

100 Years After Alzheimer: Contemporary Neurology Practice Assessment of Referrals for Dementia

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Background: The prevalence of dementia is placing an increased burden on specialists.

Methods: Canadian neurologists responded to a structured questionnaire to assess reasons for referral and services provided as well as to compare the neurologists' perceptions of their practice characteristics against cases seen over a 3-month period.

Results: The audit confirmed the participants' perception that family practitioners are the main referral source (358/453, 79%). Sixty-two percent of patients had undergone clinical investigation for dementia prior to being seen by the neurologist; 39% (177/453)

were on pharmacotherapy at the time of referral, 68% were initiated on pharmacotherapy by the neurologist. A fifth of the referrals did not meet clinical criteria for dementia, which may be directly related to the prevalence of prior workup that did not include mental status testing.

Conclusions: Neurologists currently treat patients referred for dementia who may already have been adequately evaluated and treated by primary care providers.

Keywords: Alzheimer's disease; dementia; specialist; referral and consultation; physician's practice patterns

Introduction

With increasing recognition of clinical Alzheimer's disease (AD) since Alois Alzheimer's first clinicopathological report in 1906 and the increase in the Canadian population living into their 70s and 80s, the prevalence of dementia in Canada has appreciated significantly. In 2001 the number of people with dementia increased to 364 000 from 252 000 the previous decade and by 2021 the number should be 592 000 seniors with dementia.¹ This compares proportionally to the rising incidence of dementia

reported in the United States. In 2000 there were 4.5 million people with AD and by 2050 this is expected to triple to 13.2 million.² The Canadian Study of Health and Aging estimates the Canadian economic costs of dementia during the 1990s were greater than CAD\$3.9 billion.³

Patients with dementia present with other health-related issues and may be complicated to treat. These patients have a number of comorbid conditions similar to elderly patients without dementia (approximately 2.4 chronic conditions) and are therefore at risk for polypharmacy issues, as each patient receives on average 5.1 medications.⁴

Given the increasing burden caused by dementia for medical care providers in Canada, will the health care system be able to bear the pressure? Currently there are a limited number of Canadian neurologists who subspecialize in dementia and provide continuing care for these patients. As the number of people with dementia increases, will specialists such as neurologists be available to continue care at the current level? If not, are neurologists currently taking on cases or management that could be provided by family doctors?

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We conducted a Canada-wide, prospective, electronic practice assessment (referred to as an “audit” in this article) on a small sample of neurologists to obtain information on perceptions of their current practice and to prospectively survey referrals for symptoms of dementia. Our goal was to identify inefficiencies that burden neurology practices and which could be prioritized in future planning as the demand for dementia care increases. The audit collected information on prior investigations and prescribed treatment, the content of the initial workup, degree of symptom severity at the time of referral, prevalence of comorbid conditions, and prescriptions.

Methods

A structured questionnaire was developed by a scientific steering committee (TWC, SC, SS, and AR), in collaboration with Isis Digital Medical, Inc (ISIS) to obtain data on patients with dementia referred to a neurology practice and to answer the research question—What are the perceived and documentable burdens on the neurologist who treats patients with dementia? The questions were displayed on pre-programmed Dell AXIM Personal Digital Assistants (PDAs) using IMPRES (Interactive Medical Practice Evaluation System) technology. Each PDA was leased from ISIS and recovered at the end of the study.

The questionnaire consists of 2 phases (see Appendix). The first phase collected anonymized information to describe the “perceived” practice profile of the participating neurologist such as:

- Years since completing neurology certification
- Practice setting, catchment area
- Percentage of patients with dementia symptoms
- Reason for referral
- Quality of referral (workup, cognitive tests, laboratory tests)
- Sources of referral
- Treatment initiated

Practice audit data from all patients referred for dementia-related symptoms were entered during the months June to August 2006. The second phase collected pre- and post-assessment information on consecutive anonymized patients with dementia-related symptoms. Data were collected on:

- Source of referral
- Reason for referral
- Presenting dementia symptoms
- Investigations performed

- Comorbidities
- Tests performed pre/post referral, etc.

All PDAs were returned to ISIS in early September 2006. Each set of collected data was given a site-specific identifier, and downloaded to a secure central server. At the end of the practice audit, the respondents could compare themselves to the aggregate of the group’s anticipated versus recorded practice characteristics.

