160 (suppl 2): S1-S15 and Chow, T. Structural neuroimaging in the diagnosis of dementia Alzheimer's Dementia, 2008;3:333-335. May include: complete blood count, thyroid-stimulating hormone, serum levels of creatinine, electrolytes, B12, calcium, and glucose. Criteria for ordering cranial CT scans for suspected dementia: age less than 60 years, rapid or unexplained decline in cognition or function, dementia of relatively short duration (less than 2 years), recent, significant head trauma, history of cancer, use of anticoagulants or history of bleeding disorder, history of urinary incontinence and gait disorders, unexplained neurologic symptoms, presence of any new localizing sign, unusual or atypical cognitive symptoms or presentation, or gait disturbance. MRIs are not ordered routinely.

<sup>2</sup>Follow-up is as needed and based on current guidelines: 6-9 months if the patient is driving with Mild Cognitive Impairment or dementia, 1-year otherwise, and usually 3 months if there is medication initiation or adjustment. If there is rapidly progressing dementia (e.g., frontotemporal dementia), reassessment may be offered sooner or referral to specialist initiated. Referring physicians may request follow-up at any time.

clinical reasoning informed by available evidence-based science, experience, and interactions with the patient.

### Capacity Building

There is a need to improve physician ability to recognize cognitive impairment and in particular to diagnose demen-

tia in its early stages.<sup>1,7</sup> The clinic ultimately aims to assist and empower family physicians to develop a greater degree of comfort and skill in managing patients with cognitive problems. After completion of the comprehensive assessment, recommendations for management are provided to the family physician in a brief message relayed directly through the patients' electronic medical record on the day

of the assessment and in a detailed report that is designed to increase physician understanding of the reasoning that underlies the treatment recommendations. In collaboration with the Ontario College of Family Physicians, the CFFM Memory Clinic developed an accredited, comprehensive 5-day training program to help develop interdisciplinary memory clinics within other primary care settings within the region. Currently, 13 new primary care memory clinics are being established; an evaluation of this continuing education initiative is under way.

## METHODS

An evaluation of the Memory Clinic was undertaken to describe the services provided and identify associated effects. The University of Waterloo Office of Research Ethics for research involving human participants approved this study.

### Referral and Service Tracking

Memory Clinic staff collected information related to patient date of referral, referral status (urgent vs nonurgent), age, sex, presenting problem, assessment diagnosis, and treatment recommendations for all patients assessed from July 11, 2006, to September 22, 2009.

### Patient and Caregiver Satisfaction Survey

After their clinic appointment, patients and caregivers were invited to complete a brief anonymous paper-based survey to assess their satisfaction with the clinic; this was completed in the waiting room and returned in a sealed envelope. A research associate opened the envelopes and entered the data into an electronic database. Using a 5-point Likert scale (strongly disagree to strongly agree) respondents rated a number of aspects of the clinic (timeliness, quality of explanations, willingness to recommend the clinic to others, value of the clinic in addition to regular primary care). A 7-point Likert scale (extremely dissatisfied to extremely satisfied) was used to rate overall satisfaction with the clinic visit. These surveys were distributed from October 21, 2008, to July 17, 2009.

### Physician Survey

All of the 11 family physicians working in the CFFM were invited to complete an anonymous on-line survey to assess their satisfaction with the clinic and support received. Using a 5-point rating scale (strongly disagree to strongly agree), respondents rated various aspects of the clinic (timeliness of access to assessment, assessment and treatment recommendations, effects on their knowledge and management of dementia). Using a before-and-after methodology,<sup>28</sup> respondents rated current outcomes such as confidence and capacity to manage memory problems in comparison with before their involvement with the Memory Clinic.

### Chart Audit

Two geriatricians independently audited the charts of 30 consecutively assessed patients as a method of quality assurance. The chart audit tool was one that the College of Physicians and Surgeons of Ontario<sup>29,30</sup> developed, in which quality indicators (e.g., diagnosis, investigations, prescribed medications, treatment plan, and follow-up) are

assessed as appropriate, appropriate with suggestions, or of concern. Confirmation of the diagnosis of dementia is based on available information within the chart (*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, criteria; results of standardized tests; comprehensive history; and documented interactions with patients). After the independent chart audit, the geriatricians compared their assessments. All discrepancies were resolved by consensus after jointly examining the chart and with discussion with the Memory Clinic physician.

