A Mild Dementia Knowledge Transfer Program to improve knowledge and confidence in primary care: an exploratory study

By

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Abstract

Patients with dementia are often unaware of their disease and do not seek medical attention; thus, health care providers must shift to "active detection" to identify at-risk patients early. No previous studies have focused on promoting this shift, so this study evaluates the efficacy of a new program to improve the knowledge and confidence of primary care providers in the early detection, diagnosis, and management of mild dementia.

Physicians and nurses (n = 38) were recruited from 14 practices in Ontario, Canada. The Mild Dementia Knowledge Transfer Program was run at each practice. As a Neuroscience Master’s student I demonstrated the cognitive assessment procedures, and recipients assessed remaining patients with my guidance. Assessments included patient interviews using a Data Gathering Form – developed for the Program – to provide informal cognitive assessment, and the Montreal Cognitive Assessment (MoCA) test. The procedures were discussed between assessments to enhance learning. Later, recipients discussed the assessment results with the dementia specialist and myself; diagnoses and initial care plans were formulated collaboratively. Questionnaires measuring knowledge and confidence regarding detection, assessment and care of mild dementia were developed to measure change pre-post and three months after the Program. Linear mixed-effects models analysis with time as fixed effect and intercept as random effect was conducted to test change.

Program recipients showed increases in knowledge-confidence score after the program (10.3; \(P < .001\)) paralleling increases in both knowledge and confidence sub-
scores; there was no decline after three months ($P = .83$). No differences were observed between medical and nursing staff. The number of assessments done by recipients was positively associated with knowledge-confidence change ($P = .01$). Most recipients (70%) rated the program as excellent; 65% rated interactivity as the best part, 34% rated time commitment as the worst part, and 91% rated the program as making it easier to detect dementia.

Due to the complex nature of dementia, the Program was performance-oriented, specialist-supported, clinic-based, and flexible to the needs of recipients. It showed acceptability and feasibility within primary care, and the results support its’ efficacy to improve primary care providers’ self-rated knowledge and confidence in mild dementia care.
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<table>
<thead>
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<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>CCCDTD3</td>
<td>Third Canadian Consensus Conference on the Diagnosis and Treatment of Dementia</td>
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<td>CMAJ</td>
<td>Canadian Medical Association Journal</td>
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<td>KC</td>
<td>Knowledge-confidence</td>
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<td>MCI</td>
<td>Mild cognitive impairment</td>
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<td>MDKT</td>
<td>Mild dementia knowledge transfer</td>
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<td>MoCA</td>
<td>Montreal Cognitive Assessment</td>
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<td>MMSE</td>
<td>Mini-Mental State Examination</td>
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<td>MRC</td>
<td>Medical Research Council</td>
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<td>Q1</td>
<td>Pre-program questionnaire</td>
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<td>Q2</td>
<td>Post-program questionnaire</td>
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<td>Q3</td>
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Chapter 1

Introduction

Many patients with dementia are often unaware of the extent and consequences of their cognitive deficits and they do not seek medical attention; this results in underrecognition\(^1\) and diagnostic delays.\(^2\)-\(^5\) Accordingly, health care providers must shift to an “active detection” approach by seeking cognitive deficits in the elderly population instead of relying on traditional “patient activated healthcare”. This is important because early detection of dementia in the mild stage facilitates optimal care having social, economic and medical benefits.\(^6\)-\(^9\) Early detection is also desired by many patients and caregivers.\(^10\)-\(^12\)

With the aging of populations worldwide,\(^13\) dementia and its early diagnosis are rising health priorities both within Canada and internationally. In 2000, the Canadian Study for Health and Aging estimated that there were over 60 000 new cases of dementia yearly in Canada,\(^14\) and the prevalence of dementia in the United States was expected to triple by 2050.\(^15\) Further, in 2007 while age-adjusted death rates declined for heart disease, diabetes, stroke, hypertension, and cancer, Alzheimer disease rose to be the sixth leading cause of death in the United States.\(^16\) More recently, the Rising Tide report from the Alzheimer’s Society of Canada estimated that there are over 100 000 new cases of dementia per year in Canada; this incidence is expected to increase to over 250 000 by 2038.\(^17\) Similarly, in the same timeframe dementia prevalence in Canada is projected to more than double to over 1 million cases,\(^17\) and Alzheimer’s Disease International has predicted that dementia prevalence worldwide will double over the next twenty years.\(^18\)

The rising prevalence of dementia emphasizes the relevance of a shift to active detection within primary care. This shift relies on primary care providers’ knowledge and confidence.
Primary care providers require knowledge of indicators that might suggest cognitive impairments in patients, knowledge about the diagnostic process, treatment, and ongoing management, and knowledge of the importance of early detection. Additionally, they require confidence to apply this knowledge and act on early indicators and gathered diagnostic information.

Improving primary care providers’ knowledge and confidence in mild dementia requires effective knowledge translation. No previous attempts have been made to promote the needed shift to active detection by primary care providers. This prompted the development of the Mild Dementia Knowledge Transfer (MDKT) program which utilizes contemporary knowledge translation concepts to meet the needs of primary care providers in mild dementia diagnosis and care. The purpose of this exploratory study is to implement the MDKT Program, and to evaluate its acceptability, feasibility and short- and longer-term efficacy. This work provides preliminary results regarding the usefulness of the MDKT Program to primary care providers, and it offers insights for future improvements. The following literature review will further describe the role of primary care providers in dementia diagnosis and care, the challenges in this setting, and the benefits of early diagnosis. Following this, frameworks for knowledge translation research will be described, and the theory and evidence for knowledge translation interventions, including dementia knowledge translation trials, will be reviewed. Finally, this information will be used to provide a rationale for the current MDKT Program and its investigation.
Chapter 2

Literature Review

2.1 Dementia in Primary Care

Primary care providers play a central role in dementia diagnosis and care. However, there has been debate over primary care providers’ capacity to provide the main care for patients with dementia and over which health care professional is best positioned to take the responsibility for the various stages of dementia care from detection and diagnosis to treatment initiation and ongoing management. In fact, in some countries only specialists such as neurologists, geriatric psychiatrists, and geriatricians may write the initial prescription to begin pharmacological treatment for dementia, while in other countries the diagnosis must be confirmed by the specialist. Notwithstanding, there is now agreement that primary care providers play a central role in the diagnosis and care of patients with dementia.

Downs views primary care providers as the gateway to services for people with dementia and describes them as uniquely situated to play a central role in dementia diagnosis and care; a recent international position paper aimed to define this role. This position paper presents the consensus of a panel of specialists and family medicine providers at the International Association of Geriatrics and Gerontology World Congress. They agree that the primary care provider is essential in four main domains of dementia care: detection, diagnostic workup, treatment, and follow-up. Specifically, they propose that the primary care provider identify and diagnose ‘typical’ cases, while identifying and judiciously referring atypical cases for specialist consultation. In Canada, the central role of the primary care provider in dementia diagnosis and care is also strongly emphasized. The most recent Canadian Consensus Conference on the
Diagnosis and Treatment of Dementia (CCCDTD3) recommends that most patients with dementia be assessed and managed by their primary care physician. Massoud et al also emphasize this, but note that unnecessary referrals are still made to specialized Memory Clinics which, “despite their mission of evaluating atypical and complicated dementia cases, often have a significant load of relatively uncomplicated patients” limiting access to these services and extending existing waiting lists. Indeed, while primary care providers play a decidedly central role in the detection, diagnosis, management, and continuing care of patients with dementia, there are challenges within the primary care setting leading to underrecognition, delayed diagnosis, and over-reliance on specialist consultation.

2.1.1 Challenges to dementia care in the primary care setting

Certainly, in primary care there are many challenges that act as barriers to the early detection, diagnosis and management of dementia. Numerous works have examined these barriers, which have been categorized as systems factors, patient factors, and provider factors.

2.1.1.1 Systems Factors

The reactive, time-limited nature of our current health care system leads to missed diagnostic and care opportunities in dementia. In our time-limited system, primary care providers do not tend to seek disease in their patients beyond biochemical and imaging screening, and at present there are no definitive diagnostic imaging or biochemical tests useful for the diagnosis of dementia. Typically, patients present to their physician with a complaint to “activate” investigations and treatments, but this is limited by many dementia patients’ lack of awareness of their disease. Furthermore, payment models that reward seeing more patients in briefer consultations are problematic for dementia diagnosis as it is clinically integrative based on multiple types of data and, therefore, takes time. Specifically, diagnosis requires first, awareness
of and attentiveness to early signs and symptoms that should trigger a clinical suspicion of dementia; second, information gathering from both the patient and the caregiver if available; and third, cognitive testing and complementary clinical investigations. Once a diagnosis is formulated, subsequent management entails care planning, treatment if available, and follow-up of patients’ changing cognitive and functional status and the changing needs of caregivers. Consequently, the diagnosis and continuing care of patients with dementia is a complex and time-intensive process not well accommodated by our current health care system.

Time-limitations and the complexity of diagnosis and care are more significant for dementia than for other chronic diseases. In a cross-sectional survey, physicians found dementia to be more difficult to manage compared to diabetes and heart disease (24 % vs. 6 % and 5 % respectively). Similarly, time limitation can be a major barrier to dementia care, because patients often present with co-morbidities that cannot be fully addressed within the timeframe allotted. Our reactive and time-limited health care system with a primary focus on physical complaints impedes the primary care provider’s ability to be attentive to subtle early signs of dementia and to thoroughly assess and care for these complex patients.

2.1.1.2 Patient factors

The nature of dementia is such that many patients lack insight into their disease and are not aware of the extent and implications of their cognitive impairments. Patients with dementia tend to report similar memory complaints and complaints of difficulties with daily activities compared to those without dementia; however, patients’ self-reports of their cognitive and functional abilities are significantly discordant with both caregiver reports and findings on neuropsychological tests. Thus, due to the unawareness and lack of insight associated with the disease, patients do not seek medical attention and the disease progresses undiagnosed.
Accordingly, primary care providers must take the responsibility for early diagnosis by shifting to an approach of active detection enabling early diagnosis and access to necessary treatment and planning.

2.1.1.3 Provider factors

Provider factors are characterized by a lack of knowledge and confidence. Poor knowledge of early indicators prevents primary care providers from actively detecting and responding to early signs and symptoms of dementia, thus, causing delayed diagnosis. Even once indicators of dementia have been detected, many primary care providers struggle with diagnostic uncertainty and express a strong need for specialist verification. For example, two surveys of general practitioners found that difficulty in differentiating normal aging from symptoms of dementia and a lack of confidence in making a diagnosis were top barriers to dementia diagnosis.

Diagnostic uncertainty may be due to a perceived lack of clear guidelines. However, guidelines do exist in many countries, including Canada, and application of these guidelines would contribute to improved diagnostic confidence. Alternatively, diagnostic uncertainty may be due to an absence of a simple and definitive diagnostic test, which raises concerns of a false positive diagnosis. Even though there are no definitive diagnostic tests for dementia, many clinically useful screening tests have recently been developed.

Nevertheless, a perception that there are no useful screening tests persists among primary care providers. For example, in focus groups conducted by Boise et al primary care providers perceived a lack of usefulness of cognitive assessments such as the Mini-Mental State Examination (MMSE). This may be justified in that the MMSE, which has become the ubiquitously used brief assessment of mental status, is not sensitive to detect mild dementia;
however, this is not the case for newer screening tests. Nonetheless, poor understanding of newer, more useful assessment tools prevents primary care providers from completing cognitive testing with patients suspected of cognitive impairments resulting in uncertainty and diagnostic delay. In fact, in a review of 450 medical charts of patients with dementia only 23% had undergone cognitive testing.

Additionally, some primary care providers may lack understanding of the importance of timely diagnosis and, thus, may not be motivated to improve their performance. Typically, the perception that early detection is not important relates to therapeutic nihilism and a lack of knowledge and confidence in management. This sense of futility is still frequently found among primary care providers. A survey of 282 general practitioners found that scepticism regarding the benefits of drug treatment was a main obstacle in detecting dementia, and primary care providers may also lack confidence in symptom management. Furthermore, stigma may be an obstacle preventing primary care providers from being more proactive in dementia diagnosis, as providers themselves may have difficulty accepting the diagnosis and communicating it to their patients.

Many of these challenges may be worsened by inexperience with dementia patients amongst primary care providers. A study in the United Kingdom found that primary care providers feel inexperienced and lack confidence in making and disclosing a diagnosis of dementia and thought that much of the dementia care should be handled by more experienced specialists. An earlier study found similar sentiments: primary care providers stressed that their training was inadequate for the task of early diagnosis, they felt insufficiently experienced, and they believed the task of diagnosis and disclosure belonged to specialists.
Overall, these provider factors including failure to detect early indicators, diagnostic uncertainty with a strong need for specialist verification, poor understanding of useful assessment tools, uncertainty regarding the importance of timely diagnosis, and inexperience are all characterized by a lack of knowledge and confidence which may be amendable through effective knowledge translation.

2.1.1.4 Impact of challenges to dementia care in the primary care setting

In summary, systems, patient and provider factors create many challenges to dementia diagnosis and care within primary care. The reactive culture of our healthcare system, perpetuated by time limitations and payment models unsuitable for complex care, combined with primary care providers’ lack of knowledge and confidence and patients’ unawareness of their disease produces gaps in diagnosis and care.

Consequently, under-recognition and diagnostic delays are common. An average diagnostic delay of three years from the first symptoms noticed by family members was found in a recent survey. Sebaldt et al noted considerable under-recognition after recruiting a large sample of at-risk people determined to have no cognitive impairment by their primary care provider, but finding that, in fact, after evaluation 56% had some cognitive impairment. Similarly, Valcour et al found that in a cross-sectional community sample a majority of dementia cases found were not documented in their medical records, and 67% were thought not to have dementia by their physician.

Reducing this level of under-recognition and diagnostic delay, and overcoming challenges to dementia care will require a myriad of efforts. Systems factors must be tackled through policy changes and practice redesign to accommodate the complex nature of caring for patients with chronic diseases like dementia. Provider factors may be amenable to effective
training approaches designed to enhance the knowledge and confidence of primary care providers. For example, Turner et al\textsuperscript{33} found that low knowledge of dementia and difficulty (or lack of confidence) with dementia mediated pessimism about dementia care and resistance to open communication with patients and their caregiver; this may be improved with increased knowledge. Likewise, Renshaw et al\textsuperscript{48} found that general practitioners in areas with active educational efforts were more likely to believe in the value of early diagnosis.

Primary care providers appear willing for training in dementia diagnosis and care. A survey of over 1000 physicians in England and Wales found that less than half felt they had received sufficient training in the diagnosis and management of dementia.\textsuperscript{48} A survey of over 700 American physicians’ learning interests in geriatrics found that dementia was the highest rated topic.\textsuperscript{49} In Canada, physicians participating in focus groups expressed a desire for more problem-based and case-based education led by a dementia specialist and social worker.\textsuperscript{35} Further, a recent study indicated that primary care providers desire a valid and accurate screening tool as they now believe that cognitive assessment is within their scope of practice and leads to better outcomes.\textsuperscript{50} Indeed, it seems primary care providers want training in dementia and there are several areas in which training could be advantageous including enabling active detection and early diagnosis. It is, of course, important to consider the benefits of early diagnosis if this will be a goal of current training.\textsuperscript{51}

\textbf{2.1.2 Benefits of Early Diagnosis}

The first steps in dementia care are detection and diagnosis, and effective management cannot begin until these occur. Although there is no cure for dementia and the outcome of the disease cannot be altered at present, dementia is now a treatable disorder both pharmacologically and non-pharmacologically, and, thus, necessitates early diagnosis.
Early diagnosis has social, economic and medical benefits:

- **Medical benefits.** Medically, it is important to exclude reversible causes of dementia, despite the rarity of these causes.\(^{44}\) Even if the underlying dementia is not reversible, early identification and treatment of exacerbating components (e.g., vitamin B12 deficiency, extreme thyroid marker levels, poor diabetes control) and risk factors (e.g., high blood pressure) is beneficial. Early diagnosis also allows for the early initiation of pharmacological treatment (discussed in section 2.1.2.1 Benefits of early treatment initiation).