The databases from the PDAs and the central server were constrained to ensure that one of the forced choice responses was selected. If any question was unanswered, the PDA would not allow the user to continue data entry on the referral.

Descriptive statistics were used to describe the data. We recruited neurologists to participate, as identified by IMS Health, Canada (provides data and analytics; www.imshealthcanada.com) as writing 25 or more prescriptions (new or refills) for cholinesterase inhibitors during the first quarter of calendar year 2006. This selection criterion served to indicate which neurologists are referral destinations for patients with dementia.

Results

One hundred and four neurologists were invited to participate: 29 accepted, 46 declined, and 32 did not respond. Of the 29 neurologists who accepted, 25 documented at least 3 patient referrals, 3 withdrew without submitting any information, and 1 neurologist submitted a practice profile (Phase I) but no referral data. The practice profile summary consists of 26 neurologists (19 men and 7 women), but only 25 respondents (18 men, 7 women) documented patient referrals. Nineteen neurologists identified themselves as located in private offices, 6 in university/teaching institutions and 1 in a community hospital. Of these respondents, less than one third offered a specialty memory clinic, and the remainder were involved in a general neurology practice. All respondents were located in urban settings, with 15 neurologists located in a catchment area of $\leq 500\ 000$ people and 11 in an area with $>500\ 000$ people. Neurologists in rural settings were also invited to participate but did not respond. The majority (21/26) had been in practice >10 years.

Practice Characterization

Eight respondents considered $<10\%$ of their practice to be composed of dementia referrals and 12

respondents considered 10% to 33% of their practice to be composed of dementia referrals. Two respondents felt 34% to 66% of their practice was dementia based. Despite 8 respondents offering specialty memory clinics, only 4 reported seeing their practice as at least 66% dementia-related.

Fewer than 50% of respondents (N = 12) perceived their referrals as having to wait 3 to 6 months for an initial visit. A similar number (N = 10) felt they had shorter wait times (0-2 months), and the remaining 4 respondents anticipated wait times of 7 to 12 months. The majority (N = 18, 69%) of neurologists projected that they provide long-term follow up for their referrals as compared to following referred patients to point of stabilization (N = 7, 27%) or providing consultation only (N = 1, 4%).

Referral Patterns Captured

The dataset consists of referrals for 453 patients with dementia-related symptoms. Each respondent entered at least 3 and maximum 41 referrals onto his/her PDA. The 3 western Canada neurologists and 2 Atlantic Canada neurologists entered 40 and 37 referrals, respectively, while 11 Ontario and 9 Quebec neurologists entered 215 and 161 referrals, respectively. The majority of respondents (60%) had assumed the gender profile of their practice to be equal numbers of men to women, and the patient assessment data confirmed this. Of the referrals, 75% (N = 338) were living in the community with a family member. Most were aged 65 to 85 years (73%), with 21% younger than age 65, and 5% older than 85.

The responding neurologists believed their most frequent source of referral to be family practitioners (ranked as the primary source by all respondents), followed by emergency physicians and internists. The audit confirmed the majority of patient referrals were from family practitioners (N = 358, 79%), followed by other neurologists (N = 40, 9%) and then small but fairly equally distributed numbers from internists (N = 16, 4%), emergency room physicians (N = 13, 3%), geriatricians (N = 10, 4%), psychiatrists (N = 8, 2%) or "other physicians" (N = 8, 2%). The majority of patients were referred by physicians in private practice (N = 332, 73%), however some had been referred from hospital-based practices (N = 65, 14%) and community clinics (N = 37, 8%) and least frequently from academically affiliated clinics (N = 19, 4%).

