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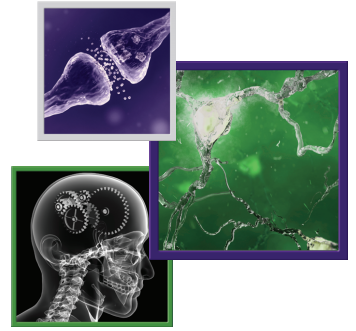
**Memory care approaches to better leverage capacity of dementia specialists: a narrative synthesis**

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# Memory care approaches to better leverage capacity of dementia specialists: a narrative synthesis

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Prior research suggests that a scarcity of dementia specialists could hamper access to disease-modifying Alzheimer's treatments. We describe alternative approaches on how to leverage specialist time for memory care in this narrative synthesis based on 17 semi-structured interviews and a targeted literature review on memory care approaches that leverage specialist time. We identified four types of approaches: community primary care practices empowered with better tools and training; primary care memory clinics; specialty memory clinics and; specialty memory centers. Several approaches to use specialist time efficiently have been implemented and some but not all evaluated. The optimal approach may depend on the local context.

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Disease-modifying treatments for Alzheimer's disease (AD) may become available soon; the leading candidate, aducanumab, is awaiting US FDA approval in June 2021 [1], with other promising candidates, gantenerumab, BAN2401 and ALZ-801, following close behind in several ongoing Phase III clinical trials [2,3]. In contrast to the current treatment paradigm, where treatments for symptom management are started after progression to the later stages of dementia, the secondary prevention paradigm of these disease-modifying treatments would necessitate diagnosis of AD during the mild cognitive impairment or early dementia stages so that treatment can be started early enough to delay the progression to late-stage disease.

Although prevalence estimates for mild cognitive impairment depend on the criteria used [4], Petersen *et al.* estimates that the prevalence of mild cognitive impairment is as high as 15–20% in people 60 years or older based on a review of many international population-based studies [5]. Being an earlier disease stage, mild cognitive impairment has milder symptomatology and clinical findings than dementia, and is therefore, more difficult to diagnosis, and until now, there has not been an urgent need to evaluate patients with subtle memory complaints for mild cognitive impairment. A sudden spike in demand to evaluate the large reservoir of prevalent cases of early-stage AD during the initial years after disease-modifying treatments become available, may therefore, pose a significant challenge to healthcare systems. As the COVID pandemic has shown, even well-resourced health systems struggle to adapt to such sudden spikes, implying the need to pre-emptively identify and address gaps in our healthcare infrastructure.

As noted by the Alzheimer's Association 2020 report, there is currently a shortage of dementia specialists, including geriatricians, neurologists, geriatric psychiatrists and neuropsychologists, in the USA [6]. Previous research demonstrated that the increase in demand for evaluation and disease-modifying treatment would likely overwhelm specialist capacity [7]. The study used a simulation model to estimate that approximately 88 million individuals in the USA may need to be assessed for the presence of mild cognitive impairment, and almost 15 million individuals with suspected mild cognitive impairment may need specialist referral for further evaluation. However, the specialist workforce can only accommodate an estimated 1.9–6.3 million additional visits per year on top of their current

workload. This discrepancy between supply and demand was projected to result in wait times of over 12-months lasting for several years and could potentially lead to two million US patients progressing to late stage dementia while on the wait list. Other countries, including Canada, France, Germany, Italy, Spain, Sweden, Australia and Japan, are estimated to face similar capacity constraints [8–11]. Follow-on work in the USA and the five largest EU countries also suggested that existing models of memory care are ill-equipped to handle the medicalized nature of a disease-modifying treatment, because today's practices are limited in scale and scope and focus on documenting degree and patterns of cognitive decline as well as referrals to social services [12,13].

