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Organisational aspects and assessment practices of Australian memory clinics: an Australian Dementia Network (ADNeT) Survey

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ABSTRACT

Objectives Conducting a national survey of clinicians and administrators from specialised dementia assessment services (memory clinics) in Australia to examine their current organisational aspects and assessment procedures and inform clinical tool harmonisation as part of the Australian Dementia Network—memory clinics project.

Design A cross-sectional survey.

Setting Public and private memory clinics across Australia.

Participants 150 individual clinicians completed the survey between May and August 2019. Responses could be given anonymously. Most clinics were publicly funded services (83.2%) and in metropolitan regions (70.9%).

Outcome measures Descriptive data on organisational aspects of memory clinics (eg, waiting times, staffing); the three most commonly used assessment tools per assessment type (eg, self-report) and cognitive domain (eg, attention).

Results Since the last national survey in 2009, the number of memory clinics across Australia has increased substantially but considerable variability has remained with respect to funding structure, staffing and assessment procedures. The average clinic employed 2.4 effective full-time staff (range 0.14–14.0). The reported waiting time for an initial assessment ranged from 1 week to 12 months with a median of 7 weeks. While most clinics (97%) offered follow-up assessments for their clients, only a few (31%) offered any form of cognitive intervention. We identified over 100 different cognitive assessment tools that were used at least 'sometimes', with widespread use of well-established core screening tools and a subset of common neuropsychological tests.

Conclusion This paper presents a current snapshot of Australian memory clinics, showing considerable heterogeneity with some common core elements. These results will inform the development of national memory clinic guidelines. Furthermore, our data make a valuable contribution to the international comparison of clinical practice standards and advocate for greater harmonisation to ensure high-quality dementia care.

Strengths and limitations of this study

- Our study is the first national memory clinics survey that presents responses from all Australian states.
- A broad definition of 'memory clinic' was used to include all clinicians specialising in dementia diagnosis to gain a broad overview of current clinical practice.
- The survey presents a comprehensive list of the most commonly used cognitive assessment tools that can inform the development of national memory clinic guidelines for harmonisation of assessment tools.
- While several strategies were used to identify memory clinics across the country, the survey cannot be considered to be exhaustive.

INTRODUCTION

About 459 000 Australians are currently living with dementia and the numbers are expected to increase dramatically over the next 30 years.[1] Nevertheless, Australia is currently lacking clear diagnostic pathways for people with dementia and cognitive decline, which may delay an early diagnosis.[2 3] A diagnosis can be made in a number of ways, for example through a general practitioner (GP), incidentally in a hospital or in a specialised assessment service or memory clinic.[2]

Since the late 1980s, memory clinics have been an integral part of Australia's dementia care services[4 5] and have repeatedly been recommended as the best services to obtain an early diagnosis of dementia.[2 3] Despite such recommendations, there is no consensus definition of a memory clinic and no published national or international agreement on the composition, services and standards of memory clinics.[6] Memory clinics are most commonly described as multidisciplinary medical assessment centres that are highly specialised for the diagnostic work-up of cognitive decline and dementia.[7] Memory clinic surveys from six different countries (Australia,[8] Ireland,[6] the Netherlands,[9 10]

British Isles[11] and England in particular,[12] Israel[13 14] and New Zealand)[15] also showed considerable heterogeneity in the diagnostic protocols that were used. Such variability was attributed to many factors including differences in the memory clinics' organisational structure, the area they service (regional vs metropolitan), the funding received by clinics, the composition and level of staffing, and the frequency of clinical services. The lack of evidence-based guidelines at the time may have also contributed to the variability. Interestingly, studies from England[16 17] and the Netherlands[18 19] that evaluated the economic aspects of a memory clinic reported mixed results with regard to the cost-effectiveness of multidisciplinary memory clinic services. All studies showed an advantage in the clinical outcomes of a multidisciplinary memory clinic (eg, measured by various quality of life indices), but memory clinic services were also associated with substantially higher costs.

The first Australian survey of memory clinics in 2009[8] provided initial benchmark data for international comparison. The 2009 survey reported results from 16 memory clinics located in five Australian states (Victoria: eight clinics, New South Wales: four clinics, South Australia: two clinics, Queensland: one clinic and Western Australia: one clinic). The results showed a comparatively long average waiting time of 10 weeks prior to the initial assessment. In contrast, a survey of English memory assessment services reported that 73% of the 80 surveyed services are able to provide an initial appointment in 6 weeks or less.[12] Moreover, Australian memory clinics reported a relatively low average effective full-time (EFT) staff allocation of 1.7 EFT, compared with the average memory clinic staffing in other countries (eg, Ireland: 3.4 EFT[6]; England: 9.9 EFT).[12] They also reported differences in the assessment protocols used across memory clinics though with relative agreement in the use of blood tests, imaging and the Mini-Mental State Examination (MMSE) as a cognitive screen.[8] Cost-effectiveness measures have not been assessed.

Importantly, it has been argued that a large variability in organisational structures and assessment procedures may contribute to delays in diagnosis, reduce accuracy and impede the provision of early interventions.[2 20] The benefits of harmonised diagnostic procedures for clinical practice and dementia research are undeniable.[21] A harmonised assessment protocol has the potential to boost collaboration between different memory clinics and between clinicians, community dementia care services and researchers. Greater harmonisation would also be required to implement national best practice standards and thereby improve the quality of diagnosis and care throughout the country.[2]

The call for greater harmonisation of diagnostic methods and processes has sparked a number of international initiatives, for example in the UK (Memory Services National Accreditation Program),[22] the USA (National Alzheimer's Coordinating Centres)[23] and the Netherlands.[9] In 2018, Australia followed this international movement and supported the establishment of the Australian Dementia Network (ADNeT), funded through the Australian National Institute for Dementia Research (NNIDR) Boosting Dementia Research Fund (provided by the National Health and Medical Research Council–NNIDR). ADNeT incorporates three main components—clinical quality registry, screening and trials, and memory clinics—to improve the quality and accessibility of dementia care services across Australia.

ADNeT-Memory Clinics set out to establish a national network of clinicians and dementia care services to boost multidisciplinary collaboration, to harmonise diagnostic standards and develop clear pathways for post-diagnostic care and support. Given this new national initiative, the current survey is important to assess baseline memory clinic practices and evaluate the resources available to deliver their services. Since the publication of the last national memory clinic survey in 2009,[8] best practice guidelines for the state-funded Cognitive, Dementia and Memory Services (CDAMS) in Victoria,[4] as well as clinical practice guidelines and principles of care for people with dementia,[24] have been published and potentially changed clinical practice compared with 10 years ago. Hence, an updated national memory clinic survey is warranted.

The main aim of this survey was to obtain current information about the variety of assessment procedures used in Australian memory clinics and to determine the most commonly used cognitive and neuropsychological test instruments. These results will be important to establish harmonised assessment protocols that are feasible for clinicians from different states and memory clinic settings. Moreover, the survey obtained some basic benchmark information to present a comparative update on some of the organisational data reported in the previous survey[8] (eg, staffing, funding) in a larger sample of memory clinics and to evaluate differences between public and private, as well as metropolitan and regional clinics, where it is appropriate.

METHODS

Sample and setting

Due to the lack of a consensus definition of memory clinics, potential participants for this survey included any clinician or coordinator who self-identified as working for a specialised diagnostic assessment service for dementia. This was done to avoid missing out on responses of dedicated cognitive assessment services that do not identify as a memory clinic and other specialised clinicians. Using this broad definition of a memory clinic, we will, in the following, refer to the services that responded to our survey as 'memory clinic' or just 'clinic'. We used various recruitment strategies including the use of already established contacts (eg, official contact list of state-funded CDAMS in Victoria) and recommendations from professional networks. Hence, this group of potential participants was previously known to the ADNeT research team. We sent a single invitation to participate in the survey but no reminder email. We also advertised our study in

professional associations (especially Australian and New Zealand Society for Geriatric Medicine (ANZSGM) and the Royal Australian and New Zealand College of Psychiatrists (RANZCP)) to increase our outreach and disseminate the survey to colleagues that were unknown to the immediate ADNeT-Memory Clinics research team. Due to our broad distribution strategies, it is difficult to estimate how many potential participants received the survey link. All respondents were able to remain anonymous or to provide voluntary identifiable information if they wished to be contacted again for future projects and information about ADNeT.