Respondents were asked at the beginning of the survey for a perceived frequency of diagnoses referred. The audit next collected diagnoses appearing on

Table 1. Comorbidity in 453 Referrals

Diagnoses	Number of Referrals, (n, %)
Cardiovascular disease	137, 30 ^a
Diabetes	71, 16
Psychiatric history	51, 11
Stroke	49, 11
Impaired mobility (eg, disabling arthritis)	38, 8
Alcohol abuse	16, 4
Polypharmacy including sedatives or anticholinergics	11, 2
History of significant head trauma	3, 1
Other	172, 38

^a Percents have been rounded.

prospectively collected referrals. Alzheimer's disease was perceived as the most frequent diagnosis and this impression was validated by a diagnosis of AD in 38% (N = 174) of actual referrals. Alzheimer's disease with cerebrovascular disease had a perceived rank as second and in actuality ranked third (N = 54, 12%) while mild cognitive impairment was perceived as third with an actual rank of second in referrals (N = 68, 15%). The fourth most frequently perceived diagnosis was vascular dementia (N = 23), yet this appeared during the audit less frequently than no cognitive impairment (N = 28), depression (N = 26), or "other" (N = 26) consecutively. Other diagnoses presented very consistently with the perceived rank order: 7-Parkinson's Disease, 8-Frontotemporal dementia, 9-Dementia with Lewy Bodies. In all, 168 mild cognitive impairment (MCI) and 28 "no cognitive impairment" (21% combined) patients referred for dementia definitely did not have a dementia diagnosis after the neurological consultation.

Almost all patients seen were given mental status testing at the time of neurological consultation (N = 441, 97%). A total of 88% of patients completed a Mini-Mental State Examination (MMSE) and 18% the Montreal Cognitive Assessment (MoCA). Mini-Mental State Examination scores for the referrals ranged from 3 to 28 out of 30, while MoCA scores ranged from 3 to 30 out of 30. Of 453, 235 (53%) patients seen were considered to have a mild severity of cognitive impairment, but only 68 (15%) were diagnosed with MCI (Table 1).

Ninety-one percent (N = 412) of patient evaluations included assessment of functional ability. Consistent with the dementia staging of patients in this audit, instrumental activities of daily living (IADL) impairments were rated as mostly mild-moderate (N = 266, 64%). Fifty one percent (N = 210) of patients had no impairment in basic activities of daily

living (BADL) and 30% (N = 123) showed mild impairment.

Respondents diagnosed 72% (N = 328) of the referrals for symptoms of dementia as having a neurodegenerative dementia. The disease stage of these 328 patients was rated by respondents to be early dementia in 51% (N = 166), middle stage in 38% (N = 125), and late stage in 10% (N = 34). Neurologists were unable to determine the diagnosis by the end of the first follow-up visit for 1% (N = 3) of patients.

Reason for Referral

Most neurologists projected in Phase I of the audit that referrals were for assistance in management. In fact, 85% (N = 383) of patients referred were for diagnosis, 74% (N = 335) for management and 10% (N = 46) for a second opinion. (The respondents could select more than one option and some overlap exists.)

The most frequently reported symptom amongst the 453 referrals was memory loss (N = 379, 84%) followed by poor concentration (N = 96, 21%) and "other" (N = 85, 19%). Behavioral and psychiatric disturbances reported on referral forms included mood disturbance (N = 49, 10%), psychosis (hallucinations N = 30, 7% and delusions N = 21, 5%) agitation (N = 38, 8%). Aphasia was present in 35 cases (8%).

Of the 349/453 (77%) patients assessed for neuropsychiatric disturbances, only 1% (N = 5) were felt to have severe symptoms that might require hospitalization. A total of 80 (23%) had symptoms disruptive to the household and requiring a new medication prescription. Together, the moderate to severe neuropsychiatrically disturbed group of patients constituted 25% of referrals. Prior psychiatric history was present in 15% of referrals and depression ranked highly among final diagnoses by the respondents.

Of referred patients, 62% (279/453) had undergone some form of clinical investigation prior to being seen by the neurologist. These investigations included blood work (N = 223), computed tomography (CT) head (N = 191), magnetic resonance imaging (MRI) brain (N = 58), single photon emission computed tomography (SPECT) brain (N = 12), electroencephalography (EEG; N = 30), MMSE/other cognitive tests (N = 59), neuropsychological assessment (N = 13), and other (N = 16). The respondents performed additional investigations on two thirds of the patients, implying diagnostic difficulty to the case that surpassed routine family practice evaluations.

Table 2. Medications Prescribed Preneurological and Postneurological Consultation. N = 453

	Before Neurology Consultation (n, %)	After Neurology Consultation (n, %)
Donepezil	94, 21 ^a	125, 28 ^a
Galantamine	35, 8	92, 20
Antipsychotics	25, 6	28, 6
Rivastagmine	24, 5	50, 11
Other	17, 4	50, 11
Memantine	16, 4	25, 6
Neuroleptics	12, 3	5, 1
Anxiolytics	7, 2	6, 1
Benzodiazapines	4, 1	2, 1

^a Percents have been rounded.