## RESULTS

One hundred seventy-four patients have been referred to the Memory Clinic; 151 had been assessed and 23 were awaiting assessment at the time this article was being written. The number of patients assessed had more than doubled each year, with the exception of 2009, in which some clinic dates were cancelled because of the team's involvement with the provincial training program. Ninety-seven percent of assessments were considered nonurgent.

Table 1 presents the characteristics of the patient population served by the Memory Clinic and Table 2 presents medication recommendations. The mean response time to assessment was  $2.2 \pm 1.8$  months, with the majority of patients being assessed within 3 months of referral. For 20.5% of patients, memory complaints were attributable to causes other than cognitive impairment (e.g., depression, anxiety). A high proportion of patients received a new diagnosis of MCI (44.4%) or dementia (19.2%) at their initial assessment. An additional four patients (2.6%) were diagnosed with MCI or dementia at follow-up, so that, in total, 100 patients assessed in the clinic received a new diagnosis of MCI or dementia, 72.4% of whom were diagnosed with mixed dementia. A trial of a cholinesterase inhibitor (AChEIs) was recommended for almost all patients diagnosed with a new dementia (it was contraindicated for four patients).

Twelve patients were referred to a geriatrician, six to confirm a new diagnosis of frontotemporal or Lewy body dementia. These referrals did not include the informal consultations between the Memory Clinic physician and geriatrician (<twice monthly) in which the geriatrician did not directly see the patient. Referrals to other services included social work outreach, and Community Care Access Centres, consistent with their mandate to provide home care, plan for long-term care placement, and conduct home safety assessments and for driving assessments.

### Patient and Caregiver Satisfaction

Fifty-five satisfaction surveys were completed: 24 by patients and 17 by caregivers (14 respondents did not identify whether they were patients or caregivers); this represents a 60.0% response rate for patients and 42.5% for caregivers based on all of the patients (N = 40) seen in the clinic during the time period in which the survey was available. There were no significant differences in ratings between patients and caregivers. Mean ratings of satisfaction with their visit to the Memory Clinic ( $5.8 \pm 1.1$ , n = 23) reflected that patients and caregivers were very satisfied with their visit to the clinic. All of the respondents agreed that their concerns and questions were adequately addressed and that they were satisfied with the amount of time the Memory Clinic

**Table 1. Characteristics of the Patient Population Served in the Memory Clinic (N = 151)**

Characteristic	n (%)
<b>Age</b>	
<40	4 (2.6)
40–49	11 (7.3)
50–59	17 (11.3)
60–69	23 (15.2)
70–79	44 (29.1)
81–89	48 (31.8)
≥90	3 (2.0)
<b>Sex</b>	
Female	81 (53.3)
Male	70 (46.4)
<b>Presenting problem</b>	
Memory or word-finding complaints, behavioral or psychological symptoms	61 (42.4)
Worsening of memory complaints, behavioral or psychological symptoms	58 (40.3)
Assessment of known dementia	11 (7.6)
Case-finding requested because of multiple risk factors	9 (6.3)
Driving concerns	4 (2.8)
Concerns about medication management	1 (0.7)
<b>Service provision</b>	
Response time to assessment, months	
<1	18 (11.9)
1–3	61 (40.1)
4–6	11 (7.2)
7–9	3 (2.0)
Number of visits	
Assessment only (1 visit)	103 (68.2)
>1 follow-up visits	48 (31.6)
Total number of assessments (initial and follow-up)	246
<b>Assessment diagnosis (excluding those prediagnosed with dementia)</b>	
New diagnosis of mild cognitive impairment*	67 (44.4)
New diagnosis of dementia	29 (19.2)
Mixed dementia <sup>†</sup>	21 (72.4)
Vascular dementia	1 (3.4)
Frontotemporal dementia	4 (13.8)
Lewy body dementia	2 (6.9)
Alzheimer's disease	1 (3.4)
Cognitive deficits associated with other conditions or medications	8 (5.3)
Normal cognitive function—memory complaints attributable to other symptoms or conditions <sup>‡</sup>	31 (20.5)
Not yet diagnosed	16 (10.6)
Miscellaneous <sup>§</sup>	2 (1.3)
<b>Medications or therapies</b>	
Initiation of a new medication	31 (20.5)
Change in medication (discontinuation, increase or decrease dose)	29 (19.2)
Maintain current medication	7 (4.6)