Against this background, the aim of this article is to describe approaches to memory care in the USA and other countries that leverage specialist time more effectively with the use of task shifting to primary care physicians and other clinical and nonclinical staff. Wells *et al.* had previously conducted a review of innovative diagnostic care pathways for dementia, focusing specifically on primary care clinics in England [14]. In their report, they highlighted several approaches, from primary-care led clinics where the general practitioner was supported by either a multidisciplinary team, specialist consultant access and/or specialized nursing support; monthly memory clinics that are embedded within a primary care clinic; to secondary-led clinics following primary care referral. Their findings suggested that greater primary care involvement in dementia diagnosis was beneficial to patient satisfaction and with potential improvement to referral and diagnostic times. Dreier-Wolfgramm *et al.* similarly reviewed collaborative primary care models for dementia, summarizing six examples from four countries (Germany, US, UK and The Netherlands) to highlight how different stakeholders from general practitioners, dementia specialists, nurses, pharmacists, case managers to social workers, can come together in the primary care setting either as a dementia team or network to improve patient care [15].

We are building on this work in two ways. First, we are including other approaches besides primary care models to leverage scarce specialists, namely tools and technology, and reorganization of specialty practices. Second, we propose a typology of approaches.

After describing the methodology behind this narrative synthesis, we start by presenting the guideline-concordant and the real-life diagnostic process and the roles of the primary care physicians and specialists in the journey of patients with mild cognitive impairment or early dementia. We describe the alternative approaches to alleviating specialist capacity constraints, focusing on the USA, but also drawing from experiences in other countries. There are no examples specifically for mild cognitive impairment and early-stage dementia, and so the existing examples discussed in this report mainly target later stage dementia patients. However, these dementia care models may be expanded to include care for mild cognitive impairment and early-stage dementia patients. The paper ends with a discussion of the limitations and future directions.

## Materials & methods

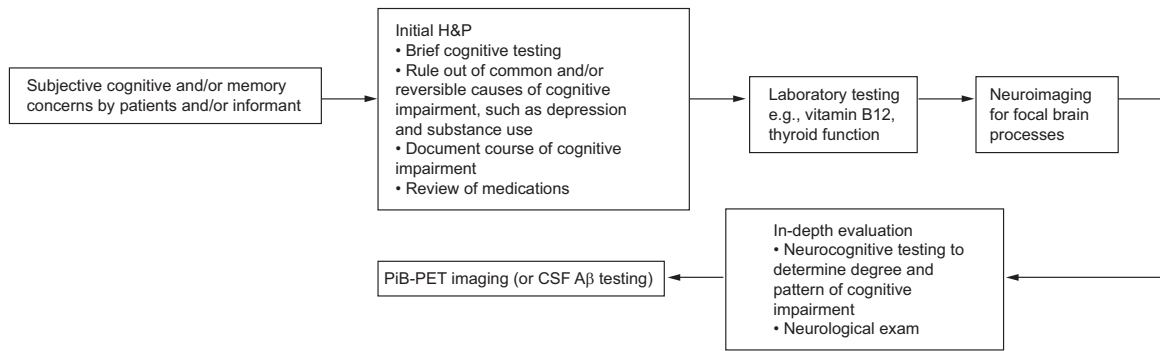
This narrative synthesis is based on a total of 17, 1/2–1 h, semi-structured interviews with primary care physicians, neurologists, geriatricians and geriatric psychiatrists practicing in the USA and Canada. The interviewees were identified through convenience sampling of healthcare practitioners, who had published peer-reviewed articles on AD or dementia diagnosis and/or care models, were listed with their contact information as a clinical staff member in relevant departments within major healthcare systems or were listed as an investigator on the Geriatrics Workforce Enhancement Program grant website [16]. The list of questions for the interviews are presented in the Appendix ([Supplementary data](#)). Briefly, we asked the physicians to walk us through the typical diagnostic pathway for a patient presenting with a subjective memory complaint with a focus on the respective roles of primary and specialty care. We invited them to share their insights into actual or hypothetical care models that would leverage scarce specialist time by shifting tasks to primary care physicians and other providers as well as into technologies that would facilitate such task shifting. As the study did not constitute human subjects research per US federal regulations (45 CFR 46, 102[f]) [17], it was exempt from internal review board (IRB) review and registration.