Survey and procedure

The survey was developed in Qualtrics.[25] All potential respondents were required to read the participant information sheet and consent form and provide consent to their participation before they were able to start the survey. Respondents were not obliged to provide any personal information (eg, name, contact address) but had the opportunity to do so, if they wished to be added to our ADNeT contact list. Participants who did not wish to be contacted again were also able to express that at the end of the survey.

The survey comprised three main parts. The first part was directed at clinical coordinators and clinicians involved in the operational management of a clinic. Here, the respondents were asked to give details about the specific organisational structure of their clinic: staffing (eg, average EFT per profession and clinic), clinical activity (eg, frequency of clinical assessments, waiting times, regulations for follow-ups), characteristics of the clinical population (eg, proportion of indigenous and non-English-speaking population) and funding support. Any respondent who was not involved in administrative tasks was able to skip this section of the survey.

The second part of the survey contained questions about the clinical and cognitive assessment tools used by the individual clinicians. Here, we investigated seven subcategories: (1) cognitive screening tools, (2) self-reported scales, (3) informant-rated scales, (4) clinician-rated scales, (5) measures of subjective cognitive concern, (6) computerised cognitive tests, and (7) standardised pen-and-paper neuropsychological measures. Within the 'neuropsychological measures' category, we further distinguished between standardised neuropsychological batteries and individual tests in nine cognitive domains (premorbid ability, processing speed, attention and working memory, memory, language, visuospatial abilities, executive functions, social cognition and effort). For each category, the survey listed commonly used test instruments determined by experienced neuropsychologists (NAK, SLN). Respondents rated on a 5-point Likert scale how often they used each test instrument in their everyday clinical practice. Under 'other' the respondents were able to add up to five additional test instruments they currently use to ensure that we captured all instruments that were not originally considered. Options to skip this component of the survey were available to those respondents who did not conduct clinical assessments (eg, dedicated coordinators of memory clinics). As some of the listed neuropsychological test instruments can only be conducted by trained neuropsychologists, we also compared the test use of neuropsychologists and non-neuropsychologists across cognitive domains.

The third part of the survey asked if respondents offered any form of cognitive intervention to their clients. If the response was no, respondents were asked to provide reasons; if yes, they were asked to provide further details about the methods. We provided a list of possible intervention types and asked them to select all that apply. The options included: computerised testing; memory strategy training; psychoeducation; independent completion (exercise material); input to rehabilitation with other clinicians; and involvement of family, friends and caregivers. Furthermore, we asked in which frequency this intervention was provided. A copy of the full survey can be acquired from the corresponding author on request.

Patient and public involvement

The design of this survey was based on previous national and international memory clinic surveys[6 8 9] to ensure a comparability of results. We further received input from expert clinicians and researchers within the ADNeT team. Questions were added, deleted and adjusted according to their feedback. As the survey was specific to current clinical practices with a particular focus on cognitive and neuropsychological assessment tools, people living with dementia and/or cognitive decline were not involved in the design of this specific survey. The dissemination of the survey was supported by the national professional associations: 'the ANZSGM' and 'the RANZCP' as well as Dementia Australia to increase our outreach and involve as many members of the target population as possible. Some of the participants of this survey were informed about the results of this survey during ADNeT-Memory Clinics meetings and/or national conferences. A link to the published results paper will be provided to all respondents that provided contact details in their survey response.

Data analysis

All survey responses were recorded and saved in Qualtrics and the data later exported into Excel. One member of the ADNeT-Memory Clinics team (IM) de-identified the data and assigned a unique study ID to each response. Identifiable information (eg, profession, clinic location) was coded and comments that contained identifiable information were separated from the response sheet and securely saved. Only anonymised data were used for the analyses presented in this paper. All statistical analyses were carried out with IBM SPSS Statistics, V.25. We conducted descriptive analyses to provide an overview of the variety of clinical settings and assessment tools that were reported by clinicians and clinical coordinators across Australia. To compare categorical variables of

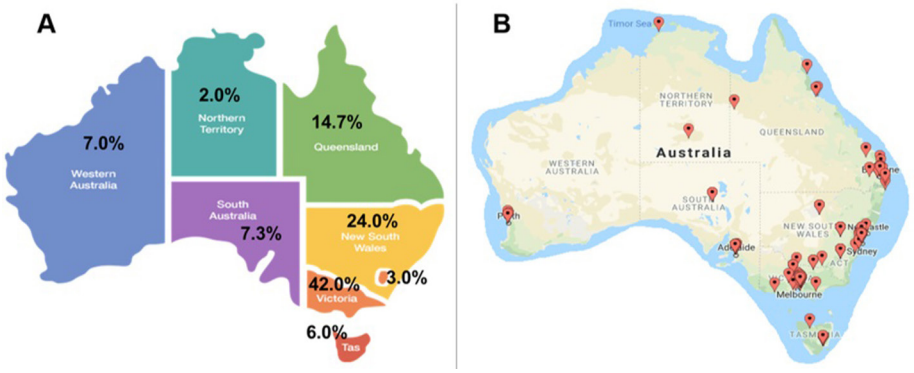

Figure 1 (A) National distribution of respondents in per cent; (B) national distribution of individual respondents.

different groups, we performed a X^2 test. When the skewness of continuous data was within the recommended range of −1 and 1, we performed parametric tests (eg, t-test); when the data were skewed, we performed non-parametric tests (eg, Mann-Whitney U test). Spearman correlations were used to investigate associations between skewed continuous data.

RESULTS

Respondents

Between May and August 2019, we obtained 318 responses. We excluded responses from 163 who did not complete the survey (eg, some data provided but did not press the 'complete button' at the end) as well as data from five respondents who accidentally completed the survey multiple times. Consequently, 150 individual responses, with representation from each of the Australian states and territories, were included. By matching addresses, postcodes and other identifiable information the respondents voluntarily provided (eg, name of clinic), we were able to identify responses from 90 different memory clinic services.

The majority of responses were from Victoria and New South Wales, reflecting a large number of memory clinics located in the two most populated states (see figure 1). Unsurprisingly, the highest density of memory clinics was found in metropolitan areas (68.4% of respondents). Most of the respondents were employed in public clinics (82.8%), compared with 17.2% employed in private clinics.

While most respondents identified as geriatricians (42.7%) and neuropsychologists (23.3%), we also received responses from occupational therapists (7.4%), neurologists (6.7%), psychiatrists (5.3%), registered nurses (3.3%), speech pathologists (2.0%), clinical psychologists (1.3%), social workers (1.3%), pharmacists (0.6%), trainee doctors (3.3%) and clinical coordinators who are not involved in any clinical work (2.7%).

Organisational aspects

Overall, 38 respondents from 38 different memory clinics reported that they fulfil the duties of a clinical coordinator or manager at their clinic site. Eighteen of these services voluntarily identified as a memory clinic or CDAMS, while the remaining services identified as geriatric services (mostly private), cognitive and memory assessment services, or did not provide clear information. Responses from all Australian states and territories were represented in this sample.

Table 1 summarises the main results from the survey regarding the clinics' general organisational aspects. The table shows the overall responses, as well as the results split for metropolitan versus regional, and public versus private clinics.