(Continued)

**Table 1. (Contd.)**

Characteristic	n (%)
B12 supplementation	18 (11.9)
<b>Referrals</b>	
Social work outreach <sup>  </sup>	18 (11.9)
Social work referral for counseling	6 (4.0)
Referral for long-term care planning, safety assessment	5 (3.3)
Referrals for specialist (geriatrician or neurologist) consultation	12 (7.8)
<b>Treatment recommendations</b>	
Reassessment (3, 6, or 12 months or as needed) <sup>#</sup>	93 (61.6)
Driving assessment	10 (6.6)
Discontinue driving	23 (15.2)
Specific treatment for depression	7 (4.6)
Follow-up with family physician for other conditions <sup>**</sup>	12 (7.9)
Reduce alcohol intake	3 (2.0)
Reassurance of normal cognitive function	18 (11.9)

Note: Percentages may not sum to 100% because of missing information.

\* Includes mild cognitive impairment with or without other symptoms (e.g., depression).

<sup>†</sup> There are no clear guidelines for the diagnosis of mixed dementia.<sup>31,32</sup> In this Memory Clinic, mixed dementia is defined as dementia having features of Alzheimer's disease and vascular dementia or Alzheimer's disease with significant vascular risk factors with or without confirmation radiologically of vascular involvement.<sup>‡</sup> For example, depression, anxiety, posttraumatic stress disorder.<sup>§</sup> For example, possible alcohol-related dementia, caregiver burden.<sup>||</sup> Consisting of a home visit conducted by a social worker.<sup>#</sup> Reassessment was recommended for 38 patients attending follow-up appointments, so 131 (86.8%) will be reassessed at the Memory Clinic.<sup>\*\*</sup> For example, anxiety, depression.

team spent with them. More than 84% of respondents agreed that they were able to obtain an appointment for the clinic in good time, had a better understanding of their symptoms and conditions, would recommend the clinic to others who had similar concerns, and thought their visit to the Memory Clinic was a valuable addition to the regular care provided their family physician.

### Physician Satisfaction

Eight physicians completed the survey (72.7% response rate). The survey respondents had been in family practice an average of 12 ± 9.3 years (range 1–25 years). Generally, physicians were very satisfied with the timeliness and quality of assessment, diagnostic and treatment recommendations, and availability of the Memory Clinic team for consultation (all mean ratings ≥4.5 on a 5-point scale). At least half of the survey respondents reported being more confident in their ability to assess (n = 4) and manage (n = 5) cognitive impairment and were more comfortable in speaking about dementia with patients and families (n = 6) than before their involvement with the Memory Clinic; six physicians indicated that the quality of care that they provide to patients with cognitive impairment has improved (sum of improved and much improved ratings) as a result of the Memory Clinic.

**Table 2. Medication Recommendations**

Medication Recommendations*	n (%)	
	New Diagnosis of Mild Cognitive Impairment (n = 67)	New Diagnosis of Dementia (n = 33)
Initiation of cholinesterase inhibitors†	0	14 (42.4)
Plans for initiation of cholinesterase inhibitors†	0	11 (33.3)
New medication§	6 (9.0)	7 (21.1)
Change in existing medication	7 (10.4)	2 (6.0)
No medication recommendations	54 (80.6)	4 (12.1)#

\* Three patients who received a new diagnosis of dementia had already been prescribed cholinesterase inhibitors; it was recommended that these patients continue to take this medication.

† Donepezil (Aricept), Galantamine (Reminyl), Rivastigime (Exelon).

‡ Recommendations were for a trial of cholinesterase inhibitors to be considered at a future date, after awaiting test results, evaluation of other interventions, or patient consultation with family physician or family.

§ Medications other than cholinesterase inhibitors (e.g., antidepressants).

|| Increase or decrease in dose or discontinuation.