We performed a thematic analysis to identify broad categories of approaches to memory care. We searched the published literature, as well as websites of government agencies, professional organizations and large academic and/or medical centers, for real-world examples of these alternative care approaches to illustrate how these approached have been applied and, if results were available and published, how they have fared.

## Results

### Guideline-concordant evaluation of cognitive decline

In the absence of sufficient evidence for net clinical benefit, systematic screening for mild cognitive impairment is currently not recommended or covered in the USA and other countries [17–21]. Outside of the Medicare Annual



**Figure 1. Diagnostic pathway of patients with memory complaints and possible Alzheimer's disease.**  
CSF A $\beta$ : Cerebral spinal fluid amyloid-beta; H&P: History & Physical; PiB-PET: Pittsburg compound B-positron emission tomography.

Wellness Visit, which is mandated to include a cognitive assessment, patients are usually only evaluated for cognitive impairment when they present with subjective memory complaints.

Because subjective memory complaints are insufficient to establish a diagnosis of cognitive impairment, physicians should evaluate the patient with a validated instrument to verify the presence of cognitive impairment and to characterize its degree and pattern [22]. Several brief cognitive tests, including the General Practitioner Assessment of Cognition and the mini-Assessment of Cognition [23,24], are adequate for detecting possible dementia. However, mild cognitive impairment, or even mild dementia, is more difficult to detect than dementia because the impairment at these earlier stages is subtler. Although still limited in their diagnostic accuracies for mild cognitive impairment, the best-established tests are the Mini-Mental Status Exam (MMSE) and the Montreal Cognitive Assessment [18,25,26]. Comprehensive neuropsychological testing should follow for patients, who test positive in order to confirm the presence of cognitive decline and determine the exact stage of decline, because a disease-modifying treatment would only be indicated in early stages of the disease.

The initial evaluation (Figure 1) [19] would also include a medical history, physical exam and diagnostic tests to identify or rule out other possible causes, including but not limited to cerebrovascular disease, thyroid dysfunction, electrolyte abnormalities, vitamin deficiencies, infectious diseases, liver disease, depression, medications or drug use. Structural imaging with computed tomography (CT) or MRI may be done to rule out focal neurological processes.

If AD is the suspected etiology of the cognitive impairment, cerebrospinal fluid testing or positron emission tomography scan for amyloid-beta may be conducted to confirm or rule out the diagnosis. While cerebrospinal fluid amyloid-beta testing has been approved in Europe, only amyloid positron emission tomography has received FDA approval and neither test is currently covered outside of clinical trials or registries [27].

### Evaluation of memory complaints under real-world conditions

Primary care is usually the initial point of contact for patients with memory concerns. We were told in our interviews with primary care physicians and specialists that there is a wide variation in how primary care physicians manage patients with suspected cognitive impairment in current real-world practice. While a few follow guideline recommendations, most do not inquire proactively about cognitive decline or even discount subjective memory complaints as normal aging, which may result in missed or delayed diagnosis of dementia [28,29].

Formal assessment with a validated brief cognitive test is even less common, as even the simple General Practitioner Assessment of Cognition and the mini-Assessment of Cognition [30] take approximately 5 min to administer and score, and the more precise MMSE or Montreal Cognitive Assessment around 15 min. Laboratory testing for potentially reversible causes of cognitive impairment is inconsistently done and neuroimaging is rarely ordered in primary care settings. The most typical approach is to refer the patient to a specialist without any further evaluation, placing the entire diagnostic process into the hand of specialists. Commonly voiced reasons for the reluctance of primary care physicians to assume a greater role in evaluating cognitive complaints include time constraints, workflow considerations and insufficient tools, knowledge and skills.

### Alternative care approaches

From our interviews, we identified several alternative care approaches that may enable nonspecialist clinicians to assume a greater role in the initial diagnostic workup of patients with suspected cognitive impairment, with strategic use of specialist resources. The alternative approaches can be broadly classified into four categories based on the care setting:

- Community primary care practices;
- Primary care memory clinics;
- Specialty memory clinics;
- Specialty centers.