Study design prevented us from ascertaining which investigations might have been repeated for patients (eg, an MRI ordered by neurologist after the patient's family doctor had obtained a CT head). A total of 335 (74%) of patients were diagnosed with comorbid health conditions (see Table 1).

Of the respondents, 73% anticipated that they would be the primary prescribers of medication for referrals. Per the audit, 39% (N = 177) of patients had been started on pharmacotherapy at the time of referral. The majority of patients left the respondents' offices with a prescription for pharmacotherapy (see Table 2), whether it was continuation of preexisting medication or initiation of new medication.

Discussion

The audit confirmed neurologists' impressions that the bulk of referrals for dementia symptoms come from family practice. Our survey for inefficiencies in dementia diagnosis and treatment at the level of referral discovered that referring doctors have often requested the appropriate diagnostic tests and initiated pharmacotherapy, yet referring doctors still valued consultation from a neurologist. The patients referred were often (>21%) diagnosed with MCI or no cognitive impairment or had mild, noncomplicated manifestations of dementia. Only 25% of referrals had moderate-severe behavioral or psychiatric symptoms of dementia or comorbid conditions which would be challenging to manage. Waitlists for patients with dementia might be shortened if primary care providers felt more comfortable diagnosing MCI. General neurologists may also feel uncomfortable diagnosing MCI; almost a tenth of referrals in this study came from other neurologists.

Initiating pharmacotherapy for dementia seemed to be one of the main functions of the consulting neurologist. The number of patients receiving new prescriptions doubled after neurological consultation. If this were the primary reason for referral, as opposed to severe neuropsychiatric disturbances (25% of referrals) or comorbidity complicating medication prescription (eg, cardiovascular disease prevalence in this sample of 41%), perhaps a shift from neurologists to family practitioners as gatekeepers to pharmacologic intervention would help address the impending crush of need for neurological consultation for dementia. Ongoing pharmaceutical management takes up time and probably accounted for neurologists assuming long-term follow-up care among the respondents, but a shift to either follow-up until point of stabilization, or sending a management plan for the family practitioner to follow would free neurologists up to serve a larger number of patients. Polypharmacy, though widely recognized as a common problem among the elderly individuals, appears to have already been addressed by the referring physicians and did not appear to be a problem in patients seen in our audit.^{8,9} Respondents appear to have helped hone medication regimens for patients: the comparison of medications before and after the neurological assessment shows a trend towards reducing antipsychotics, neuroleptics, and anxiolytic uses.

Although the majority of patients (62%) had undergone investigations prior to time of referral, only 21% were referred with a basic cognitive assessment (eg, MMSE or MoCA). Of particular interest was the preponderance of brain scans, both CT and MRI, ordered by referring physicians. Patients seem to have had neuroimaging more frequently than the 20-minute bedside mental status test. This may explain why 21% of patients referred for "dementia" had no cognitive impairment (6%) or only mild impairment (15%). The Quality Standards Subcommittee of the American Academy of Neurology 2001 practice parameters suggest that structural neuroimaging with either a noncontrast CT or MR scan in the initial evaluation of patients with dementia is appropriate to improve accuracy of clinical diagnosis.⁷ Though many of our patients had investigations performed by the referring physician, those investigations did not include the MMSE. The MMSE is a quick and useful tool for screening and would potentially have identified patients with no or mild cognitive impairment.

In 2001, the Quality Standards Subcommittee of the American Academy of Neurology updated their 1994 Practice Parameter for the diagnostic process for dementia in the elderly patients to include use

of standardized testing using tools such as the MMSE.⁸ Although this was a guideline for neurological practice, there is no reason a family doctor or nurse or trained office staff member could not administer this mental status test. Cody et al conducted a questionnaire to primary care physicians in Arkansas in an attempt to determine their diagnostic, referral, and management practices. From the responses, the authors concluded that their findings support the training of primary care physicians in the diagnosis and management of persons with dementia and providing tools to improve care.⁹ Given that our audit reached similar conclusions to those in the United States, perhaps appropriate educational programs teaching family physicians how to use a cognitive assessment tool and appropriate identification of cognitive impairment may decrease the burden on neurologists in the future.