- **Reduce uncertainty.** Often undiagnosed patients and their family members remain uncertain about the ongoing changes they are witnessing. During this time, family members may blame the patient for behaviours that the patient cannot control.\(^{52}\) Early diagnosis would reduce these uncertainties by enhancing understanding of why the changes are happening and facilitating appropriate adjustment. Diagnosis marks a transition from the uncertainty of early cognitive and behavioural changes to a phase in which the patient and family adjusts and adapts to these impairments; however, this cannot happen if diagnosis is late and arises from crisis.\(^{53}\)

- **Planning.** Early diagnosis may allow the patient to participate in social, financial and legal planning including advance directives and discussions of long term care options.\(^{44,52}\) Early diagnosis may also facilitate goal-setting and fulfillment of postponed, shorter-term ambitions.\(^8\)

- **Safety and avoiding crisis.** Cognitive impairments may leave patients vulnerable to deceit by dishonest individuals and organizations.\(^{54}\) Cognitive impairments may also result in financial loss due to errors made, weight loss due to difficulties shopping and cooking, or harms due to errors in the use of medications. Driving, use of the stove and potential wandering also present risks. Early diagnosis would enable prevention of many of these hazards through planned safety initiatives.\(^{52,55}\)
• **Support.** Early diagnosis allows entrance into a culture of support, minimizing the potential uncertainty and isolation faced prior to diagnosis. It offers a better quality of life through enhanced knowledge and preparation for possible problems. Additionally, a diagnosis is essential to access some community resources which can ease the burden associated with changes produced by the disease.

• **Societal costs.** Societal costs may be direct, such as long term care costs and physician visits, or indirect, such as lost productivity of family caregivers. Early diagnosis may delay long-term institutionalization reducing societal costs. Further, a recent cost-benefit analysis suggests that early diagnosis and treatment have the potential to result in large net social and fiscal savings. Net social benefits sum the monetized value of impacts of an intervention on all persons (e.g., patients, caregivers, and taxpayers), and fiscal effects are the changes in public expenditures borne by taxpayers.

2.1.2.1 Benefits of early treatment initiation

Currently, the approved cholinesterase inhibitors donepezil, galantamine, and rivastigmine are the first-line pharmacological treatment for dementia. There have been, and continue to be, many trials evaluating the impact and efficacy of these medications. Several current systematic reviews show consistent positive effects for all three cholinesterase inhibitors producing significant improvements in cognition, functional capacity, behavior and global clinical severity with no evidence of significant differences between them in terms of efficacy. Meta-analyses support the beneficial effects of cholinesterase inhibitor treatment for stabilizing and slowing declines in cognition, function, behaviour, and global clinical severity. Rockwood et al identified several symptoms that physicians rated as improved with treatment: cognitive symptoms including cognitive activation (described as alertness or being ‘in tune’), attention, and
initiative; behavioural symptoms including apathy, mood, and agitation; and functional symptoms including social interactions, and involvement in leisure and domestic activities. Improvements in any of these symptoms are particularly important to patients and their caregivers. Both Gauthier⁷ and Selzter⁶² reviewed evidence demonstrating the importance of treatment that is initiated early in the disease course: in placebo-controlled trials with open label extensions those who initially receive placebo have lower cognitive and functional levels while receiving placebo and once started on treatment they improve, but never to the level of those who received active treatment from the beginning of the trial. More recently, a follow-up study of patients previously enrolled in randomized controlled trials found that earlier treatment with longer duration of treatment significantly delayed time to institutionalization; for each year of treatment, the risk of being institutionalized within a given period was reduced by 31% for galantamine and 29% for the other cholinesterase inhibitors.⁶³ Overall, evidence supports the efficacy of cholinesterase inhibitors in slowing cognitive, functional, behavioural, and global declines as well as delaying institutionalization, and demonstrates the importance of initiating treatment early to maximize benefits.

2.2 Knowledge Translation

To produce the necessary shift to active detection in primary care and to improve mild dementia diagnosis and management, effective knowledge translation is essential. First, this section will explore the complexity of knowledge translation and discuss some frameworks for knowledge translation research. Second, the theory and evidence relevant to intervention selection that informed the current study will be reviewed.
2.2.1 Frameworks for knowledge translation research

The field of knowledge translation is relatively new and does not yet have a mature and agreed upon definitional and theoretical underpinning. The literature draws from many disciplines including management, education, and healthcare resulting in concepts being shared without a standard definition, and multiple terms being used to describe various components of the knowledge translation process. For example, in an attempt to create a search filter for the field of knowledge translation, McKibbon et al have identified over 90 terms; these terms all refer to the general concept of knowledge translation, but have differing scope and emphasis. Overall, these terms describe various components and applications of the process of ensuring judicious and timely use of current “best knowledge”, which is derived from current scientific evidence, and also, in health care, clinical expertise. Knowledge translation in health care has a broad audience including researchers, clinicians, policy-makers, and the public; moreover, knowledge translation strategies vary according to the target audience and the type of knowledge being translated.

Adding further complexity to the notion of knowledge translation is the myriad of proposed theories and frameworks for achieving knowledge translation. Estabrooks et al argue that currently there is no satisfactory overarching knowledge translation theory and that there is some question as to whether there can or should be an overarching theory. Mann agrees suggesting that a comprehensive theoretical background has not been achieved due to the complexities of professional practice. Broadly, theories relevant to knowledge translation, which are essentially theories of change, can be classified as one of two kinds: classical models of change, which are passive and focus on describing or explaining how change occurs; or planned change models, which are active and focus on causing change. An example of a classical model
is the theory of innovation diffusion first published in 1962. \textsuperscript{72} This theory describes the flow of innovations through groups. Innovations pass through five stages: knowledge or awareness; persuasion or interest; decision or evaluation; implementation or trial; and, finally, confirmation or decision to adopt long-term. This theory further classifies individuals by their propensity to adopt innovations ranging from those who create the innovations, through early adopters, the early and late majorities, and finally to those who lag behind.

Although classical change models serve as a useful description of how changes may occur, knowledge translation in health care focuses largely on causing change and is, thus, better served by planned change models also known as planned action theories. Graham et al\textsuperscript{71} undertook a focused literature search to identify planned action theories and found 78 articles describing 31 models published between 1983 and 2006. They conducted a theory analysis of these models, and from this analysis they developed a conceptual framework called the “knowledge-to-action cycle” incorporating the commonalities of these planned action models and providing an approach for knowledge translation research.\textsuperscript{73} The knowledge-to-action cycle has been adopted by the Canadian Institutes of Health Research as the accepted model for knowledge translation.\textsuperscript{74}

The knowledge-to-action cycle was first described in 2006,\textsuperscript{73} and has since been thoroughly described in several articles\textsuperscript{65, 68, 74-80} and the book \textit{Knowledge translation in healthcare: moving from evidence to practice}.\textsuperscript{81} The framework has two main components: the knowledge creation funnel and the action cycle (Figure 1).
The knowledge creation funnel contains three generations of knowledge; through successive generations knowledge becomes progressively more refined and useful for the end user. First-generation knowledge is derived from primary research or knowledge inquiry. Second-generation knowledge is derived from the synthesis of first-generation knowledge usually through systematic review processes, such as those undertaken by the Cochrane Collaboration. Finally, third-generation knowledge consists of knowledge products or tools (e.g., clinical practice guidelines, and patient decision aids) that have been created by utilizing the best-quality second-generation
knowledge and further distilling it and framing it for use by decision-makers (e.g., clinicians, policy-makers, patients). This knowledge creation funnel provides the high-quality evidence-based knowledge for knowledge translation. The action cycle then focuses on moving the created knowledge into use. It consists of 8 action phases that may occur sequentially or simultaneously: identify the problem that needs addressing; identify the knowledge or research relevant to the problem; adapt the knowledge to the local context; assess barriers to using the knowledge; select, tailor, and implement interventions to promote knowledge use; monitor the knowledge use; evaluate the outcomes of using the knowledge; sustain ongoing knowledge use.\textsuperscript{73} It is important to emphasize that the action cycle is a dynamic and iterative process with each phase informing the others, and the knowledge creation funnel potentially informing each phase.\textsuperscript{83} The knowledge-to-action cycle will be used to frame the current study.

\textbf{2.2.2 Theoretical background for intervention selection}

There are many theories for knowledge translation and learning. The theories with greater relevance to the MDKT Program are reviewed.

- \textit{Cognitivist theories} of learning focus on internal mental processes for acquiring insight and meaning.\textsuperscript{70} Problem-solving is an example of this type of learning, and knowledge learned through problem solving is thought to be sustained and readily accessible.\textsuperscript{84} \textit{Constructivist theories} propose that learning occurs through the construction of meaning via experience.\textsuperscript{70} \textit{Social Learning theories} describe learning as occurring through modeling behavior observed in others.\textsuperscript{70} Interventions that provide demonstration or modeling and promote practice, problem-solving and experience in a clinical setting make use of cognitivist, constructivist, and social learning theories. This type of intervention that focuses on demonstration followed by supervised practice,
is also supported by the psychomotor domain in Theory of Learning Domains, which describes skills learning.\textsuperscript{85}

- \textit{Adult Learning Theory} suggests that adult learners are self-directed and goal-oriented being motivated by learning that is applicable to current problems.\textsuperscript{84-85} As such, they flourish in a learning environment that promotes collaboration and active participation in directing their learning to meet their current needs.\textsuperscript{85}

- \textit{Theory of Planned Behaviour} suggests that an individual’s performance of a behavior is driven by their intention to perform that behavior and this is influenced by attitude, subjective norms, and perceived behavioural control.\textsuperscript{86} Attitude relates to the individual’s desire for and perception of outcomes of the behaviour; subjective norm is the individual’s perception of whether important people think the behaviour should be performed; and behavioural control is based on the individual’s perception that they can perform the behaviour.\textsuperscript{87} Thus, to influence behaviour, one must aim to influence behavioural intention by promoting positive attitudes, having the behaviour recommended by reliable sources, and improving confidence in skill performance or self-efficacy. \textit{Social Cognitive Theory} suggests that self-efficacy is influenced by performance accomplishments and vicarious experience.\textsuperscript{88} Performance accomplishment is most influential in raising self-efficacy; for example, performing a clinical test raises our belief that we can perform it in the future. Vicarious experience raises self-efficacy by observation of others performing; this emphasizes the usefulness of demonstration. Thus, to improve perceived behavioural control, or self-efficacy, demonstration and performance accomplishment are important.

- \textit{Implicit or tacit learning} is learning of non-explicit knowledge or process knowledge; that is, knowledge related to how to be and how to do things.\textsuperscript{89} Tacit learning is important for knowledge flexibility and interacts with explicit learning processes synergistically in skills learning.\textsuperscript{90-91}
Process knowledge is learned by experience and interactions with others; in other words, it is learned by doing.\textsuperscript{89} Interventions can enhance learning by sharing tacit knowledge and allowing for implicit learning through doing.

**2.2.3 Background evidence for intervention selection**

Many diverse knowledge translation intervention trials aimed at health care providers have been conducted. These encompass varying settings, recipients, types of knowledge to be transferred, objectives, barriers and intervention types or combinations of intervention types. The following is a brief overview of some common intervention types and evidence of their efficacy.

**2.2.3.1 Intervention types**

- **Printed educational materials** are written documents that summarize information or evidence and include peer-review journals, monographs, and clinical practice guidelines.\textsuperscript{87, 92} They are a passive dissemination method used to raise awareness by reaching a large audience; active distribution and reminders are sometimes included. Effects are very mixed although likely better than no intervention at all.\textsuperscript{92} Printed materials are more useful when combined with other educational mechanisms.\textsuperscript{87}

- **Audit and feedback** provides an evaluation and summary of clinical performance followed by feedback with or without recommendations for change.\textsuperscript{87, 93} It can be verbal, electronic, or written, and information may be obtained from medical records, computerized databases, patients, or by observation.\textsuperscript{87, 93} A Cochrane review of 118 trials showed variable efficacy, but overall small-to-moderate improvements are produced.\textsuperscript{94} Further, the efficacy tends to be greater when initial performance is low and feedback is more intensive.\textsuperscript{94} It may be less useful for implicit tasks, or where decisions must be customized to each patient.\textsuperscript{87}
• Continuing education meetings and workshops include large group sessions and small group learning occurring outside the clinical setting; they commonly and traditionally consist of lectures and conferences. A Cochrane review of 81 trials showed that educational meetings can be effective, but typically with only small and often mixed effects. Effect is improved by including interactivity. Further, these meetings were more effective if the learning objective was more important, but less effective if the behaviour to be learned or changed was complex. Overall, emphasis should be on active learning activities addressing issues that are relevant, practical, and currently meet the needs of the recipients.

• Educational outreach visits involve face-to-face clinic visits by a trained professional to deliver simple key messages. Effects are small-to-moderate; the most consistent effects are on prescribing practices and simple prevention in primary care. This method is most suited when changes to specific clinical practices are possible by providing simple directed messages.

• Specialist outreach clinics and multi-professional collaboration. Collaborative care between professions tends to improve care of chronic conditions, but the specific professions involved and methods of providing care vary widely and the necessary components are unclear. Specialist outreach clinics that merely shift outpatient care to a new setting improve access, while more multifaceted interventions including specialist collaboration with primary care are associated with improved outcomes.

2.2.3.2 Trends in knowledge translation intervention evidence

Overall, there are many intervention strategies showing very mixed effects within and between intervention types. Small positive effects are common, but there is wide variability. Prior reviews suggest that multifaceted interventions, or interventions including more than one
intervention type, show greater efficacy; however, Grimshaw et al\textsuperscript{99} recently concluded that there was no statistical evidence of a relationship between number of interventions used and effect size. Like single interventions, there is great variability in effects of multifaceted interventions.

Generally, the evidence supports the notion that evidence or new knowledge is not self-implementing.\textsuperscript{100} Many of the more traditional passive knowledge translation interventions such as stand-alone printed materials and lecture-style educational meetings have little impact on clinical practice. It is also important to consider the nature of the evidence or knowledge being provided. High-quality evidence from systematic reviews is essential for knowledge translation activities,\textsuperscript{75, 82} but much of this evidence must be supplemented with clinical expertise and local specialists act as important interpreters of evidence for primary care professionals.\textsuperscript{67, 101} Thus, the evidence to be provided in knowledge translation efforts must be well supported, relevant and usable. Further, simple guidelines, like those for prescribing practices, are more easily transferred than guidelines for complex management issues.\textsuperscript{87} This is of particular concern in geriatric issues, including dementia diagnosis and care, which are often chronic, complex and progressive.\textsuperscript{102}

Active knowledge translation interventions utilizing interactive techniques are essential in enhancing the uptake of more complex knowledge and to change behaviour.\textsuperscript{93} Audit and feedback, interactive continuing education meetings and educational outreach visits certainly have the potential to actively promote knowledge uptake. However, these methods are less effective when the knowledge involves complex and implicit behaviours that must be customized to each patient as is the case in many geriatric conditions, particularly dementia. On the other hand, care of chronic conditions appears most improved by collaboration between specialists and primary care. As such, several knowledge translation concepts appear relevant to geriatric issues; active involvement of the learner\textsuperscript{95, 103-104} along with practice opportunities,\textsuperscript{93} personalized
feedback, and collaboration between specialty and primary care positively impact best practices, particularly within the complex arena of elder care.

On the whole, well-designed knowledge translation interventions can be successful; however, no single intervention is superior in all settings. There are no clear guidelines for selecting knowledge translation interventions, and often selection is an ‘art’ requiring a common sense approach that considers the present needs, the setting and the possibilities for change. Similarly, the PARiHS framework suggests that implementation of new knowledge or evidence is a function of the evidence, the context, and the facilitation.