### Developing competencies in community primary care practices

There is an ongoing concern in countries as varied as Germany, Hungary, Singapore, Saudi Arabia, Nepal, the USA and the UK that primary care training in geriatric medicine and dementia care may not be robust enough [31–37]. A survey of general internal medicine residency programs in the USA reported that 93% of programs had a required geriatrics curriculum, but 71% of the programs only required 13–36 half days of geriatric training during the 3-year residency, with the remaining 29% requiring only 12 half days or less of geriatric training [38].

Two potential solutions to overcome the lack of training would be the introduction of tools and technologies to simplify the decision process and improve capabilities. As an example for tools, Kaiser Permanente published an informational dementia guideline through their Care Management Institute, consolidating evidence-based recommendations about every step in the care pathway from screening to treatment [19]. The guideline not only summarizes the important components of the patient history and physical exam, but also, specifically recommends the MMSE for cognitive assessment, lists out the diagnostic tests that should be ordered as part of the routine work-up and details when and what type of neuroimaging should be ordered and when the patient should be referred to a specialist. Blood-based biomarkers [39,40] and computerized cognitive testing [41–43] are examples of technologies that are currently being developed to further simplify the initial diagnostic process.

Education programs, such as the Evidence-based Interventions in Dementia project in the UK or the Connecticut Older Adult Collaborative for Health (COACH) program in the USA, may further help improve primary care physicians' ability to manage a greater part of the evaluation process. The EVIDEM-ED project developed customized practice-based workshops for general practitioners with the aim to improve clinical recognition and management of dementia [44]. The COACH program on the other hand aims to improve the health of the elderly through a multiorganizational, multidisciplinary geriatric education center [45]. COACH is a collaborative network of experts, primary care physicians and other health professionals to disseminate knowledge and expertise and promote best practices in the community. COACH is just one example of the educational programs targeting geriatric care that are funded by the Health Resources and Services Administration through its Geriatrics Workforce Enhancement Program [16].

Educational programs can utilize existing telehealth technology to develop telementoring programs like Project Extension for Community Healthcare Outcomes (ECHO) [46,47]. Developed by the University of New Mexico (UNM) Health Sciences Center, Project ECHO is a remote learning program to address obstacles to access to specialty care in rural areas. Realizing that many patients with chronic conditions live in rural areas that are too far from major health systems to receive specialty care, specialists at UNM partnered with rural primary care physicians to form 'a community of practice' [48]. In addition to providing care protocols for rural primary care physicians, UNM specialists and the rural primary care physicians meet weekly via videoconference for teleECHO lectures and grand rounds to review and discuss cases. Project ECHO was initially developed for the management of hepatitis C, but the model has been since replicated by other centers [49] for a myriad of other conditions, such as osteoporosis [47], chronic pain [48], rheumatology [50], diabetes [51], geriatrics [52] and end-of-life care for patients with advanced dementia [53].

More recently, the Alzheimer's Association launched a 6-month pilot Project ECHO program to train primary care physicians in community-based dementia care [54]. The program brings together expert multidisciplinary specialist teams and primary care practices in bi-weekly interactive learning sessions. Based on the Alzheimer's Association's Dementia Care Guidance for HealthCare Professionals, the learning sessions consists of instructional presentations and case-based discussions. Primary care physicians are provided with guidance on which patients to evaluate, validated tools for cognitive assessment, indications for referral, diagnostic criteria for AD and mild

cognitive impairment and medical management. There is also a companion pilot that connects nonphysician participants from assisted-living facilities with dementia care experts [55].

The effectiveness of educational interventions has been mixed. A unblinded cluster-randomized controlled trial evaluating the impact of the Evidence-based Interventions in Dementia practice-based workshops found that the educational intervention did not increase dementia detection rates [56]. On the other hand, another study comparing an electronic tutorial, a decision support software and practice-based workshops found that all three educational interventions improved the detection rate for dementia compared with the control group. Dementia detection rate was 11% in the control arm, 20% in the electronic tutorial arm, 30% in the decision support software arm and 31% in the practice-based workshop arm [57].