We observed no statistically significant differences between metropolitan and regional clinics for any of the reported organisational aspects we surveyed (see table 1). A comparison of public and private memory clinics, unsurprisingly, revealed a significant difference in the clinics' funding sources (X^2=30.18, p<0.001). We would like to note that each clinic was always assigned to both features, 'metropolitan/regional' and 'private/public'. Despite our proportions were relatively balanced (eg, 29% of metropolitan clinics and 36% of regional were private), this overlap in the data may have influenced our analysis. However, given the overall small sample size, it can be assumed that only strong associations will have reached significance.

Seventy-three per cent of public clinics report some support from state health funds while the private services mainly rely on patient charges and rebates from the Australian public health insurance, Medicare. Funding support is also commonly supplemented by research funds, commonwealth funding, support from the department of veteran affairs, donated time of staff members or rural workforce support.

In terms of waiting times, overall, the average reported waiting time for an initial assessment was 9.9 weeks (SD=9.7; median=7 weeks). However, substantial variability was observed, ranging from less than 1 week to about 12 months' waiting time. Some clinics also reported that they follow a triaging procedure to reduce the waiting times for urgent cases. We observed a significant difference in the waiting times reported by private (mean: 5.3, SD:3.1) and public clinics (mean: 11.9, SD: 10.8; $p_{\text{Mann-Whitney U test}}$=0.031).

Table 1 Result summary—general organisational structures

	All	Metropolitan	Regional	Public	Private
Respondents (n)					
	38	24	14	26	12
Clinic type					
Public	26	17	9	/	/
Private	12	7	5	/	/
Service area					
1 community	14 (37%)	11 (46%)	3 (21%)	10 (38%)	4 (33%)
>1 community	24 (63%)	13 (54%)	11 (79%)	16 (62%)	8 (67%)
Frequency (n=38)					
<1×a week	4 (10%)	1 (4%)	3 (21%)	3 (12%)	1 (8%)
1×a week	6 (16%)	5 (21%)	1 (7%)	6 (23%)	0
>1×a week	28 (74%)	18 (75%)	10 (71%)	17 (45%)	11 (92%)
Waiting times (n=37)					
Averagewaiting time	9.9 weeks (±9.7)	10.4 weeks (±10.3)	9 weeks (±8.6)	11.9 weeks* (±10.8)	5.3 weeks* (±3.1)
Waiting times range	3 days–12 months	3 days–12 months	1 week–9 months	2 weeks–12 months	1 week–10 weeks
EffectiveFull Time (EFT) staff (n=34)					
Average EFT per clinic (n=34)	2.4 (±3.2)	3.1 (±4.0)	1.4 (±1.2)	2.7 (±3.5)	1.6 (±2.4)
EFT range	0.1–14.0	0.1–14.0	0.2–3.6	0.1–14.0	0.2–8.0
Numberof new patients per clinic day (n=38)					
Average number	3.3 (±2.4)	3.2 (±2.6)	3.5 (±2.1)	3.1 (±2.1)	3.7 (±3.0)
Number range	1–11	1–11	1–8	1–10	1–11
Follow-ups					
Follow-ups provided	37 (97%)	24 (100%)	13 (93%)	25 (96%)	12 (100%)
Number of follow- up patients per clinic day (n=37)					
Average number	4.2 (±3.3)	4.4 (±2.9)	3.7 (±4.1)	4.5 (±3.8)	3.5 (±2.0)
Number range	1–16	1–12	1–16	1–16	1–8
Proportion of patients from an indigenous background (n=25)					
≤5%	22 (88%)	12 (92%)	10 (83%)	16 (84%)	6 (100%)
>5%–10%	2 (8%)	1 (8%)	1 (8%)	2 (11%)	0
>10%	1 (4%)	0 (0%)	1 (8%)	1 (5%)	0
Proportion of patients from a CALD background (n=38)					
≤10%	24 (63%)	11 (46%)	13 (93%)	14 (54%)	10 (84%)
>10%–20%	3 (8%)	3 (13%)	1 (7%)	3 (12%)	1 (8%)
>20%–30%	2 (5%)	2 (8%)	0 (0%)	2 (8%)	0
>30%–40%	1 (3%)	1 (4%)	0 (0%)	1 (4%)	0
>40%–50%	5 (13%)	5 (21%)	0 (0%)	4 (15%)	1 (8%)
>50%	2 (5%)	2 (8%)	0 (0%)	2 (8%)	0
Main source of referrals					
GP	35 (92%)	22 (92%)	13 (92%)	24 (92%)	11 (92%)
Other (neurologist, geriatrician)	3 (8%)	2 (8%)	1 (8%)	2 (8%)	1 (8%)
Main source of funding					
State-health funds	19 (50%)	12 (50%)	7 (50%)	19 (73%)†	0
Patient charges/ Medicare	9 (23%)	7 (29%)	2 (14%)	1 (4%)	8 (67%)
State funds+patient charges	3 (8%)	3 (13%)	0	3 (12%)	0
Commonwealth	1 (3%)	0	1 (7%)	1 (4%)	0
State-health funding+other	1 (3%)	1 (4%)	0	1 (4%)	0
Patient charges+other	5 (13%)	1 (4%)	4 (29%)	1 (4%)	4 (33%)

T-test and X^2 were used to compare metropolitan versus regional and public versus private services for each variable. Only significant differences are highlighted in the table.
Community is defined as a catchment area; frequency indicates how often a clinic is operating.
Medicare is an Australian public health fund.
*Significant public versus private memory clinics (Mann-Whitney U test, p=0.031).
†Significant difference according to X^2 test comparison (X^2; p<0.001).
CALD, culturally and linguistically diverse; EFT, effective full time ; GP, general practitioner.;

Most clinics reported that they run services at least once per week or more often (see table 1). Very few clinics, mostly in regional areas, ran less frequently. Thirty-four respondents (89%) reported on their clinic's staffing. The mean allocation per clinic was 2.4 (SD=3.2) EFT positions (range: 0.1–14.0). No significant correlation was found between the clinics' EFT and waiting time (Spearman's r=0.288, p=0.104).

Few differences were observed in terms of the representation of the various professions in public versus private, and metropolitan versus regional memory clinics (online supplemental appendix A). Specifically, private clinics reported lower EFTs for a dedicated clinical coordinator (mean EFT: 0.01; $p_{\text{Mann-Whitney U test}}$=0.020) than public clinics (mean EFT: 0.32), and metropolitan memory clinics reported a higher average EFT for trainee doctors (mean EFT: 0.35) compared with regional clinics (mean EFT: 0.01; $p_{\text{Mann-Whitney U test}}$=0.038).

Almost all clinics (97%) reported that follow-up assessments/reviews form part of their standard services. These follow-ups are mostly conducted on an ad hoc basis, and the frequency may differ from case to case (eg, after 6 months, after 12 months). In a number of clinics, follow-ups were predominantly scheduled for people initially diagnosed with mild cognitive impairment. On a regular clinic day, an average of 3.3 (SD=2.4) new patients and 4.2 (SD=3.3) follow-up patients are assessed (see table 1). All clinics reported seeing patients from cultural and linguistically diverse (CALD) backgrounds. In some cases, CALD patients were reported to represent up to 50% of the clinic's case load. While a wide variety of languages were reported (eg, Cantonese, Arabic, Spanish, Maltese) for CALD clients, the most commonly represented languages were Italian, Greek and Mandarin. Twenty-five clinics (66%) reported that they regularly assessed patients with an indigenous background but only three clinics reported this proportion to be larger than 5%.

GPs were the most common referral source for 35 (92%) memory clinics. The remaining three clinics reported that most of their referrals come from a neurologist or a geriatrician.

Clinical assessments

One of the main aims of this survey was to identify the most commonly used clinical assessment tools across Australian memory clinic clinicians. The 141 clinicians who responded to this part of the survey represented 14 different professions, with the majority being geriatricians (42%) or neuropsychologists (24%). The types of assessments carried out by different professionals are presented in figure 2. Using a X^2 test, a significant difference was only observed for neuropsychological testing (X^2=75.06, p<0.001). Post-hoc testing using the Fisher's exact test showed that neuropsychological tests were most commonly conducted by trained neuropsychologists (z=7.47, p<0.001). However, clinicians from other professions (eg, neurologists, psychiatrists, speech pathologists) also reported the use of neuropsychological tests (see figure 2).