2.2.3.3 Dementia knowledge translation interventions in the primary care setting

There have been several differing attempts to improve dementia practices within primary care that will be reviewed. Table 1 provides a summary of these interventions sorted by their main intervention strategy: practice redesign, system redesign, care management, small group sessions, use of media only, and comparative trials.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Design</th>
<th>Sample/recipients</th>
<th>Intervention</th>
<th>Outcome measures</th>
<th>Results</th>
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<tbody>
<tr>
<td>Wenger et al, 2009&lt;sup&gt;109&lt;/sup&gt;</td>
<td>Clinic-level cluster non-randomized, controlled pre-post trial</td>
<td>40 primary care professionals at 2 medical groups in California, USA Patients ≥75 years failing screening or identified by caregiver.</td>
<td>Practice redesign. Intervention and control practices received screening with three-word recall, but only intervention practices received practice redesign: 3-hour educational program, structured visit notes guiding patient visit, and patient information handouts.</td>
<td>Audits of pre- and post-intervention medical records using dementia quality indicators.</td>
<td>Before intervention, quality of care was the same in intervention and control groups. After, intervention group patients did not receive better care for cognitive impairment than control group patients (44% vs 41%, P = .67).</td>
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<tr>
<td>Reuben et al, 2010&lt;sup&gt;110&lt;/sup&gt;</td>
<td>Uncontrolled pre-post trial</td>
<td>10 physicians at 2 community-based practices in California and Washington, USA Patients ≥ 75 years with dementia or screening</td>
<td>Practice redesign and referral to Alzheimer’s Association. Redesign included three-word recall screening, structured visit notes prompting guiding patient visit, patient education materials, and physician education by geriatrician on incorporating new materials/care processes into practice. (Adapted from Wenger et al, 2009)</td>
<td>Audits of pre- and post-intervention medical records using dementia quality indicators.</td>
<td>Percentage of quality indicators satisfied rose from 38% to 46% (P &lt; .05). Referral of patients to Alzheimer’s Association chapters increased from 0% to 17%. Some quality indicators related to cognitive assessment and examination did not improve.</td>
</tr>
<tr>
<td>Banerjee et al, 2007&lt;sup&gt;111&lt;/sup&gt;</td>
<td>Uncontrolled pre-post trial</td>
<td>290 consecutive referrals to service in South London</td>
<td>System redesign. Introduction of additional multidisciplinary service. Initial assessment completed by any team member. Diagnosis and management plan established by team as a whole. Then, profession-specific skills used as needed. Assessment and</td>
<td>Six goals: acceptability; appropriate referral rate; access by minority groups; detecting early onset dementia; detecting mild dementia; and increase number of new cases seen. Also, used measures of</td>
<td>All goals met: 95% acceptability; 94% appropriate referrals; 2-fold greater access by minority groups; 17% of referrals ≤ 65 years; 68% with mild dementia; 63% increase in new cases seen. At follow-up, those referred to the service</td>
</tr>
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</table>
### Care Management

**Care management with optional small-group sessions.**

- Intervention clinics received 1 year of care management; controls continued usual care.
- Trained care managers (social workers) conducted home and telephone assessments using care management software to generate problem lists and related care-plan actions. Care manager collaborated with caregiver and sent information to patients’ primary care providers. Referral to community agencies guided by flagged problems. Also, primary care providers were offered 5 interactive seminars.

**Primary outcome** was adherence to 23 guideline recommendations. Secondary outcomes were receipt of community resources and patient and caregiver health and quality-of-care measures.

- Patients in intervention clinics received care adherent to a higher percentage of guideline recommendations (63.9% vs. 32.9%; P < .001) and more received community agency assistance (P ≤ 0.03). Patient health-related quality of life, overall quality of patient care, social support, and level of unmet needs were better for intervention patients (P < 0.05 for all).

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<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Setting</th>
<th>Participants</th>
<th>Interventions</th>
<th>Outcomes</th>
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<tbody>
<tr>
<td>Vickrey et al, 2006&lt;sup&gt;112&lt;/sup&gt;</td>
<td>Clinic-level, cluster randomized, controlled trial.</td>
<td>3 health care organizations collaborating with 3 community agencies in California, USA. 18 primary care clinics and 408 patients with dementia ≥ 65 years and their informal caregivers.</td>
<td>Care management with optional small-group sessions.</td>
<td>Primary outcome was adherence to 23 guideline recommendations. Secondary outcomes were receipt of community resources and patient and caregiver health and quality-of-care measures.</td>
<td>Patients in intervention clinics received care adherent to a higher percentage of guideline recommendations (63.9% vs. 32.9%; P &lt; .001) and more received community agency assistance (P ≤ 0.03). Patient health-related quality of life, overall quality of patient care, social support, and level of unmet needs were better for intervention patients (P &lt; 0.05 for all).</td>
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<tr>
<td>Chodosh et al, 2006&lt;sup&gt;113&lt;/sup&gt;</td>
<td>Post-only follow-up of Vickrey et al, 2006</td>
<td>232 medical providers from 16 clinics who had participated in Vickrey et al, 2006.</td>
<td>Care management with optional small-group sessions. See Vickrey et al, 2006.</td>
<td>Providers surveyed 9 months after intervention onset: knowledge, attitudes, and perception of quality of dementia care in their practice evaluated</td>
<td>Intervention providers had better knowledge in assessing capacity (P = .02), and viewed management as more difficult in primary care (P = .03). No other differences in knowledge, attitudes, or care quality.</td>
</tr>
<tr>
<td>Study</td>
<td>Design Type</td>
<td>Participants</td>
<td>Care Management</td>
<td>Primary Outcome</td>
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<td>Callahan et al, 2006</td>
<td>Physician-level cluster randomized, controlled pre-post trial</td>
<td>153 patients with Alzheimer disease and their caregivers from primary care practices within 2 US university-affiliated health care systems.</td>
<td>Care management. Intervention patients received 1 year of care management by a care manager (geriatric nurse practitioner) working with the patient’s family caregiver and primary care physician. Care manager assessed patients regularly with a checklist linked to specific behavioural intervention protocols focused on nonpharmacological interventions. Collaboration with primary care physician to institute drug therapy if nonpharmacological approach failed.</td>
<td>Primary outcome was fewer behavioural and psychological symptoms in patients assessed at baseline and at 6, 12, and 18 months. Secondary outcomes included assessments of depression, cognition, activities of daily living, resource use, and caregiver’s depression severity.</td>
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<tr>
<td>Cherry et al, 2004</td>
<td>Uncontrolled pre-post trial</td>
<td>Primary care physicians in Los Angeles could refer their patients and obtain training 83 community-dwelling dementia patients and their caregivers were referred</td>
<td>Care management, guideline dissemination, mailed toolkit and optional workshops. Practice guidelines disseminated as pocket version with toolkit. Physician training sessions with physician leaders, caregivers as speakers and a theatre troupe to enact physician visit and cognitive assessment. Physicians could refer patients to care manager who provided cognitive testing, family support, home visits and care coordination.</td>
<td>Survey of 112 physicians before and 126 physicians 3 years after initiation of project (sample may be different as survey identifiers were not used) to assess self-reported practice change. Also, improved adherence to key guideline recommended care processes.</td>
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<td>Intervention patients had significantly fewer behavioural and psychological symptoms of dementia at 12 months (-5.6; P = .01) and at 18 months (-5.4; P =.01). Intervention caregivers reported significant improvements in distress at 12 month, and improved depression at 18 months. No differences in patient depression, cognition, activities of daily living, or rates of hospitalization, nursing home placement, or death.</td>
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<table>
<thead>
<tr>
<th>Study</th>
<th>Study Design</th>
<th>Setting</th>
<th>Session Type</th>
<th>Measures</th>
<th>Results</th>
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<tbody>
<tr>
<td>Levine et al, 2007&lt;sup&gt;116&lt;/sup&gt;</td>
<td>Uncontrolled, retrospective pre-post trial</td>
<td>Peer educators presented 109 community-based sessions to 1309 medical practitioners</td>
<td>Facilitated small-group session and toolkit. Expert faculty initially trained 60 non-expert peer educators to conduct small-group, learner-centered CME using tool kits on memory loss.</td>
<td>After the session, participants rated their knowledge and skills before (retrospective pre) and after (post) the session. Ratings were repeated 6 months later and compared to retrospective pre. Significant increases in self-reported knowledge, confidence, and practice skills seen post-session and 6-months post ($P &lt; .001$) and two-thirds reported use of $\geq 3$ of 21 tools at 6 months.</td>
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<td>Waldorff et al, 2003&lt;sup&gt;117&lt;/sup&gt;</td>
<td>Nonrandomized, controlled pre-post trial</td>
<td>535 general practices with 727 physicians in Denmark</td>
<td>Guideline dissemination with reminder letters and optional lecture, outreach visit, and small-group session. Guideline mailed to all physicians. Intervention physicians invited to lecture series, to have a small-group session, and to have a physician facilitator visit their practice. Intervention physicians also mailed three reminder letters. Control physicians only received the guidelines.</td>
<td>Adherence to Danish guideline recommendations monitored by laboratory test data (thyroid stimulating hormone requested with vitamin B12). Mailed questionnaires verified tests were used for diagnostic evaluation of dementia and also asked if a cognitive test was used. No increase in the adherence to guideline recommendations was observed regarding the use of laboratory or cognitive tests.</td>
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<tr>
<td>Iliffe et al, 1999&lt;sup&gt;118&lt;/sup&gt;</td>
<td>Uncontrolled post-only trial</td>
<td>774 primary care professionals in United Kingdom</td>
<td>Lecture and small-group sessions. Large overview lecture with small-group facilitated workgroups on diagnosis and management of dementia.</td>
<td>Post-program evaluation questionnaire. Program viewed as good overall by 94% of respondents, relevant to job by 94%, and good at enabling change in practice by 93% of respondents.</td>
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<tr>
<td>Waldorff et al, 2008&lt;sup&gt;119&lt;/sup&gt;</td>
<td>Uncontrolled post-only trial</td>
<td>All 3632 GPs in Denmark</td>
<td>E-learning program (ELP). Interactive 90-minute ELP presenting Danish Dementia</td>
<td>Logon to e-learning program. Only 192 GPs (5.3%) had logged-on and 32 (17%) had at least one re-logon.</td>
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Guidelines using audio slides, video-cases and self-study. Promoted by Danish Medical Association and College websites and journals, and by one email.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Study Design</th>
<th>Population</th>
<th>Intervention</th>
<th>Primary Outcome</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waldorff et al, 2009&lt;sup&gt;120&lt;/sup&gt;</td>
<td>Single-blind randomized, controlled pre-post trial</td>
<td>All GPs in Copenhagen Municipality, Denmark</td>
<td>Reminder letters. Three letters mailed to GPs to increase use of a dementia e-learning program (ELP) (see Waldorff et al, 2008). GPs were randomized to receive either three reminder letters or nothing.</td>
<td>Primary outcome was proportion of GPs with at least one log-on to the ELP. Secondary outcomes proportion of GPs with more than one log-on and number of slides viewed.</td>
<td>Only 15 of 320 GPs (4.7%) logged-on. Those receiving letters had a significantly more logons ($P = .02$) and were 8-fold more likely to have logged-on. No differences in secondary outcomes.</td>
</tr>
<tr>
<td>Byszewski et al, 2003&lt;sup&gt;121&lt;/sup&gt;</td>
<td>Uncontrolled pre-post trial</td>
<td>301 randomly selected primary care physicians in Canada mailed questionnaire. 86 returned pre- and post- questionnaire.</td>
<td>Mailed toolkit. The Driving and Dementia Toolkit with background information, local resources and forms, and screening questions mailed to participating physicians.</td>
<td>Changes in pre-post knowledge and self-reported confidence and practice change assessed with mailed questionnaire.</td>
<td>Knowledge and confidence increased significantly ($P \leq .05$) for most questions. Also, more physicians reported asking recommended assessment questions.</td>
</tr>
<tr>
<td>Downs et al, 2006&lt;sup&gt;122&lt;/sup&gt;</td>
<td>Unblinded, practice-level cluster randomised, controlled pre-post trial</td>
<td>36 general practices in central Scotland and London Patients $\geq 75$ with dementia</td>
<td>E-tutorial, decision support software, scenario-discussion workshops. Comparison of these three educational interventions. Eight practices were randomly assigned to the electronic tutorial, eight to decision support software, 10 to workshops, and 10 to control.</td>
<td>Rates of detection of dementia and concordance with guidelines regarding diagnosis and management.</td>
<td>Decision support software ($P = 0.01$) and scenario-discussion workshops ($P = 0.01$) both significantly improved rates of detection compared to control. There were no differences by intervention in concordance with guidelines.</td>
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</table>
Wenger et al\textsuperscript{109} utilized a practice redesign strategy to improve the care of dementia patients measured by developed quality indicators. They use the term practice redesign to indicate changes to the usual way in which care for dementia patients was delivered at the participating primary care practices. This study also included redesigns to improve care for falls and urinary incontinence. Improvements were seen in the care of falls and urinary incontinence, but there was no improvement in the care of dementia. Reuben et al\textsuperscript{110} hypothesized that this may be due to the physicians’ inadequate knowledge of community resources and behavioural management, and also due to lack of time during office visits to provide counseling and support. They then piloted a modified version of the previous practice redesign that included feedback to physicians on baseline performance, focus groups to identify unmet needs and customizations to meet these needs, and referral linkages to the Alzheimer’s Association.\textsuperscript{110} In their uncontrolled pre-post pilot study, this adapted version of the practice redesign improved the percentage of quality indicators satisfied and improved referral to the Alzheimer’s Association.

Rather than redesigning the way in which individual primary care practices care for dementia patients, Banerjee et al\textsuperscript{111} focused on a system redesign by creating a new multidisciplinary referral service to take on the burden of early identification and intervention in dementia. They set six goals for the referral service. All of these goals were met, and the service reduced behavioural disturbances and improved patients’ quality of life compared to before referral.

Three interventions use different strategies for dementia care management in an attempt to improve the care of patients with dementia in primary care.\textsuperscript{112,114-115} The concept of care management involves a health care professional who is responsible for coordinating the care and support services required by a patient, usually with a chronic condition. Vickrey et al\textsuperscript{112} used a
care management strategy that was successful in improving adherence to guideline recommendations. Chodosh et al\textsuperscript{113} hypothesized that improvements in primary care provider knowledge and attitudes played a role in the success of this care management program. To test this hypothesis, they surveyed the providers participating in the study by Vickrey et al and found very limited difference in provider knowledge or attitudes between the intervention and control groups.\textsuperscript{113} This suggests that improvements in provider knowledge or attitudes were not responsible for the success of the care management strategy. Similarly, Callahan et al\textsuperscript{114} tested the efficacy of a care management strategy, but this strategy focused on improving behavioural and psychological symptoms in patients with dementia. Intervention patients had significantly fewer behavioural and psychological symptoms after 12 and 18 months in the program. Finally, Cherry et al\textsuperscript{115} provided a care management referral service along with disseminating guidelines and toolkits and provided optional workshops for providers. The workshops were creative including physician leaders and informal caregivers as speakers and a theatrical component to demonstrate physician visits and cognitive assessments. There were higher rates of adherence to chosen guidelines, but it is unclear if this is due to provider improvements or actions taken by the care managers.

These outlined redesign and care management interventions required very intensive changes often including new staff, which may be necessary.

The following interventions used small-group sessions, along with other strategies, targeted at primary care providers in an attempt to improve dementia care. Levine et al\textsuperscript{116} made use of the influence of trained peer-educators to facilitate small-group sessions focused on the use of a toolkit. After the session, participants rated their knowledge, confidence and skills to be better than before the session, and six months later two-thirds of participants reported using at
least 3 of the 21 provided tools. Waldorff et al\textsuperscript{117} provided guidelines with reminder letters to general practitioners who were also invited to receive outreach visits or attend a lecture or small-group sessions. These attempts did not improve the use of laboratory and cognitive tests by general practitioners. Iliffe et al\textsuperscript{118} used both a large lecture and small-group sessions focused on diagnosis and management; participants viewed the intervention positively and after the intervention 93\% of respondents viewed it as being good at enabling a change in practice.

Three other interventions used only media with no direct primary care provider contact. Waldorff et al\textsuperscript{119} provided all Danish general practitioners with access to an e-learning program offering training on newly developed Danish dementia guidelines. Very few practitioners logged-on to the program, and in a further study they determined that a series of three reminder letters did not help.\textsuperscript{120} In a different approach, Byszewski et al\textsuperscript{121} mailed the Driving and Dementia toolkit to randomly selected Canadian physicians. Those who completed both pre- and post-questionnaires showed improvements in self-rated knowledge and confidence and more physicians reported asking recommended questions related to driving.

There has been only a single attempt to compare intervention strategies for improving dementia care in the primary care setting. Downs et al\textsuperscript{122} compared three strategies in a cluster randomized trial and found that both decision support systems built into electronic medical records and workshops providing case scenario discussions improved dementia detection rates. However, neither of these improved concordance with guidelines, nor did an electronic tutorial.

Due to the complexities involved in this type of research many of these trials do not use randomization or control groups and outcome measures vary in value. These methodological issues, the variety of intervention designs, and the relatively limited amount of evidence make it difficult to draw conclusions about improving dementia practice in the primary care setting.
Overall, it seems that more intensive interventions, particularly those that incorporate additional human resources focused specifically on dementia care, produced the most improvements as measured by quality indicators. These strategies focus on adding to the current system rather than improving the skills of primary care providers, and the focus is on management of already diagnosed patients rather than earlier detection.

Interventions that do not add personnel show mixed effects. Use of already available community resources such as the Alzheimer’s Association (or Alzheimer Society in Canada) can improve management and psychosocial support. Small-group sessions aimed at primary care providers may improve knowledge, confidence and the use of tools, but retrospective self-report as used by Levine et al is vulnerable to considerable bias. Passive media-only interventions are likely not effective on their own, although focused toolkits may be helpful for some items of care such as driving assessment. Finally, scenario-discussion workshops and decision support systems were shown to improve detection rates, but not guideline-adherent care.