A systematic literature review of the impact of Project ECHO models on provider and patient-related outcomes by McBain *et al.* [58] found favorable evidence of provider satisfaction, increased knowledge and increased clinical confidence. Some evidence suggested improved patient-related outcomes, including improved access for patients, reduced healthcare resource utilization and better clinical outcomes. However, McBain *et al.* found that the evidence was generally low-quality, retrospective, nonexperimental and, thus, subject to bias.

### Primary care memory clinics

A further evolution of the role of primary care physicians is the emergence of primary care memory clinics. Primary care collaborative memory clinics (PCCMC) originated in ON in 2006 to address specialist capacity constraints in dementia care [59]. PCCMCs are multidisciplinary teams that include one or two primary care physicians, two to three nurses, a social worker and administrative support staff. Depending on resource availability, some PCCMCs also include a pharmacist, an occupational therapist and even representatives from the local AD association to provide additional information, education and support to patients and their caregivers. While PCCMCs are led by specially trained primary care physicians in its routine operations, designated specialists are available to each memory clinic for consultation via telephone or e-mail. Referral to specialists is reserved for complex cases.

The physicians leading each PCCMC are usually full-time primary care physicians with their own general practice, but they devote 1–2 days a month to the memory clinic, assessing patients referred to them by their primary care colleagues [60]. The physicians had to complete an accredited, 5-day Memory Clinic Training Program to develop real-world competencies on how to operate a memory clinic and skills related to the assessment and management of patients with memory problems. The training program consists of a 2-day workshop, a day of observation and training at the Center for Family Medicine Memory Clinic and finally 2 days of on-site mentorship at the newly formed memory clinic. Learning is facilitated through case-based discussions, problem-solving exercises, pocket cue cards and coaching. Booster sessions are also scheduled to allow previously trained teams to update their learning and share best practices.

PCCMCs work collaboratively with the patient's own primary care physicians to coordinate care, ensuring that care for most patients remains in the hands of their established primary care physician. While referral rates to specialists for memory concerns are reportedly as high as 82% in Canada under usual practice [61], PCCMCs have referral rates of approximately 10% [59,62,63], and wait times for specialty care have as a result been shortened [64]. There are 92 PCCMCs across ON as of 2017 [65].

The Gnosall memory clinic model in the UK is another example of a primary care memory clinic model [66]. Distinct from the ON PCCMC model, it is not led by a specialized primary care physician. Instead, it embeds a part-time eldercare facilitator and a monthly specialist-led memory clinic within the primary care clinic. The specialist will be available by telephone and email for consultation between the monthly memory clinic dates.

In the Gnosall memory clinic pathway, the patient's primary care physician conducts the initial evaluation. For the patient who requires further evaluation by a specialist, an eldercare facilitator will arrange to meet with the patient and the patient's family member or caregiver, usually at the patient's home, to gather additional information. The patient is then evaluated at the monthly primary care memory clinics by the specialist with the eldercare facilitator present. The specialists will diagnose the patient and formulate a treatment plan. The eldercare facilitator will coordinate the care of the patient between the primary care physician and the specialists for as long as needed and will identify and refer the patient and the patient's family members to additional resources as appropriate. An evaluation of the model suggests that it reduced cost compared with a specialist-led model and achieved high levels of satisfaction among patients and their families [67].

Another primary care memory clinic model uses dementia nurses to facilitate care [68,69]. In the Norway model [69], a local dementia team, consisting of either two nurses or a nurse and an occupational therapist, gathers clinical

information to assist the primary care physician with the diagnosis. The dementia team is trained on cognitive assessment procedures and can administer and help interpret the MMSE, the clock drawing test, the ‘informant questionnaire on cognitive decline in the elderly-16 item’ version and the instrumental ‘activities of daily living’ scale. Primary care physicians receive a checklist for the physical exam and laboratory testing and guidance on when neuroimaging should be performed. There is also a standardized case record file and a diagnostic guide for the dementia team and the patient’s primary care physician to use. The impact of these models on patient care and clinical outcomes remain unclear; the original papers that described the models did not report on its performance, nor have we identified any subsequent publications.