Overall, the respondents reported the use of more than 100 different test instruments across all assessment types and cognitive domains. The most commonly used test instruments are displayed in tables 2 and 3. Both tables display the percentage of respondents at each frequency of test use on a 5-point Likert scale (1=always; 5=rarely/never) and the mean Likert scale ratings (smaller mean represents more frequent test use). The tables also display the total number of respondents who reported using any of the listed tools within a specific assessment type or within a cognitive domain.

In specific, table 2 summarises the most commonly used test instruments across different assessment types in a routine dementia assessment. One hundred and twenty-six respondents (90%) reported the use of self-reports. Within this category, most clinicians (n=122/97%) reported the use of a variety of depression and

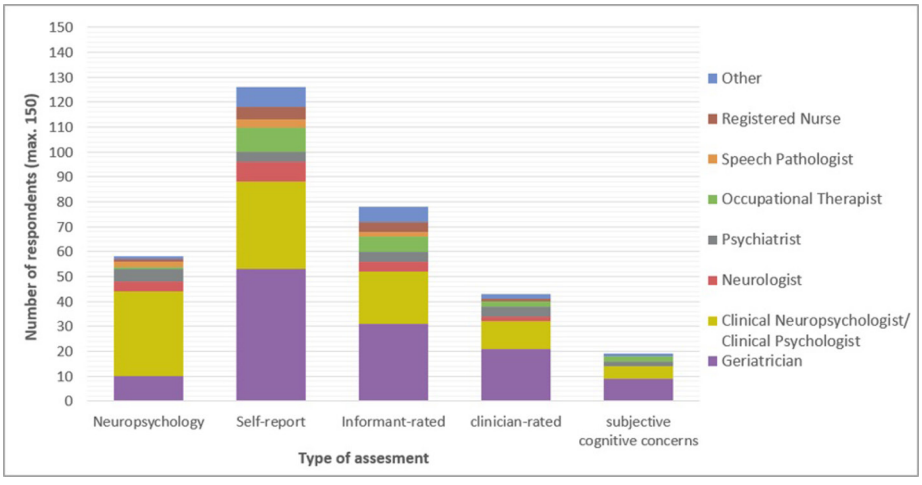

Figure 2 Types of assessments conducted by clinicians of different professions. Other=general practitioner, administration staff, social worker, geriatric advanced trainee, geriatric registrar.

Table 2 Three most commonly used general mood, sleep, self-rated and informant-rated and clinical/cognitive assessment tools

		Percentage of respondents					
		Always (1)	Most of the time (2)	About half the time (3)	Sometimes (4)	Rarely/never (5)	Mean rating (SD)
Self-report (n=126)							
1	GDS-15	15.9	32.5	15.1	17.5	19.0	2.9 (1.4)
2	DASS-21	6.3	11.1	7.9	16.7	57.9	4.1 (1.3)
3	Epworth Sleepiness Scale	0.8	3.2	1.6	32.0	62.4	4.5 (0.8)
Informant-rated measures (n=77)							
1	IQCODE	20.8	13.0	5.2	24.7	36.4	3.4 (1.6)
2	CBI-R	5.2	5.2	2.6	16.9	70.1	4.4 (1.1)
3	Zarit Burden	9.1	5.2	0	9.1	76.6	4.4 (1.3)
Clinician-rated measures (n=42)							
1	Clinical Dementia Rating	7.3	22.0	2.4	29.3	39.0	3.7 (1.4)
2	Neuropsychiatric Inventory	11.9	14.3	11.9	19.0	42.9	3.7 (1.5)
3	Hamilton Depression Rating	2.4	2.4	0	9.8	85.4	4.7 (0.8)
Subjective cognitive concerns (n=19)							
1	IQCODE	31.6	5.3	5.3	42.1	15.38	3.0 (1.6)
2	ECOG (self)	0	5.3	0	5.3	89.5	4.8 (0.7)
3	ECOG (informant)	0	5.3	0	0	94.7	4.8 (0.7)
Cognitive screening (n=141)							
1	Clock drawing	39.7	31.2	8.5	9.9	10.6	2.2 (1.3)
2	MMSE	34.0	36.9	6.4	8.5	14.2	2.3 (1.4)
3	MoCA	7.8	18.4	13.5	34.0	26.2	3.5 (1.3)

CBI-R, Cambridge Behavioural Inventory-Revised; DASS, Depression Anxiety Stress Scale; ECOG, Measurement of Everyday Cognition; GDS, Geriatric Depression Scale; IQCODE, Informant Questionnaire on Cognitive Decline in the Elderly; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment.

anxiety scales (eg, Geriatric Depression Scale, Depression Anxiety Stress Scales; see table 2), while only 43 of the 126 respondents (34%) reported the use of sleep scales (eg, Epworth Sleepiness Scale, Pittsburgh Sleep Quality Index). Nevertheless, those 43 respondents reported a relatively frequent use of the Epworth Sleepiness Scale (see table 2), so that it was identified as one of the top three self-reported measures. Compared with the self-reported measures, clinician rated measures (30%) or formal assessments of subjective cognitive concerns (14%) were only reported by a relatively low proportion of respondents (see table 2). A comparison of the test use of clinicians from metropolitan and regional memory clinics showed that self-reported measures were more commonly used in metropolitan clinics (see full table in online supplemental appendix B: X^2=4.59, p=0.032).

Table 3 summarises the top three neuropsychological test instruments reported for each cognitive domain included in our survey.

As mentioned earlier, testing of different cognitive domains was mostly carried out by trained neuropsychologists. Indeed, many of the tests summarised in table 3 require a specific neuropsychological training. For the readers' information, we listed the number and percentage of respondents for this part of this survey who identified as neuropsychologists and compared the test use of neuropsychologists and non-neuropsychologists. The p values of this comparison are displayed in table 3. Overall, respondents reported that they assess domains like *language*, *executive function* or *processing speed* 'most of the time' during their routine assessment. In contrast, even the most popular test instruments assessing domains like *social cognition* and *effort* were on average only used 'sometimes' (see table 3).

Unsurprisingly, subtests of neuropsychological test batteries (Wechsler Memory Scale and Wechsler Adult Intelligence Scale (WAIS), see table 3) and or other specific tests that require a training (Test of Premorbid Function, see table 3) are significantly more often used by neuropsychologists (see table 3) as non-neuropsychologists would not be qualified to conduct them. A stark difference in the test use of neuropsychologists and non-neuropsychologists can be observed in the domain 'visuospatial' abilities. Neuropsychologists use the 'Rey complex figure' test more often than non-neuropsychologists (t=−4.6, p<0.001), who, in contrast, use

Table 3 Three most commonly used neuropsychological test instruments for each cognitive domain