# Cholinesterase inhibitors were contraindicated for these patients.

All of the physicians agreed (sum of agree and strongly agree ratings) that the Memory Clinic consultation notes were meaningful and helpful to their management of memory problems and cognitive impairment and that as a result they had a greater awareness of cognitive impairment in their patient population and were better able to recognize risk factors for dementia. Similarly, the majority of physicians ( $\geq 6$ ) agreed that they were more knowledgeable about the risk factors associated with dementia and the diagnosis and management of mild cognitive impairment, understood the tests that are used to diagnose cognitive impairment better, and were more likely to consider cognitive impairment in their patients; they agreed that the Memory Clinic was an effective use of health system resources and optimized the use of geriatricians and specialized geriatric services for more-complex cases of cognitive impairment. Additional comments made by physicians suggested that the Memory Clinic assists patients to remain at home longer, reduces ordering of unnecessary tests, reduces the burden on wait times for geriatricians, and provides “an excellent teaching opportunity.”

#### Chart Audit

The level of agreement in the audit assessments was 97.2% (calculated as percentage agreement). The chart audit revealed no concerns with the assessment and management of dementia in the clinic; the audit of diagnosis, prescribed medications, treatment plan, and follow-up were all classified as appropriate or, in a minority of cases, as appropriate with suggestions. Suggestions were made regarding additional considerations, including the potential presence of a mood or sleep disorder, potential adverse events to

watch for, assessment of adherence to a previously prescribed intervention, and potential medication dosage reductions. Generally, comments made by the assessors indicated agreement with diagnosis and intervention, particularly in relation to the appropriateness of the decision of whether to refer to a specialist.

#### DISCUSSION

With the shortage of specialists and the anticipated increase in the number of Canadians who will develop dementia in the coming years, new models of dementia care need to be developed and tested. The results of this evaluation have demonstrated that a memory clinic operating within primary care can provide timely access to specialized care and can enhance family physician capacity for dementia care. This unique and innovative collaborative model of interdisciplinary service delivery, with emphasis on enhancing family physician capacity for dementia care, represents a major move toward filling dementia care service gaps that are well documented within the literature.<sup>3,7</sup> The model allowed family physicians to become more knowledgeable and skilled in managing their patients with dementia, and periodic monitoring of patients in the clinic ensured that optimal care was being provided. For patients with MCI, diagnosis and ongoing monitoring allowed for early intervention if MCI progressed to dementia, as well as evaluation of driving risk. This is a potentially significant outcome because, by the time a family physician or specialist diagnoses a patient with dementia, there is often already significant decline, with missed opportunities for possible stabilization of cognitive function at a higher level. It is common for patients to present in primary care early in the evolution of disease, when symptoms are mild, vague, and nonspecific.<sup>33</sup> Memory complaints can also be a manifestation of other conditions such as depression and sleep disorders. The purpose of a primary care memory clinic is to appropriately diagnose and manage all of these conditions in collaboration with the patient's family physician while effectively identifying cases requiring the more-specialized expertise of the memory clinic or a specialist. The fact that 65% of patients did not receive a diagnosis of dementia but were instead managed appropriately through other means highlights the effectiveness of this model of care, because these cases would have been referred to specialists without the Memory Clinic, which would be an inappropriate use of limited specialist resources. Moreover, diagnosing and managing a greater proportion of patients with memory complaints at the primary care level enhances the capacity at the specialist level to manage more-complex or urgent referrals in a more timely manner. Furthermore, the clinic increases specialists' efficiency by providing reliable and detailed baseline clinical data and testing results and the capacity for specialists to delegate ongoing management of patients back to the primary care memory clinic. Although this study was not designed to assess the regional effect of the clinic on specialist wait times or other specialized geriatric services, this would be an important focus of future studies.

Although published reports of Memory Clinic outcomes note that medication treatment is a main assessment outcome,<sup>34</sup> the types of recommendations made by the

Memory Clinic studied here reflect an evidence-based and interdisciplinary approach to care. All patients with a new diagnosis of dementia without contraindications were appropriately offered a trial of AChEIs and other medications were optimized to reduce adverse effects on cognitive functioning. Other treatment recommendations targeted the multifaceted nature of dementia care (e.g., need for regular monitoring, long-term care planning, safety assessment, community supports, and management of comorbidity, including depression). The results of the chart audit indicate that assessment, diagnosis, treatment, and specialist referral decisions were appropriate.