### Specialty memory clinics

Specialty clinics in neurology, geriatrics and geriatric psychiatry with a high volume of patients with memory disorders may want to further reorganize into memory clinics [70]. In addition to specialist physicians, the core team of specialty memory clinics might include a clinical psychologist, who can conduct in-depth cognitive testing; specialized nursing staff, who links the different components of the service together and provides continuity of care; a liaison to Alzheimer’s societies, who serves as a lay expert-by-experience to help guide and reassure patients and their families; and a social worker to help provide additional linkage to community resources and services. The memory clinic may also include, either in-house or by consultation, a clinical pharmacologist, a dietitian, an occupational therapist and a speech therapist. Ideally, the memory clinic should be connected to other specialty clinics, such as ophthalmology and otorhinolaryngology and translator services.

Some specialty memory clinics restrict their availability to only 1–2 days a week. In such cases, key clinic staff may continue managing memory clinic activity and ensure accessibility to patients and their families by phone or email throughout the other days of the week.

Some clinics will prearrange for some components of the evaluation to be completed by the referring clinician prior to the initial visit, while others will assume responsibility for the full evaluation. Many memory clinics that operate a website include a ‘What to Expect’ section for referred patients, describing what the initial and follow-up visits typically entail and contact information [71–74]. These informational websites help ensure that patients present to the clinic with the requested medical records and are prepared for the extensive evaluation process ahead.

Productivity in specialty care, as measured by wait times and wait lists, can be improved by better alignment of demands and capacity [75]. By focusing on memory disorders, specialty clinics could theoretically reduce variation in the patient pool and allow for better planning and strategic investments on specialized equipment and training of staff, improving the overall efficiency and productivity of the clinic. For example, the San Jose Kaiser Permanente memory clinic assigns a case manager to each patient to coordinate care [73]. The Napa–Solano Kaiser Permanente memory clinic offers patients a class prior to their initial visit [74]. The class discusses with patients and their families the difference between normal age-related cognitive changes and memory disorders. Patients and their family members will also complete a questionnaire about the memory loss symptoms during the class.

### Specialty centers

Comprehensive specialty centers like the Cleveland Clinic Lou Ruvo Center for Brain Health (LRCBH) have integrated clinical, research and community outreach capabilities [76]. With vast in-house resources, LRCBH functions as a ‘one stop medical home’ that integrates different components of care together. It provides patients with expert diagnosis and treatment at its outpatient clinic, caregiver programs, neuropsychology evaluations, neuroimaging and physical and occupational therapy. Similar to the veterans affairs system [77], LRCBH has telemedicine capabilities to reach patients who live farther away from the center. Its high patient volume, in-house experts and cutting-edge technology and standardized evaluation process facilitate patient recruitment, clinical trial monitoring and basic science and translational research. The center further contributes to community wellness by organizing free-education sessions on a variety of subjects ranging from new treatment options, the advance directive and guardian nomination registries and general wellness [78]. LRCBH has its main site in Las Vegas, NV, USA, two sites in Cleveland, OH, USA, and another site in Weston, FL, USA. All clinical and research programs are aligned under a single leadership to achieve efficiency of scale [76]. Spain’s Fundació ACE, Institut Català de Neurociències Aplicades is another example of a comprehensive AD specialty center that provides clinical care, cutting-edge research and educational programs [79] as are the 28 Memory and Research Centers (Centres mémoire de ressources et de recherche) in France [12].