Overall, very intensive interventions that incorporate dedicated dementia staff improve dementia management, but they have not focused on improving primary care providers’ knowledge which may limit active dementia detection. Less intensive interventions have variable effects and have been less rigorously tested. More research is needed to elucidate effective methods of improving dementia practice, particularly within the confines of current settings by building the capacity of current primary care practices to provide this care. Additionally, much of the research has focused on improved management, but research on improving early diagnosis is lacking.
2.3 Research Rationale, Objectives, and Hypothesis

The knowledge-to-action cycle was used to frame the rationale for this research. Again, this framework consists of a central knowledge creation funnel that produces usable knowledge for translation while the action cycle attempts to move this knowledge into practice. The stages of the action cycle related to this research are described below:

- **Identify problem.** Patients with dementia are often unaware of their disease and do not seek medical attention; this results in underrecognition\(^1\) and diagnostic delays.\(^2\)-\(^5\) Thus, health care providers must shift to an “active detection” approach based on knowledge and confidence to detect, diagnose and treat dementia in the mild stages.

- **Identify knowledge relevant to problem.** The most recent Canadian Dementia Guidelines are a set of high-quality guidelines produced in the manner described by the knowledge creation funnel. They cover all aspects of dementia diagnosis and care for primary care providers and are the accepted recommendations in Canada. Additionally, the Dementia Assessment Tools provide an efficient method of assessing mild dementia and may act as a medium for improving primary care providers’ knowledge and confidence in mild dementia.

- **Adapt the knowledge to local context.** The MDKT Program links primary care providers with the local dementia specialist team and offers training in the Dementia Assessment Tools derived from the local Memory Clinics. These tools meet guideline recommendations, but are specific to the local Memory Clinics allowing seamless communication between primary care providers and the dementia specialist, and providing a common base for future collaboration.
• **Assess barriers to knowledge use.** System, patient, and provider factors make dementia diagnosis and care challenging within primary care. Provider factors are characterized by lack of knowledge and confidence, which may be improved by knowledge translation.

• **Select, tailor, and implement interventions to promote knowledge use.** The MDKT Program integrates contemporary knowledge translation concepts, including theoretical concepts and trends in current evidence, to meet the needs of primary care providers in the diagnosis and care of dementia in the mild stage. Due to the complex nature of dementia detection, assessment and management, the MDKT Program emphasizes active involvement of recipients through interaction between recipients and a dementia specialty team allowing for exchange of tacit knowledge, practice, and tailoring to the needs and availability of the recipients.

• **Monitor the knowledge use.** Given that the gaps in dementia diagnosis and care in the primary care setting are, at least in part, due to primary care providers’ lack of knowledge and confidence in this area, the current evaluation aims to monitor improvements in knowledge and confidence.

The current research on the MDKT Program is supported by the knowledge-to-action cycle, which has been adopted by the Canadian Institutes of Health Research as the accepted model for knowledge translation. Because the necessary shift in dementia practice relies on primary care providers’ knowledge and confidence, the study aims to establish a program of dementia knowledge translation between a specialist team and primary care providers aimed at increasing primary care providers’ knowledge base and confidence in mild dementia, therefore, enabling active detection, diagnosis and treatment of patients in the mild stages of dementia. This is an exploratory study with the objective of implementing the MDKT Program and evaluating its acceptability, feasibility and short- and longer-term efficacy. Finally, we hypothesize that recipients’ (participating primary care providers’) knowledge and confidence in mild dementia
care will improve after the MDKT Program and that the program will be acceptable, feasible, and rated positively by recipients.
Chapter 3

Methods

The study was approved by the Queen’s University Health Sciences & Affiliated Teaching Hospitals Research Ethics Board. All participating primary care providers and patients provided written informed consent (see Appendix A-D for both primary care provider and patient letters of information and consent forms).

3.1 Study design

The current study was an exploratory study with the purpose of implementing the MDKT Program and gathering information regarding its acceptability, feasibility and efficacy in the primary care setting. Specifically, an uncontrolled pre-post-post design was used with questionnaires to evaluate short-term efficacy immediately after the program and longer-term efficacy three months after the program. Efficacy was quantified in terms of improved self-reported knowledge and confidence. Program evaluation data were also collected using mixed methods (i.e., both quantitative and qualitative methods) gathering information regarding acceptability and feasibility of the program.

3.2 Intervention

3.2.1 Program development

As discussed above, there are no clear guidelines for selecting, tailoring and developing knowledge translation programs. 78-79, 107 Therefore, knowledge of the recipients’ shortcomings through years of referrals and contacts with the specialist underlined the common sense approach used to develop the program. It entailed selecting theory- and evidence-based concepts with the
potential to overcome identified barriers, and developing and tailoring a program incorporating these concepts to meet the knowledge translation objectives. On top of available theory and evidence, the initial program development process incorporated the dementia specialist’s experience both with the care of patients with dementia and with the training of health care providers. Further, the program was informally piloted at a few sites to inform development before the program was finalized for the current exploratory phase of its evaluation.

3.2.2 Program description

Figure 2 provides an outline of the MDKT Program which was run at each participating practice site.
The MDKT Program consisted of a baseline meeting, an assessment date, a review date, and the possibility of future collaboration. Each component will be described in sequence:
3.2.2.1 Baseline meeting

After recruitment, the initial meeting was primarily related to logistical concerns. At this meeting the program procedures were discussed including patient selection, the assessment date and the review date. Each site determined which staff members would be involved in the program and how they would use the assessment date within their clinic schedules. Their needs and time availability were used to determine how many patients would be selected for cognitive assessment. Patient selection was made as described in section 3.4 Patient selection. The pre-program questionnaire was then completed by each participating primary care provider (questionnaires are described in section 3.5 Outcome measures).

At the baseline meeting, each site received an MDKT toolkit containing paper and electronic copies of the Canadian Dementia Guidelines \(^{36,123-128}\) and the Dementia Assessment Tools. The Dementia Assessment Tools were a Data Gathering Form and the Montreal Cognitive Assessment (MoCA). \(^{129}\) Below is a detailed description of the contents of the MDKT kit:

- **Canadian Dementia Guidelines.** These guidelines were presented in a series of articles in the Canadian Medical Association Journal (CMAJ) and are based on the recommendations from the Third Canadian Consensus Conference on the Diagnosis and Treatment of Dementia CCCDTD3. \(^{36,123-128}\) This is a case-based series presenting the recommendations in an accessible manner for primary care providers covering all aspects of dementia care including diagnosis and treatment. The knowledge to be transferred in the MDKT Program was based on these guidelines and they were provided in the MDKT toolkit as a resource for all recipients.

- **Data Gathering Form (Appendix E).** This is a semi-structured focused history-taking form developed specifically for this Program and derived from the first visit history form used in the Memory Clinics adapted for use in the primary care setting. It provides a conversational, non-
threatening method for obtaining information on the general cognitive abilities of each patient including simple calculations and the person’s capacity to acknowledge errors. Further, it serves as a knowledge transfer vehicle providing i) a range of concepts that could be referred back to by recipients in their daily interactions with at-risk patients, ii) clues to help recipients suspect cognitive deficits in their patients emphasizing “active detection”, and iii) ideas about the range of implications of cognitive deficits and the process of dementia. It acted as a tool to transfer the concepts of informal cognitive testing to recipients encouraging them to consider the cognitive implications of answers provided by their patients. It contained questions on general medical information, including risk factors for dementia, which could be compared to the patient’s known medical history. It also included personal questions such as making a family tree, giving dates and ages at marriage, retirement, graduation, and other significant life events. This component of the Data Gathering Form aimed at gathering information on cognitive abilities including memory, working memory, logical thinking, time orientation and calculation abilities. Because corroborative history may not have been available for some aspects in some patients, the accuracy of exclusively “memory data” (e.g.; date of birth of grandchildren) may have been unknown, but the ability of the patient to make simple calculations (e.g.; given previous birthdates, “how old were you when your first grandchild was born”) provided valuable information on their cognitive abilities. Similarly, information on day-to-day functional abilities may not been reliable in all cases when collected directly from the patient, but patients’ insight about these activities and the level of detail provided gave an impression about general cognitive abilities. This interview also allowed for informal assessment of language abilities. Overall, the Data Gathering Form provided a method for conducting the clinical history and informal cognitive assessment necessary in the
diagnostic workup, but more importantly, it provided concepts to hone recipients’ active detection skill. Finally, this form served as an introduction to the formal cognitive screening.

- **Montreal Cognitive Assessment (MoCA; Appendix F).** The MoCA was the screening cognitive test used in the patient assessments. It is suited for earlier detection of mild dementia in primary care providing several advantages over other commonly used brief cognitive tests such as the Mini-Mental State Examination (MMSE). Unlike the MMSE, the MoCA tests domains of executive functioning and abstract thinking, besides the commonly tested domains of language, calculation, short delay recall, and orientation. Also, the MoCA can distinguish between high and low levels of education. It has a high sensitivity and specificity in detecting dementia and mild cognitive impairment (MCI) with a sensitivity of 100% in detecting dementia compared to 78% for the MMSE. Subsequent to its development in 2005 and use throughout Canada, it has been further validated in a Memory Clinic population in the United Kingdom, and in a community-based population in the Southeastern United States. Overall, it is better able to distinguish between normal cognitive aging, MCI and dementia, rendering it more suitable for early detection of cognitive impairments and more widely used than other screening tests. I received training by the dementia specialist on all assessment tools prior to commencing the Program.

3.2.2.2 Assessment date

On the assessment date I demonstrated the Dementia Assessment Tools to the recipients. Patients were booked at 60-minute intervals allowing for discussion, exchange of observations and practice between assessments to enhance learning. I demonstrated the assessment procedures on the first patients, and the recipients assessed the remaining patients under my guidance. This joint assessment was used to permit the recipients to first observe the procedures and learn the
methodology followed by practicing with supervision. The number of demonstrations given and the number of patients assessed were determined by the recipients’ needs and availability.

3.2.2.3 Review meeting

The review meeting occurred within two weeks of the assessment date. At the review meeting, the Memory Clinic team (dementia specialist and myself) met with the primary care teams’ recipients to discuss the procedures and the results obtained on each patient. Diagnosis was discussed and established collaboratively dependent on the clinical information obtained. Care planning was then discussed including treatment options, further investigations if needed, referral to community resources such as the First Link program of the Alzheimer Society, and issues such as driving, safety and power of attorney.

3.2.2.4 Future collaboration

Each clinic was offered the opportunity to repeat the program. Also, each clinic was encouraged to contact the dementia specialist or myself in the future to provide further support as needed.

3.2.2.5 MDKT Program objectives

The MDKT Program had the following learning objectives:

After the program, recipients should have sufficient knowledge and confidence to

- actively detect mild dementia in at-risk patients by being aware of and attentive to early signs and triggers.
- gather a history from patients suspected of mild dementia by using informal cognitive assessment techniques including the Data Gathering Form to collect information on cognitive abilities.
• use a formal cognitive test to screen cognitive status of patients suspected of having cognitive impairments. The MoCA should be used for this purpose.
• accurately administer, score and interpret the MoCA.
• integrate clinical information to formulate a diagnosis based on accepted criteria.
• initiate appropriate pharmacological and nonpharmacological treatment.
• refer patients to appropriate community resources such as the Alzheimer Society.

3.3 Knowledge transfer recipients

The recipients of the MDKT Program were primary care providers recruited from practice sites within the referral area of the Kingston Memory Clinics using The College of Physicians and Surgeons of Ontario Public Register. Recruitment was done by telephone; calls were made by both the dementia specialist and myself. A recruitment flyer was sent by fax or email dependent on providers’ preference. This flyer provided more details regarding the MDKT Program (Error! Reference source not found.). Follow-up phone calls were made if further discussion was desired. Additionally, a personal visit by myself to further discuss the study was provided to practice sites wanting more details before agreeing to participate. Half of the sites received this visit, which also served to build rapport and coordinate scheduling. Sampling was based on the dementia specialist’s previous experience with the potential recipients in terms of the perceived baseline knowledge of and familiarity with dementia to provide a wide range of baseline knowledge of dementia from minimal to advanced.

3.4 Patient selection

Recipients (i.e., participating primary care providers) from each practice site selected a number of patients for cognitive assessment. Patients already diagnosed with dementia were
excluded, unless the primary care providers had uncertainties about the diagnosis or cognitive assessment on that patient. At least half of the patients selected should have been suspected of having some cognitive deficits, but primary care providers were encouraged to select both patients they suspected of having cognitive deficits and patients with no such suspicion. This was encouraged to provide experience with a range of assessment types (i.e., varying levels of cognitive deficits), and also to provide feedback to the providers on their level of suspicion. Primary care providers may have suspected patients of having cognitive deficits based on awareness of early signs or triggers: for example, memory or thinking problems during history taking, medication problems perhaps showing up as changes in previously stable condition (thyroid markers, blood pressure, diabetes control) or unawareness of medications being taken, unexplained weight loss, missed office visits, driving problems, problems at work, difficulty with daily functioning, unusual repetition of same questions, language problems such as word finding difficulties, and early signs of impaired executive functioning. The number of patients selected was determined by the practice sites themselves dependant on their perceived needs and their availability. For example, if the site anticipated needing more practice they might select more patients for the program; this of course was balanced against the practice site staffs’ time availability to participate and assess more patients.

3.5 Outcome measures

3.5.1 Questionnaire development

Questionnaires were developed to collect both quantitative and qualitative information from recipients at three time points: pre-program (Q1), post-program (Q2), and three months post-program (Q3). The questionnaires collected self-reported knowledge and confidence measures and a program evaluation. Several resources were consulted to inform initial
questionnaire development including item generation, question type and wording, use of scales, and question presentation (both visual presentation and question order). Subsequently, further items were generated, question types determined, wording and question order were established, and a preliminary visual display was created. To ensure content validity, the questionnaires were piloted among Memory Clinic staff and they were reviewed by a sociologist with expertise in questionnaire development. Questions were removed, reworded, or reordered according to the feedback received. The finalized questionnaires can be seen in Figure 3 and Figure 4.
## Figure 3. Pre-program questionnaire (Q1)

### Dementia Knowledge Transfer Pre-Program Questionnaire

**PART 1**
Please answer the following questions by checking the **most appropriate** response for you at this time.
*(Consider a scale from 1 – 7 with 1 being the lowest and 7 being the highest possible)*

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Highest level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How aware are you of indicators that may suggest mild dementia in a patient?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. How confident do you feel in detecting mild dementia among your patients?</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Once suspected, how confident do you feel in assessing the possibility of mild dementia in a patient?</td>
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<tr>
<td>4. How familiar are you with using the Montreal Cognitive Assessment (MoCA)?</td>
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<td></td>
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<td></td>
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<tr>
<td>5. How confident are you about the accuracy of the Montreal Cognitive Assessment (MoCA)?</td>
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<tr>
<td>6. How knowledgeable are you of the recent Canadian Dementia Guidelines?</td>
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<tr>
<td>7. How confident do you feel in caring for patients with mild dementia?</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>8. How aware are you of community resources for patients with dementia?</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PART 2**
*(Select **most appropriate** response)*

<table>
<thead>
<tr>
<th>Question</th>
<th>Almost never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Most times</th>
<th>Almost always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you look for signs of mild dementia in elderly or at risk patients?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. In cases of suspected cognitive changes do you use the Montreal Cognitive Assessment (MoCA)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Do you, or the doctors you work with, diagnose dementia in patients when they are in a more advanced stage?</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>4. How often are your dementia patients (or suspected patients) referred to specialized clinics?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Do you feel that early detection of dementia is important?</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6. At present, what assessments do you use to evaluate potential cognitive deficits? (please list)</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>7. What type of practice are you part of? <em>(e.g., Comprehensive Care Model, Solo Practice, Family Health Team)</em></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8. What is your role within the practice? <em>(e.g., physician, nurse, nurse practitioner)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Please, provide an estimate of the proportion of elderly patients in your practice.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Have you had specific training on dementia in the past? (please describe)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thank you for taking the time to fill out this questionnaire!
Figure 4. Post-program and three-month post-program questionnaires (Q2 & Q3)

Dementia Knowledge Transfer Post-Program Questionnaire

PART 1
Please answer the following questions by checking the most appropriate response for you at this time. (Consider a scale from 1 – 7 with 1 being the lowest and 7 being the highest possible)