The number of referrals to neurologists would be significantly reduced if primary care physicians could diagnose and manage the 37% of patients with mild-stage dementia. Our finding highlights the question of whether primary care physicians want to or feel adequately resourced/trained to diagnose dementia. Because evidence-based medicine and outcomes ultimately decide resourcing (more so in national healthcare systems), it remains to be seen whether geriatricians, neurologists, psychiatrists, nurse practitioners/physicians assistants, geriatric psychiatrists, behavioral neurologists, clinical social workers, or psychologists are best suited to be the principal care providers for patients with dementia. In the present era of poor-to-mediocre treatments, it may not really matter. But as better diagnostic/prognostic tests mature (ie, predicting which MCI patients will go on to develop dementia) and better treatments become available, it is likely the neurologist will assume a greater role in the care of patients with dementia and resources should shift in that direction. Our current recommendation is that neurologists involved in continuing education with family physicians should strongly endorse the use of the MMSE (or MoCA) as an initial cognitive assessment tool. There is a need for future studies to address which health care professional groups will be able to provide the best care to these patients.

There is a common perception that patients with dementia are free from other diseases such as kidney failure and some cancers, because these diseases have a reduced life expectancy and dementia is a disease of longevity. As would be expected by the high ranking of AD with cerebrovascular disease and vascular dementia, cardiovascular disease was the most

common comorbid medical condition. Diabetes and stroke were also fairly common in this audit sample. A Canadian survey of 398 caregivers corroborates our audit and reported comorbid conditions of high blood pressure (36%), heart disease (21%), high cholesterol (20%), diabetes (19%), and stroke (11%) in their sample.¹⁰ Our data echo previous reports on the relationship between cardiovascular risk factors and risk of dementia.¹¹⁻¹⁵ Prevention of hypertension and diabetes arising from poor lifestyle choices will prove important to reducing the anticipated burden of dementia on the health care system as a whole.

This study is limited by selection bias and low response rate from the neurologists eligible to participate. Selection criteria tended to locate neurologists who prescribe cholinesterase inhibitors and might exclude neurologists who provide consultation to family practitioners without then continuing to manage the patients medically. The small sample of participating neurologists may not adequately reflect practice across Canada. We do not have practice characteristics or demographics of the neurologists who chose not to participate, further limiting the generalizability of our conclusions. The authors feel, despite the limitations in sample, that the data reflect trends observed across Canadian neurology practices.

Despite the selection bias, few respondents in this study had devoted the majority of their practice to dementia care. For example, only 28.2% of consultations performed by Ontario neurologists over the previous calendar year (2005) were coded as dementia-related. The billing requests were submitted by 207 of the 248 neurologists in the province (Ontario Medical Association, July 27, 2007). If neurologists only allot a third of their new patient evaluations to dementia referrals, an increase in demand will require a change in that proportion of service provided by an individual neurologist or an increase in the number of neurologists available. The majority of respondents perceived that wait times for

dementia evaluation were 6 months or less. This implies that neurologists are currently able to accommodate the flow of referrals in a timely fashion, however this perception merits validation. An increase in referrals without dedication of more practice time allotted to dementia care would increase the wait time. Shifting from provision of continuing management of patients with dementia might create more space for one-time consultations, should the need arise and neurologists are unable to devote a larger percentage of time to dementia care.

There are incentives not to take patients with dementia into a practice: academically-affiliated hospitals may reflect settings with greater staff and resources allocated to the assessment and treatment of dementia, closer to the multidisciplinary practices described by Waldemar.¹⁶ We might hypothesize that neurologists maintaining private offices without the access to staffing, educational materials, and support to meet the needs of the demented patient and family may find it difficult and time-inefficient to accept these referrals. Our questionnaire did not collect data as to whether any referrals for symptoms of dementia had been rejected or deferred elsewhere by the respondents.