The National Institute on Aging (NIA) in the USA has similarly established a network of AD research facilities since 1978 [80]. These National Institute on Aging-funded AD research centers are embedded in major academic centers with teaching, research and clinical capabilities [81]. For example, the University of Pennsylvania Comprehensive AD Center (CADC) can be broadly divided into an administrative team, a training team, various research teams and an outreach team. The administrative team's role is to coordinate activities between the University of Pennsylvania CADC and other CADCs and AD Centers. It also provides financial oversight and oversees grants, Institutional Review Boards, Intellectual Property and corporate alliances. The training team is tasked with the development of multidisciplinary healthcare providers and scientists, including physicians, nurses, therapists and basic and translational scientists. Research teams try to discover, develop and disseminate novel models in diagnosis, treatment, patient care and health policies. The outreach, education and dissemination team assists the other teams with publications and organizes meetings with other CADCs and other public and private entities to advance the mission of the CADCs. While specialty centers like the CDACs and LRCBH may not necessarily be able to instantaneously increase the number of specialists to meet the high demand for specialty services, they contribute research to advance the field; train new multidisciplinary healthcare practitioners, who then return to their communities to further disseminate the knowledge, in best care practices; and educate the community with outreach programs and educational sessions.

## Discussion

Routine screening for mild cognitive impairment is currently not standard of care, but the advent of disease-modifying treatments for AD might trigger substantial demand for evaluation for mild cognitive impairment, which may likely overwhelm dementia specialist capacity [7]. As increasing the number of specialists is difficult in the short run, this paper looks at tools and alternative care approaches to use scarce specialist time more efficiently, which we broadly grouped into four separate categories: community primary care practices; primary care memory clinics; specialty memory clinics; and specialty centers.

The first two approaches capitalize on the primary care workforce by providing additional resources to support primary care clinics in memory care either as part of their routine practice, or if demand requires and resources allow, specialized memory clinics within the primary care setting. Specialist time would of course be needed to support these two approaches to either develop the training material, run the workshops, serve as consultants for the general practitioners and/or to establish a memory clinic within a primary care clinic. In return for this investment in specialist time, primary care may be able to take on some of the more straightforward workload from specialists, such as screening out negative cases of mild cognitive impairment, provide counseling to concerned patients and manage post-diagnosis care for patients with mild cognitive impairment.

While the interest of our paper is more geared toward addressing the emerging need to diagnose mild cognitive impairment rather than dementia care, many of the examples in our paper are drawn from dementia care models. As such, there is much overlap between our paper and the Wells *et al.* [14] and Dreier-Wolfgramm *et al.* [15] papers, which had, similar to our paper, highlighted how dementia care can be better incorporated into primary care with the innovative use of case managers, specialized nursing support, multidisciplinary teams, specialist consultants and/or multidisciplinary professional networks dedicated specifically to promoting dementia care. Our paper provides greater details on the different types of educational resources that may be provided to general practitioners. Extending beyond the scope of the Wells *et al.* and Dreier-Wolfgramm *et al.* papers, the last two approaches focus on how memory clinics can be organized and operated within the specialty clinic and specialty center settings to streamline the workflow and gain efficiencies for specialists.

## Limitations

While conceptually promising, few of the approaches have been formally evaluated. Some evidence suggests that selected approaches may improve patient care, but the evidence is usually limited in scope (e.g., only one or two outcomes are evaluated) and/or quality (e.g., many studies relied on self-reported perceptions of change without validation and ascertainment of changes in outcomes or surveys with low response rates). Furthermore, because there are no real-world examples specifically for evaluation and management of mild cognitive impairment and early-stage dementia, the examples given in this paper are drawn from dementia care and other chronic conditions. It is unclear how well these approaches would generalize to mild cognitive impairment and early-stage dementia. Further evaluation is warranted to learn how the various approaches impact: access to care, for example, reduce wait-times and/or time-to-diagnosis, shorten travel distance to care; diagnosis and/or treatment rates and accuracy



of diagnoses by primary care providers; collaborative networks established; patient, patient caregiver and healthcare provider satisfaction; clinical outcomes and; resource utilization, for example, specialist referral rates, hospitalization rates.

Finally, because this report builds its narrative on semi-structure interviews, supplemented with real-world examples, it may be limited in its generalizability by the convenience sample of interviewees. While we have missed other approaches to memory care, we believe our paper provides a good overview of the broad categories of approaches from the primary care and specialty care perspectives.