<table>
<thead>
<tr>
<th>Question</th>
<th>Lowest level</th>
<th>Highest level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How aware are you of indicators that may suggest mild dementia in a patient?</td>
<td>☐ 3 4 5 6 7</td>
<td>☐ 3 4 5 6 7</td>
</tr>
<tr>
<td>2. How confident do you feel in detecting mild dementia among your patients?</td>
<td>☐ 3 4 5 6 7</td>
<td>☐ 3 4 5 6 7</td>
</tr>
<tr>
<td>3. Once suspected, how confident do you feel in assessing the possibility of mild dementia in a patient?</td>
<td>☐ 3 4 5 6 7</td>
<td>☐ 3 4 5 6 7</td>
</tr>
<tr>
<td>4. How familiar are you with using the Montreal Cognitive Assessment (MoCA)?</td>
<td>☐ 3 4 5 6 7</td>
<td>☐ 3 4 5 6 7</td>
</tr>
<tr>
<td>5. How confident are you about the accuracy of the Montreal Cognitive Assessment (MoCA)?</td>
<td>☐ 3 4 5 6 7</td>
<td>☐ 3 4 5 6 7</td>
</tr>
<tr>
<td>6. How knowledgeable are you of the recent Canadian Dementia Guidelines?</td>
<td>☐ 3 4 5 6 7</td>
<td>☐ 3 4 5 6 7</td>
</tr>
<tr>
<td>7. How confident do you feel in caring for patients with mild dementia?</td>
<td>☐ 3 4 5 6 7</td>
<td>☐ 3 4 5 6 7</td>
</tr>
<tr>
<td>8. How aware are you of community resources for patients with dementia?</td>
<td>☐ 3 4 5 6 7</td>
<td>☐ 3 4 5 6 7</td>
</tr>
</tbody>
</table>

PART 2
(Select most appropriate response)

<table>
<thead>
<tr>
<th>Question</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In detecting mild dementia, this program has made it</td>
<td>☐ Much more difficult ☐ More difficult ☐ No different ☐ Easier ☐ Much easier</td>
</tr>
<tr>
<td>2. Will you, or the doctors you work with, search for/rule out mild dementia in elderly or at risk patients?</td>
<td>☐ Almost never ☐ Seldom ☐ Sometimes ☐ Most times ☐ Almost always</td>
</tr>
<tr>
<td>3. How difficult will it be for you to integrate the information from this program into your practice?</td>
<td>☐ Quite easy ☐ Fairly easy ☐ Moderately difficult ☐ Difficult ☐ Very difficult</td>
</tr>
<tr>
<td>4. Collaboration with the specialist was comfortable and I look forward to further communication.</td>
<td>☐ Disagree ☐ Disagree slightly ☐ Do not agree or disagree ☐ Agree slightly ☐ Agree</td>
</tr>
<tr>
<td>5. I feel free to contact the specialist if I require further support.</td>
<td>☐ Disagree ☐ Disagree slightly ☐ Do not agree or disagree ☐ Agree slightly ☐ Agree</td>
</tr>
<tr>
<td>6. This program has increased my knowledge of mild dementia.</td>
<td>☐ Disagree ☐ Disagree slightly ☐ Do not agree or disagree ☐ Agree slightly ☐ Agree</td>
</tr>
<tr>
<td>7. After this program, I feel more confident with mild dementia.</td>
<td>☐ Disagree ☐ Disagree slightly ☐ Do not agree or disagree ☐ Agree slightly ☐ Agree</td>
</tr>
<tr>
<td>8. Will open communication with the specialist enhance your practice?</td>
<td>☐ Yes ☐ No ☐ Maybe</td>
</tr>
<tr>
<td>9. Would you like to consider participating in the program as a community leader?</td>
<td>☐ Yes ☐ No ☐ Maybe</td>
</tr>
</tbody>
</table>

OVER PLEASE
3.5.2 Primary outcome: knowledge and confidence scores

All recipients completed the single pre-program (Q1), post-program (Q2), and three-month post-program (Q3) questionnaires. Part 1 of each questionnaire included identical subjective measures regarding the detection, assessment, and care of mild dementia; these
measures were presented in eight alternating questions rating knowledge and confidence constructs each on a seven-point numeric scale. The four knowledge questions and the four confidence questions were each aggregated creating a 28-point knowledge sub-score and a 28-point confidence sub-score. These were then aggregated to provide a composite 56-point knowledge-confidence (KC) score. The knowledge, confidence and composite scores were considered the primary outcomes of the MDKT Program. Q1 provided baseline values for comparison with Q2 to assess short-term efficacy or change immediately after the program. Q2 values were compared with Q3 values three months after completion of the program to evaluate longer-term efficacy or stability of the change.

As explanatory variables, information was collected on recipient, site and program factors. Recipient factors were collected on Part 2 of Q1. These consisted of recipient demographics and pre-program practice information regarding cognitive assessments used, previous training, and proportion of elderly patients (> 65 years of age). The site factor was practice model (e.g., family health team, community health centre, long term care). Program factors were a measure of intervention exposure and included number of demonstrations given by the Neuroscience Master’s student, number of colleague-conducted assessments observed, number of assessments done, number of patients reviewed with the dementia specialist and total interventions (demonstrations, observations, assessments, and reviews).

3.5.3 Program evaluation

Part 2 of the post-program (Q2) and three-month post-program (Q3) questionnaires collected a program evaluation regarding recipients’ 1) impressions of the program; 2) impressions of collaboration with the specialist; 3) impressions of changes to practice including “active detection” and ease of integration of new information into practice; and 4) overall
impressions, best and worst parts of program, and perceived barriers to integrating the information into practice. These questions collected quantitative data both on Likert scales or as frequencies in multiple response sets (these allow recipients to choose more than one answer per question). Along with the quantitative data gathered, open-ended “Other” options and an “additional comments” box were included to capture narrative answers providing qualitative data. These qualitative data were collected to provide context and enrich the quantitative data collected. This program evaluation will provide information regarding the acceptability and feasibility of the MDKT Program.

3.6 Analysis

All data were entered into PASW Statistics software version 18 (SPSS Inc, Chicago, IL), which was used for all statistical analyses.

3.6.1 Primary outcome: knowledge and confidence scores

To test for change in (knowledge-confidence) KC score and each sub-score between the three time points (Q1, Q2, and Q3), a repeated measures analysis using linear mixed-effects models was conducted. Linear mixed-effects models analysis provides a general and flexible approach accounting for the correlation of measurements over time within individuals, and allowing for missing data points. The term mixed-effects models refers to the use of both fixed and random effects in the same analysis. In the mixed-effects model used here, time was included as a fixed effect to estimate the mean scores (KC score, and each sub-score) at each of the three time points (Q1, Q2, Q3). Intercept was included as a random effect to account for variability in pre-program (Q1) scores and within-provider correlation over the three time points. To examine the effects of potentially explanatory recipient and program factors on pre-program scores (Q1) and change between the three time points, main effects and interaction effects with
time for each factor were tested. The main effects tested reflect the impact of the factors on Q1 scores, and the interaction effects with time reflect the impact of the factors on change between the three time points. For analysis, profession was aggregated into two values: medical (family doctor, family medicine resident, medical student) and nursing (physician assistant, nurse practitioner, registered nurse and registered practical nurse). Similarly, the site factor, practice model, was aggregated into two values: clinic-based (family health team, community health centre, family health group), and institutional (long term care and retirement residence). Because of multiple comparisons, a conservative P value of < .01 was used to detect significance for the tests of these explanatory factors. All other statistical tests were considered significant at P < .05. Additionally, Friedman tests were used to test the change in individual knowledge and confidence questions between the three time points.

3.6.2 Program evaluation

Descriptive and qualitative analyses were performed on the program evaluation measures collected on Q2 and Q3. Descriptive analysis was used for the quantitative data collected on Likert scales and in multiple response sets. Frequencies were used to display this data graphically. The five-level Likert scales were binned into three-level scales for analysis. Differences in responses between Q2 and Q3 were tested using Wilcoxon signed-rank test for ordinal data collected on Likert scales and using McNemar’s test for dichotomous variables in the multiple response sets. Qualitative data were analyzed using a recursive thematic analysis process as described by Braun and Clarke. An inductive approach was used, meaning themes were generated from the data itself rather than by fitting the data to preexisting themes based on a theoretical framework. First, the qualitative data were read extensively and coded according to key features in the data. The coded data were collated into themes, and the themes were checked
for congruence with the original qualitative data. The defined themes were used to present the results of the thematic analysis, and the results of the descriptive analysis were tied to the qualitative data in the report.
Chapter 4

Results

4.1 Knowledge transfer recipient characteristics

Thirty-eight primary care providers from 14 practice sites representing 5 primary health care models participated (Table 2). Forty-nine patients were assessed.

<table>
<thead>
<tr>
<th>Table 2. Sample Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recipient Characteristics (n = 38)</strong></td>
</tr>
<tr>
<td>Profession</td>
</tr>
<tr>
<td>Family doctor</td>
</tr>
<tr>
<td>Family medicine resident</td>
</tr>
<tr>
<td>Medical student</td>
</tr>
<tr>
<td>Physician assistant</td>
</tr>
<tr>
<td>Nurse practitioner</td>
</tr>
<tr>
<td>Registered nurse</td>
</tr>
<tr>
<td>Registered practical nurse</td>
</tr>
<tr>
<td>Practice model</td>
</tr>
<tr>
<td>Family health group</td>
</tr>
<tr>
<td>Family health team</td>
</tr>
<tr>
<td>Community health centre</td>
</tr>
<tr>
<td>Long term care</td>
</tr>
<tr>
<td>Retirement residence</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Years in practice, mean (SD)</td>
</tr>
<tr>
<td>Percentage elderly patients (&gt;65 years) in practice, mean (SD)</td>
</tr>
<tr>
<td>Previous dementia training</td>
</tr>
<tr>
<td>Cognitive assessments used before program</td>
</tr>
<tr>
<td>MoCA*</td>
</tr>
<tr>
<td>MMSE†</td>
</tr>
<tr>
<td>Other</td>
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</table>

<table>
<thead>
<tr>
<th>Site Characteristics (n = 14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice model</td>
</tr>
<tr>
<td>Family health group</td>
</tr>
<tr>
<td>Family health team</td>
</tr>
<tr>
<td>Community health centre</td>
</tr>
<tr>
<td>Long term care</td>
</tr>
<tr>
<td>Retirement residence</td>
</tr>
</tbody>
</table>

Values are expressed as number (percentage) unless otherwise indicated.

*Montreal Cognitive Assessment
†Mini-Mental State Examination
There was a median of 2 (range, 1-9) recipients and 3 (range, 2-8) patients per site. Five sites refused participation: 2 were not interested, 1 was unavailable during the study timeframe, 1 already had their needs met, and 1 had staff limitations. Therefore, 14 of the 19 sites contacted participated giving a participation rate of 74%. All 38 recipients completed the pre-program questionnaire (Q1); 35 recipients completed the post-program questionnaire (Q2); and 33 recipients completed the three-month post-program questionnaire (Q3). Thus, only 30 recipients completed all three questionnaires, but all recipients completed at least two questionnaire.

Recipients’ pre-program dementia practice information is shown in Figure 5.

Figure 5. Pre-program practice information

Before the program, half (47%) of the recipients actively sought signs of mild dementia in their patients most times, half (47%) did this sometimes, and 5% seldom did this. When assessing patients with a potential cognitive impairment, nearly half (47%) of recipients already used the MoCA most times, but over a third (37%) used the MoCA seldom. Almost half (42%) of recipients referred dementia patients to specialized clinics most times, 45% did this sometimes, and 13% seldom did this. Most (92%) recipients felt that early detection of dementia was important, while only 5% thought it was not important.
4.2 Program exposure

Recipients received a median of 1 (range, 0-3) assessment procedures demonstration from myself, assessed 1 (range, 0-2) patient, observed their colleagues assess 0 (range, 0-3) patients, and reviewed 3 (range, 1-8) patients with the Memory Clinic team. The median number of exposures received (sum of demonstrations, assessments, observations, and discussions) by recipients was 5 (range, 1-14).

4.3 Primary outcome: knowledge and confidence scores

Table 3 shows the self-reported knowledge and confidence outcomes at the three time points (Q1, Q2, and Q3) estimated using a linear mixed-effects model including data from all 38 recipients.

<table>
<thead>
<tr>
<th></th>
<th>Fixed Effects</th>
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<th>Random Effects</th>
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<td>Q1</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
<td>Q1-Q2</td>
<td>Q2-Q3</td>
<td>Variability</td>
<td>P Value</td>
<td>P Value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Estimate (SE)</td>
<td>Estimate (SE)</td>
<td>Estimate (SE)</td>
<td>P Value</td>
<td>P Value</td>
<td>Estimate (SE)</td>
<td>P Value</td>
<td>P Value</td>
</tr>
<tr>
<td>Total KC Score†</td>
<td></td>
<td>30.8 (1.1)</td>
<td>41.1 (1.1)</td>
<td>40.9 (1.1)</td>
<td>&lt;.001</td>
<td>.83</td>
<td>27.9 (7.9)</td>
<td>&lt;.001</td>
<td>16.0 (2.8)</td>
</tr>
<tr>
<td>Knowledge Sub-score</td>
<td></td>
<td>14.5 (0.6)</td>
<td>19.8 (0.6)</td>
<td>20.0 (0.6)</td>
<td>&lt;.001</td>
<td>.80</td>
<td>8.7 (2.3)</td>
<td>&lt;.001</td>
<td>3.6 (0.6)</td>
</tr>
<tr>
<td>Confidence Sub-score</td>
<td></td>
<td>16.3 (0.6)</td>
<td>21.3 (0.6)</td>
<td>21.2 (0.6)</td>
<td>&lt;.001</td>
<td>.92</td>
<td>6.0 (2.0)</td>
<td>.002</td>
<td>5.5 (1.0)</td>
</tr>
</tbody>
</table>

Linear mixed-effects model with time as a fixed effect and intercept as a random effect.
†Composite knowledge-confidence score comprising the sum of both knowledge and confidence sub-scores.

Recipients showed a significant increase in KC score in Q2 after the program compared to Q1 (estimated mean change [SE], 10.3 [0.9]; P < .001) accounted for by increases in both knowledge (5.3 [0.4]; P < .001) and confidence (5.0 [0.6]; P < .001) sub-scores. This is an improvement of 33% in KC score, 37% in knowledge sub-score, and 31% in confidence-subscore. Additionally, there was no decline from Q2 in any of the three scores three months after the program was
completed in Q3 (KC -0.2 [1.0]; knowledge 0.1 [0.5]; confidence -0.1[0.6]; all $P > .05$). As intended by the selective sampling used in recruitment, there was significant variability in pre-program (Q1) scores between recipients (KC 27.9; knowledge 8.7; confidence 6.0; all $P \leq .05$).

The main effects and interaction effects with time of recipient, site and program factors on KC score are presented in Table 4.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Main Effect</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1 Estimate (SE)</td>
<td>Q2-Q1 Estimate (SE)</td>
</tr>
<tr>
<td></td>
<td>P Value</td>
<td>P Value</td>
</tr>
<tr>
<td><strong>Recipient Factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profession*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>4.6 (2.1) .03</td>
<td>-0.9 (2.0) .64</td>
</tr>
<tr>
<td>Nursing</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>-4.9 (2.3) .03</td>
<td>1.8 (2.0) .38</td>
</tr>
<tr>
<td>Male</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Percentage elderly patients (&gt;65 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 50 %</td>
<td>-5.3 (2.1) .02</td>
<td>6.6 (2.1) .003</td>
</tr>
<tr>
<td>&gt; 50 %</td>
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<tr>
<td>Previous dementia training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5.7 (2.1) .01</td>
<td>-1.3 (2.0) .51</td>
</tr>
<tr>
<td>No</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>Cognitive assessments used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MoCA – yes</td>
<td>4.0 (2.1) .06</td>
<td>-0.4 (1.9) .85</td>
</tr>
<tr>
<td>MoCA – no</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td>MMSE – yes</td>
<td>-3.5 (2.5) .17</td>
<td>-0.7 (2.2) .77</td>
</tr>
<tr>
<td>MMSE – no</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td><strong>Site Factor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice Model†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinic-based</td>
<td>-4.8 (2.7) .09</td>
<td>7.6 (2.7) .01</td>
</tr>
<tr>
<td>Institutional</td>
<td>Reference</td>
<td>Reference</td>
</tr>
<tr>
<td><strong>Program Factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrations given by</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neuroscience Master’s student</td>
<td>-3.5 (1.7) .04</td>
<td>3.4 (1.5) .02</td>
</tr>
<tr>
<td>No. colleague-conducted</td>
<td>-5.0 (1.4) .01</td>
<td>2.7 (1.3) .05</td>
</tr>
<tr>
<td>assessments observed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. assessments done</td>
<td>-3.5 (1.9) .07</td>
<td>4.2 (1.6) .01</td>
</tr>
<tr>
<td>No. patients reviewed with</td>
<td>-0.2 (0.5) .76</td>
<td>0.4 (0.5) .35</td>
</tr>
<tr>
<td>dementia specialist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total interventions‡</td>
<td>-0.7 (0.4) .06</td>
<td>0.7 (0.3) .03</td>
</tr>
</tbody>
</table>

Linear mixed-effects model with knowledge-confidence score as the dependent variable, time as a fixed effect and intercept as a random effect. Recipient, site factors program factors are included as factors. Each factor was included in the model individually to assess main effect and interaction with time.