		Percentage of respondents						
		Always (1)	Most of the time (2)	About half the time (3)	Sometimes (4)	Rarely/ never (5)	Overall mean rating (SD)	NP vs non-NP+ (p-value)
Premorbid Function (n=44/ Neuropsychologists= 33 [75%])								
1	TOPF*	15.9	34.1	6.8	9.1	34.1	3.1 (1.6)	<0.001
2	WAIS-IV Vocabulary	4.5	15.9	6.8	18.2	54.2	4.0 (1.4)	0.162
3	NART	6.8	2.3	6.8	11.4	72.7	4.4 (1.2)	0.065
Processing Speed (n=51 / Neuropsychologists= 34 [67%])								
1	Trail Making A	35.3	39.2	7.8	15.7	2	2.1 (1.1)	0.392
2	WAIS-IV Coding*	17.6	29.4	5.9	19.6	27.5	3.1 (1.5)	<0.001
3	WAIS-IV Symbol Search*	13.7	19.6	9.8	21.6	35.3	3.1 (1.5)	<0.001
Attention/ Working Memory (n=48 / Neuropsychologists = 34 [75%])								
1	Digit Span (2 subtests)	33.3	16.7	2.1	12.5	35.4	3.0 (1.8)	1.00
2	Digit Span (3 subtests)*	14.6	25	4.2	20.8	35.4	3.4 (1.5)	<0.001
3	TEA	0	2.1	6.3	14.6	77.1	4.5 (1.1)	0.169
Memory (n=47 / Neuropsychologists= 34 [72%])								
1	WMS-IV Logical Memory*	29.8	23.4	12.8	6.4	27.7	2.8 (1.6)	0.006
2	Rey Complex Figure (30min delay)	21.3	21.3	8.5	17	31.9	3.2 (1.6)	0.251
3	WMS-IV Visual Reproduction*	17	21.3	12.8	17.01	31.9	3.3 (1.5)	<0.001
Language (n=54/ Neuropsychologists = 34 [63%])								
1	Category Fluency (Animals)	46.3	33.3	7.4	7.4	5.6	1.9 (1.2)	0.903
2	COWAT (FAS)*	42.6	20.4	7.4	7.4	22.2	2.5 (1.6)	<0.001
3	Boston Naming (60 items)*	16.7	27.8	13	20.4	22.2	3.0 (1.4)	0.03
Visuo-spatial abilities (n=57 / Neuropsychologists = 34 [60%])								
1	Clock drawingˆ	40.4	33.3	5.3	12.3	8.8	2.2 (1.3)	0.001
2	Rey Complex Figure* (copy)	33.3	33.3	3.5	8.8	21.1	2.5 (1.5)	<0.001
3	Cube copying/drawingˆ	26.3	31.6	5.3	21.1	15.8	2.7 (1.5)	0.002
Executive function (n=54 / Neuropsychologists = 34 [63%])								
1	Trail Making B	29.6	44.4	7.4	13	5.6	2.2 (1.2)	0.183
2	WAIS-IV Similarities*	29.6	24.1	7.4	9.3	29.6	2.9 (1.7)	<0.001
3	Stroop (D-KEFS)*	7.4	11.1	3.7	16.7	61.1	4.1 (1.3)	0.019
Social Cognition (n=8 / Neuropsychologists = 4 [50%])								
1	Reading the Mind in the Eyes	0	0	12.5	62.5	25	4.1 (0.6)	0.624
2	The Awareness of Social Interference Test	0	0	12.5	37.5	50	4.4 (0.7)	0.674
3	Facial Expression of Emotion/ Ekman Faces	0	0	0	12.5	87.5	4.9 (0.4)	0.391
Effort (n=30 / Neuropsychologists= 27 [90%])								
1	WAIS-IV embedded measure - reliable digit span	0	16.7	6.7	36.7	40	4.0 (1.1)	0.136
2	WAIS-IV embedded measure logical Memory - delayed recognition*	0	10	13.3	33.3	43.3	4.1 (1.0)	<0.001
3	Advanced Clinical Solutions – word choice*	0	10	13.3	30	46.7	4.1 (1.0)	<0.001

NP versus non-NP+= t-test comparison of test use of neuropsychologists versus non-neuropsychologists.
*Significantly more often used by neuropsychologists.
†Significantly more often used by non-neuropsychologists.
COWAT, Controlled Oral Word Association Test; D-KEFS, Delis-Kaplan Executive Function System; NART, National Adult Reading Test; NP, neuropsychologist; TEA, Test of Everyday Attention; TOPF, Test of Premorbid Function; WAIS, Wechsler Adult Intelligence Scale; WMS, Wechsler Memory Scale.

the 'clock drawing' (t=3.6, p=0.001) and 'cube copying/ drawing' (t=3.2, p=0.002) more often to assess visuospatial abilities. Moreover, we observed that the 'National Adult Reading Test' was more frequently used by clinicians from metropolitan than regional areas (t=−2.21, p=0.032) and the test 'WAIS-IV embedded measure: reliable digit span'

was more frequently reported by clinicians from public than private clinics (t=−2.80, p=0.010, see full table in online supplemental appendix B).

Only 10 respondents (7%) reported the use of computerised assessment tools, and these were used infrequently. The 'Q-Interactive' test was the most commonly used (mean rating=3.9, SD=1.7) followed by the computerised 'Wisconsin Card Sorting Test' (mean rating=4.3, SD=1.1).

Cognitive interventions

Only 46 (31%) from 34 different identifiable memory clinics (38%) reported that they offer any form of cognitive intervention. The majority of respondents who offer cognitive interventions identified as neuropsychologists (n=16/35%), geriatricians (n=13/28%) or occupational therapists (n=7/15%). Other professions were psychologists, psychiatrists, neurologists, speech pathologists and registered nurses. No differences were found between respondents working for public or private (X^2=0.003, p=0.956) and metropolitan or regional memory clinics (X^2=0.07, p=0.791). Not all clinicians that work for the same memory clinic reported that they are able to provide cognitive interventions. Hence, we concentrated our analysis on the individual response level and did not provide further clinic-based analysis.

Most respondents who offer cognitive intervention reported the use of a combination of different cognitive interventions, with a mix of *psychoeducation*, *involvement of family members* and *input to rehabilitation* being the most commonly reported combination (33%). Moreover, 89% of clinicians (41 out of 46) reported that they conduct an individualised rather than a standardised approach. The overall data further suggest that there is a significant difference in the provision of *memory strategy training* by profession (X^2=16.87, p=0.018). However, pairwise comparisons of all professions post hoc (using Bonferroni correction) did not identify which specific professions differ from each other. Interestingly, more than half (52%) of the respondents who offer interventions are only able to provide one session. Only 7 out of the 46 respondents (15.2%) reported that they can provide more than five sessions of cognitive intervention to their patients. Respondents who do not provide cognitive intervention reported a lack of resources, often accompanied by a lack of appropriate training as the most common reason for not offering cognitive interventions.

DISCUSSION

This survey provides an updated overview of the current clinical situation of memory clinics across Australia. It further identified the most commonly used assessment tools, which mark an important first step in ADNeT's effort to harmonise and improve standards of diagnostic procedures across Australian memory clinics.

Our survey included a substantially larger number of respondents than previous memory clinic surveys in Australia[8] or internationally.[6 11] We broadened our target group to all clinicians involved in the specialised assessment of dementia and cognitive decline, and identified responses from 90 different memory clinic services. This broad recruitment approach provided a more comprehensive overview of current clinical practices in the specialised assessment of people with dementia and cognitive decline across Australia.

The survey confirmed the large heterogeneity in the organisational aspects (eg, staffing, number of patients, waiting times) of memory clinic services across Australia, previously reported in the national survey from 2009.[8] Similar variability in memory clinic services has been observed in the Netherlands, Ireland, the UK, Israel and New Zealand, and greater harmonisation has been internationally endorsed.[6 9 11 13 15]

Previous memory clinic surveys[6 8] identified relatively long waiting times for an initial assessment and understaffing as the main issues that may compromise a timely and accurate dementia diagnosis in a memory clinic setting. Woodward and Woodward[8] reported an average of 10 weeks' waiting time in their first Australian survey. Our results suggest that the waiting time remained largely unchanged over the past 10 years (average waiting time=9.9 weeks). However, waiting times also greatly varied between services. The services with the shortest and the longest waiting time were both operating in metropolitan areas at relatively high frequency (4–5 times a week). The clinic with the shortest waiting time was a private service and with one of the largest staff numbers in our survey. However, over all respondents, no meaningful relationship between staffing and waiting times was observed. The UK National Health Service's *Implementation guide and resource pack for dementia care*[26] recommends a maximum waiting time of 6 weeks to diagnosis as the minimum standard for memory clinics. Our survey showed that only 43% of cognitive assessment services would be able to offer an initial assessment within 6 weeks, with the majority falling short of this, most likely due to understaffing. Time to initial diagnosis was not assessed in our survey and should be added to future memory clinic surveys.