## Conclusion

We identified four types of approaches for better leverage specialist time, ranging from building-up primary care capabilities to operating efficient specialty centers that holistically ties in research, patient care and education. Successful implementation of any of these approaches would depend on having appropriate resources (e.g., funding, specially trained nurses, pharmacists and nonclinical support staff, time for training and/or collaborative meetings) and awareness of available resources (e.g., primary care providers would need to know about free-educational resources and/or collaborative opportunities).

Further evaluation, refinement and promulgation of these approaches is desirable, particularly in light of the potential advent of a disease-modifying treatment for AD that might dramatically increase demand. But even in the absence of a disease-modifying treatment, the aging population [82] and the ensuing increased burden of cognitive decline mean that such novel care collaborations and models are dearly needed.

## Future perspective

The advent of disease-modifying Alzheimer's treatment will likely stress the capacity of healthcare systems to identify and initiate treatment quickly enough for patients with mild cognitive impairment to slow the progression to Alzheimer's dementia. Innovative care approaches to develop collaborative multidisciplinary team matrices, strengthen primary care capabilities and efficiently leverage specialist time would be pivotal to delivering timely care. Going forward, we expect routine diagnosis and management of AD to shift to primary care settings, as we have witnessed for other population-level chronic diseases, like depression, heart failure and diabetes. Our review shows several models for deeper involvement of primary care with different approaches how roles and responsibilities are divided between primary and specialty care. Which of these models will be adapted will be a function of the existing care system. In pluralistic systems, like the USA, adaptation will follow local market conditions and business objectives, whereas centrally planned systems, like France and the UK, will see a more unified approach. In countries with devolved decision making, like Canada and Germany, regional stakeholders will negotiate changes. Whatever the pathway to adaptation, decision makers will need solid real-world evidence to allocate resources efficiently and fairly.

## Supplementary data

To view the supplementary data that accompany this paper please visit the journal website at: [www.futuremedicine.com/doi/suppl/10.2217/nmt-2020-0038](http://www.futuremedicine.com/doi/suppl/10.2217/nmt-2020-0038)

## Author contributions

J Lam was responsible for research design and implementation. S Mattke - senior author - obtained funding, research design and implementation. Both J Lam and S Mattke wrote and edited the manuscript.

## Financial & competing interests disclosure

The research was conducted under a contract from Biogen Inc. to the University of Southern California. The sponsor had no role in the design and execution of the analysis, drafting of the manuscript and decision to submit. S Mattke serves on the board of directors of Senscio Systems, Inc., and the scientific advisory board of AiCure Technologies, Boston Millennia Partners and Zano Zano Healthcare Services. He has received consulting fees from AARP, Biotronik, Bristol-Myers Squibb and Defined Health. The authors have no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript apart from those disclosed.

No writing assistance was utilized in the production of this manuscript.

## Summary points

### Introduction

- While the potential advent of a disease-modifying Alzheimer's treatment offers great hope to patients and their loved ones, research shows that health systems are ill-prepared to handle the complexity and volume of identifying treatment-eligible patients.
- Scarcity of dementia specialists appears to be not only the most constraining factor but also the one that is the hardest to address, as it difficult to increase the number of specialists in the short run.

### Materials & methods

- This narrative synthesis based on 17 semi-structured interviews of practicing physicians in Canada and the USA explores different possible approaches to memory care.

### Results

- There are four care approaches with varying degrees and roles of primary and specialty care involvement that may help alleviate specialist capacity constraint:
  - Community primary care practices empowered with better tools and training;
  - Primary care memory clinics;
  - Specialty memory clinics;
  - Specialty memory centers.

### Discussion & conclusion

- These care approaches can be further adapted to best fit the local context.
- With proper training, tools and specialist support, primary care would be capable of assuming a greater role in the evaluation of memory complaints and determination of treatment eligibility of Alzheimer's disease disease-modifying treatments.

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