Conclusion

One hundred years ago, it took a neurologist–neuropathologist to recognize and describe Alzheimer’s disease. Today, family practitioners are the primary source of referral for patients with dementia and dementia-related symptoms, yet they should be capable of making the diagnosis and providing treatment for cases with stable comorbidity and mild behavioral or psychiatric disturbances. In view of the increasing number of cases of dementia anticipated in the coming years, better education of family physicians regarding cognitive screening and pre-referral investigations may help to diminish the strain on neurologists and the health care system.

Appendix Audit Questionnaire

Practice Profile (Answered Only Once by Physician)

Please complete the following profile details for your practice.

You will be asked to enter this data only once.

All responses will be aggregated.

Your personal information will not be passed on for 3rd party use.

Years since completing Neurology certification:	1-5 6-10 11-20 21-30 >30	Check only one
Practice setting being assessed:	Community hospital University/Teaching hospital Private office	Check only one
Is this setting a specialty Memory Clinic?	Yes No	Check only one
Practice setting being assessed is:	Urban Rural	Check only one
Referring catchment area:	<250000 250 000-500 000 500 000-1 000 000 >1 000 000	Check only one
What percentage of patients within your practice are referred for dementia-related symptoms?	<10% 10-33% 34-66% >66%	Check only one
Rank consecutively in order of frequency (starting with 1 being the most frequent, up to 7) your sources of referral for patients with dementia-related symptoms:	Family practitioners Neurologists Geriatricians Psychiatrists Emergency physicians Internists Others	Check all that apply Rank by frequency
After receiving a referral, what is the average wait time in months for a patient with dementia-related symptoms to see you?	0-2 months 3-6 months 7-12 months >12 months	Check only one
Patients referred to you with dementia-related symptoms are:	More often men than women More often women than men About the same number of men and women	Check only one
For patients referred to you with dementia-related symptoms, which of the following most applies:	Seen for consultation only Followed to point of stabilization Long-term follow-up	Check only one
What percentage of your patients with dementia-related symptoms are challenging (as opposed to straightforward) to diagnose?	<25% 26-50% 51-75% >75%	Check only one
What percentage of your patients with dementia-related symptoms are challenging (as opposed to straightforward) to manage?	<25% 26-50% 51-75% >75%	Check only one

(continued)

Of those patients you diagnose with dementia-related symptoms, rank consecutively in order of frequency (starting with 1 being the most frequent) up to the 5 most common diagnoses:	Normal/no cognitive impairment Mild cognitive impairment Alzheimer's disease Vascular dementia Alzheimer's disease with cerebrovascular Disease/Mixed dementia Dementia with lewy bodies Frontotemporal dementia Parkinson's disease with dementia Traumatic brain injury Primary progressive aphasia Progressive supranuclear palsy Corticobasal degeneration Normal pressure hydrocephalus Prion disease Depression/Depressive pseudodementia Other types of dementia	Rank order from 1-most to 5-least
What best describes how you generally manage pharmacotherapy with your patients in your practice?	I generally prescribe my patients' medication I generally pass on my recommendation for medication to the referring physician I equally prescribe medication as well as pass on my recommendation for medication to the referring physician	
Of those patients referred to you for dementia-related symptoms, what percentage are already on pharmacotherapy for their dementia symptoms?	<10% 10-33% 34-66% >66%	Check only one

Thank you for completing your Practice Profile.
 You may begin entering your patient assessments by selecting "Perform an assessment" from the main menu.
 Please tap screen or wait 5 seconds to return to the main menu

Patient Assessment
Pre-Examination Questions

This referral came from:	Family practitioner Neurologist Geriatrician Psychiatrist Emergency physician Internist Other	Check only one
What is the practice type of the doctor who wrote this referral:	Private practice Hospital-based practice Academically-affiliated clinic Community clinic	Check only one
What was the reason for this referral?	Diagnosis Management 2nd opinion	Check all that apply
Were symptoms outlined in the referral?	Yes No	Check only one
If yes, what symptoms were outlined in the referral? Check all that apply	Memory loss Poor concentration Aphasia Mood disturbance Agitation Delusions Hallucinations Other	Check all that apply

(continued)