Indeed, staffing varied largely across memory clinics. Our survey results suggest that the average EFT increased from 1.7 EFT reported in 2009[8] to 2.4 EFT. In an international comparison, however, this staffing allocation is still comparatively low (eg, Ireland[6]: 3.4 EFT). A clinical coordinator position to handle general administration issues was included in only 44% of services. It can be assumed that clinicians in the remaining services must fulfil administrative duties in parallel to their clinical work. This is likely to affect the clinicians' capacity to see more clients for assessment and could potentially add to the delay in establishing a dementia diagnosis.

The composition of memory clinic teams varied widely between clinics, a finding also observed internationally.[6 9 11] The majority of clinics in our study reported the employment of geriatricians (76%). A similar percentage of geriatrician involvement was reported by the latest

memory clinic survey in the Netherlands.[9] With 73%, geriatricians were one of the professions repoted to be frequently involved in memory clinic assessments. Moreover, the Dutch survey [9] reported an even stronger involvement of neurologists (81%) and psychologists (94%). The distribution of professions that responded to our survey differed substantially (psychologists: 24.6%; neurologists: 6.7%). Higher involvement rates for neurologists and psychologists were also reported in memory clinic surveys in the British Isles[11] and Israel,[13] while a distribution similar to the one we observed was reported for memory clinics in Ireland[6] and New Zealand.[15] The distribution of professions reported in this study matches previous results of Woodward and Woodward,[8] who also reported a strong involvement of geriatricians and seems therefore representative for the Australian memory clinic landscape. However, our results may have been influenced by our participation call in the regular newsletter of Australia's largest geriatric society (ANZSGM), while we were unable to use a similar dissemination strategy through other professional associations (eg, Australia and New Zealand Association of Neurologists). Importantly, our survey showed that only a small number of clinics include allied health professionals like occupational therapists (24%) or speech pathologists (12%). A similar observation was made in the Irish memory clinic survey[6] and Israel.[13] We expect this would inevitably restrict post-diagnostic care options provided by these services and should be further assessed.

To gain a first idea of interventions the memory clinics are able to provide themselves, all respondents were asked if their clinic offered any form of cognitive intervention. Our survey showed that less than one-third of respondents (30%) reported that they offer cognitive interventions with the majority only offering a single session. In comparison, a recent survey conducted across memory services in the Netherlands showed that 72% offer some form of psychosocial interventions including cognitive interventions. A more detailed evaluation study would be required to identify which type of cognitive intervention would be most effective and should be recommended. The survey results presented in this paper cannot contribute to this discussion. Nevertheless, we would like to argue that, due to its high specialisation, memory clinics would be generally well equipped for the provision of high-quality and evidence-based cognitive interventions. As outlined in the current Australian 'Clinical Practice Guidelines and Principles of Care for People with Dementia',[24] memory clinics are also encouraged to focus on the diagnostic assessment. Consequently, most of the Australian clinics reported a lack of funding or adequate training to offer more complex post-diagnostic support. This may be one possible reason why post-diagnostic support provided by memory clinics has not been shown to be more effective than GP services.[27] Importantly, we did observe that almost all memory clinics (97%) are able to offer a follow-up appointment. Unfortunately, obtaining more detailed information about the content of these appointments or any other types of interventions that may be provided (eg, pharmacological, lifestyle counselling) was outside the scope of this survey. In how far memory clinics are currently and could generally be involved in a holistic and long-lasting post-diagnostic support is part of a larger discussion about the goals and purpose of memory clinics.[6 28] In Australia, ADNeT, as well as other projects,[29] has been commissioned to address this issue in due course.

There appears to be international agreement on the main components of a comprehensive assessment of dementia and cognitive decline including family and medical history, blood tests and structural neuroimaging, yet notably cognitive assessment protocols remain variable.[6 9 11] Our survey results made a similar observation. We identified more than 100 cognitive test instruments that clinicians use at least 'sometimes' in their assessments. Some agreement was observed in the use of cognitive screens, with the MMSE and clock drawing test being the most commonly used test tools.[9 13 15]

Based on our survey results, we identified the three most commonly used tests across the major cognitive domains (eg, attention, language, memory) and types (eg, self-report, informant-rated, see tables 2 and 3). This forms the basis for the development of a harmonised neuropsychological test protocol. Such a protocol would provide a minimum data set that would be uniform across memory clinics, thereby enabling comparison of practices and outcomes across clinics, the pooling of patient data for joint examination and the ready recruitment nationally for clinical trials. A core minimum data set does not constrain any clinic if there is a wish or need to expand the assessment to meet client and/or service needs.

LIMITATIONS

We aimed to reach as many Australian clinicians who conduct specialised dementia assessments in Australia as possible, to gain a representative overview of current clinical practice across the country. Hence, we used a broad memory clinic definition and allowed for anonymous responses which have been previously reported to be beneficial for large response rates.[30] Due to the anonymity of respondents, we were unable to follow up with individual respondents to clarify their responses and to ensure the best possible data quality. All respondents were asked to answer the questions to the best of their knowledge, and we have no reason to believe that the quality of our data was greatly impacted by this procedure. Nevertheless, it is possible that individual respondents interpreted some questions differently which may have increased the variability in our data. To balance this potential impact, we discussed outliers in the data and statistically controlled for outliers (eg, run statistical analyses with and without outlier data in the sample) to ensure that only robust results are reported.

This survey also aimed to capture how many Australian memory clinic clinicians can offer some form of cognitive

intervention. It is important to acknowledge that some of the interventions that were reported can be included in a standard assessment session (eg, involvement of family members), while others require a separate appointment (eg, memory strategy training) and additional staff and funding. Other types of interventions were also not included in this survey that predominantly focused on assessment tools and procedures. Moreover, our study showed that a large percentage of respondents is able to offer a follow-up session to their clients. However, the exact post-diagnostic support that is provided within these follow-up sessions was not investigated in this survey. A more detailed analysis of the post-diagnostic support that is offered and the resources required to provide it was unfortunately outside the scope of this survey and should be considered for future scoping surveys. Nevertheless, our results show that the provision of non-pharmacological cognitive interventions is not part of the standard services memory clinic clinicians are able to provide. Ways to include memory clinics into a holistic post-diagnostic care should be explored.

CONCLUSION

Since the last national memory clinic surveys in Australia services have expanded noticeably and with the rapidly ageing of the population, the demand for memory clinics is still growing. Our survey results present a picture of considerable heterogeneity in assessment procedures, while identifying some common elements that can be the basis of future harmonisation of practices. This survey is the first step toward an effort to develop standards for memory clinic assessments and post-diagnostic care, such that each individual with cognitive deficits can receive prompt state-of-the-art assessment and care.

All ADNeT initiatives work closely together to achieve these improvements. The ADNeT clinical quality registry will monitor the ongoing improvements of memory clinic procedures through regular feedback and benchmarked outcome measures. Harmonised diagnostic procedures that map onto common research outcomes across memory clinics also facilitate translation of research findings into practice and the clients' participation in research. Memory clinics will be an important entry point into clinical trials as new drugs and therapies are developed with national support through ADNeT trials.

To further the harmonisation of memory clinic procedures, we will employ Delphi methods, including expert opinions from clinicians, researchers, people living with dementia and carers from all Australian states and territories to develop national best practice standards. Furthermore, the survey results confirm the need for better resourcing of memory clinics and cognitive assessment services to further support early diagnosis of dementia and cognitive decline by increasing staff levels to match international standards. With projections of exponentially increasing numbers of people who will develop dementia in the next decades, it is essential that memory services are well equipped in terms of funding and best practices to provide early diagnosis and evidence-based post-diagnostic care.