*Family doctor, family medicine resident and medical student were included in medical. Physician assistant, nurse practitioner, registered nurse and registered practical nurse were included in nursing.

†Family health team, community health centre, family health group were included as clinic-based. Long term care and retirement home were included as institutional.

‡Includes sum of demonstrations, colleague-assessments observed, assessments done, and reviews with specialist.
Greater pre-program KC score was observed in those with previous dementia training (estimate [SE], 5.7 [2.1]; \( P = .01 \)). Lower pre-program score was observed in those who observed more colleague-conducted assessments (-5.0 [1.4]; \( P = .001 \)). No differences were observed between medical and nursing staff in pre-program score or in change from Q1 to Q2 and stability over three months from Q2 to Q3. Change in KC score from Q1 to Q2 were significantly associated with number of assessments done (4.2 [1.6]; \( P = .01 \)). Also, Q1 to Q2 KC change was greater in recipients with fewer elderly patients (6.6 [2.1]; \( P = .003 \)) and in those from clinic-based practice models. Stability of KC score increases over the three months from Q2 to Q3 were not significantly impacted by recipient, site or program factors. Although some factors did not reach significance levels, higher pre-program scores appear to be related to recipient factors such as medical profession, male gender and lower proportion of elderly patients; similarly, greater Q1 to Q2 changes appear to be related to program factors such as number of demonstrations and total interventions.

The main and interaction effects of these factors on knowledge and confidence sub-scores separately gave similar results. Table 5 presents the main and interaction effects with time of recipient, site and program factors on knowledge sub-score, and Table 6 presents the same for confidence sub-score. Differences from the results obtained on the KC score are highlighted.
<table>
<thead>
<tr>
<th>Table 5. Impact of factors on knowledge sub-score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameter</strong></td>
</tr>
<tr>
<td><strong>Q1</strong></td>
</tr>
<tr>
<td><strong>Estimate</strong></td>
</tr>
<tr>
<td><strong>Recipient Factors</strong></td>
</tr>
<tr>
<td>Profession* (Medical: family doctor, family medicine resident, medical student; Nursing: physician assistant, nurse practitioner, registered nurse and registered practical nurse)</td>
</tr>
<tr>
<td>Medical</td>
</tr>
<tr>
<td>Nursing</td>
</tr>
<tr>
<td>Gender (Female: reference)</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Percentage elderly patients (&gt;65 years)</td>
</tr>
<tr>
<td>≤ 50%</td>
</tr>
<tr>
<td>&gt; 50%</td>
</tr>
<tr>
<td>Previous dementia training (Yes: reference)</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Cognitive assessments used (MoCA: neurology resident, neurology fellow; MMSE: neurology resident, neurology fellow)</td>
</tr>
<tr>
<td>MoCA – yes</td>
</tr>
<tr>
<td>MoCA – no</td>
</tr>
<tr>
<td>MMSE – yes</td>
</tr>
<tr>
<td>MMSE – no</td>
</tr>
<tr>
<td>Site Factor</td>
</tr>
<tr>
<td>Practice Model† (Clinic-based: family health team, community health centre, family health group; Institutional: long term care and retirement home)</td>
</tr>
<tr>
<td>Clinic-based</td>
</tr>
<tr>
<td>Institutional</td>
</tr>
<tr>
<td>Program Factors</td>
</tr>
<tr>
<td>Demonstrations given by Neuroscience Master’s student</td>
</tr>
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<td>Neurology student</td>
</tr>
<tr>
<td>No. colleague-conducted assessments observed</td>
</tr>
<tr>
<td>2.4 (0.8)</td>
</tr>
<tr>
<td>No. assessments done</td>
</tr>
<tr>
<td>-1.8 (1.0)</td>
</tr>
<tr>
<td>No. patients reviewed with dementia specialist</td>
</tr>
<tr>
<td>Dementia specialist</td>
</tr>
<tr>
<td>Total interventions‡</td>
</tr>
<tr>
<td>0.2 (0.2)</td>
</tr>
</tbody>
</table>

Linear mixed-effects model with knowledge sub-score as the dependent variable, time as a fixed effect and intercept as a random effect. Recipient, site factors program factors are included as factors. Each factor was included in the model individually to assess main effect and interaction with time.

*Family doctor, family medicine resident, medical student were included in medical. Physician assistant, nurse practitioner, registered nurse and registered practical nurse were included in nursing.

†Family health team, community health centre, family health group were included as clinic-based. Long term care and retirement home were included as institutional.

‡Includes sum of demonstrations, colleague-assessments observed, assessments done, and reviews with specialist.

§Statistical significance different from that found for knowledge-confidence score at $P < .01$.

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Main Effect</th>
<th>Interaction</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Q1 Estimate (SE)</td>
<td>P Value</td>
</tr>
<tr>
<td>Profession*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>2.2 (1.1)</td>
<td>.05</td>
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<td>Nursing</td>
<td>Reference</td>
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<tr>
<td>Gender</td>
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<tr>
<td>Female</td>
<td>-1.8 (1.2)</td>
<td>.13</td>
</tr>
<tr>
<td>Male</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Percentage elderly patients (&gt;65 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 50 %</td>
<td>-3.0 (1.1)</td>
<td>.01§</td>
</tr>
<tr>
<td>&gt; 50 %</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Previous dementia training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3.0 (1.1)</td>
<td>.01</td>
</tr>
<tr>
<td>No</td>
<td>Reference</td>
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</tr>
<tr>
<td>Cognitive assessments used</td>
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<td>2.0 (1.1)</td>
<td>.07</td>
</tr>
<tr>
<td>MoCA – no</td>
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<td>Practice Model†</td>
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<td></td>
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<td>.04</td>
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<tr>
<td>Program Factors</td>
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<td></td>
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<tr>
<td>Demonstrations given by</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neuroscience Master’s student</td>
<td>-2.4 (0.9)</td>
<td>.01§</td>
</tr>
<tr>
<td>No. colleague-conducted assessments observed</td>
<td>-2.5 (0.7)</td>
<td>.001</td>
</tr>
<tr>
<td>No. assessments done</td>
<td>-1.7 (1.0)</td>
<td>.08</td>
</tr>
<tr>
<td>No. patients reviewed with dementia specialist</td>
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<td>.47</td>
</tr>
<tr>
<td>Total interventions‡</td>
<td>-0.4 (0.2)</td>
<td>.02</td>
</tr>
</tbody>
</table>

Linear mixed-effects model with confidence sub-score as the dependent variable, time as a fixed effect and intercept as a random effect. Recipient, site factors program factors are included as factors. Each factor was included in the model individually to assess main effect and interaction with time.

*Family doctor, family medicine resident, medical student were included in medical. Physician assistant, nurse practitioner, registered nurse and registered practical nurse were included in nursing.

†Family health team, community health centre, family health group were included as clinic-based. Long term care and retirement home were included as institutional.

‡Includes sum of demonstrations, colleague-assessments observed, assessments done, and reviews with specialist.

§Statistical significance different from that found for knowledge-confidence score at $P < .01$. 

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The few differences present were seen in the impact of gender, previous dementia training, proportion of elderly patients in the practice and number of demonstrations on pre-program scores, and the impact of number of demonstrations and number of assessments on Q1 to Q2 change. While female gender and a lower proportion of elderly patients showed trends for lower pre-program KC scores, female gender was significantly associated with a lower pre-program knowledge sub-score (knowledge -3.1 [1.2], \( P = .01 \); confidence -1.8 [1.2], \( P = .13 \)), and a lower proportion of elderly patients was significantly associated with a lower pre-program confidence sub-score (confidence -3.0 [1.1], \( P = .01 \); knowledge -2.4 [1.2], \( P = .05 \)). In contrast, while previous dementia training was significantly associated with higher pre-program KC scores, previous training was only significantly associated with a higher confidence sub-score, but showed a trend for a higher knowledge sub-score (confidence 3.0 [1.1], \( P = .01 \); knowledge 2.6 [1.1], \( P = .02 \)). Additionally, number of demonstrations showed only a trend for greater KC score change from Q1 to Q2; however, number of demonstrations was significantly associated with both lower pre-program confidence sub-score (-2.4 [0.9]; \( P = .01 \)) and greater confidence sub-score change from Q1 to Q2 (2.1 [0.9]; \( P = .01 \)). Finally, while number of assessments done was significantly associated with greater changes in KC score from Q1 to Q2, number of assessments done was significantly associated with greater knowledge sub-score changes, but only showed a trend for greater confidence sub-score changes (confidence 2.1 [0.9], \( P = .03 \); knowledge 2.2 [0.7], \( P = .01 \)).

When analyzed individually, scores for each knowledge and confidence question increased significantly from Q1 to Q2 (Table 7).
Only data from the 30 recipients who complete all three questionnaires could be included in this analysis. The greatest increases from Q1 to Q2 were in familiarity with using the MoCA (raw change in mean score of 2.0 on the 7-point scale) and in confidence about its accuracy (raw change of 1.9). The smallest increases were in confidence in caring for patients with mild dementia (raw change of 0.8) and in awareness of community resources (raw change of 0.5).

### 4.4 Program evaluation

#### 4.4.1 Descriptive analysis

Figure 6 graphically presents the quantitative program evaluation.
Figure 6. Quantitative program evaluation

**Impressions of Program**

- In detecting dementia, this program has made it:
  - More difficult: 10%
  - No different: 90%
  - Easier: 0%

- My knowledge of mild dementia has increased:
  - Disagree: 100%

- After this program, I feel more confident with mild dementia:
  - Disagree: 0%
  - Do not agree or disagree: 10%
  - Agree: 90%

**Impressions of Collaboration with Specialist**

- Collaboration was comfortable and I look forward to more:
  - Disagree: 0%
  - Do not agree or disagree: 10%
  - Agree: 90%

- I feel free to contact the specialist in the future:
  - Disagree: 0%

- Will open communication enhance your practice?
  - Yes: 50%
  - No: 20%
  - Maybe: 30%

**Impressions of Practice Change**

- How difficult will it be to integrate the new knowledge?
  - Easy: 0%
  - Moderately difficult: 10%
  - Difficult: 90%

- Do you search for mild dementia in at risk patients?
  - Seldom: 70%
  - Sometimes: 20%
  - Most times: 10%

Frequencies based on average of Q2 and Q3
The differences between frequencies at Q2 and Q3 were tested using Wilcoxon signed-rank tests and McNemar’s tests and the only significant difference was found in rating the level of information as the best part of the program (Q2 66% vs. Q3 42%; \( P = .04 \)). Thus, the frequencies in these charts are based on the average frequencies for Q2 and Q3.

Recipients’ impressions of the program were very good. Most recipients (91%) rated the program as making it easier to detect mild dementia in their patients. Nearly all recipients agreed that the program increased their knowledge of (97%) and confidence in (96%) diagnosing mild dementia. Regarding collaboration with the dementia specialist, 96% of recipients agreed collaboration was comfortable, 93% felt free to contact the dementia specialist for further support, and 88% felt that open communication with the specialist would enhance their practice. Regarding changes to practice, 88% felt it would be easy to integrate the information from this program into their practice. After the program more recipients said they would actively seek signs of mild dementia most times compared to before the program (60% vs. 47%).

Overall, recipients found the program to be excellent (70%), effective (53%), empowering (29%), and innovative (29%), while only one recipient found it to be unnecessary. Ratings of the best and worst parts of the program are shown. A majority of participants rated interactivity (65%), level of information (54%), and relevance to job (52%) as the best parts of the program. The worst parts of the program were time commitment (34%) and materials provided (6%). Time limitation was the most commonly (68%) perceived barrier to the integration of the program information into practice. Some recipients rated human resources shortage (22%) as a perceived barrier.
4.4.2 Thematic analysis

The thematic analysis identified four major themes from recipients’ narrative/open-ended questionnaire responses: amount of MDKT materials; time availability in practice and in MDKT Program; style of intervention; and value of MDKT Program.

4.4.2.1 Amount of MDKT materials

Recipients were somewhat divided regarding the MDKT materials provided in the program. This is also reflected in Figure 6 as 35% of recipients rated materials provided as the best part of the program and 6% as the worst. The amount of materials was regarded as too much by some and too limited by others:

*Materials provided were useful, but very time consuming to read through; ... I'm not sure how much has been retained. (KT33)*

*I would have liked more written information. (KT03)*

A “handout of community resources for dementia patients” (KT41), a “summary sheet [of the Canadian Dementia Guidelines to act as a reference]” (KT33), and a “decision tree on how to proceed” (KT18) were suggested to address the desire for more written information and to remedy the problem of lengthy guidelines.

4.4.2.2 Time availability in practice and in the MDKT Program

Time availability was a significant issue for many recipients. Time commitment was most commonly rated as the worst part of the program (Figure 6), and limited time impacted on some recipients’ involvement in the program. Some felt the program was too long, while others felt it was not long enough:

*More time spent would [provide] more knowledge to staff. (KT44)*
[I would like] more time for discussion. (KT40)

For one nurse practitioner, despite rating the program as excellent, time limitation was “discouraging because [I] needed more time to practice ... and incorporate skills”. (KT34)

Although time availability was a problem for many, committing the time was regarded as worth it:

*I struggled finding the time to do it [the program], but I’m really glad I did it; ... it was worth it* (KT23)

*Makes for a long day, but beneficial* (KT13)

Also, time limitation was rated as the commonest barrier to integrating the MDKT information into practice (Figure 6). In the long term care setting integration “may be slightly more difficult ... due to staff shortage and time it takes to complete [assessment]” (KT24), but KT13 noted this “could improve with more trained staff”. Physicians without access to a nurse commented that having a nurse to conduct the assessments would help alleviate the time constraints, but there are evident cost limitations to this. On the other hand, some nurses felt that their role within the practice limited their ability to use these tools and detect dementia due to the low frequency of seeing individual patients, the length of time they are able to devote to them, and the reason for the visit:

*I lack direct patient contact unless being seen for another issue.* (KT02)

*I am a relief nurse and work very few hours as a retired RN.* (KT03)

*I don’t interact long enough with those seen to detect problems. ... [There is limited] time for the Data Gathering Form. However, I am more conscious of how to do that [detect problems] in a short time now and bring it to the doctor’s attention.* (KT04)

4.4.2.3 Style of intervention

Overall, the MDKT Program was seen as a good learning experience since it is based in the recipients’ own patients and practices, and it emphasizes interactivity. The style of the program was liked and thought of as advantageous:
Excellent learning experience (KT16)

Great program; very educational (KT41)

This was excellent ... I’ve learned much more than I would in a lecture. This was extremely useful and a great way of doing CME/CPD. (KT23)

Interactivity was most commonly rated as the best part of the program (Figure 6), and this was highlighted in many recipients’ comments. Recipients felt that “coming to our practice and helping us do assessments” (KT18) was valuable as this combined feedback on their performance of the assessments and the ability to discuss specifics regarding their own patients:

[I]learned a lot from the feedback given after doing the patient interview. This made me more aware of questions to ask when I did a patient interview on my own in the practice. (KT04)

[Program] was very helpful with select difficult patients (KT08)

[One of the best parts was] the ability to discuss patients/cases from my practice I’m currently struggling with. (KT23)

[Importantly], there was time to discuss patients’ diagnoses and treatment. (KT40)

The success of the interactive portions of the program relates to the characteristics of the program facilitators (the dementia specialty team) and personnel was rated as one of the best parts of the program by 41% of recipients (Figure 6). Importantly, the dementia specialty team was “knowledgeable and approachable” (KT06) offering practical insight and exemplar patient interactions:

[The Neuroscience Master’s student] was very good with patients, very specific. (KT40)

[One of the best parts] was interacting with the [dementia specialist] as her practical knowledge was very useful. (KT43)

Teaching and talking with [the dementia specialist] was the most valuable part of this project for me. (KT36)
4.4.2.4 Value of MDKT Program

Largely, recipients commented positively that the program was “very well done and appreciated” (KT17), “an excellent session” (KT43), and “wonderful” (KT28). Conversely, one physician “felt [the program] was primarily a drug company sponsored awareness program to increase the available market for their product” (KT05). Equally, this recipient also rated the program as unnecessary. The program was considered “well prepared” (KT40); however, one recipient suggested that the dementia specialty team choose the patients to be assessed “as the ones we chose were not the best examples”. (KT36) This suggestion will not be implemented as patient selection is an important component of the learning process requiring suspicion of and awareness to signs and symptoms of cognitive impairment.