This model of care is consistent with a chronic disease management approach to care.<sup>35</sup> The number of referrals for specialist consultation (8%) falls within the expected range<sup>35</sup> and suggests enhanced capacity to manage cognitive impairment within primary care, with referrals for specialist consultation being limited to the more-complex issues. Specialist support to the family physician lead is nonetheless critical to the success of the clinic. Identified patient and caregiver and health system effects are consistent with published reports of the benefits associated with Memory Clinics.<sup>14,19</sup>

The results of this study support capacity building in primary care to provide quality assessment and management of dementia. Evaluation results have informed improvements to this care model. Further implementation of the memory clinic has the potential to significantly affect the quality of dementia care in this province and other jurisdictions developing models of interdisciplinary primary care practice, as well as a model for improvement of management of other chronic diseases at a primary care level.

There are a number of limitations to this study. The sample size for the physician survey was small ( $N = 8$ ), limiting the generalizability of the findings to other settings. Because patients and caregivers were not randomly selected to complete a satisfaction survey, there may have been a selection bias in that only those satisfied with the care received agreed to complete a survey. Although not a direct limitation of this model of care but rather the state of medical science, the lack of a consistently agreed-upon way to diagnose MCI can affect the replication of the findings depending on how MCI is diagnosed. The findings of this study are highly relevant to the context of the Canadian healthcare system and may be less applicable to jurisdictions in which there are more-than-adequate specialist resources for dementia care or where primary care physicians are not the gatekeepers for specialist care.

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**Conflict of Interest:** The editor in chief has reviewed the conflict of interest checklist provided by the authors and has determined that the authors have no financial or any other kind of personal conflicts with this paper.

**Author Contributions:** Linda Lee: initiative concept, study design; review and analysis, interpretation, manuscript drafting, critical manuscript review, final manuscript approval. Loretta M. Hillier: study design, data collection and analysis, manuscript drafting, critical manuscript review, final manuscript approval. Paul Stolee: study design, critical manuscript review, final manuscript approval.

George Heckman: initiative concept and support, chart audit, interpretation, critical manuscript review, final manuscript approval. Micheline Gagnon: initiative support, chart audit, interpretation, critical manuscript review, final manuscript approval. Carrie McAiney and David Harvey: study concept and design, critical manuscript review, final manuscript approval.