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Contributors IM designed study method and data collection tools, organised and facilitated data collection, cleaned, analysed and interpreted the data, and drafted and revised the paper. NAK designed the study method and data collection tool, interpreted the data and revised the manuscript for intellectual content. MYO made major contribution to the design of the data collection and reviewed the manuscript. JDC made major contributions to the analyses and interpretation of the data, and revised the manuscript for intellectual content. SLN and PSS designed and conceptualised the study and its methods, interpreted the data and revised the manuscript for intellectual content. All authors read and approved the final manuscript.

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Appendix A

Profession	**# of clinics[X] (%) (max.: 34)**	**Mean EFT (SD)**	**Public** Mean EFT (SD)	**Private** Mean EFT (SD)	**metropolitan** Mean EFT (SD)	**regional** Mean EFT (SD)	**public vs private – *p*^**	**metropolitan vs regional *p*^**
Geriatrician	26 (76%)	1.23 (2.14)	0.77 (1.71)	1.41 (2.51)	1.33 (2.45)	0.39 (0.03)	.163	.274
Clinical coordinator[+]	15 (44%)	0.52 (0.34)	0.32 (0.37)	0.01 (0.03)	0.24 (0.35)	0.24 (0.35)	.020*	.986
Clinical Neuropsychologist	13 (38%)	0.69 (0.59)	0.32 (0.54)	0.11 (0.33)	0.34 (0.55)	0.16 (0.41)	.140	.180
Trainee doctor	10 (29%)	0.68 (1.52)	0.28 (0.49)	0	0.35 (1.13)	0.01 (0.03)	.072	.038*
Registered nurse	9 (26%)	0.78 (0.54)	0.28 (0.49)	0	0.17 (0.33)	0.26 (0.57)	.120	.849
Occupational Therapists	8 (24%)	0.81 (0.59)	0.26 (0.50)	0	0.28 (0.55)	0.06 (0.17)	.163	.377
Social worker	8 (24%)	0.23 (0.16)	0.08 (0.14)	0	0.07 (0.12)	0.04 (0.13)	.154	.199
Psychiatrist	6 (18%)	0.28 (0.36)	0.07 (0.20)	0	0.07 (0.22)	0.01 (0.05)	.298	.416
Clinical Psychologist	4 (12%)	0.63 (0.40)	0.10 (0.27)	0	0.03 (0.08)	0.14 (0.34)	.489	.416
Speech Pathologist	4 (12%)	0.16 (0.16)	0.03 (0.08)	0	0.01 (0.03)	0.03 (0.11)	.489	.743
Neurologist	3 (9%)	0.20 (0.10)	0.02 (0.07)	0	0.03 (0.08)	0	.618	.478
Rehabilitation Physician	1 (3%)	0.30	n/a	n/a	n/a	n/a	n/a	n/a
Aged Care Physician	1 (3%)	0.30	n/a	n/a	n/a	n/a	n/a	n/a
Consultant Physician	1 (3%)	0.20	n/a	n/a	n/a	n/a	n/a	n/a
General Practitioner	1 (3%)	0.20	n/a	n/a	n/a	n/a	n/a	n/a

EFT = effective full time (1.0 = 35 hours/ week).

[X] # of clinics who reported that this profession is part of their team

[+] paid time uniquely dedicated to clinic administration tasks

^ Mann-Whitney-U test used due to skewed data

* significant p value, p<.05

Appendix B

	All	metro-politan	regional	Chi-square (p)/ t (p)^^	public	private	Chi-square (p)/ t (p)^^
All respondents involved in clinical assessments (n)	**140**	**99**	**41**		**116**	**24**	
Self-reported measures	**90%**	**92%**	**80%**	4.59 (.03)*	**90%**	**83%**	1.07 (.30)
1) GDS (15 items)	2.9 (1.4)^	3.0 (1.4)	2.9 (1.4)	0.13 (.90)	2.9 (1.4)	3.2 (1.4)	0.95 (.35)
2) DASS (21 items)	4.1 (1.3)	4.2 (1.2)	3.7 (1.6)	1.70 (.10)	4.1 (1.3)	4.1 (1.4)	0.07 (.94)
3) Epworth Sleepiness Scale	4.5 (0.8)	4.5 (0.8)	4.5 (0.7)	0.12 (.90)	4.5 (0.7)	4.5 (0.9)	-0.40 (.70)
Informant-rated measures	**55%**	**51%**	**66%**	1.51 (.22)	**56%**	**50%**	0.38 (.54)
1) IQCODE	3.4 (1.6)	3.6 (1.6)	3.1 (1.6)	1.34 (.19)	3.4 (1.6)	3.6 (1.3)	0.45 (.66)
2) CBI-R	4.4 (1.1)	4.4 (1.1)	4.4 (1.1)	-0.08 (.93)	4.4 (1.2)	4.8 (0.6)	1.71 (.10)
3) Zarit Burden	4.4 (1.3)	4.2 (1.4)	4.7 (1.0)	-1.49 (.14)	4.3 (1.3)	4.8 (0.9)	1.42 (.17)
Clinician-rated measures	**30%**	**29%**	**32%**	0.02 (.90)	**29%**	**33%**	0.09 (.76)
1) Clinical Dementia Rating	3.7 (1.4)	3.8 (1.3)	3.6 (1.6)	0.33 (.74)	3.7 (1.4)	3.6 (1.5)	-0.27 (.80)
2) Neuropsychiatric Inventory	3.7 (1.5)	3.5 (1.5)	4.2 (1.3)	-1.56 (.13)	3.6 (1.6)	4.1 (0.6)	1.60 (.12)
3) Hamilton Depression Rating	4.7 (0.8)	4.7 (0.9)	4.8 (0.4)	-0.70 (.50)	4.7 (0.9)	4.7 (0.5)	-0.9 (.93)
Subjective Cognitive Concerns	**14%**	**13%**	**15%**	0.04 (.85)	**14%**	**13%**	0.03 (.85)
1) IQCODE	3.0 (1.6)	3.2 (1.7)	2.8 (1.5)	0.42 (.68)	2.9 (1.7)	3.7 (0.58)	1.35 (.21)
2) ECog (Self)	4.8 (0.7)	4.7 (0.9)	5.0 (0.0)	-1.30 (.22)	4.8 (0.8)	5.0 (0)	1.29 (.22)
3) ECog (Informant)	4.8 (0.7)	4.8 (0.8)	5.0 (0.0)	-0.67 (.51)	4.8 (0.8)	5.0 (0)	1.00 (.33)
Cognitive Screening	**99%**	**99%**	**100%**	0.04 (.84)	**100%**	**100%**	0.99 (.32)
1) Clock drawing	2.2 (1.3)	2.1 (1.3)	2.4 (1.5)	-1.22 (.22)	2.2 (1.3)	2.4 (1.6)	0.70 (.49)
2) MMSE	2.3 (1.4)	2.2 (1.3)	2.7 (1.6)	-1.87 (.07)	2.3 (1.4)	2.6 (1.5)	1.11 (.28)
3) MoCA	3.5 (1.3)	3.6 (1.3)	3.4 (1.4)	0.50 (.62)	3.5 (1.2)	3.5 (1.5)	-0.26 (.80)
Neuropsychological Measures							
	All	**metro-politan**	**regional**	**Chi-square (p)/ t (p)^^**	**public**	**private**	**Chi-square (p)/ t (p)^^**
n	**59**	**42**	**17**		**51**	**8**	
Premorbid function	**76%**	**79%**	**71%**	0.20 (.65)	**76%**	**75%**	0.35 (.55)
1) TOPF	3.1 (1.6)	**3.2 (1.5)**	**2.6 (1.7)**	1.19 (.25)	3.1 (1.6)	2.8 (1.5)	-0.41 (.69)
2) WAIS-IV Vocabulary	4.0 (1.4)	4.2 (1.2)	3.3 (1.6)	1.90 (.08)	4.0 (1.4)	3.7 (1.5)	-0.51 (.63)
3) NART	4.4 (1.2)	4.3 (1.3)	4.8 (0.4)	-2.21 (.03)*	4.5 (1.1)	3.8 (1.6)	-1.01 (.36)
Processing Speed	**86%**	**90%**	**76%**	2.03 (.16)	**86%**	**88%**	0.01 (.93)
1) Trail Making A	2.1 (1.1)	**2.2 (1.2)**	**1.9 (0.9)**	0.76 (.45)	2.0 (1.1)	2.6 (1.4)	1.0 (.35)
2) WAIS-IV Coding	3.1 (1.5)	3.1 (1.6)	3.1 (1.5)	0.06 (.95)	3.1 (1.5)	3.0 (1.6)	-0.17 (.86)
3) WAIS-IV Symbol Search	3.1 (1.5)	3.6 (1.5)	3.1 (1.5)	1.05 (.31)	3.5 (1.5)	3.1 (1.8)	-0.51 (.63)
Attention/ Working Memory	**81%**	**83%**	**76%**	0.78 (.54)	**80%**	**87%**	0.23 (.63)
1) Digit span (2 subtests)	3.0 (1.8)	3.1 (1.8)	2.9 (1.8)	0.36 (.72)	3.0 (1.8)	3.3 (1.9)	0.44 (.67)
2) Digit span (3 subtests)	3.4 (1.5)	3.3 (1.6)	3.5 (1.5)	-0.45 (.66)	3.5 (1.5)	2.6 (1.7)	-1.36 (.21)