Generally, recipients found the program to be worthwhile. The program was “very informative” (KT26):

*This program provided extremely valuable information. (KT02)*

*I learned several important facts in diagnosing mild dementia. (KT43)*

Many recipients noted that “the training [was] very helpful and useful” (KT24) in general as well as with specific patients and with use of the assessment tools:

*Useful tips regarding MoCA utilisation, and use of history to detect mild dementia. (KT33)*

*[The best part of the program was] education for nursing staff in use of the MoCA. (KT05)*

Although the relevance of the program was enhanced by assessing and discussing recipients’ own patients, one nurse practitioner pointed out that “this is one piece of knowledge in my geriatric practice” (KT34), and one physician echoing this noted that “this is one part of multiple comorbidities” (KT15). Nevertheless, the MDKT Program encouraged further improvement both in learning and in care delivery:

*I look forward to “testing” more patients as confidence to provide testing increases (KT06)*

*I look forward to learning more! (KT26)*
[Now] need to improve [other] staff’s awareness/education. (KT44)

Thanks for ... encouraging improved care standards. (KT15)
Chapter 5

Discussion

The current exploratory study sought to investigate the acceptability, feasibility and efficacy of the MDKT Program, which aimed to improve primary care providers’ knowledge and confidence in actively detecting, diagnosing and treating mild dementia. The results support the short- and longer-term efficacy of the MDKT Program as recipients’ self-reported knowledge and confidence in the detection, assessment and care of mild dementia improved immediately after the program and this improvement was stable three-months after it was completed. Recipients’ knowledge and confidence before the program were influenced by previous training, proportion of elderly patients, and gender; also, differences in pre-program knowledge and confidence impacted program participation such as the number of demonstrations and observations. Additionally, recipient factors such as practice model and proportion of elderly patients influenced improvements in knowledge and confidence, as did program exposure such as number of demonstrations given and assessments done. Furthermore, the acceptability and feasibility of the MDKT Program are supported by the results in three ways: 1) a high participation rate of 74%; 2) a large range of total program exposures demonstrating flexibility to the needs and availability of recipients; and 3) a program evaluation showing largely positive impressions regarding the program, collaboration with the dementia specialty team, and potential practice change.

5.1 Study design

The MDKT Program was a complex intervention involving many components including a toolkit, a dementia specialty team, and several dynamic interactions: namely, a baseline
meeting, an assessment date, and a review meeting. The considerable variability and complexity of this type of intervention makes evaluation difficult. The many dynamic components of complex interventions are hard to isolate, define and control, and determining their interdependencies is challenging. Due to these methodological challenges, the Medical Research Council (MRC) developed a framework for the evaluation of complex interventions providing an iterative step-wise approach: defining the intervention involves identifying the existing evidence and theoretical basis for the intervention; an exploratory phase is undertaken to gather preliminary data regarding the intervention and determine its acceptability and feasibility; an explanatory phase is undertaken once the intervention design has been finalized, and there are many methodological issues in this phase, which usually involves a randomized controlled trial to compare the fully defined intervention against an appropriate control; lastly, a pragmatic phase is used to determine the reliability of the intervention and results in broader and uncontrolled settings over the long term. Importantly, this evaluative process must incorporate both quantitative and qualitative methods to provide richer data.

The first phase, defining the intervention, was fulfilled in this study during program development. Because there are no clear guidelines for selecting, tailoring and developing knowledge translation interventions, a common sense approach was used to develop the MDKT Program based on available theory and evidence. A common sense approach entails selecting theory- and evidence-based concepts that have the potential to overcome identified barriers, and to use these concepts to develop a program to meet the knowledge translation objectives. The barriers were providers’ lack of knowledge and confidence including missing early indicators, diagnostic uncertainty, poor understanding of current assessment tools and inexperience, as well as time limitations. Equally, the complex nature of dementia detection,
assessment and management was also considered a barrier to knowledge translation. To overcome these barriers an active knowledge translation approach was used emphasizing active involvement of recipients through collaboration with a dementia specialty team in recipients’ own practices with their own patients. This allowed for context relevant exchange of tacit knowledge, practice, and tailoring to the needs and availability of the recipients.

In accordance with the second phase of the MRC Framework the current study was exploratory making use of both quantitative and qualitative methods. This approach enables the evaluation of the potential usefulness of an intervention including its acceptability, feasibility and preliminary efficacy.

Due to the exploratory nature of this study, sampling was selective to provide a range of baseline knowledge and confidence. This was successful as baseline variability in scores was significant. Although selective sampling can introduce bias, it was important in this exploratory phase to ensure a sample with diverse baseline characteristics. Similarly, the collected baseline characteristics demonstrate that the sample was diverse. Recipients represented seven professional roles from both medicine and nursing, and there was a wide range of years in practice (SD, 13.9 years). Additionally, recipients had practices with varying proportions of elderly patients. There were slightly more female recipients; this was driven by a lack of male nurses, which may be expected among the nursing population, and is likely not due to a sampling bias. Additionally, recipients came from five different practice models: family health teams, community health centres, and family health groups are all community clinic-based models; long term care and retirement residences are both institutional care sites. In terms of dementia practice, just over half of recipients had received dementia specific training in the past, and recipients’ baseline practice characteristics were diverse in terms of cognitive assessments used, frequency
of searching for dementia symptoms, and referral patterns. In contrast, nearly all recipients believed that early detection of dementia is important. This finding may represent a general improvement in primary care providers’ attitude toward early detection and a desire for more training and improved tools. Alternatively, this finding may be due to the voluntary nature of participation and those who do not believe that early detection is important may not be willing to participate. For this reason, our results cannot be generalized to those with a negative view toward early detection. Nevertheless, the diversity present within the study sample was beneficial and allowed the exploration of the impact of baseline demographic and practice characteristics on program efficacy.

Likewise, although there were consistent components to the program including the toolkit, dementia specialty team, and program outline, the level of program exposure was flexible in terms of number of demonstrations, observations of colleagues, assessments, and reviews. This flexibility resulted in a wide range of total program exposures between recipients (range, 1-14). These differences allowed for evaluation of the impact of program exposures on program efficacy potentially offering insight into the most important components of the program.

Finally, the use of a program evaluation with both qualitative and quantitative methods allowed the collection of complementary data contextualizing the efficacy data and providing information regarding the acceptability and feasibility of the MDKT Program. Quantitative data provided descriptive statistics and measurements of the relative size of recipients’ impressions of program features. Thematic analysis was used to analyze the qualitative data; thematic analysis is a method for identifying, analyzing and reporting patterns or themes within a set of qualitative data. In this way, the qualitative data provided elaboration on recipients’ impressions that cannot be collected quantitatively. Thematic analysis was selected as the qualitative method
because of its flexibility and relative ease of use, particularly for non-expert qualitative researchers.

5.2 Program Features

The MDKT Program provided an intervention based on current knowledge translation theory and evidence that was driven by the needs and availability of a heterogeneous group of primary care providers. Thus, the program took place in recipients’ own clinics with their own patients and was supported by the specialist team focusing on performance and problem-solving. There are several key features of the MDKT Program that are important and may have lead to its success.

Firstly, the MDKT Program was performance-oriented. The MDKT Program was highly focused on enhancing performance opportunities for recipients. Recipients actively participated in the process of dementia diagnosis and initial care planning with their own patients including active detection during patient selection, cognitive assessment during the assessment date, and discussions of diagnosis and care planning on the review date. By carrying out the diagnostic and initial care processes with their own patients following demonstrations and discussions with the dementia specialty team, recipients had a chance to not only observe the process, but also to practice in a very context relevant way, which is essential to knowledge flexibility and future applicability.90

Rather than focusing solely on the delivery of factual information, guided performance emphasizes the often ignored, yet critical, process components of learning. This is particularly important for dementia. For example, providing the Dementia Assessment Tools and only describing their use may not have resulted in learning. Similarly, demonstrating the use of the tools, the diagnostic process and initial care planning without practice may have been somewhat
more effective, but would still leave gaps in learning. Therefore, an interactive approach with demonstrations as well as guided recipient performance is necessary. Our results support this notion as those who performed more assessments showed higher improvements, reflecting the relevance of practice in gaining knowledge and confidence in the diagnosis of mild dementia. Additionally, interactivity was rated as the best part of the MDKT Program by a large majority of recipients.

Because early indicators of dementia are subtle and often missed by primary care providers, the MDKT Program attempted to enhance awareness of these indicators and promote active detection in two ways. First, the patient selection process encouraged recipients to think critically about the cognitive status of their patients, and to determine their level of suspicion regarding their patients based on awareness of early signs and triggers: this is the process of active detection. They were then able to test the accuracy of their suspicions against the results of the cognitive assessments conducted, and this feedback aimed to hone their active detection skills. Second, the Data Gathering Form provided a semi-structured method for considering early indicators of dementia in patients. This is a conversational method for gathering information about patients’ cognitive status. In this way, the Data Gathering Form provided a method for conducting the clinical history necessary in the diagnostic workup, and at the same time provided concepts to sharpen recipients’ active detection skills and awareness of early dementia indicators.

Similarly, learning to conduct and interpret cognitive assessments also requires practice and many primary care providers have anxiety about carrying out cognitive assessment. On the assessment date, I demonstrated the use of the cognitive assessment tools. Recipients’ then practiced the cognitive assessment process with guidance. Between patients the assessment process was discussed to enhance learning by emphasizing accurate performance.
accomplishment, addressing questions and concerns, and critically thinking about the meaning of information obtained and how this relates to cognitive abilities. This offered tangible feedback for recipients and integrated learning in context. The focus of the assessment date was to learn the appropriate use, scoring and initial interpretation of the Dementia Assessment Tools through a dynamic performance-oriented process.

Finally, the review meeting served to further integrate recipients’ learning in the process of formulating a diagnosis and initial care plan for each assessed patient. This is an important step because diagnostic uncertainty is common among primary care providers as there is no definitive diagnostic test and dementia diagnosis is, therefore, clinically integrative. This final stage of the MDKT Program enabled recipients to critically evaluate all clinically relevant information, including the results of the cognitive assessment, and to formulate diagnoses and care plans with guidance from the dementia specialist.

There are many theories relevant to the performance-oriented nature of the MDKT Program. The psychomotor domain in the theory of learning domains supports the process of learning through demonstration and guided practice as was done in the MDKT Program. Allowing for experience in the clinical setting makes use of constructivist theories of learning, and modeling the diagnostic and care planning process employs social learning theories. In social cognitive theory, demonstration and performance accomplishment both enhance self-efficacy, which in turn influences behavioural change as described in the theory of planned behaviour. Finally, performance enables implicit learning of process knowledge that is essential to flexible skill learning. Generally, the MDKT Programs’ emphasis on performance for learning is well supported by theory. Furthermore, trends in knowledge
translation evidence suggest that more interactive techniques including performance opportunities tend to be more successful. 93

Secondly, the MDKT Program was special-support, with learning based on collaboration between the dementia specialty team and the recipients. Evidence for specialist-primary care collaboration shows that collaborative care tends to improve care of chronic conditions. 96, 98 Additionally, the theory of planned behaviour suggests that subjective norms, or the opinion of important people such as a specialist, influence one’s intentions driving behavioural performance. 86-87 Local specialists can also be important interpreters of evidence for primary care providers by supplementing and contextualizing research evidence with clinical expertise. 67, 101 In the MDKT Program, collaboration with the specialty team allowed for sharing of important experience-based knowledge linking factual knowledge to clinical practice. The thematic analysis revealed that, sharing of experience and tacit knowledge was valuable, particularly regarding specific problems with patients and use of the assessment tools. This view is supported by a qualitative study that found tacit and experience-based knowledge to be particularly important components adding substantial value to facilitated interventions. 145 This is essential in dementia care where active detection is based on often subtle symptoms, diagnosis is clinically integrative, and management is complex. In the program evaluation, the dementia specialty team personnel were rated as a best part of the program by many recipients, and their practical insights and approach with patients were integral to the interactive learning experience. Furthermore, collaboration with the specialist was comfortable and recipients felt free to contact the specialist in the future. These links would enable ongoing support for future dementia care issues as needed.
Thirdly, the MDKT Program was *clinic-based*; that is, the program was conducted in recipients’ own practices with their own patients. This greatly enhances the relevance and salience of the learning. Equally, by selecting their own patients recipients could tailor the program to their needs by including patients currently presenting diagnostic challenges. Adult learning theory suggests that adult learners are motivated by learning applicable to current needs or problems.84-85 Further, according to cognitivist theories of learning, learning through problem-solving is well sustained and readily accessible in the future.70 Problem-based scenario-discussion workshops have been shown to improve dementia detection rates.122 Thus, by focusing on current problems within recipients’ own practices and using a problem-based process, the MDKT Program enhanced learning. This is emphasized by recipients’ feelings that practice in their own clinics, with direct feedback and discussion about their own patients was particularly valuable.

Additionally, because the program is clinic-based, it is more accessible to recipients as they do not have to attend specified sessions at a location outside their clinic. Finally, by being based in recipients’ own clinics the program emphasizes capacity building within the limits of current practice settings. That is, staff learn to provide dementia care within their own practice and with the support of community resources without having to add specialized human resources to improve dementia care within primary care.111-115

Finally, the MDKT Program was *flexible to recipient needs*. The MDKT Program initially aimed to be flexible to recipient needs in two ways. First, recipients’ perceived needs and time availability were used to determine the number of patients selected for cognitive assessment. This allowed recipients to select more patients if they anticipated needing more practice. Again, the wide range of total program exposures supports the capacity of the program to meet the needs and availability of the recipients. Second, the dynamic and interactive approach used in the
program allowed flexibility around the learning needs of recipients’ throughout the learning process.

Additionally, the results point out important aspects of the program and support its flexibility to recipient needs. First, recipient profession did not affect knowledge and confidence gain emphasizing the adaptability of the program to different practice roles. Second, previous dementia training provided a pre-program advantage, but did not affect change suggesting the program was adaptable to previous levels of knowledge and confidence. Third, those with fewer elderly patients had lower pre-program confidence scores, but had a greater increase after the program suggesting they had less experience with dementia and, thus, perceived greater benefits from the program. Finally, those with lower pre-program knowledge-confidence scores chose to observe more assessments, and those with lower knowledge scores received more demonstrations; both findings support the flexibility of the program to accommodate baseline needs. In contrast, those from clinic-based sites improved more after the program than those from institutional practice sites. Two possible explanations for this are, one, the small number of recipients (n = 7) from long-term care and retirement residences may have produced a selection bias resulting in smaller improvements, and, two the live-in continuing care provided at these institutions may mean that patients are typically in more advanced stages of dementia and training on mild dementia is less relevant to these recipients. Overall, these finding suggest that the MDKT Program is effective for primary care providers in various professional roles and with varying levels of prior knowledge, particularly for those with less experience, and that it is flexible to meet their needs and availability.

While the above key features may be important contributors to the success of the program, recipients pointed out that time commitment was the worst part of the program and that
Time limitation was the most important barrier to integrating the provided knowledge into practice. Time limitation is a challenging issue to overcome and may necessitate systems changes. However, training midlevel providers such as nurses or other staff to conduct the cognitive assessments would help alleviate some of the time burden on physicians. Despite time availability being the worst part of the program, only a third of recipients rated it as such, and, for many, committing the time was considered worth it.

5.3 Limitations

As an exploratory study, this research has important limitations and results should be considered preliminary. In this exploratory phase a control group was not used which puts internal validity at risk. The relatively small sample size limits generalizability, but the heterogeneity of the sample in both profession and practice model reflects the variety in primary care highlighting the utility of the program in this setting. The sample size also impairs the ability to draw strong conclusions about the comparative utility of the program for various subgroups within primary care. In particular, the small number of some practice models means that conclusions cannot be drawn about the efficacy of the program in one practice model over another.

Additionally, there are several key features that appear to contribute to the success of the MDKT Program; namely, the program was performance-oriented, specialist-supported, clinic-based, and flexible to recipient needs. However, the study was not designed to determine which components or combinations of components are necessary. Nevertheless, due to the interrelatedness of these features, it is likely that all components are important. Their individual level of importance also cannot be determined from the current research.
Furthermore, the self-reported nature of the primary outcome measure collected via questionnaire has limitations. There are several levels of knowledge use and, similarly, several levels of knowledge use outcomes. For the purposes of this study, outcomes and knowledge use were monitored by participation, satisfaction, and conceptual knowledge use (i.e., changes in knowledge, understanding, skills, or attitudes). Specifically, our primary outcome measure of knowledge and confidence was self-report, which may have importance and relevance to individual recipients, but it does not provide objective measures of change. This means that while some conclusions can be drawn about provider outcomes, the impact of knowledge use on patients is unknown.