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## REFERENCES

1. Iliffe S, Manthorpe J. Dementia in the community: Challenges for primary care development. *Rev Clin Gerontol* 2002;12:243-252.
2. Feldman HH, Jacova C, Robillard A et al. Diagnosis and treatment of dementia: 2. Diagnosis. *Can Med Assoc J* 2008;178:825-836.
3. Callahan CM, Hendrie HC, Tierney WM. Documentation and evaluation of cognitive impairment in elderly primary care patients. *Ann Intern Med* 1995;122:422-429.
4. Sternberg SA, Wolfson C, Baumgarten M. Undetected dementia in community-dwelling older people: The Canadian Study of Health and Aging. *J Am Geriatr Soc* 2000;48:1430-1434.
5. Steele C, Rovner B, Chase GA et al. Psychiatric symptoms and nursing home placement of patients with Alzheimer's disease. *Am J Psychiatr* 1990;147:1049-1051.
6. Barrett JJ, Haley WE, Harrell LE et al. Knowledge about Alzheimer disease among primary care physicians, psychologists, nurses, and social workers. *Alzheimer Dis Assoc Disord* 1997;11:99-106.
7. Chodosh J, Petitti DB, Elliott M et al. Physician recognition of cognitive impairment: Evaluating the need for improvement. *J Am Geriatr Soc* 2004;52:1051-1059.
8. Woods RT, Moniz-Cook E, Iliffe S et al. Dementia: Issues in early recognition and intervention in primary care. *J Royal Soc Med* 2003;96:320-324.
9. Hinton L, Franz CE, Reddy G et al. Practice constraints, behavioral problems and dementia care: Primary care physicians' perspectives. *J Gen Intern Med* 2007;22:1487-1492.
10. Turner S, Iliffe S, Downs M et al. General practitioners' knowledge, confidence and attitudes in the diagnosis and management of dementia. *Age Ageing* 2004;33:467.
11. Harris DP, Chodosh J, Vassar SD et al. Primary care providers' views of challenges and rewards of dementia care relative to other conditions. *J Am Geriatr Soc* 2009;57:2209-2216.
12. Brodaty H, Gresham M, Luscombe G. The Prince Henry dementia caregiver's training programme. *Int J Geriatr Psychiatr* 1997;12:183-192.
13. Morgan DG, Crossley M, Kirk A et al. Improving access to dementia care: Development and evaluation of a rural and remote memory clinic. *Aging Ment Health* 2009;13:17-30.
14. Van der Cammen TJ, Simpson JM, Fraser RM et al. The memory clinic: A new approach to the detection of dementia. *Br J Psychiatr* 1987;150:359-364.
15. Luce A, McKeith I, Swann A et al. How do memory clinics compare with traditional old age psychiatry services? *Int J Geriatr Psychiatr* 2001;16:837-845.
16. Jolley D, Benbow SM, Grizzell M. Memory clinics. *Postgrad Med J* 2006;82:199-206.
17. Logiudice D, Wlatrowicz W, Brown K et al. Do memory clinics improve quality life of carers? A randomized pilot trial. *Int J Geriatr Psychiatr* 1999;14:626-632.
18. Hogan B. Human resources training and geriatrics. *Geriatr Today: J Can Geriatr Soc* 2001;4:7-10.
19. Greening L, Greaves I, Greaves N et al. Positive thinking on dementia in primary care: Gnosall Memory Clinic. *Com Pract* 2009;52:20-23.
20. Rosser WW, Colwill JM, Kasperi J et al. Patient-centered medical homes in Ontario. *N Eng J Med* 2010;362:e7.
21. Statistics Canada. Population and dwelling counts, for census metropolitan areas, 2006 and 2001 censuses [on-line]. Available at <http://www12.statcan.ca/english/census06/data/popdwll/Table.cfm?T=205&SR=1&S=3&O=D.&RPP=33> Accessed February 12, 2009.
22. Patterson CJ, Gauthier S, Bergman H et al. The recognition, assessment and management of dementing disorders: Conclusions from the Canadian Consensus Conference on Dementia. *Can Med Assoc J* 1999;160(Suppl 2):S1-S15.
23. Chow T. Structural neuroimaging in the diagnosis of dementia. *Alzheimers Dement* 2007;3:333-335.
24. Guerriero Austrom M, Damush TM, Hartwell CW et al. Development and implementation of nonpharmacologic protocols for the management of patients with Alzheimer's disease and their families in a multiracial primary care setting. *Geronotology* 2004;44:548-553.

25. Pratt R, Clare L, Kirchner V. 'It's like a revolving door syndrome': Professional perspectives on models of access to services for people with early-stage dementia. *Aging Ment Health* 2006;10:55-62.
26. Venohr I, Fine R, Saunders V et al. Improving dementia care through community linkages: A multi-site demonstration project. *Home Health Care Serv Q* 2001;19:51-63.
27. Chertkow H. Introduction: The Third Canadian Consensus Conference on the Diagnosis and Treatment of Dementia, 2006. *Alzheimers Dement* 2007;3: 262-265.
28. Rockwell SK, Kohn H. Post- then pre evaluation. *J Extension* 1989;27:1-7.
29. Wenghofer E, Klass D, Abrahamowicz M et al. Doctor scores on national qualifying examinations predict quality of care in future practice. *Med Educ* 2009;43:1166-1173.
30. Wenghofer E, Williams AP, Faulkner D et al. Physician-patient encounter: The structure of performance in family and general office practice. *J Contin Ed Health Prof* 2006;26:285-293.
31. Jellinger KA. The enigma of mixed dementia. *Alzheimers Dement* 2007;3: 40-53.
32. Robillard A. Clinical diagnosis of dementia. *Alzheimers Dement* 2007;3: 261-452.
33. Summerton N. The medicine of primary care. *Br J Gen Pract* 1999;49:604-605.
34. Werner P, Goldstein D, Heinik J. The process and organizational characteristics of memory clinics in Israel in 2007. *Arch Gerontol Geriatr* 2009;49: 115-120.
35. Scott I. Chronic disease management: A primer for physicians. *Int Med J* 2008;38:427-437.