3) TEA	4.5 (1.1)	4.8 (0.6)	4.2 (1.0)	2.05 (.06)	4.6 (0.7)	4.9 (0.4)	1.22 (.24)
Memory	**80%**	**83%**	**71%**	1.21 (.27)	**80%**	**75%**	0.12 (.73)
1) WMS-IV Logical Memory	2.8 (1.6)	**2.9 (1.6)**	**2.5 (1.6)**	0.71 (.49)	2.9 (1.7)	2.3 (1.2)	-0.93 (.38)
2) Rey Complex figure (30min)	3.2 (1.6)	3.0 (1.6)	3.8 (1.4)	-1.62 (.12)	3.2 (1.6)	3.3 (1.9)	0.23 (.82)
3) WMS-IV Visual Reproduction	3.3 (1.5)	3.4 (1.6)	2.8 (1.4)	1.17 (.25)	3.3 (1.6)	3.0 (1.4)	-0.47 (.66)
Language	**92%**	**93%**	**88%**	0.33 (.56)	**90%**	**100%**	0.86 (.36)
1) Category Fluency (Animals)	1.9 (1.2)	1.8 (1.1)	2.3 (1.3)	-1.46 (.16)	1.9 (1.1)	2.1 (1.4)	0.46 (.66)
2) COWAT (FAS)	2.5 (1.6)	2.3 (1.6)	2.8 (1.7)	-0.92 (.37)	2.4 (1.6)	2.6 (1.7)	0.30 (.77)
3) Boston Naming (60items)	3.0 (1.4)	2.8 (1.4)	3.7 (1.3)	-2.34 (.03)*	3.0 (1.4)	3.4 (1.8)	0.60 (.56)
Visuo-spatial	**97%**	**98%**	**94%**	0.45 (.50)	**96%**	**100%**	0.33 (.57)
1) Clock drawing	2.2 (1.3)	2.1 (1.3)	2.4 (1.4)	-0.74 (.46)	2.0 (1.2)	2.9 (1.8)	1.26 (.24)
2) Rey Complex figure (copy)	2.5 (1.5)	2.3 (1.5)	3.0 (1.6)	-1.45 (.16)	2.5 (1.6)	2.6 (1.6)	0.22 (.83)
3) Cube copying/ drawing)	2.7 (1.5)	2.7 (1.5)	2.6 (1.4)	0.20 (.84)	2.7 (1.5)	2.8 (1.5)	0.14 (.90)
Executive Function	**92%**	**90%**	**94%**	0.21 (.65)	**90%**	**100%**	0.86 (.36)
1) Trail Making B	2.2 (1.2)	2.2 (1.1)	2.3 (1.3)	-0.41 (.68)	2.2 (1.2)	2.1 (1.3)	-0.20 (.85)
2) WAIS-IV Similarities	2.9 (1.7)	2.8 (1.6)	3.1 (1.7)	-0.59 (.56)	2.8 (1.7)	3.0 (1.8)	0.26 (.80)
3) Stroop (DKEFS)	4.1 (1.3)	4.2 (1.4)	4.0 (1.2)	0.49 (.63)	4.2 (1.3)	3.6 (1.7)	-0.95 (.37)
Social Cognition	**14%**	**12%**	**18%**	0.34 (.56)	**16%**	**0**	1.45 (.23)
1) Reading the Mind in the Eyes	4.1 (0.6)	4.0 (0.7)	4.3 (0.6)	-0.73 (.50)	4.1 (0.6)	n/a	n/a
2) The Awareness of Social Interference Test	4.4 (0.7)	4.6 (0.5)	4.0 (1.0)	0.96 (.42)	4.4 (0.7)	n/a	n/a
3) Facial Expressions of Emotion / Ekman Faces	4.9 (0.4)	4.8 (0.4)	5.0 (0)	-1.00 (.37)	4.9 (0.4)	n/a	n/a
Effort	**51%**	**48%**	**59%**	0.61 (.44)	**51%**	**50%**	0.00 (.96)
1) WAIS-IV embedded measure reliable digit span	4.0 (1.1)	4.3 (0.9)	3.4 (1.3)	2.03 (.06)	4.2 (1.0)	2.8 (1.0)	-2.8 (.05)*
2) WAIS-IV embedded measure logical Memory, delayed recognition	4.1 (1.0)	4.3 (0.9)	3.8 (1.1)	1.09 (.29)	4.2 (0.9)	3.8 (1.5)	-0.52 (.63)
3) Advanced Clinical Solutions – word choice	4.1 (1.0)	4.3 (0.9)	3.8 (1.1)	1.21 (.25)	4.3 (0.8)	3.0 (1.4)	-1.80 (.16)

^ the values refer to the mean rating on the Likert Scale (1=always; 2=most of the time; 3=about half the time; 4=sometimes; 5=never/rarely)

^^ chi-square applies for nominal data describing if assessments of a particular type were conducted (highlighted in green) / t-tests were performed for to determine differences in test use across different clinical settings

** highlights a significant difference p<.05*

Appendix C

ADNeT Chief Investigators	
ADNeT Chief Investigators	**Principal Institution**
Christopher Rowe	The University of Melbourne
Perminder Sachdev	University of New South Wales
Sharon Naismith	University of Sydney
Michael Breakspear	The Council of the Queensland Institute of Medical Research
Henry Brodaty	University of New South Wales
Kaarin Anstey	Neuroscience Research Australia
Ralph Martins	Macquarie University
Stephanie Ward	University of New South Wales
James Vickers	University of Tasmania
Colin Masters	The University of Melbourne

ADNeT Associate Investigators	
ADNeT Associate Investigators	**Principal Institution**
Peter Schofield	Neuroscience Research Australia
Rob Grenfell	The Council of the Queensland Institute of Medical Research
Susan Kurrle	University of Sydney
Elizabeth Beattie	Queensland University of Technology
Ashley Bush	Florey Institute of Neuroscience and Mental Health
Maria Crotty	Flinders University
Annette Dobson	University of Queensland
Leon Flicker	University of Western Australia
Paul Maruff	The University of Melbourne
John McNeil	Monash University
Peter Nestor	University of Queensland
Olivier Salvado	University of Queensland
Susannah Ahern	Monash University