Did the patient come with prior investigations performed?	Yes No	Check only one
If yes, what investigations were performed prior to referral? Check all that apply	Blood work CT brain scan MRI brain scan SPECT brain scan EEG MMSE/Other cognitive tests Neuropsychological assessment Other	Check all that apply
Patient's gender:	Male Female	Check only one
Patient's age:	Number pad Data captured individually but reported in these age ranges <65 65-70 71-75 75-80 81-85 >86	Enter patient's age in number pad
Is language a barrier to assessment of this patient?	Yes No	Check only one If no skip next Question
Is an interpreter required to complete this assessment with this patient?	Yes No	Check only one
Patient's current living situation:	Living alone Living with spouse or other family member Caregiver readily available Retirement home Nursing home	Check only one
Is this patient currently receiving pharmacotherapy for dementia-related symptoms?	Yes No	Check only one
If yes, what medications is the patient receiving? Check all that apply	Galantamine Donepezil Rivastigmine Memantine Benzodiazepines Neuroleptics Antipsychotics Anxiolytics Other	Check all that apply
Post-examination questions		
Does the patient have any health problems?	Yes No	Check only one
If yes, please indicate what health problems the patient has:	Cardiovascular disease Stroke Impaired mobility (eg, disabling arthritis) Diabetes Psychiatric history History of significant head trauma Polypharmacy including sedatives or anticholinergics Alcohol abuse Other	Check all that apply

(continued)

Did you test this patient for cognitive impairment?	Yes No	If No, skip to question 16— Functional status
If yes, what is the severity of the cognitive impairment?	None Mild Moderate Severe	Check only one
Was a MMSE completed?	Yes No	
If Yes, what was the score	_____score	Use number pad to input
Was a MoCA completed?	Yes No	
If Yes, what was the score	_____score	Use number pad to input
Did you assess this patient's functional ability?	Yes No	Check only one If no, skip next 2 questions
If yes, what is the severity of IADL impairment? (IADL = instrumental, eg, balancing cheque book)	None Mild Moderate Severe	Check only one
If yes, what is the severity of BADL impairment? (BADL = basic, eg, dressing)	None Mild Moderate Severe	Check only one
Did you assess this patient for neuropsychiatric disturbance?	Yes No	Check only one
If yes, what is the severity of the neuropsychiatric disturbance?	None Mild, not requiring interventions Moderate, disruptive to household and requiring medication Severe, the major dementia-related symptom and difficult to treat, may need hospitalization to manage	Check only one
Did you order or have work-up investigations performed?	Yes No	Check only one
If yes, what work-up investigations were ordered or performed? Check all that apply	Blood work CT brain scan MRI brain scan SPECT brain scan EEG MMSE/Other cognitive tests Neuropsychological assessment Other	Check all that apply
What is your clinical diagnosis for this patient?	Normal/no cognitive impairment Mild cognitive impairment Alzheimer's disease Vascular dementia Alzheimer's disease with cerebrovascular disease/mixed dementia Dementia with lewy bodies Frontotemporal dementia Parkinson's disease with dementia Traumatic brain injury Primary progressive aphasia	Check only one

(continued)

	Progressive supranuclear palsy Corticobasal degeneration Normal pressure hydrocephalus Prion disease Depression/depressive pseudodementia Other types of dementia	
Is this a neurodegenerative dementia?	Yes No	Check only one
If yes, what is the patient's Disease Stage:	Early Middle Late Unable to determine at this visit	Check only one
Will you prescribe or recommend to the referring physician to initiate and/or continue pharmacotherapy as a result of this visit?	Yes No	Check only one If No, skip next question
If yes, what medications will the patient be prescribed or continue on as a result of this visit?	Galantamine Donepezil Rivastigmine Memantine Benzodiazepines Neuroleptics Antipsychotics Anxiolytics Other	Check all that apply Skip next question
If no, what is the main reason treatment was not initiated or continued?	Awaiting patient's test results to formulate my recommendation Patient does not need medication at this time Cost of medication Don't believe medication is useful for this patient Patient/caregiver refusal of prescription Patient unable to comply with prescription Medication is causing adverse effects Other	Check only one
Thank you for completing a Patient Assessment. You may start another assessment by selecting "Perform an assessment" from the main menu. Please tap screen or wait 5 seconds to return to the main menu.		User taps Done

Abbreviations: BADL, basic activities of daily living; CT, computed tomography; EEG, electroencephalography; IADL, instrumental activities of daily living; MMSE, Mini-Mental State Examination; MRI, magnetic resonance imaging; SPECT, single photon emission computed tomography.

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