Admittedly, self-reported knowledge and confidence measures have several limitation; however, they may be good proxy measures of instrumental change and may reflect important upstream aspects of planned behaviour.\textsuperscript{87} Likewise, Cabana et al\textsuperscript{146} provided a schema that places changes in knowledge and attitudes (or confidence) as prerequisites for changes in behaviour and clinical practice. Also, level of certainty, related to knowledge and confidence, promotes clinical action,\textsuperscript{147} and higher self-reported competence relates to better dementia practice.\textsuperscript{148} In summary, there are several limitations to the current research, including lack of control, sample size and outcome measures that must be acknowledged.

5.4 Future directions

The current study provides evidence for the acceptability, feasibility and potential efficacy of the MDKT Program. These preliminary findings suggest that the MDKT Program may be useful in improving dementia practice in primary care and deserves further investigation. As such, some future directions are suggested.
• **Additional materials.** As indicated in the thematic analysis some recipients found that there were too many materials provided in the MDKT Toolkit, while others felt there were too few. Some felt that although the Canadian Dementia Guidelines are a valuable resource, it is a lot to read and a one-page summary of the guidelines was suggested. This will be included in the MDKT toolkit in the future. Along with a summary of the guidelines, a dementia care algorithm was suggested. This would act as a decision aid to support decisions regarding dementia diagnostic workup and care processes, and it would guide primary care providers through the process including detection, assessment, diagnosis, care planning and continuing care. Such a dementia care algorithm reflecting the Canadian Dementia Guidelines and incorporating the skills practiced during the MDKT Program will be included in the MDKT toolkit in the future. Additionally, some felt that not enough information regarding community resources was provided. This is also reflected in the result that, of all the knowledge and confidence questions assessed on the questionnaires, the question regarding awareness of community resources improved the least. In the future, a list of community resources will be provided in the MDKT toolkit. Along with this, referral forms for the First Link program of the Alzheimer Society will be included. The Alzheimer Society is a very valuable resource for patients with dementia and their families, and the First Link referral form provides a simple method for primary care providers to link patients with the society. Another useful referral source is the Driveable program for driving assessment, and referral forms for this service will also be included in the MDKT Toolkit.

5.4.1 **Improvements to outcome measures**

The self-reported measures of knowledge and confidence have limitations as previously discussed. Although these self-report measures served the purposes of this exploratory study, measures of instrumental knowledge use or actual evidence of practice change are important for
future investigation. Additionally, while patient outcomes are important endpoint for any knowledge translation effort, measurement of practice changes may be sufficient. In other words, if there is sufficient evidence for the benefit of a particular practice change, it may be appropriate to measure change in that behaviour without actually measuring change in a clinical outcome. For example, appropriate adherence to process of care recommendations is a legitimate outcome measure for knowledge translation interventions as these will in turn impact patient outcomes. Further, process of care outcomes are less susceptible to uncontrollable patient variations that would confound patient outcome measures. This is relevant to dementia care as there is the possibility of many comorbidities, it is an insidious yet progress disease, and clinical outcome measures such as nursing home placement may take several years of follow-up. There are several outcome measures that may be pursued in evaluating the impact of the MDKT Program in the future in an attempt to more directly measure practice change:

- **Assess use of the Dementia Assessment Tools.** This could be done in several ways. First, use of the tools could be monitored through self-report by explicitly asking recipients about their use of these tools. This offers the potential advantage of providing qualitative data. Recipients could provide details about their use of the tools: when they use them, and when they do not; why they use them, and why they do not; and how they use them including alterations to their use. This may offer insight into barriers and facilitators that would inform future changes to the MDKT Program. This may be of particular importance for the Data Gathering Form, because, unlike the MoCA, this is a non-standardized tool and providers are encouraged to modify it to meet their needs. Second, use of the Dementia Assessment Tools could be monitored through review of medical charts and differences in their use and accuracy could be assessed before and after the program. However, patient privacy is a limitation to this method. Third, changes in physicians’
referrals for specialist consultation could also be used to assess practice change. Changes to baseline referral information provided and the reason for referral may be relevant. Namely, changes in the use of cognitive assessments and evidence of initial diagnostic workup could provide evidence of practice change. Finally, use of the tools could be assessed through observation. This is a very intensive method of monitoring use of the tools, but would provide information about the accuracy of administration of cognitive assessment and tool use.

- **Assessment of adherence to quality indicators.** There have been several attempts at developing quality indicators for dementia care and also in using them to evaluate knowledge translation interventions.\(^\text{150-151}\) One recent set of indicators was developed specifically for the primary care setting.\(^\text{152}\) Although not all of these quality indicators would be appropriate for evaluating the impact of the MDKT Program, selected indicators may be a useful means of evaluation. On the other hand, quality indicators could be developed based on the Canadian Dementia Guideline recommendations and these could be used to evaluate the impact of the MDKT Program on knowledge use. This method would be resource intensive, but would likely produce more relevant measures.
Chapter 6

Summary and Conclusions

Patients with dementia are often unaware of their disease and do not seek medical attention resulting in underrecognition and diagnostic delays. Timely detection of dementia facilitates optimal care and primary care providers must shift to an “active detection” approach to identify dementia early. Therefore, the Mild Dementia Knowledge Transfer (MDKT) Program aimed to increase primary care providers’ knowledge base and confidence in mild dementia enabling active detection, diagnosis and treatment of patients in the early stages of dementia.

The MDKT Program integrates contemporary knowledge translation concepts to address many of the barriers perceived by primary care providers including missing early indicators, diagnostic uncertainty, poor understanding of current assessment tools, inexperience, and the complex nature of dementia detection, assessment and care. To overcome these barriers an active knowledge translation approach was used emphasizing interaction between a dementia specialty team and primary care providers in their own practices with their own patients.

The current exploratory study sought to investigate the acceptability, feasibility and efficacy of the MDKT Program.

After the program, primary care providers’ had improved self-rated knowledge and confidence in the detection, assessment and care of mild dementia, and this improvement was stable three-months after the program was completed. Primary care providers who assessed more patients had greater increases in knowledge and confidence, and more demonstrations were associated with greater improvements in confidence. Additionally, the results suggest that the
MDKT Program is effective for primary care providers in various professional roles and with varying levels of prior knowledge, particularly for those with less experience.

Primary care providers’ evaluation of the program and collaboration with the dementia specialist was largely positive. Most primary care providers believed the program made active detection of dementia easier and improved their knowledge and confidence in mild dementia. The greatest problem was time commitment which was rated as the worst part of the program and time limitation was the top barrier to integrating the program information into practice; however, most primary care providers said it would be easy to integrate the information and committing the time was considered worth it. As a whole, these findings support the acceptability and feasibility of the MDKT Program.

Overall, because of the complex nature of dementia detection, diagnosis and care a highly interactive knowledge translation intervention was appropriate. As such, the MDKT Program was performance-oriented, specialist-supported, clinic-based, and flexible to the needs of recipients, and these key features likely contributed to the success of the program.

In conclusion, the MDKT Program was acceptable and feasible in the primary care setting and the results support its short- and longer-term efficacy. The exploratory nature of the study make conclusions about efficacy only preliminary and further investigation is warranted to determine the programs impact on practice change.
References


12. Jha A, Tabet N, Orrell M. To tell or not to tell—comparison of older patients’ reaction to their diagnosis of dementia and depression. *Int J Geriatr Psychiatry.* Sep 2001;16(9):879-885.


24. Martin S. Fee-for-service v. salary: the debate is heating up. *CMAJ.* Sep 30 2003;169(7):701.


Appendix A
Primary Care Provider Letter of Information

LETTER OF INFORMATION

MILD DEMENTIA KNOWLEDGE TRANSFER: BUILDING CONFIDENCE

Thank you for your interest in this project. You are being invited to participate in a program directed by Dr. Angeles Garcia of the Department of Medicine and the Centre for Neuroscience Studies at Queen’s University. The aim of this study is to implement and evaluate a new dementia knowledge transfer method.

The program is interactive and engages the learner through applied one-on-one mentoring and collaboration with the dementia specialist team. You will complete a pre-program questionnaire and then select patients and a date for cognitive screening. You will screen your patients with our assistance and there will be time for discussions, exchange of observations and practice of the screening materials. At a follow-up meeting, issues relevant to care such as diagnosis, treatment and community resources will be discussed. You will complete a post-program questionnaire at the end of this meeting and again in 3 months time.

There are no risks involved in participating in this study. You may benefit from this program through improved confidence in detecting, diagnosing and caring for patients with mild dementia. Other healthcare professionals and patients may be helped through results derived from this study. It is hoped that this program will lead to better knowledge transfer regarding detection, diagnosis and treatment of mild dementia.

Your confidentiality is guaranteed and your anonymity will be protected. All data files will be locked and access restricted to researchers directly involved in this study. Your name will not appear in any publication.

Your participation in this program is voluntary. You can refuse to participate or terminate involvement at any time. You may withdraw without prejudice or penalty and your withdrawal will not affect your career or ability to collaborate with the specialist in the future.

Please feel free to consult Dr. Angeles Garcia (613-544-5220 Ext. 2229), the principal investigator in this study, at any time to discuss these procedures, or any other questions that may arise. If you have any questions regarding your rights as a research participant, you may contact Dr. John McCann, Head of the Department of Medicine (613-533-6327), or Dr. Albert Clark, Research Ethics Board at Queen’s University (613-533-6081).

Please, let us know if you have any questions, concerns or complaints with regards to this project.
Appendix B
Primary Care Provider Consent Form

CONSENT FORM

MILD DEMENTIA KNOWLEDGE TRANSFER: BUILDING CONFIDENCE

I have read and understand the letter of information.

I have had the purposes and procedures of this study explained to me. I have been given sufficient time to consider the above information and to seek advice if I choose to do so. I have had the opportunity to ask questions which have been answered to my satisfaction.

I am voluntarily signing this form and I have been assured that all information collected during the program will be kept confidential.

I understand that I may withdraw my consent to participate in this research project at any time with no penalty to me.

I agree to participate in this program and will ensure that the patients involved in the program process are aware and have agreed to have medical and personal information shared with the investigator, Dr. A. Garcia, and her research team for the purpose of this program.

I have been provided with a copy of this form and a letter of information for my records.

NAME (please print): ___________________________ DATE: _________________

SIGNATURE: ___________________________

INVESTIGATOR

I, or one of my colleagues, have carefully explained to the participant the nature of the above research study. I certify that, to the best of my knowledge, the participant understands clearly the nature of the study and demands, benefits, and risks involved to participant in this study.

SIGNATURE (Investigator): ___________________________ DATE: _________________

SIGNATURE (Witness): ___________________________ DATE: _________________
Appendix C
Patient Letter of Information

PATIENT LETTER OF INFORMATION

MILD DEMENTIA KNOWLEDGE TRANSFER: BUILDING CONFIDENCE

Thank you for your interest in this project. Your family doctor has been invited to participate in a program directed by Dr. Angeles Garcia of the Department of Medicine and the Centre for Neuroscience Studies at Queen’s University. The aim of this study is to implement and evaluate a new training program for doctors and nurses.

In this program, your family doctor will learn more about assessing memory in patients. This may involve sharing some of your relevant medical information with the research team. Your permission to do this is requested; however, your confidentiality is guaranteed and your anonymity will be protected. All data files will be locked and access restricted to researchers directly involved in this study. Your name will not appear in any publication.

There are no risks to you in this study. In the case of finding an abnormal result, you will be informed and appropriate medical care will be available to you. Also, other healthcare professionals and patients may be helped through results derived from this study. It is hoped that this study will lead to better training for healthcare professionals regarding memory assessment.

Your involvement in this program is completely voluntary. You can freely refuse to partake or terminate your involvement at any time. You may withdraw without prejudice or penalty and your withdrawal will not affect your present or future medical care.

If you have any questions you may contact Dr. Angeles Garcia (613-544-5220 ext. 2229), the principal investigator in this study, at any time to discuss these procedures or any other questions that may arise, or you may contact Dr. John McCans, Head of the Department of Medicine (613-533-6327), or Dr. Albert Clark, Research Ethics Board at Queen’s University (613-533-6081).

Please, let us know if you have any questions, concerns or complaints with regards to this project.
Appendix D
Patient Consent Form

PATIENT CONSENT FORM

MILD DEMENTIA KNOWLEDGE TRANSFER: BUILDING CONFIDENCE

I have read and understand the letter of information.

I have had the purposes, procedures and technical language of this study explained to me. I have been given sufficient time to consider the above information and to seek advice if I choose to do so. I have had the opportunity to ask questions which have been answered to my satisfaction.

I am voluntarily signing this form. I agree to have relevant medical and personal information shared with the researchers for the purpose of this program and I have been assured that all information collected will be kept confidential.

I understand that I may withdraw my consent to participate in this research project at any time with no penalty to me.

I have been provided with a copy of this form and a letter of information for my records.

NAME (please print): ___________________ DATE: ________________
SIGNATURE: __________________________

INVESTIGATOR

I, or one of my colleagues, have carefully explained to the participant the nature of the above research study. I certify that, to the best of my knowledge, the participant understands clearly the nature of the study and demands, benefits, and risks involved to participant in this study.

SIGNATURE (Investigator): ___________________ DATE: ________________
SIGNATURE (Witness): ___________________ DATE: ________________
# Appendix E

## Data Gathering Form

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<th>Data Gathering Form</th>
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<td><strong>Family Doctor:</strong></td>
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<td><strong>Address:</strong></td>
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<td><strong>Data Collector:</strong></td>
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<td><strong>Patient Name:</strong></td>
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<td><strong>Age:</strong></td>
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<td><strong>Years of Education:</strong></td>
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### Introduction
*Include basic questions only*
(e.g.: How long have you been a patient of Dr X? Do you live close by? Living in the same place for long time? Living alone? Career?)

### Reason for Visit
*Requested by patient, doctor or other health care professional*
(e.g.: Did your doctor ask you to come today? Are you concerned about your memory?)

### Past Medical History
*Report years, control, current status and treatment/medications for each*

- Hypertension:
- Strokes:
- Cardiac disease:
- Head trauma:
- DM:
- Cholesterol:
- Depression:
- Other:

### Current medical status

- Pain / pain treatment:
- Sleep / sleep treatment:
- **Active conditions** [specify conditions and treatments]:
Habits/Activities [smoking, alcohol intake, drugs. Social life, physical activity (sports, gardening, dancing), intellectual activity (reading, playing cards, board games, etc.), volunteering, travel etc.]
(e.g.: How do you spend your day?)

Awareness of Cognitive Deficits [inquire about memory changes, word finding difficulties, problems managing finances, work, cooking, driving (accidents), shopping]
(e.g.: How is your memory? Have you had any car accidents in the last year?)

Family Tree [inquire about children, grandchildren or siblings names, DOB, ages, and how old patient was at time of the birth]
(e.g.: How many children do you have? How old are they? What are their birthdates? How old were you when they were born?)

Relevant Personal Events [inquire about graduation year, wedding anniversary, moving cities, and age at the time]
(e.g.: What year did you marry? How many years have you been married / widow? How old were you when you married?)
Appendix F
Montreal Cognitive Assessment (MoCA)
Appendix G

Recruitment Flyer

Mild Dementia Knowledge Transfer: Building Confidence

Thank you for your interest in this project directed by Dr. Angeles Garcia, Director of the Memory Clinics at Queen’s University. The aim of this study is to implement and evaluate a new method of dementia knowledge transfer in primary care.

**Importance**
- Because patients with dementia are often unaware of the extent and consequences of their cognitive deficits, early diagnosis of dementia requires active detection by healthcare professionals.
- Average time to diagnosis is three years; this is too long.
- Currently there are 500,000 cases of dementia in Canada. This will double over the next 30 years.
- Waiting times for referrals to the Memory Clinic are now over one year due to increased demand.

**The Program**
- The program is a collaboration between members of your practice and the dementia specialty team. It is interactive and tailored to your practice needs.
- It will consist of a short meeting (30 min), a screening date at your clinic (time dependent on your needs and availability) and a follow-up (60-90 min) scheduled at your convenience and a short questionnaire (3 months post-program).
- You will choose some of your patients for screening. The trained Memory Clinic assistant will assist you and/or your nursing staff in screening the patients using tools derived from the Memory clinic - a data gathering form and the Montreal Cognitive Assessment (MoCA).
- Each patient must consent and will be required for one visit. You will follow up with them to provide the results.
- The screenings will be done by the team member who would typically fill this role, but it is important that all members understand the methods.
- We will provide all materials. A room at your clinic for the screening date will be required.

Primary care practitioners are essential in the early diagnosis of mild dementia. This program intends to provide you and your staff with the tools necessary to detect, diagnose and treat mild dementia.

Please feel free to contact me (Tyler Chesney, MSc Candidate) or Dr. Garcia, at 613-544-3400 ext. 3369 if you have any questions or comments. The details of the program can be negotiated to suit your practice needs.

**Early detection of mild dementia in Primary Care**

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